A Comparison of Chesapeake Bay Estuary Model Calibration With 1985 - 1994 Observed Data and Method of Application to Water Quality Criteria

Prepared by the Modeling Subcommittee of the Chesapeake Bay Program

November 2002
A Comparison of Chesapeake Bay Estuary Model Calibration With 1985 - 1994 Observed Data and Method of Application to Water Quality Criteria

A Report of the
Modeling Subcommittee
Chesapeake Bay Program Office
Annapolis, MD

November, 2002
Principal Authors

Lewis C. Linker
U.S. EPA Chesapeake Bay Program Office
Annapolis, MD

Gary W. Shenk
U.S. EPA Chesapeake Bay Program Office
Annapolis, MD

Ping Wang
UMCES, Chesapeake Bay Program Office
Annapolis, MD

Carl F. Cerco
U.S. Army Corps of Engineers
Waterways Experiment Station
Vicksburg, MS

Arthur J. Butt
Department of Environmental Quality
Richmond, VA

Peter J. Tango
Department of Natural Resources
Annapolis, MD

Robert W. Savidge
Chesapeake Research Consortium
Edgewater, MD
Table of Contents

Section 1
Overview of Problem and Description of Methods..........................................................5

Section 2
Applying The Chesapeake Water Quality Model (CBWQM) To Proposed Water Quality
Criteria.........................................................................................................................8

Section 3
Comparison of Model Estimates to Observations for DO, Chlorophyll, and Clarity…24

Main Stem  
CB1TF...................................................................................................................27  
CB2OH....................................................................................................................43  
CB3MH...................................................................................................................65  
CB4MH...................................................................................................................99  
CB5MH.................................................................................................................130  
CB6PH...................................................................................................................161  
CB7PH...................................................................................................................180  
CB8PH...................................................................................................................199  

Patuxent  
PAXTF...............................................................................................................212  
PAXOH...................................................................................................................228  
PAXMH...................................................................................................................244  

Potomac  
POTTF...............................................................................................................269  
POTOH...................................................................................................................285  
POTMH...................................................................................................................301  

Rappahannock  
RPPTF...............................................................................................................338  
RPPOH...................................................................................................................354  
RPPPMH...............................................................................................................370  

York  
MPNTF...............................................................................................................395  
MPNOH...............................................................................................................411  
PMKOH...............................................................................................................427  
PMKTF...............................................................................................................443  
YRKMT...............................................................................................................459  
YRKPH...............................................................................................................478  
PIAMH...............................................................................................................497  
MOBPH...............................................................................................................510  

James  
JMSTF...............................................................................................................529  
JMSOH...............................................................................................................545  
JMSMH...............................................................................................................561  
JMSPH...............................................................................................................580  

East Shore  
EASMH...............................................................................................................593  
CHOOH...............................................................................................................612  
CHOMH1...........................................................................................................628  
CHOMH2...........................................................................................................641  
TANMH...............................................................................................................657  
POCMH...............................................................................................................670
Section 1. Overview of Problem and Description of Methods

A comparison of modeling and monitoring data to examine model bias is the initial step in the application of the Chesapeake Bay Water Quality Model (CBWQM)) to proposed water quality criteria. The proposed water quality criteria include dissolved oxygen (DO), clarity, and chlorophyll, each with fixed concentrations, durations, and frequency within specific regions of the Bay.

Data comparison is based on all available mainstem and tributary monitoring data from 1985 to 1994 - the full ten years of model calibration. Comparing the CBWQM estimates of DO, clarity, and chlorophyll to observations is used to detect uncertainty in the model calibration. A methodology is described in Section 2, to correct for systematic model errors in the three proposed water quality criteria. The methodology is applied to all regions of the Bay.

Each observation of the three proposed water quality criteria is compared to a model computation taken at the same time and location in model space. The comparison is made only for the critical season of each of the proposed water quality criteria, e.g., March-May for the spring criteria of chlorophyll, and July-August for the summer criteria of chlorophyll. Comparisons are made for each proposed criteria at each CB Criteria Segment (CBCS). A CBCS is here defined as an area delineated by the planer boundaries of a CB segment, and temporally and spatially by the definitions of the proposed water quality criteria for DO, chlorophyll, or clarity. Table 1 lists the Chesapeake Bay (CB) segments assessed by this report and the associated monitoring stations.

Table 1. CB Segments and Monitoring Stations.

<table>
<thead>
<tr>
<th>REGION SEGMENT</th>
<th>CB CRITERIA</th>
<th>STATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainstem CB1TF</td>
<td>CB1.1, CB2.1</td>
<td></td>
</tr>
<tr>
<td>CB2OH</td>
<td>CB2.2, CB3.1</td>
<td></td>
</tr>
<tr>
<td>CB3MH</td>
<td>CB3.2, CB3.3W, CB3.3C, CB3.3E</td>
<td></td>
</tr>
<tr>
<td>CB4MH</td>
<td>CB4.1C, CB4.1E, CB4.1W, CB4.2E, CB4.2C, CB4.2W, CB4.3W, CB4.3E, CB4.3C, CB4.4</td>
<td></td>
</tr>
<tr>
<td>CB5MH</td>
<td>CB5.1W, CB5.1, CB5.2, CB5.3, CB5.4, CB5.4W, CB5.5</td>
<td></td>
</tr>
<tr>
<td>CB6PH</td>
<td>CB6.1, CB6.2, CB6.3, CB6.4</td>
<td></td>
</tr>
</tbody>
</table>
Table 1 (continued). CB Segments and Monitoring Stations.

<table>
<thead>
<tr>
<th>REGION</th>
<th>SEGMENT</th>
<th>STATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7PH</td>
<td>EE3.5,</td>
<td>CB7.1N, CB7.1, CB7.1S, CB7.2E,</td>
</tr>
<tr>
<td></td>
<td>CB7.2,</td>
<td>CB7.3E, CB7.3, CB7.4N</td>
</tr>
<tr>
<td></td>
<td>CB7.4,</td>
<td>CB8.1, CB8.1E</td>
</tr>
<tr>
<td></td>
<td>CB8PH</td>
<td></td>
</tr>
<tr>
<td>Patuxent</td>
<td>PAXTF</td>
<td>TF1.3, TF1.4, TF1.5</td>
</tr>
<tr>
<td></td>
<td>PAXOH</td>
<td>TF1.6, TF1.7</td>
</tr>
<tr>
<td></td>
<td>PAXMH</td>
<td>RET1.1, LE1.1, LE1.2, LE1.3,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LE1.4</td>
</tr>
<tr>
<td>Potomac</td>
<td>POTTF</td>
<td>TF2.1, TF2.2, TF2.3, TF2.4</td>
</tr>
<tr>
<td></td>
<td>POTOH</td>
<td>RET2.1, RET2.3, RET2.2</td>
</tr>
<tr>
<td></td>
<td>POTMH</td>
<td>RET2.4, LE2.2, LE2.3</td>
</tr>
<tr>
<td>Rappahannock</td>
<td>RPPTF</td>
<td>TF3.1D, TF3.1A, TF3.1E, TF3.1B,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TF3.2, TF3.2A</td>
</tr>
<tr>
<td></td>
<td>RPPOH</td>
<td>TF3.3</td>
</tr>
<tr>
<td></td>
<td>RPPM</td>
<td>RET3.1, RET3.2, LE3.1, LE3.2,</td>
</tr>
<tr>
<td></td>
<td>PMH</td>
<td>LE3.4, LE3.6</td>
</tr>
<tr>
<td>York</td>
<td>MPNTF</td>
<td>TF4.4, TF4.4A</td>
</tr>
<tr>
<td></td>
<td>MPNOH</td>
<td>RET4.2</td>
</tr>
<tr>
<td></td>
<td>PMKTF</td>
<td>TF4.2, TF4.1A</td>
</tr>
<tr>
<td></td>
<td>PMKOH</td>
<td>RET4.1</td>
</tr>
<tr>
<td></td>
<td>YRKM</td>
<td>RET4.3, LE4.1</td>
</tr>
<tr>
<td></td>
<td>YRKPH</td>
<td>LE4.2, LE4.3</td>
</tr>
<tr>
<td></td>
<td>PIAM</td>
<td>LE3.7</td>
</tr>
<tr>
<td></td>
<td>MOBPH</td>
<td>WE4.1, WE4.2, WE4.3, WE4.4</td>
</tr>
<tr>
<td>James</td>
<td>JMSTF</td>
<td>TF5.2, TF5.2A, TF5.3, TF5.5,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TF5.5A, TF5.6</td>
</tr>
<tr>
<td></td>
<td>JMSOH</td>
<td>RET5.2, LE5.1</td>
</tr>
<tr>
<td></td>
<td>JMSMH</td>
<td>LE5.2, LE5.3</td>
</tr>
<tr>
<td></td>
<td>JMSPH</td>
<td>LE5.5, LE5.4</td>
</tr>
<tr>
<td>East Shore</td>
<td>EASMH</td>
<td>EE1.1</td>
</tr>
<tr>
<td></td>
<td>CHOOO</td>
<td>ET5.1</td>
</tr>
<tr>
<td></td>
<td>CHOMH1</td>
<td>EE2.1</td>
</tr>
<tr>
<td></td>
<td>CHOMH2</td>
<td>ET5.2</td>
</tr>
<tr>
<td></td>
<td>TANMH</td>
<td>EE3.1, EE3.2</td>
</tr>
<tr>
<td></td>
<td>POCMH</td>
<td>EE3.3, EE3.4</td>
</tr>
</tbody>
</table>
For each of the CB segments, and for each of the criteria, the comparison includes scatter plots, cumulative plots, regressions, and reporting of summary statistics for computed and observed data. A regional map of the CB segment with the associated monitoring stations used in the analysis is included.

Dissolved oxygen is evaluated for the protection of migratory fish, open water, deep water, deep channel, and deep channel anoxic criteria. Different CBCSs have different DO criteria. Some segments lack the depth of deep and channel designated uses, while other segments do not require protection of the migratory fish resource. In all CB segments listed in Table 1, two seasons, spring and summer, are evaluated for chlorophyll. Clarity (ke or light attenuation) is also evaluated in all CB segments. Table 2 lists the criteria evaluated in each CB segment.

Table 2. Criteria Evaluated In Each CB Segment.
Section 2. Applying The Chesapeake Water Quality Model (CBWQM) And Observed Data To Proposed Water Quality Criteria

The Chesapeake 2000 nutrient and sediment allocations will be based on load allocation process requires that specific water quality conditions being met over critical time periods within CBCSs. These CBCSs are given either a ‘pass’ or ‘fail’ status. While the CBWQM can estimate changes in water quality due to changes in input loads with reasonable accuracy, an exact match of the simulated and observed data is impossible.

This section describes the way the criteria attainment and load allocation process uses the strengths of both the CBWQM and the observations. The observed data is used to assess criteria attainment during a ‘base’ period corresponding to the years of calibration for the CBWQM, 1985-1994. The CBWQM is used in scenario mode to determine the effect of changes in nutrient and sediment loads on water quality concentrations. A modified 1985-1994 observed data set is generated for each scenario using both the model and the observations. The same criteria attainment assessment process applied to the observed data is then applied to this ‘scenario’ data to determine likely criteria attainment under modified loading scenarios.

MODEL AGREEMENT WITH DATA

An extensive calibration and review process enabled a better calibration of the CBWQM than possible with earlier versions. The CBWQM was judged to be sufficiently calibrated for application to the Chesapeake Bay and its major tidal tributaries in January, 2002 by the Modeling Subcommittee; however, as Figure 1 illustrates, even a well calibrated model will not always match the monitored data when evaluating the pass/fail metric of a water quality criterion. Figure 1 shows hypothetical frequency plots for model calibration output and observed data in a CBCS decision area.

**FIGURE 1. Hypothetical Frequency Distribution of Observed and Model Calibration Data in CB5 for the Deep Channel Criterion**

- **Data**
- **Model**
In the Figure 1 hypothetical, we are showing dissolved oxygen in the Deep Channel portion of Chesapeake Bay mainstem segment of CB5 during the period the Deep Channel DO criterion is applied, May 1 through September 30. From this graph one could infer, subject to other calibration measures, that the model was estimating the observed data fairly well, since it matches the mean, approximates the range, and has the same characteristic shape. Despite the acceptable calibration, if the criterion was set so that this decision area must have a dissolved oxygen concentration of less than 2 mg/l no more than 10 percent of the time, using the model would lead to a ‘pass’, while using the data would lead to a ‘fail’.

Given that discrepancies exist in the determination of criteria attainment between the CBWQM and monitored data, it is appropriate to use the more accurate monitored data to assess attainment. The CBWQM must be used, however, to assess the relative changes in water quality due to management actions that have not yet occurred, that is, to link management actions, actual or planned, recommended or merely proposed, to water quality. To assess water quality criteria in the Chesapeake, a synergy of the monitoring and modeling strengths, a combination of the comparative accuracy of the monitored data and the ability of the CBWQM to predict changes, is used.

OVERVIEW OF METHODOLOGY

When a CBWQM scenario is run, we can compare the water quality output of the scenario to the water quality output of the calibration over any time or space scale within the model domain. Figure 2 shows the hypothetical output of a CBWQM scenario with aggressive management to reduce loads compared with the same CBWQM output for the calibration. These are shown on a frequency plot so that changes in the prediction of attainment can be seen along with the blue line of the observed data. Figure 3 shows the relationship between the calibration and scenario CBWQM output in more analytical detail. By regressing the scenario output against the calibration output, we can find a relationship that can be used to transform the observed data set.
Once the relationship between the calibration and any particular scenario is established, this relationship is used to generate an “observed” data set for the scenario (Figure 4). The value of each observation of dissolved oxygen, chlorophyll, and light extinction in the 1985-1994 data set is replaced with a ‘scenario-modified’ value. The ‘scenario-modified’ values represent an estimate of an observed data set under the conditions of nutrient and sediment management represented by the scenario.

**FIGURE 4.** Example of the Regression Equation applied to the Observed

Figure 5 shows the flow of information for determining criteria attainment under two scenarios. The base criteria attainment is determined based solely on observations. The CBWQM is used in conjunction with this data set to generate a ‘scenario data set’ for each scenario by a sequence of steps which include generation of regressions, spatial distribution of model data with an interpolator, and examination of criteria exceedance in space and time with a cumulative frequency distribution. These steps as discussed in more detail below.
REGRESSION DEVELOPMENT

Criteria attainment judgements are made for CBCS decision areas for specific times of the year. The CBWQM has water quality values for more than 13,000 points, or cells, within the model domain, and on average about 400 for each CB segment on a daily basis. To make the modification of the original data set and generate the scenario data set, it is necessary to 1) choose a particular space and time domain over which regressions will be run, 2) choose an appropriate distribution, i.e., log or normal distribution, and 3) to examine the need for multiple regressions to find the most appropriate relationships between the CBWQM calibration and scenario CBWQM runs.

The model cells corresponding to the monitoring stations were chosen as the most appropriate scale as the assessment of progress and attainment of the water quality criteria will be assessed at the monitoring stations on a three year running average of monitoring data. This is consistent with the principal of “planning load reductions with the model, testing achievement of the criteria with the monitoring data.” The same methodology for assessing water quality criteria using the Spatial Interpolator Model and the Cumulative Frequency Distribution (CFD) is used for both the planning and determination of the nutrient and sediment allocations (model) and testing of achievement of the water quality criteria by 2010 (monitoring data). This ensures...
consistency between the model planning approach and the monitoring assessment approach. As monitoring data is expanded into the shallows in future years, the next version of the CBWQM, planned for completion in 2006, will incorporate the expanded monitoring set in a consistent manner.

The aggregation of time is on a monthly scale in the regression between the CBWQM calibration and scenario CBWQM runs. A monthly scale uses the data points for all paired average daily values of the calibration and the scenario. This has the advantage of having a sufficient number of points (about 30, corresponding to days in the month) to establish each regression while using an appropriate temporal scale which takes into account other seasonally changing influences like temperature’s effect on reaction rates and physical processes, such as the saturation of DO in water. In addition, a monthly scale of aggregation for each month in the ten year period, i.e., 120 months, takes into account management actions influencing water quality, such the reductions of loads from point sources though the 1985 to 1994 period, as well as the changes in loads from hydrology, NPS management actions, and other changes through time. Aggregating to a coarser scale would lose temporal detail without improving the regressions.

Multiple regressions were examined extensively, but were statistically shown to improve the regressions marginally, while adding additional complexity and uncertainty of the coefficients, so that a single regression of each water quality parameter was chosen (Modeling Subcommittee Minutes - July, 2002). Based on the underlying distribution of the model results, a log-log regression was chosen for the clarity and chlorophyll parameters. Dissolved oxygen displayed a normal distribution and an untransformed regression was chosen for this parameter. Final regressions for each criterion, cell, and month can be found at ftp://ftp.chesapeakebay.net/modeling/modmon_files/regressions/

SPATIAL INTERPOLATOR
Once the scenario data are adjusted, the Spatial Interpolator Model is applied to estimate the extent of the adjusted values of DO, clarity, and chlorophyll in the CB segment. The CB segment level is the smallest spatial level for the application of the draft water quality criteria. The interpolator is run for each month and the average monthly value is assessed at each cell of the Spatial Interpolator Model as a “pass/fail” for the draft water quality criteria. Information of the Spatial Interpolator Model can be found at http://www.chesapeakebay.net/cims/interpolator.htm

CUMULATIVE FREQUENCY DISTRIBUTION (CFD)
The collection of “pass/fail” cells in the months covered by the water quality criteria is aggregated into a cumulative frequency function (CDF) representing the seasonal attainment of the water quality criteria as expressed as a percent. Details of the CDF methodology can be found in a presentation called “CFD_description-10_02.ppt”, available for download from this FTP folder (just cut & paste the following URL into the address bar on your internet browser, and right click to download): ftp://ftp.chesapeakebay.net/Modeling/modmon_files/
ASSESSMENT OF THE CHESAPEAKE WATER QUALITY MODEL (CBWQM) TO EVALUATE PROPOSED WATER QUALITY CRITERIA

Within the context of the regression – interpolator - CFD method, it is useful to assess the degree of model calibration in each designated use region areas where the model will be applied based on the accuracy of the unadjusted model output in matching the observed data.

To assess the model calibration a strict one-to-one comparison is made between the observed and simulated data, compared at the same time (observed and simulated) and space (real and virtual). Tables 2 and 1 describe the proposed designated use regions, the criteria evaluated in each segment, and the monitoring stations used respectively. Based on a set of empirical decision rules, the relative "goodness" or “skill” of model calibration to the observed data was determined.

In order to assess the skill of the Chesapeake Bay Water Quality Model (CBWQM) calibration based on comparisons of unadjusted simulated and observed data, a set of empirical decision rules were developed. Based on the decision rules, the proposed designated use regions were rated as "high certainty", "moderate certainty", or "low certainty". The rating was determined by relative performance of the predicted compared to observed metrics under each set of rules.

One comparison between the observed and simulated data is the central tendency, the mean or median, of the data. Another is the dispersion, or standard deviation. Range comparisons of the minimum or maximum were also employed, as well as examination of the frequency and scatter plots. Combined, the summary statistics and statistical plots were used to determine a relative confidence estimate of model calibration. Best professional judgement was used in cases where most, but not all, of the criteria were met. While the criteria of migratory, deep water, and deep channel is applied for the entire year, emphasis in this evaluation was placed on the periods critical for the living resources protected by the criteria. Evaluation of the migratory criteria emphasized the late winter/spring period, while still considering the entire year. In the same way, the dissolved oxygen deep water and deep channel emphasized the summer period. The decision rules yielded equivalent results when three of the authors applied them independently. The decision rules were:

**DO**:
- \( R^2 > 0.5 \) desirable,
- Mean differences not greater than 1.0 mg/l (or roughly 10%),
- Minimum concentrations do not differ by more than 2.0 mg/l,
- Standard deviations do not differ by more than 0.5, and
- Best professional judgement.

**Chlorophyll**
- \( R^2 > 0.2 \) desirable,
- Mean differences not greater than two times the concentration,
- Maximum concentrations do not differ by more than 20.0 ug/l,
- Standard deviations do not differ by more than three times the other standard deviation, and
Best professional judgement.

Water clarity
R^2 > 0.2 desirable,
Mean differences not greater than two times the concentration,
Maximum concentrations do not differ by more than two times Ke,
Standard deviations do not differ by more than two standard deviations, and
Best professional judgement.

A summary of the relative confidence in model calibrations to observed data is provided in Table 3.

Table 3. Relative Assessment of CBWQM Calibration – Unadjusted Model Estimates.

<table>
<thead>
<tr>
<th>CB Segment</th>
<th>Migratory Feb-June</th>
<th>Open Water all year</th>
<th>Dissolved Oxygen Deep Water</th>
<th>Chlorophyll a Spring</th>
<th>Chlorophyll a Summer</th>
<th>Water Clarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB1TF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB2OH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB3MH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB4MH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB5MH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB6PH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB7PH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CB8PH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PAXTF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PAXOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PAXMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PTTTF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PTOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>POTOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>POT7H</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RPPTF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RPOOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RPPMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>MPNTF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>MPNOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PMKTF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PMKOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>YRKMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>YRKH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PIAMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>MOBPH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>JMSTF</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>JMSOH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>JMSMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>JMSPH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>EASMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CHOHH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CHOMH2</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CHOMH1</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>TANMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>POCMH</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Key
- High Certainty
- Moderate Certainty
- Low Certainty
Most of the migratory DO regions received high to moderate scores with only the MPNTF and CHOOH receiving “low certainty” scores. All the open water DO regions received high to moderate scores. Deep Water DO also received all high to moderate scores, with the exception of CB5MH and CB6PH. In the case of Deep Channel DO, the only segment that received a low score was CB5MH. Spring chlorophyll was estimated to have low certainty in the regions of PAXOH, RPPTF, RPPOH, JMSMH, and CHOMH2, otherwise high to moderate certainty was estimated. Summer chlorophyll was estimated to have low certainty in the regions of CB3MH, PAXTF, PAXOH, POTOH, RRPTF, PMKOH, JMSOH, JMSPH, EASMH, CHOOH, and CHOMH2. Water clarity was rated as a high or moderate certainty in all regions with the exception of PMKTF. Figures 6-12 represent the information of Table 3 in a spatial format, showing the extent of the different regions of high, moderate, and low certainty for the DO, chlorophyll, and clarity criteria.
Relative Assessment of the CBWQM Calibration Dissolved Oxygen - Migratory Criteria

Relative Model Confidence

- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY
Figure 7
Relative Assessment of the CBWQM Calibration
Dissolved Oxygen - Open Water Criteria

Relative Model Confidence
- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY
Figure 8
Relative Assessment of the CBWQM Calibration
Dissolved Oxygen - Deep Water Criteria

Relative Model Confidence
- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY
Relative Assessment of the CBWQM Calibration
Dissolved Oxygen - Deep Channel Criteria

Relative Model Confidence
- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY
Relative Assessment of the CBWQM Calibration Chlorophyll a - Spring Criteria

Relative Model Confidence

- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY

[Map of the area with color coding for relative model confidence]
Figure 11
Relative Assessment of the CBWQM Calibration Chlorophyll a - Summer Criteria

Relative Model Confidence
- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY
Relative Assessment of the CBWQM Calibration
Water Clarity Criteria

Relative Model Confidence
- NOT APPLICABLE
- HIGH CERTAINTY
- MODERATE CERTAINTY
- LOW CERTAINTY

Chesapeake Bay Program
SUMMARY:
All models have uncertainty. Uncertainty is addressed in the application of the CBEMP to proposed water quality criteria by 1) a water quality model in continuous use and refinement in the Chesapeake Bay for more than a decade and a half with demonstrable improvements in scale, model calibration, and model capability; 2) an adjustment methodology which takes into account the degree of model calibration skill and by application of regression and spatial interpolation, adjusts model output to best estimate achievement of the proposed water quality criteria; and 3) a cumulative frequency distribution which accounts for violation of the proposed criteria over time and space and allows for exceedences of criteria up to 10% of time and space while still protecting living resources within the designated use.

Application of the CBEMP is recommended for all CBCSs and all criteria, but in CBCSs with low certainty, interpretation of model responses should proceed with more caution due to lower confidence in model predictions for those temporal and spatial domains. An example would be the deep channel DO estimates in CB5 where the model overestimates dissolved oxygen. The regression-spatial interpolator method adjust the estimated DO down, to be more consistent with the observed data, but the anoxic response of the sediment is not simulated; i.e., the first order correction of adjusting the model output down is addressed but the second order effects of a reduced anoxic effect from the sediment is not.
Section 3. Comparison of Model Estimates to Observations for DO, Chlorophyll, and Clarity

Model estimates are compared to observations using the model cell corresponding to each monitoring station observation and depth. The observations, which are essentially instantaneous, are compared to the mean daily model estimate. This is a difficult evaluative test of model estimates as even slight temporal phase shifts in model response can indicate a poor comparison between the model calibration and observations. As the model will be applied on a ten-year average basis for the evaluation of load reductions needed to remove water quality impairments in the Bay caution should be used in applying these comparisons alone. Additional information on the CBWQM calibration can be found on the CBP web site http://www.chesapeakebay.net/modsc.htm under the “Current Projects and Info” tab.
Regions of the Chesapeake Bay with Proposed Water Quality Standards Assessed by the Water Quality Model

CBP Monitoring Segments
- Yellow: Criteria Assessed
- Blue: Criteria Not Assessed
Chesapeake Bay Standard Segment CB1TF

Location Map of Segment CB1TF within the Chesapeake Bay Model Grid

Chesapeake Bay Program
Regression of Calibration vs. Observations

Using the 366 pairs of predictions and observed data, the slope is 0.9017 and the intercept is 1.4189. The R-Squared value for this regression is 0.6900.

LOG10 Regressions of Calibration vs. Observations

Using the 366 pairs of predictions and observed data, the slope is 0.8722 and the intercept is 0.1485. The R-Squared value for this regression is 0.6615.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>10.6928</td>
<td>10.2851</td>
</tr>
<tr>
<td>Min. observed</td>
<td>5.448</td>
<td>6.328</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.2667</td>
<td>13.31</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.9153</td>
<td>1.7644</td>
</tr>
<tr>
<td>Median observed</td>
<td>10.8500</td>
<td>10.4070</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>13.0000</td>
<td>12.5210</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>8.0000</td>
<td>7.7635</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.4076 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 366
Number of Predicted Violations 0
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CB1TF Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations

Using the 750 pairs of predictions and observed data, the slope is 0.8417 and the intercept is 1.2527. The R-Squared value for this regression is 0.7544.

LOG10 Regressions of Calibration vs. Observations

Using the 750 pairs of predictions and observed data, the slope is 0.7487 and the intercept is 0.2407. The R-Squared value for this regression is 0.6507.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 8.6658</td>
<td>Mean predicted 8.8071</td>
</tr>
<tr>
<td>Min. observed 5.3524</td>
<td>Min. predicted 4.513</td>
</tr>
<tr>
<td>Max. observed 14.7</td>
<td>Max. predicted 14.03</td>
</tr>
<tr>
<td>Std. Dev. Observed 2.5338</td>
<td>Std. Dev. predicted 2.6146</td>
</tr>
<tr>
<td>Median observed 7.6633</td>
<td>Median predicted 8.2954</td>
</tr>
<tr>
<td>90th Percentile observed 13.0400</td>
<td>90th Percentile predicted 13.1060</td>
</tr>
<tr>
<td>10th Percentile observed 6.2000</td>
<td>10th Percentile predicted 5.7484</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1413 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 750
Number of Predicted Violations 0
Number of Observed Violations 0

---

¹ observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment CB1TF Season: June 11 – Feb 14
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CB1TF  Season: June 11 – Feb 14

(Scatter Plot )

[Scatter plot image]
Regression of Calibration vs. Observations

Using the 111 pairs of predictions and observed data, the slope is 0.0984 and the intercept is 7.9843. The R-Squared value for this regression is 0.0022.

LOG10 Regressions of Calibration vs. Observations

Using the 111 pairs of predictions and observed data, the slope is 0.1330 and the intercept is 0.8090. The R-Squared value for this regression is 0.0061.

Statistics (units in $\mu$g/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>95th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference -2.0151 $\mu$g/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB1TF  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (µg/l)
Segment CB1TF  Season: July 1 – Sept 30
(Scatter Plot)
**Regression of Calibration vs. Observations**
Using the 96 pairs of predictions and observed data, the slope is 0.0900 and the intercept is 7.6962. The R-Squared value for this regression is 0.0013.

**LOG10 Regressions of Calibration vs. Observations**
Using the 96 pairs of predictions and observed data, the slope is 0.0118 and the intercept is 0.8571. The R-Squared value for this regression is 0.0001.

**Statistics (units in µg/l)**

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.0672</th>
<th>Min. observed 1.0000</th>
<th>Max. observed 23.4000</th>
<th>Std. Dev. Observed 5.8988</th>
<th>Median observed 6.5500</th>
<th>95th Percentile observed 20.5000</th>
<th>10th Percentile observed 1.6000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean predicted 4.1225</td>
<td>Min. predicted 0.6822</td>
<td>Max. predicted 10.4410</td>
<td>Std. Dev. predicted 2.3334</td>
<td>Median predicted 3.7057</td>
<td>95th Percentile predicted 9.4411</td>
<td>10th Percentile predicted 1.7014</td>
</tr>
</tbody>
</table>

**Differences (predicted – observed)**

Mean difference -3.9447 µg/l

---

¹ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB1TF  Season: March 1 – May 30

Cumulative Frequency Distribution – PAired Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment CB1TF  Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 276 pairs of predictions and observed data, the slope is 0.3548 and the intercept is 1.3338. The R-Squared value for this regression is 0.1143.

LOG10 Regressions of Calibration vs. Observations

Using the 276 pairs of predictions and observed data, the slope is 0.4752 and the intercept is 0.2382. The R-Squared value for this regression is 0.1813.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
<th>Min. observed</th>
<th>Min. predicted</th>
<th>Max. observed</th>
<th>Max. predicted</th>
<th>Std. Dev. Observed</th>
<th>Std. Dev. predicted</th>
<th>Median observed</th>
<th>Median predicted</th>
<th>90th Percentile observed</th>
<th>90th Percentile predicted</th>
<th>10th Percentile observed</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0898</td>
<td>2.1307</td>
<td>0.9286</td>
<td>0.8093</td>
<td>13.0000</td>
<td>13.3120</td>
<td>1.3220</td>
<td>1.2599</td>
<td>1.6250</td>
<td>1.7566</td>
<td>3.2500</td>
<td>3.4868</td>
<td>1.0833</td>
<td>1.2974</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0409 l/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CB1TF  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CB1TF  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment CB2OH

Location Map of Segment CB2OH within the Chesapeake Bay Model Grid
MIGRATORY **Dissolved Oxygen**
Segment CB2OH (Mainstem CB2 Oligohaline)
Feb 15 - June 10

Regression of Calibration vs. Observations

Using the 523 pairs of predictions and observed data, the **slope** is 0.8581 and the **intercept** is 1.2252. The **R-Squared** value for this regression is 0.6632.

LOG10 Regressions of Calibration vs. Observations

Using the 523 pairs of predictions and observed data, the **slope** is 0.8098 and the **intercept** is 0.1866. The **R-Squared** value for this regression is 0.6033.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>9.5661 mg/l</td>
<td>9.7204 mg/l</td>
</tr>
<tr>
<td>Min. observed</td>
<td>Min. predicted</td>
</tr>
<tr>
<td>2.8</td>
<td>3.047</td>
</tr>
<tr>
<td>Max. observed</td>
<td>Max. predicted</td>
</tr>
<tr>
<td>13.705 mg/l</td>
<td>14.32</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>2.2523 mg/l</td>
<td>2.1375</td>
</tr>
<tr>
<td>Median</td>
<td>Median predicted</td>
</tr>
<tr>
<td>9.5000 mg/l</td>
<td>10.0630</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>90th Percentile predicted</td>
</tr>
<tr>
<td>observed 12.3000</td>
<td>12.2800</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>10th Percentile predicted</td>
</tr>
<tr>
<td>observed 6.6000</td>
<td>6.8706</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1543 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 523
Number of Predicted Violations 17
Number of Observed Violations 14

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CB2OH Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CB2OH  Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1076 pairs of predictions and observed data, the slope is 0.7345 and the intercept is 2.6275. The R-Squared value for this regression is 0.6095.

LOG10 Regressions of Calibration vs. Observations

Using the 1076 pairs of predictions and observed data, the slope is 0.5421 and the intercept is 0.4517. The R-Squared value for this regression is 0.4947.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.8410</td>
<td>7.0982</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.45</td>
<td>1.221</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.8333</td>
<td>13.81</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.3871</td>
<td>2.5373</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.0000</td>
<td>6.8353</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.9000</td>
<td>10.9820</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.6600</td>
<td>3.9234</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.7428 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1076
Number of Predicted Violations 72
Number of Observed Violations 9
Migratory Dissolved Oxygen (mg/l)

Segment CB2OH Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CB2OH  Season: June 11 – Feb 14
(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment CB2OH (Mainstem CB2 Oligohaline)
May 1 - Sept 30

**Regression of Calibration vs. Observations**¹

Using the 169 pairs of predictions and observed data, the **slope** is 0.4308 and the **intercept** is 2.3341. The **R-Squared** value for this regression is 0.1382.

**LOG10 Regressions of Calibration vs. Observations**¹

Using the 169 pairs of predictions and observed data, the **slope** is 0.5009 and the **intercept** is 0.3309. The **R-Squared** value for this regression is 0.1102.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Mean observed</th>
<th>Mean predicted</th>
<th>Min. observed</th>
<th>Min. predicted</th>
<th>Max. observed</th>
<th>Max. predicted</th>
<th>Std. Dev. Observed</th>
<th>Std. Dev. predicted</th>
<th>Median observed</th>
<th>Median predicted</th>
<th>90th Percentile observed</th>
<th>90th Percentile predicted</th>
<th>10th Percentile observed</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>4.6305 mg/l</td>
<td>5.3309 mg/l</td>
<td>1.5 mg/l</td>
<td>2.633 mg/l</td>
<td>8 mg/l</td>
<td>9.401 mg/l</td>
<td>1.7094 mg/l</td>
<td>1.4749 mg/l</td>
<td>5.0000</td>
<td>5.1793</td>
<td>6.7000 mg/l</td>
<td>7.4383 mg/l</td>
<td>2.3500 mg/l</td>
<td>3.5053 mg/l</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.5 mg/l</td>
<td>2.633 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. observed</td>
<td>8 mg/l</td>
<td>9.401 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7094 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median observed</td>
<td>5.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90th Percentile</td>
<td>6.7000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.3500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 0.7004 mg/l

**Violations of Standards**
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 169
Number of Predicted Violations 0
Number of Observed Violations 1

¹ observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB2OH Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB2OH Season: May 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 172 pairs of predictions and observed data, the slope is 0.4569 and the intercept is 4.6962. The R-Squared value for this regression is 0.3782.

LOG10 Regressions of Calibration vs. Observations

Using the 172 pairs of predictions and observed data, the slope is 0.4482 and the intercept is 0.5417. The R-Squared value for this regression is 0.3844.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.6517</th>
<th>Mean predicted 8.6580</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.6</td>
<td>Min. predicted 3.292</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.75</td>
<td>Max. predicted 13.33</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.9226</td>
<td>Std. Dev. predicted 2.5881</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.4850</td>
<td>Median predicted 8.9597</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.0100</td>
<td>90th Percentile predicted 12.0040</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.3800</td>
<td>10th Percentile predicted 5.0635</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0062 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 172
Number of Predicted Violations 2
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB2OH Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB2OH  Season: Oct 1 – April 30
(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment CB2OH (Mainstem CB2 Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 112 pairs of predictions and observed data, the slope is 1.4278 and the intercept is -3.4750. The R-Squared value for this regression is 0.1356.

LOG10 Regressions of Calibration vs. Observations
Using the 112 pairs of predictions and observed data, the slope is 1.2541 and the intercept is -0.3108. The R-Squared value for this regression is 0.1631.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.9730</td>
<td>8.0177</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>4.0360</td>
</tr>
<tr>
<td>Max. observed</td>
<td>41.3000</td>
<td>12.3290</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>6.1217</td>
<td>Std. Dev. predicted 1.5786</td>
</tr>
<tr>
<td>Median observed</td>
<td>6.7142</td>
<td>Median predicted 8.0208</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>18.9000</td>
<td>95th Percentile predicted 10.5140</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>2.8500</td>
<td>10th Percentile predicted 5.8559</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0446 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment CB2OH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB2OH  Season: July 1 – Sept 30
(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment CB2OH (Mainstem CB2 Oligohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 106 pairs of predictions and observed data, the slope is 0.8131 and the intercept is 0.5720. The R-Squared value for this regression is 0.2089.

LOG10 Regressions of Calibration vs. Observations
Using the 106 pairs of predictions and observed data, the slope is 0.5852 and the intercept is 0.2334. The R-Squared value for this regression is 0.1328.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 6.9815</td>
<td>Mean predicted 7.8824</td>
</tr>
<tr>
<td>Min. observed 0.7500</td>
<td>Min. predicted 0.3945</td>
</tr>
<tr>
<td>Max. observed 37.7027</td>
<td>Max. predicted 25.6890</td>
</tr>
<tr>
<td>Std. Dev. Observed 7.7643</td>
<td>Std. Dev. predicted 4.3647</td>
</tr>
<tr>
<td>Median observed 4.1000</td>
<td>Median predicted 6.9351</td>
</tr>
<tr>
<td>95th Percentile observed 25.6964</td>
<td>95th Percentile predicted 17.7000</td>
</tr>
<tr>
<td>10th Percentile observed 1.4969</td>
<td>10th Percentile predicted 3.9043</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.9009 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB2OH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB2OH  Season: March 1 – May 30

(Scatter Plot)
OLIGOHALINE Light Attenuation
Segment CB2OH (Mainstem CB2 Oligohaline)
April 1 - Oct 30

Regression of Calibration vs. Observations

Using the 275 pairs of predictions and observed data, the slope is 0.6339 and the intercept is 0.7466. The R-Squared value for this regression is 0.2574.

LOG10 Regressions of Calibration vs. Observations

Using the 275 pairs of predictions and observed data, the slope is 0.6548 and the intercept is 0.1551. The R-Squared value for this regression is 0.3072.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>2.0010</td>
<td>1.9789</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.6500</td>
<td>0.6711</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>6.9007</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>1.1957</td>
<td>0.9570</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.6250</td>
<td>1.7561</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>3.2500</td>
<td>3.0022</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>1.0833</td>
<td>1.3213</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0221 1/m

\(^1\) observed is dependent, predicted is independent
Ke (1/m)

Segment CB2OH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CB2OH  Season: April 1 – Oct 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1084 pairs of predictions and observed data, the slope is 0.8700 and the intercept is 0.2581. The R-Squared value for this regression is 0.6585.

LOG10 Regressions of Calibration vs. Observations

Using the 1084 pairs of predictions and observed data, the slope is 1.0990 and the intercept is -0.1534. The R-Squared value for this regression is 0.6402.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.9894</td>
<td>10.0357</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.25</td>
<td>2.062</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.3</td>
<td>16.04</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.5639</td>
<td>2.3912</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.4500</td>
<td>10.1575</td>
</tr>
<tr>
<td>90&lt;sup&gt;th&lt;/sup&gt; Percentile observed</td>
<td>11.8000</td>
<td>90&lt;sup&gt;th&lt;/sup&gt; Percentile predicted 13.0690</td>
</tr>
<tr>
<td>10&lt;sup&gt;th&lt;/sup&gt; Percentile observed</td>
<td>5.5000</td>
<td>10&lt;sup&gt;th&lt;/sup&gt; Percentile predicted 6.7192</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.0462 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 1084
Number of Predicted Violations 32
Number of Observed Violations 71

---

<sup>1</sup> observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CB3MH  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CB3MH  Season: Feb 15 – June 10
(Scatter Plot )
Regression of Calibration vs. Observations

Using the 2012 pairs of predictions and observed data, the *slope* is 0.8351 and the *intercept* is 1.4613. The *R-Squared* value for this regression is 0.4824.

LOG10 Regressions of Calibration vs. Observations

Using the 2012 pairs of predictions and observed data, the *slope* is 0.8081 and the *intercept* is 0.1778. The *R-Squared* value for this regression is 0.4069.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.1788</td>
<td>0.05</td>
<td>15.9333</td>
<td>2.6329</td>
<td>6.9350</td>
<td>6.8465</td>
<td>1.554</td>
<td>13.76</td>
<td>6.7385</td>
</tr>
<tr>
<td>Min. observed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.8465</td>
<td>1.554</td>
<td></td>
<td>6.7385</td>
</tr>
<tr>
<td>Max. observed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.8465</td>
<td>1.554</td>
<td></td>
<td>6.7385</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.8465</td>
<td>1.554</td>
<td></td>
<td>6.7385</td>
</tr>
<tr>
<td>Median observed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.8465</td>
<td>1.554</td>
<td></td>
<td>6.7385</td>
</tr>
<tr>
<td>90th Percentile obs.</td>
<td>10.8000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.7097</td>
<td>4.0228</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>4.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.0228</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3323 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 2012
Number of Predicted Violations 115
Number of Observed Violations 128

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CB3MH  Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CB3MH  Season: June 11 – Feb 14

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 636 pairs of predictions and observed data, the slope is 0.3013 and the intercept is 2.4871. The R-Squared value for this regression is 0.0724.

LOG10 Regressions of Calibration vs. Observations

Using the 636 pairs of predictions and observed data, the slope is 0.4978 and the intercept is 0.2164. The R-Squared value for this regression is 0.0126.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max. observed</td>
<td>10.092</td>
<td>9.45</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2466</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.5185</td>
<td>Median predicted 3.0605</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>6.3210</td>
<td>90th Percentile predicted 6.0780</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.4880</td>
<td>10th Percentile predicted 0.7493</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.2179 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 636
Number of Predicted Violations 155
Number of Observed Violations 173

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB3MH Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB3MH  Season: May 1 – Sept 30
(Scatter Plot )
Regression of Calibration vs. Observations\(^1\)

Using the 220 pairs of predictions and observed data, the slope is 0.4115 and the intercept is 4.6516. The R-Squared value for this regression is 0.3131.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 220 pairs of predictions and observed data, the slope is 0.3960 and the intercept is 0.5684. The R-Squared value for this regression is 0.2658.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 7.7575</th>
<th>Mean predicted 7.5483</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.77</td>
<td>Min. predicted 2.191</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.77</td>
<td>Max. predicted 13.28</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2519</td>
<td>Std. Dev. predicted 3.0622</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.9800</td>
<td>Median predicted 8.0137</td>
</tr>
<tr>
<td>90(^{th}) Percentile observed</td>
<td>10.6000</td>
<td>90(^{th}) Percentile predicted 11.6955</td>
</tr>
<tr>
<td>10(^{th}) Percentile observed</td>
<td>4.8500</td>
<td>10(^{th}) Percentile predicted 3.4519</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.2092 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 220
Number of Predicted Violations 26
Number of Observed Violations 9

\(^1\) observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB3MH  Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB3MH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 190 pairs of predictions and observed data, the slope is 0.4728 and the intercept is 0.6242. The R-Squared value for this regression is 0.2138.

LOG10 Regressions of Calibration vs. Observations

Using the 190 pairs of predictions and observed data, the slope is 0.4719 and the intercept is 0.1293. The R-Squared value for this regression is 0.1652.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.4965</td>
<td>1.8450</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>0.0054</td>
</tr>
<tr>
<td>Max. observed</td>
<td>7.9</td>
<td>7.761</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.6870</td>
<td>1.6500</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.9000</td>
<td>1.3994</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>4.2449</td>
<td>90th Percentile predicted 4.5309</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.0300</td>
<td>10th Percentile predicted 0.2453</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3485 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l.

Number of predicted and observed pairs 190
Number of Predicted Violations 67
Number of Observed Violations 100

---

1 observed is dependent, predicted is independent
Deep Channel  Dissolved Oxygen (mg/l)
Segment CB3MH  Season: May 1 – Sept 30
Cumulative Frequency Distribution — PAIRED Simulated and Observed Data
Deep Channel Dissolved Oxygen (mg/l)
Segment CB3MH Season: May 1 – Sept 30

(Scatter Plot )
Regression of Calibration vs. Observations

Using the 169 pairs of predictions and observed data, the slope is 0.4531 and the intercept is 4.0215. The R-Squared value for this regression is 0.3693.

LOG10 Regressions of Calibration vs. Observations

Using the 169 pairs of predictions and observed data, the slope is 0.4120 and the intercept is 0.5358. The R-Squared value for this regression is 0.3111.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.0687</td>
<td>6.7260</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.7</td>
<td>1.148</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.58</td>
<td>12.28</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>2.4143</td>
<td>3.2386</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.4000</td>
<td>7.3493</td>
</tr>
<tr>
<td>90th Percentile obs.</td>
<td>10.0000</td>
<td>11.1080</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>3.9700</td>
<td>2.2621</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3427 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 169
Number of Predicted Violations 43
Number of Observed Violations 10

---

1 observed is dependent, predicted is independent
Deep Channel Dissolved Oxygen (mg/l)
Segment CB3MH Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel  Dissolved Oxygen (mg/l)
Segment CB3MH  Season: Oct 1 – April 30
(Scatter Plot)
DEEP CHANNEL ANOXIC Dissolved Oxygen
Segment CB3MH (Mainstem CB3 Mesohaline)
May 1 - Sept 30

Regression of Calibration vs. Observations

Using the 210 pairs of predictions and observed data, the slope is 0.4420 and the intercept is 0.3819. The R-Squared value for this regression is 0.2732.

LOG10 Regressions of Calibration vs. Observations

Using the 210 pairs of predictions and observed data, the slope is 0.4632 and the intercept is 0.0897. The R-Squared value for this regression is 0.2430.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 1.0577</td>
<td>Mean predicted 1.5287</td>
</tr>
<tr>
<td>Min. observed 0</td>
<td>Min. predicted -0.0078</td>
</tr>
<tr>
<td>Max. observed 6.8</td>
<td>Max. predicted 6.701</td>
</tr>
<tr>
<td>Std. Dev. Observed 1.392</td>
<td>Std. Dev. predicted 1.6546</td>
</tr>
<tr>
<td>Median observed 0.500</td>
<td>Median predicted 0.9193</td>
</tr>
<tr>
<td>90th Percentile observed 3.0000</td>
<td>90th Percentile predicted 4.4590</td>
</tr>
<tr>
<td>10th Percentile observed 0.0200</td>
<td>10th Percentile predicted 0.0509</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.4711 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 210
Number of Predicted Violations 113
Number of Observed Violations 136

1 observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB3MH Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB3MH Season: May 1 – Sept 30
(Scatter Plot)
DEEP CHANNEL ANOXIC Dissolved Oxygen
Segment CB3MH (Mainstem CB3 Mesohaline)
Oct 1 - April 30

Regression of Calibration vs. Observations

Using the 195 pairs of predictions and observed data, the slope is 0.4731 and the intercept is 3.6793. The R-Squared value for this regression is 0.3718.

LOG10 Regressions of Calibration vs. Observations

Using the 195 pairs of predictions and observed data, the slope is 0.4459 and the intercept is 0.4926. The R-Squared value for this regression is 0.3274.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
<th>Mean difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>6.6531</td>
<td>6.2857</td>
<td>-0.3674 mg/l</td>
</tr>
<tr>
<td>Max. observed</td>
<td>11.5667</td>
<td>12.23</td>
<td></td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.4699</td>
<td>3.1834</td>
<td></td>
</tr>
<tr>
<td>Median observed</td>
<td>6.9000</td>
<td>6.5690</td>
<td></td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>9.9000</td>
<td>90th Percentile predicted</td>
<td>10.6250</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>3.5000</td>
<td>10th Percentile predicted</td>
<td>1.9214</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3674 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 195
Number of Predicted Violations 53
Number of Observed Violations 19

1 observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB3MH  Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB3MH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 227 pairs of predictions and observed data, the slope is 0.3459 and the intercept is 11.8883. The R-Squared value for this regression is 0.0077.

LOG10 Regressions of Calibration vs. Observations
Using the 227 pairs of predictions and observed data, the slope is 0.3171 and the intercept is 0.8167. The R-Squared value for this regression is 0.0138.

Statistics (units in µg/l)

Mean observed 15.2653  Mean predicted 9.7637
Min. observed 0.4010  Min. predicted 4.7817
Max. observed 44.3000  Max. predicted 16.9400
Std. Dev. Observed 9.1791  Std. Dev. predicted 2.3281
Median observed 12.7000  Median predicted 9.7119
95th Percentile observed 34.1000  95th Percentile predicted 13.8410
10th Percentile observed 5.5000  10th Percentile predicted 6.6122

Differences (predicted – observed)
Mean difference -5.5016 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB3MH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB3MH Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 223 pairs of predictions and observed data, the slope is 0.3319 and the intercept is 5.9431. The R-Squared value for this regression is 0.0378.

LOG10 Regressions of Calibration vs. Observations
Using the 223 pairs of predictions and observed data, the slope is 0.6993 and the intercept is 0.1536. The R-Squared value for this regression is 0.1273.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.2000</td>
<td>1.4091</td>
</tr>
<tr>
<td>Max. observed</td>
<td>45.0000</td>
<td>41.1150</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>8.3411</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.9335</td>
<td>Median predicted</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>28.3000</td>
<td>95th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>2.7000</td>
<td>10th Percentile predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 3.4587 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (µg/l)
Segment CB3MH  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB3MH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 564 pairs of predictions and observed data, the slope is 0.5400 and the intercept is 0.7554. The R-Squared value for this regression is 0.2885.

LOG10 Regressions of Calibration vs. Observations

Using the 564 pairs of predictions and observed data, the slope is 0.4517 and the intercept is 0.2203. The R-Squared value for this regression is 0.2152.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.3493</td>
<td>1.0999</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.5200</td>
<td>Min. predicted 0.4595</td>
</tr>
<tr>
<td>Max. observed</td>
<td>4.3333</td>
<td>Max. predicted 5.8465</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.5633</td>
<td>Std. Dev. predicted 0.5602</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.3000</td>
<td>Median predicted 0.9298</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>2.1667</td>
<td>90th Percentile predicted 1.6466</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.8125</td>
<td>10th Percentile predicted 0.6860</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.2494 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CB3MH  Season: April 1 – Oct 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing cumulative frequency distribution for Ke (1/m) over the percent of population from April 1 to Oct 30. The graph compares simulated and observed data.]
Ke (1/m)

Segment CB3MH  Season: April 1 – Oct 30
(Scatter Plot)
Chesapeake Bay Standard Segment CB4MH

Location Map of Segment CB4MH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 7369 pairs of predictions and observed data, the slope is 0.7632 and the intercept is 1.8845. The R-Squared value for this regression is 0.5522.

LOG10 Regressions of Calibration vs. Observations

Using the 7369 pairs of predictions and observed data, the slope is 0.7988 and the intercept is 0.1832. The R-Squared value for this regression is 0.4697.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.4128</td>
</tr>
<tr>
<td>Min.</td>
<td>0.03</td>
</tr>
<tr>
<td>Max.</td>
<td>15.3</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.6146</td>
</tr>
<tr>
<td>Median</td>
<td>8.2400</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.8500</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.3250</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1409 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 7369
Number of Predicted Violations 92
Number of Observed Violations 289

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment CB4MH Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment CB4MH Season: Jan 1 – Dec 31
(Scatter Plot )
Regression of Calibration vs. Observations\textsuperscript{1}

Using the 1962 pairs of predictions and observed data, the slope is 0.7235 and the intercept is -0.1257. The R-Squared value for this regression is 0.2896.

LOG10 Regressions of Calibration vs. Observations\textsuperscript{1}

Using the 1962 pairs of predictions and observed data, the slope is 1.0135 and the intercept is -0.2034. The R-Squared value for this regression is 0.2779.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>0.0108</td>
</tr>
<tr>
<td>Max. observed</td>
<td>10.5</td>
<td>10.03</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.4819</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>2.4000</td>
<td>Median predicted</td>
</tr>
<tr>
<td>90\textsuperscript{th} Percentile observed</td>
<td>6.6000</td>
<td>90\textsuperscript{th} Percentile predicted</td>
</tr>
<tr>
<td>10\textsuperscript{th} Percentile observed</td>
<td>0.1000</td>
<td>10\textsuperscript{th} Percentile predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.3210 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 1962
Number of Predicted Violations 147
Number of Observed Violations 806

\textsuperscript{1} observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)
Segment CB4MH  Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB4MH Season: May 1 – Sept 30
(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment CB4MH (Mainstem CB4 Mesohaline)
Oct 1 - April 30

Regression of Calibration vs. Observations

Using the 1677 pairs of predictions and observed data, the slope is 0.4879 and the intercept is 4.4493. The R-Squared value for this regression is 0.3911.

LOG10 Regressions of Calibration vs. Observations

Using the 1677 pairs of predictions and observed data, the slope is 0.4583 and the intercept is 0.5304. The R-Squared value for this regression is 0.3242.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.6358</td>
<td>8.5805</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.75</td>
<td>1.833</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.75</td>
<td>14.59</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.2427</td>
<td>2.8745</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.8000</td>
<td>9.0977</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.4000</td>
<td>12.2050</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.6000</td>
<td>4.4926</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0553 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1677
Number of Predicted Violations 52
Number of Observed Violations 39

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)
Segment CB4MH Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB4MH Season: Oct 1 – April 30

(Scatter Plot)
DEEP CHANNEL **Dissolved Oxygen**  
Segment CB4MH (Mainstem CB4 Mesohaline)  
May 1 - Sept 30

Regression of Calibration vs. Observations

Using the 939 pairs of predictions and observed data, the **slope** is 0.5257 and the **intercept** is -0.2263. The **R-Squared** value for this regression is 0.4629.

**LOG10 Regressions of Calibration vs. Observations**

Using the 939 pairs of predictions and observed data, the **slope** is 0.6659 and the **intercept** is -0.0794. The **R-Squared** value for this regression is 0.3687.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 1.1975</th>
<th>Mean predicted 2.7084</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>Min. predicted -0.0354</td>
</tr>
<tr>
<td>Max. observed</td>
<td>6.9</td>
<td>Max. predicted 9.91</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.5146</td>
<td>Std. Dev. predicted 1.9602</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.5000</td>
<td>Median predicted 2.3034</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>3.7000</td>
<td>90th Percentile predicted 5.8189</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.0000</td>
<td>10th Percentile predicted 0.5583</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 1.5109 mg/l

**Violations of Standards**
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l.

Number of predicted and observed pairs 939  
Number of Predicted Violations 129  
Number of Observed Violations 481

---

1 observed is dependent, predicted is independent
Deep Channel Dissolved Oxygen (mg/l)
Segment CB4MH Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel  Dissolved Oxygen (mg/l)
Segment CB4MH  Season: May 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 894 pairs of predictions and observed data, the slope is 0.5531 and the intercept is 3.4991. The R-Squared value for this regression is 0.4744.

LOG10 Regressions of Calibration vs. Observations

Using the 894 pairs of predictions and observed data, the slope is 0.5440 and the intercept is 0.4270. The R-Squared value for this regression is 0.4011.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.1000</td>
<td>1.3819</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.8000</td>
<td>13.2280</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>2.3811</td>
<td>2.9653</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.9850</td>
<td>8.0050</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>10.5000</td>
<td>11.3220</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>4.3300</td>
<td>3.3759</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.1239 mg/l

Violations of Standards

Standard violation estimated using an instantaneous minimum DO standard of 1 mg/l.

Number of predicted and observed pairs 894
Number of Predicted Violations 96
Number of Observed Violations 48

---

1 observed is dependent, predicted is independent
Deep Channel  Dissolved Oxygen (mg/l)
Segment CB4MH  Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel  Dissolved Oxygen (mg/l)  
Segment CB4MH  Season: Oct 1 – April 30  
(Scatter Plot )
Regression of Calibration vs. Observations

Using the 922 pairs of predictions and observed data, the slope is 0.5279 and the intercept is -0.0647. The R-Squared value for this regression is 0.5022.

LOG10 Regressions of Calibration vs. Observations

Using the 922 pairs of predictions and observed data, the slope is 0.5913 and the intercept is -0.0145. The R-Squared value for this regression is 0.4341.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Mean observed 0.9503</th>
<th>Mean predicted 1.9227</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed 0</td>
<td>Min. predicted -0.0064</td>
</tr>
<tr>
<td>Max. observed 6.9</td>
<td>Max. predicted 9.102</td>
</tr>
<tr>
<td>Std. Dev. Observed 1.3969</td>
<td>Std. Dev. predicted 1.8751</td>
</tr>
<tr>
<td>Median observed 0.2100</td>
<td>Median predicted 1.4118</td>
</tr>
<tr>
<td>90th Percentile observed 3.0000</td>
<td>90th Percentile predicted 4.6342</td>
</tr>
<tr>
<td>10th Percentile observed 0.0100</td>
<td>10th Percentile predicted 0.0239</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.9724 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 922
Number of Predicted Violations 184
Number of Observed Violations 428

---

1 observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB4MH Season: May 1 – Sept 30
Cumulative Frequency Distribution — PAIRED Simulated and Observed Data
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB4MH Season: May 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 890 pairs of predictions and observed data, the slope is 0.5991 and the intercept is 3.0080. The R-Squared value for this regression is 0.5369.

LOG10 Regressions of Calibration vs. Observations

Using the 890 pairs of predictions and observed data, the slope is 0.5654 and the intercept is 0.3990. The R-Squared value for this regression is 0.4479.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.2160</td>
<td>7.0234</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.1</td>
<td>0.3893</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.4</td>
<td>12.8</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.4764</td>
<td>3.0285</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.4500</td>
<td>7.3031</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>10.2000</td>
<td>10.8730</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.9000</td>
<td>2.9003</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.1925 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 890
Number of Predicted Violations 72
Number of Observed Violations 44
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB4MH Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Anoxic
Dissolved Oxygen (mg/l)
Segment CB4MH  Season: Oct 1 – April 30

(Scatter Plot)
MESOHALINE Chlorophyll
Segment CB4MH (Mainstem CB4 Mesohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 570 pairs of predictions and observed data, the slope is 0.7701 and the intercept is 3.0380. The R-Squared value for this regression is 0.1600.

LOG10 Regressions of Calibration vs. Observations
Using the 570 pairs of predictions and observed data, the slope is 0.7804 and the intercept is 0.2144. The R-Squared value for this regression is 0.1847.

Statistics (units in µg/l)

Mean observed 11.6846    Mean predicted 11.2280
Min. observed 1.5000     Min. predicted 5.6486
Max. observed 44.3000    Max. predicted 26.9780
Std. Dev. Observed 6.9356 Std. Dev. predicted 3.6029
Median observed 10.0000  Median predicted 10.3535
95th Percentile observed 26.7267 95th Percentile predicted 17.8490
10th Percentile observed 5.1661 10th Percentile predicted 7.7370

Differences (predicted – observed)

Mean difference -0.4566 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB4MH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB4MH  Season: July 1 – Sept 30
(Scatter Plot)
MESOHALINE Chlorophyll
Segment CB4MH (Mainstem CB4 Mesohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 555 pairs of predictions and observed data, the slope is 0.0298 and the intercept is 8.8727. The R-Squared value for this regression is 0.0007.

LOG10 Regressions of Calibration vs. Observations
Using the 555 pairs of predictions and observed data, the slope is 0.1694 and the intercept is 0.7352. The R-Squared value for this regression is 0.0076.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.3366</td>
</tr>
<tr>
<td>Min.</td>
<td>1.0000</td>
</tr>
<tr>
<td>Max.</td>
<td>37.5500</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>6.4251</td>
</tr>
<tr>
<td>Median</td>
<td>7.8000</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>22.8000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.8000</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 6.2403 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB4MH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB4MH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1355 pairs of predictions and observed data, the slope is 0.3859 and the intercept is 0.5554. The R-Squared value for this regression is 0.2139.

LOG10 Regressions of Calibration vs. Observations

Using the 1355 pairs of predictions and observed data, the slope is 0.4100 and the intercept is 0.1629. The R-Squared value for this regression is 0.2162.

Statistics (units in 1/m)

Mean observed 0.8970
Min. observed 0.4063
Max. observed 3.2500
Std. Dev. Observed 0.3083
Median observed 0.8125
90th Percentile observed 1.3000
10th Percentile observed 0.5909

Mean predicted 0.8852
Min. predicted 0.3706
Max. predicted 3.5385
Std. Dev. predicted 0.3695
Median predicted 0.7838
90th Percentile predicted 1.2588
10th Percentile predicted 0.5729

Differences (predicted – observed)

Mean difference -0.0118 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CB4MH  Season: April 1 – Oct 30

Cumulative Frequency Distribution — PAIRED Simulated and Observed Data
Chesapeake Bay Standard Segment CB5MH

Location Map of Segment CB5MH within the Chesapeake Bay Model Grid

Chesapeake Bay Program
OPEN WATER Dissolved Oxygen
Segment CB5MH (Mainstem CB5 Mesohaline)
Jan 1 - Dec 31

Regression of Calibration vs. Observations

Using the 4653 pairs of predictions and observed data, the slope is 0.7867 and the intercept is 1.8425. The R-Squared value for this regression is 0.6149.

LOG10 Regressions of Calibration vs. Observations

Using the 4653 pairs of predictions and observed data, the slope is 0.7993 and the intercept is 0.1947. The R-Squared value for this regression is 0.5692.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed Mean</th>
<th>Predicted Mean</th>
<th>Observed Min</th>
<th>Predicted Min</th>
<th>Observed Max</th>
<th>Predicted Max</th>
<th>Observed Std Dev</th>
<th>Predicted Std Dev</th>
<th>Observed Median</th>
<th>Predicted Median</th>
<th>Observed 90th Percentile</th>
<th>Predicted 90th Percentile</th>
<th>Observed 10th Percentile</th>
<th>Predicted 10th Percentile</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference 0.1191 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 4653
Number of Predicted Violations 0
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment CB5MH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment CB5MH  Season: Jan 1 – Dec 31
(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment CB5MH (Mainstem CB5 Mesohaline)
May 1 - Sept 30

Regression of Calibration vs. Observations¹

Using the 2039 pairs of predictions and observed data, the slope is 0.9939 and the intercept is -1.7989. The R-Squared value for this regression is 0.3913.

LOG10 Regressions of Calibration vs. Observations¹

Using the 2039 pairs of predictions and observed data, the slope is 1.6446 and the intercept is -0.7305. The R-Squared value for this regression is 0.3494.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.7139</td>
<td>0</td>
<td>11.5</td>
<td>2.5004</td>
<td>5.0000</td>
<td>1.5736</td>
<td>6.4024</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>90th</td>
<td>7.8000</td>
<td>8.9330</td>
</tr>
<tr>
<td>10th</td>
<td>1.0000</td>
<td>4.7503</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.8390 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 2039
Number of Predicted Violations 0
Number of Observed Violations 317

¹ observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB5MH  Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)

Segment CB5MH Season: May 1 – Sept 30

(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment CB5MH (Mainstem CB5 Mesohaline)
Oct 1 - April 30

Regression of Calibration vs. Observations

Using the 1848 pairs of predictions and observed data, the slope is 0.5748 and the intercept is 4.2221. The R-Squared value for this regression is 0.5841.

LOG10 Regressions of Calibration vs. Observations

Using the 1848 pairs of predictions and observed data, the slope is 0.5749 and the intercept is 0.4417. The R-Squared value for this regression is 0.5622.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.7497</th>
<th>Mean predicted 9.6158</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.4</td>
<td>3.796</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15</td>
<td>14.93</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.8788</td>
<td>2.4980</td>
</tr>
<tr>
<td>Median observed</td>
<td>10.0000</td>
<td>10.0475</td>
</tr>
<tr>
<td>90th Percentile obs.</td>
<td>11.9800</td>
<td>12.6730</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>7.2250</td>
<td>6.2097</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.1339 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1848
Number of Predicted Violations 0
Number of Observed Violations 5

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB5MH  Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB5MH Season: Oct 1 – April 30

(Scatter Plot)
 Regression of Calibration vs. Observations

Using the 1533 pairs of predictions and observed data, the slope is 0.8078 and the intercept is -1.1784. The R-Squared value for this regression is 0.5171.

LOG10 Regressions of Calibration vs. Observations

Using the 1533 pairs of predictions and observed data, the slope is 1.3578 and the intercept is -0.5178. The R-Squared value for this regression is 0.4818.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>2.7876</td>
<td>4.9099</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>0.8191</td>
</tr>
<tr>
<td>Max. observed</td>
<td>8.28</td>
<td>10.96</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.1358</td>
<td>1.9013</td>
</tr>
<tr>
<td>Median observed</td>
<td>2.5600</td>
<td>4.5899</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>6.1200</td>
<td>7.9324</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.2000</td>
<td>2.7222</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 2.1222 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l.

Number of predicted and observed pairs 1533
Number of Predicted Violations 2
Number of Observed Violations 411

---

1 observed is dependent, predicted is independent
Deep Channel  Dissolved Oxygen (mg/l)
Segment CB5MH  Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel  Dissolved Oxygen (mg/l)
Segment CB5MH  Season: May 1 – Sept 30
(Scatter Plot )
Regression of Calibration vs. Observations

Using the 1468 pairs of predictions and observed data, the slope is 0.5639 and the intercept is 3.9311. The R-Squared value for this regression is 0.5236.

LOG10 Regressions of Calibration vs. Observations

Using the 1468 pairs of predictions and observed data, the slope is 0.5669 and the intercept is 0.4323. The R-Squared value for this regression is 0.4763.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.9227</td>
<td>8.8524</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.4</td>
<td>2.66</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.2</td>
<td>13.94</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.0002</td>
<td>2.5667</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.1400</td>
<td>9.3088</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.3000</td>
<td>11.9210</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.2900</td>
<td>5.2269</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0703 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1468
Number of Predicted Violations 7
Number of Observed Violations 11

1 observed is dependent, predicted is independent
Deep Channel Dissolved Oxygen (mg/l)
Segment CB5MH Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Dissolved Oxygen (mg/l)
Segment CB5MH Season: Oct 1 – April 30

(Scatter Plot)
DEEP CHANNEL ANOXIC Dissolved Oxygen
Segment CB5MH (Mainstem CB5 Mesohaline)
May 1 - Sept 30

Regression of Calibration vs. Observations

Using the 1031 pairs of predictions and observed data, the slope is 0.7270 and the intercept is -0.2019. The R-Squared value for this regression is 0.5234.

LOG10 Regressions of Calibration vs. Observations

Using the 1031 pairs of predictions and observed data, the slope is 0.9894 and the intercept is -0.1615. The R-Squared value for this regression is 0.4803.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>90th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>90th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>2.3415</td>
<td>0</td>
<td>7.43</td>
<td>1.9378</td>
<td>2.0000</td>
<td>5.2900</td>
<td>0.1000</td>
<td>3.4983</td>
<td>0.0128</td>
<td>10.35</td>
<td>1.9282</td>
<td>3.1135</td>
<td>6.5227</td>
<td>1.3599</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.1568 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 1031
Number of Predicted Violations 60
Number of Observed Violations 341

---

1 observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB5MH Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB5MH Season: May 1 – Sept 30
(Scatter Plot)
DEEP CHANNEL ANOXIC Dissolved Oxygen
Segment CB5MH (Mainstem CB5 Mesohaline)
Oct 1 - April 30

Regression of Calibration vs. Observations

Using the 978 pairs of predictions and observed data, the slope is 0.5915 and the intercept is 3.6673. The R-Squared value for this regression is 0.5744.

LOG10 Regressions of Calibration vs. Observations

Using the 978 pairs of predictions and observed data, the slope is 0.5852 and the intercept is 0.4141. The R-Squared value for this regression is 0.5208.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.4847</th>
<th>Min. observed 0.3</th>
<th>Max. observed 13.95</th>
<th>Std. Dev. Observed 2.0643</th>
<th>Median observed 8.7000</th>
<th>90th Percentile observed 10.9000</th>
<th>10th Percentile observed 5.7000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean predicted 8.1440</td>
<td>Min. predicted 2.06</td>
<td>Max. predicted 13.06</td>
<td>Std. Dev. predicted 2.6447</td>
<td>Median predicted 8.5736</td>
<td>90th Percentile predicted 11.3470</td>
<td>10th Percentile predicted 4.3755</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3408 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 978
Number of Predicted Violations 29
Number of Observed Violations 18

1 observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment CB5MH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 449 pairs of predictions and observed data, the slope is 0.9033 and the intercept is 1.5816. The R-Squared value for this regression is 0.1608.

LOG10 Regressions of Calibration vs. Observations
Using the 449 pairs of predictions and observed data, the slope is 0.8345 and the intercept is 0.1580. The R-Squared value for this regression is 0.1530.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>95th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>9.1732</td>
<td>0.0000</td>
<td>34.1000</td>
<td>4.9982</td>
<td>7.9000</td>
<td>19.6000</td>
<td>4.3000</td>
<td>8.4047</td>
<td>4.9381</td>
<td>18.9280</td>
<td>2.2190</td>
<td>7.8784</td>
<td>13.1490</td>
<td>6.1627</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.7685 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB5MH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing cumulative frequency distribution of chlorophyll concentration for Segment CB5MH during the season from July 1 to Sept 30. The graph displays the simulated and observed data with a linear scale for percent of population against chlorophyll concentration.]
Chlorophyll Concentration (ug/l)
Segment CB5MH  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 381 pairs of predictions and observed data, the slope is 0.5004 and the intercept is 3.5206. The R-Squared value for this regression is 0.0721.

LOG10 Regressions of Calibration vs. Observations

Using the 381 pairs of predictions and observed data, the slope is 0.7731 and the intercept is 0.0621. The R-Squared value for this regression is 0.1102.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.1525</td>
<td>13.2542</td>
</tr>
<tr>
<td>Min.</td>
<td>1.0000</td>
<td>5.0312</td>
</tr>
<tr>
<td>Max.</td>
<td>46.8600</td>
<td>34.2150</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>8.5722</td>
<td>4.6001</td>
</tr>
<tr>
<td>Median</td>
<td>7.2000</td>
<td>12.4090</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>28.6000</td>
<td>22.2160</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.7127</td>
<td>8.4751</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 3.1016 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB5MH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB5MH Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1014 pairs of predictions and observed data, the slope is 0.2715 and the intercept is 0.5907. The R-Squared value for this regression is 0.0831.

LOG10 Regressions of Calibration vs. Observations

Using the 1014 pairs of predictions and observed data, the slope is 0.2981 and the intercept is 0.1786. The R-Squared value for this regression is 0.1015.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.3824</td>
<td>0.3685</td>
</tr>
<tr>
<td>Max. observed</td>
<td>3.2500</td>
<td>2.4634</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>0.2637</td>
<td>0.2801</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.7222</td>
<td>0.6786</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>1.0833</td>
<td>1.1704</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.5200</td>
<td>0.5115</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0345 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CB5MH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CB5MH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment CB6PH

Location Map of Segment CB6PH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 2768 pairs of predictions and observed data, the slope is 0.8416 and the intercept is 1.1140. The R-Squared value for this regression is 0.6523.

LOG10 Regressions of Calibration vs. Observations

Using the 2768 pairs of predictions and observed data, the slope is 0.8973 and the intercept is 0.0861. The R-Squared value for this regression is 0.6208.

Statistics (units in mg/l)

Mean observed 8.7252 Mean predicted 9.0438
Min. observed 3.53 Min. predicted 4.687
Max. observed 14.16 Max. predicted 14.63
Std. Dev. Observed 2.0804 Std. Dev. predicted 1.9965
Median observed 8.5300 Median predicted 8.4299
90th Percentile observed 11.6700 90th Percentile predicted 12.1100
10th Percentile observed 6.1800 10th Percentile predicted 6.8700

Differences (predicted – observed)

Mean difference 0.3187 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 2768
Number of Predicted Violations 0
Number of Observed Violations 0
Open Water Dissolved Oxygen (mg/l)

Segment CB6PH Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment CB6PH Season: Jan 1 – Dec 31
(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment CB6PH (Mainstem CB6 Polyhaline)
May 1 - Sept 30

Regression of Calibration vs. Observations

Using the 1112 pairs of predictions and observed data, the slope is 0.8344 and the intercept is -0.2465. The R-Squared value for this regression is 0.4617.

LOG10 Regressions of Calibration vs. Observations

Using the 1112 pairs of predictions and observed data, the slope is 1.0841 and the intercept is -0.1703. The R-Squared value for this regression is 0.3978.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>4.7513</td>
<td>5.9900</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.35</td>
<td>2.339</td>
</tr>
<tr>
<td>Max. observed</td>
<td>10.19</td>
<td>11.01</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.8233</td>
<td>1.4849</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.7025</td>
<td>5.6943</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>7.2000</td>
<td>90th Percentile predicted 8.4776</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>2.3900</td>
<td>10th Percentile predicted 4.3896</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.2387 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 1112
Number of Predicted Violations 0
Number of Observed Violations 50

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB6PH Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB6PH Season: May 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 954 pairs of predictions and observed data, the slope is 0.6087 and the intercept is 3.6425. The R-Squared value for this regression is 0.6102.

LOG10 Regressions of Calibration vs. Observations

Using the 954 pairs of predictions and observed data, the slope is 0.6130 and the intercept is 0.3923. The R-Squared value for this regression is 0.6289.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.7</td>
<td>4.698</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.2</td>
<td>14.07</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7392</td>
<td>Std. Dev. predicted 2.2322</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.3525</td>
<td>Median predicted 9.7089</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.3800</td>
<td>90th Percentile predicted 12.0990</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.9400</td>
<td>10th Percentile predicted 6.2032</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0057 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 954
Number of Predicted Violations 0
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment CB6PH Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)

Segment CB6PH  Season: Oct 1 – April 30

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 230 pairs of predictions and observed data, the slope is 1.6538 and the intercept is -2.6350. The R-Squared value for this regression is 0.0906.

LOG10 Regressions of Calibration vs. Observations
Using the 230 pairs of predictions and observed data, the slope is 1.4765 and the intercept is -0.3949. The R-Squared value for this regression is 0.1034.

Statistics (units in µg/l)

Mean observed 8.5646 Mean predicted 6.7721
Min. observed 0.0000 Min. predicted 4.4141
Max. observed 31.0000 Max. predicted 11.1440
Std. Dev. Observed 5.4272 Std. Dev. predicted 0.9876
Median observed 7.4253 Median predicted 6.7032
95th Percentile observed 20.2000 95th Percentile predicted 8.3993
10th Percentile observed 3.3000 10th Percentile predicted 5.6065

Differences (predicted – observed)
Mean difference -1.7925 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment CB6PH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB6PH  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 186 pairs of predictions and observed data, the slope is 0.2346 and the intercept is 6.3778. The R-Squared value for this regression is 0.0077.

LOG10 Regressions of Calibration vs. Observations
Using the 186 pairs of predictions and observed data, the slope is 0.2996 and the intercept is 0.5695. The R-Squared value for this regression is 0.0105.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.8284</td>
<td>10.4461</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.0000</td>
<td>4.5396</td>
</tr>
<tr>
<td>Max. observed</td>
<td>35.7000</td>
<td>21.2980</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>7.6373</td>
<td>2.8626</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.9007</td>
<td>10.1710</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>26.6000</td>
<td>16.8580</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.3000</td>
<td>7.5676</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.6177 µg/l

\(^1\) observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB6PH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment CB6PH  Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 363 pairs of predictions and observed data, the slope is 0.0608 and the intercept is 0.7090. The R-Squared value for this regression is 0.0018.

LOG10 Regressions of Calibration vs. Observations

Using the 363 pairs of predictions and observed data, the slope is 0.0550 and the intercept is 0.2261. The R-Squared value for this regression is 0.0017.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.7501</td>
</tr>
<tr>
<td>Min.</td>
<td>0.3714</td>
</tr>
<tr>
<td>Max.</td>
<td>2.1667</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.2736</td>
</tr>
<tr>
<td>Median</td>
<td>0.6842</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>1.0833</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.4643</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0750 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CB6PH  Season: March – May Sept – Nov

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CB6PH  Season: March – May Sept – Nov
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 7460 pairs of predictions and observed data, the slope is 0.8929 and the intercept is 0.6213. The R-Squared value for this regression is 0.7373.

LOG10 Regressions of Calibration vs. Observations

Using the 7460 pairs of predictions and observed data, the slope is 0.9460 and the intercept is 0.0368. The R-Squared value for this regression is 0.7186.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.1244</td>
</tr>
<tr>
<td>Min.</td>
<td>2.81</td>
</tr>
<tr>
<td>Max.</td>
<td>13.75</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.1132</td>
</tr>
<tr>
<td>Median</td>
<td>7.9850</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.0750</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.4750</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.2790 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 7460
Number of Predicted Violations 3
Number of Observed Violations 67

---

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

**Segment CB7PH**  **Season: Jan 1 – Dec 31**

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment CB7PH Season: Jan 1 – Dec 31
(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment CB7PH (Mainstem CB7 Polyhaline)
      May 1 - Sept 30

Regression of Calibration vs. Observations¹

Using the 1780 pairs of predictions and observed data, the slope is 0.4084 and the intercept is 3.3837. The R-Squared value for this regression is 0.1997.

LOG10 Regressions of Calibration vs. Observations¹

Using the 1780 pairs of predictions and observed data, the slope is 0.3513 and the intercept is 0.5280. The R-Squared value for this regression is 0.1422.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>5.6934</td>
<td>5.6557</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.335</td>
<td>0.4118</td>
</tr>
<tr>
<td>Max. observed</td>
<td>10.2</td>
<td>10.66</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.6147</td>
<td>1.7666</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.8300</td>
<td>5.5932</td>
</tr>
<tr>
<td>90⁰ Percentile</td>
<td>7.7050</td>
<td>8.0257</td>
</tr>
<tr>
<td>10⁰ Percentile</td>
<td>3.4000</td>
<td>3.4402</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0377 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 1780
Number of Predicted Violations 15
Number of Observed Violations 8

¹ observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)
Segment CB7PH Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations

Using the 1599 pairs of predictions and observed data, the slope is 0.5111 and the intercept is 4.8745. The R-Squared value for this regression is 0.5061.

LOG10 Regressions of Calibration vs. Observations

Using the 1599 pairs of predictions and observed data, the slope is 0.4628 and the intercept is 0.5575. The R-Squared value for this regression is 0.5029.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic Type</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.4208</td>
<td>8.8957</td>
</tr>
<tr>
<td>Min.</td>
<td>5.0343</td>
<td>2.227</td>
</tr>
<tr>
<td>Max.</td>
<td>13.62</td>
<td>13.48</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.6082</td>
<td>2.2386</td>
</tr>
<tr>
<td>Median Observed</td>
<td>9.5100</td>
<td>9.2371</td>
</tr>
<tr>
<td>90th Percentile Observed</td>
<td>11.3600</td>
<td>90th Percentile Predicted</td>
</tr>
<tr>
<td>10th Percentile Observed</td>
<td>7.3100</td>
<td>10th Percentile Predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.5251 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1599
Number of Predicted Violations 7
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)
Segment CB7PH Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment CB7PH Season: Oct 1 – April 30
(Scatter Plot )
**POLYHALINE Chlorophyll**  
Segment CB7PH (Mainstem CB7 Polyhaline)  
July 1 - Sept 30

**Regression of Calibration vs. Observations**
Using the 459 pairs of predictions and observed data, the slope is 0.9793 and the intercept is 0.4760. The R-Squared value for this regression is 0.1904.

**LOG10 Regressions of Calibration vs. Observations**
Using the 459 pairs of predictions and observed data, the slope is 1.1164 and the intercept is -0.1293. The R-Squared value for this regression is 0.1893.

**Statistics** (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.2273</td>
<td>6.8942</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.0000</td>
<td>3.7304</td>
</tr>
<tr>
<td>Max. observed</td>
<td>23.9000</td>
<td>12.8690</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>3.8741</td>
<td>1.7264</td>
</tr>
<tr>
<td>Median observed</td>
<td>6.7765</td>
<td>6.4578</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>14.6000</td>
<td>10.6150</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.8000</td>
<td>5.0577</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference -0.3331 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment CB7PH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations
Using the 378 pairs of predictions and observed data, the slope is 0.8041 and the intercept is -0.0105. The R-Squared value for this regression is 0.1042.

LOG10 Regressions of Calibration vs. Observations
Using the 378 pairs of predictions and observed data, the slope is 0.9238 and the intercept is -0.1096. The R-Squared value for this regression is 0.1092.

Statistics (units in µg/l)

|                         | Mean observed | Min. observed | Max. observed | Std. Dev. Observed | Median observed | 95th Percentile observed | 10th Percentile observed | Mean predicted | Min. predicted | Max. predicted | Std. Dev. predicted | Median predicted | 95th Percentile predicted | 10th Percentile predicted |
|-------------------------|---------------|---------------|---------------|--------------------|-----------------|-------------------------|-------------------------|               |               |               |                   |                 |                          |                          |
| Mean observed 8.2656    | Mean predicted 10.2918 |
| Min. observed 0.0000   | Min. predicted 3.8292 |
| Max. observed 47.4726  | Max. predicted 20.6730 |
| Std. Dev. Observed 7.5330 | Std. Dev. predicted 3.0245 |
| Median observed 5.4447  | Median predicted 9.8686 |
| 95th Percentile observed 25.6000 | 95th Percentile predicted 16.3050 |
| 10th Percentile observed 1.8743  | 10th Percentile predicted 6.9589 |

Differences (predicted – observed)

Mean difference 2.0262 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (μg/l)
Segment CB7PH  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB7PH  Season: March 1 – May 30
(Scatter Plot)
POLYHALINE Light Attenuation
Segment CB7PH (Mainstem CB7 Polyhaline)
March-May Sept-Nov

Regression of Calibration vs. Observations

Using the 730 pairs of predictions and observed data, the slope is 0.3218 and the intercept is 0.4921. The R-Squared value for this regression is 0.0663.

LOG10 Regressions of Calibration vs. Observations

Using the 730 pairs of predictions and observed data, the slope is 0.3124 and the intercept is 0.1589. The R-Squared value for this regression is 0.0651.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 0.7358</th>
<th>Mean predicted 0.7570</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.3250</td>
<td>Min. predicted 0.3758</td>
</tr>
<tr>
<td>Max. observed</td>
<td>2.6000</td>
<td>Max. predicted 1.6898</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.2831</td>
<td>Std. Dev. predicted 0.2265</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.6842</td>
<td>Median predicted 0.7189</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>1.0833</td>
<td>90th Percentile predicted 1.0828</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.4333</td>
<td>10th Percentile predicted 0.5029</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0213 1/m

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CB7PH  Season: March – May Sept – Nov

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing cumulative frequency distribution of Ke (1/m) over the percent of population.](image-url)
Ke (1/m)

Segment CB7PH  Season: March – May Sept – Nov

(Scatter Plot)
OPEN WATER Dissolved Oxygen
Segment CB8PH (Mainstem CB8 Polyhaline)
Jan 1 - Dec 31

Regression of Calibration vs. Observations
Using the 5098 pairs of predictions and observed data, the slope is 0.7584 and the intercept is 1.9102. The R-Squared value for this regression is 0.7427.

LOG10 Regressions of Calibration vs. Observations
Using the 5098 pairs of predictions and observed data, the slope is 0.7637 and the intercept is 0.2240. The R-Squared value for this regression is 0.7174.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.1577</td>
<td>8.2374</td>
</tr>
<tr>
<td>Min. observed</td>
<td>3.7</td>
<td>4.433</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.4</td>
<td>15.39</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7888</td>
<td>2.0325</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.8900</td>
<td>7.8817</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>10.8000</td>
<td>90th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.0350</td>
<td>10th Percentile predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0797 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 5098
Number of Predicted Violations 0
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)
Segment CB8PH Season: Jan 1 – Dec 31
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)

Segment CB8PH  Season: Jan 1 – Dec 31

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 234 pairs of predictions and observed data, the slope is 0.4643 and the intercept is 3.2256. The R-Squared value for this regression is 0.0434.

LOG10 Regressions of Calibration vs. Observations
Using the 234 pairs of predictions and observed data, the slope is 0.7436 and the intercept is 0.1254. The R-Squared value for this regression is 0.0685.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>6.9141</td>
<td>0.0000</td>
<td>22.1076</td>
<td>4.4931</td>
<td>6.0250</td>
<td>7.9447</td>
<td>15.6630</td>
<td>2.0151</td>
<td>7.5194</td>
</tr>
<tr>
<td>Min. observed</td>
<td></td>
<td>0.0000</td>
<td></td>
<td></td>
<td></td>
<td>4.5984</td>
<td>12.0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. observed</td>
<td></td>
<td></td>
<td>22.1076</td>
<td>4.4931</td>
<td>6.0250</td>
<td></td>
<td>15.6630</td>
<td>2.0151</td>
<td></td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>4.4931</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.5984</td>
<td>12.0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median observed</td>
<td>6.0250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.5194</td>
<td>15.6630</td>
<td>2.0151</td>
<td></td>
</tr>
<tr>
<td>95th Percentile</td>
<td>16.6000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95th Percentile</td>
<td>12.0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.3000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10th Percentile</td>
<td>5.7287</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.0306 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB8PH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB8PH  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 187 pairs of predictions and observed data, the slope is 0.5028 and the intercept is 2.0258. The R-Squared value for this regression is 0.1916.

LOG10 Regressions of Calibration vs. Observations
Using the 187 pairs of predictions and observed data, the slope is 0.9579 and the intercept is -0.1990. The R-Squared value for this regression is 0.2166.

Statistics (units in µg/l)

- Mean observed 8.4597
- Min. observed 0.0000
- Max. observed 26.2000
- Std. Dev. Observed 6.5819
- Median observed 6.3000
- 95th Percentile observed 22.1000
- 10th Percentile observed 1.9000

- Mean predicted 12.7951
- Min. predicted 4.9616
- Max. predicted 35.3350
- Std. Dev. predicted 5.7297
- Median predicted 10.9980
- 95th Percentile predicted 24.3330
- 10th Percentile predicted 7.2531

Differences (predicted – observed)

- Mean difference 4.3353 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CB8PH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CB8PH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations\(^1\)

Using the 391 pairs of predictions and observed data, the slope is 0.5160 and the intercept is 0.3619. The R-Squared value for this regression is 0.1809.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 391 pairs of predictions and observed data, the slope is 0.5640 and the intercept is 0.0991. The R-Squared value for this regression is 0.1957.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 0.8477</th>
<th>Mean predicted 0.9415</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.3095</td>
<td>0.4799</td>
</tr>
<tr>
<td>Max. observed</td>
<td>2.6000</td>
<td>2.3665</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.3675</td>
<td>0.3029</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.7647</td>
<td>0.8791</td>
</tr>
<tr>
<td>90(^{th}) Percentile</td>
<td>1.3000</td>
<td>1.3185</td>
</tr>
<tr>
<td>10(^{th}) Percentile</td>
<td>0.4643</td>
<td>0.6313</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0937 1/m

\(^1\) observed is dependent, predicted is independent
Ke (1/m)

Segment CB8PH  Season: March – May Sept – Nov

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CB8PH  Season: March – May  Sept – Nov

(Scatter Plot)
MIGRATORY Dissolved Oxygen
Segment PAXTF (Patuxent Tidal Fresh)
Feb 15 - June 10

Regression of Calibration vs. Observations

Using the 334 pairs of predictions and observed data, the slope is 0.6041 and the intercept is 5.2562. The R-Squared value for this regression is 0.4664.

LOG10 Regressions of Calibration vs. Observations

Using the 334 pairs of predictions and observed data, the slope is 0.4422 and the intercept is 0.6214. The R-Squared value for this regression is 0.4492.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 9.5950</td>
<td>Mean predicted 7.1827</td>
</tr>
<tr>
<td>Min. observed 5.5</td>
<td>Min. predicted 1.495</td>
</tr>
<tr>
<td>Max. observed 13</td>
<td>Max. predicted 12.1</td>
</tr>
<tr>
<td>Std. Dev. Observed 1.6280</td>
<td>Std. Dev. predicted 1.8405</td>
</tr>
<tr>
<td>Median observed 9.5456</td>
<td>Median predicted 7.2587</td>
</tr>
<tr>
<td>90th Percentile observed 11.7000</td>
<td>90th Percentile predicted 9.4193</td>
</tr>
<tr>
<td>10th Percentile observed 7.3932</td>
<td>10th Percentile predicted 4.6122</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.4123 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 334
Number of Predicted Violations 67
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment PAXTF  Season: Feb 15 – June 10
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment PAXTF Season: Feb 15 – June 10

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 594 pairs of predictions and observed data, the slope is 0.5372 and the intercept is 5.7525. The R-Squared value for this regression is 0.3598.

LOG10 Regressions of Calibration vs. Observations

Using the 594 pairs of predictions and observed data, the slope is 0.2789 and the intercept is 0.7594. The R-Squared value for this regression is 0.2512.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.7946</th>
<th>Mean predicted 5.6627</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>4.4</td>
<td>Min. predicted -0.5191</td>
</tr>
<tr>
<td>Max.</td>
<td>13.3798</td>
<td>Max. predicted 10.45</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.1085</td>
<td>Std. Dev. predicted 2.3541</td>
</tr>
<tr>
<td>Median</td>
<td>8.6918</td>
<td>Median predicted 5.4077</td>
</tr>
<tr>
<td>90th Per.</td>
<td>11.5890</td>
<td>90th Percentile predicted 9.2347</td>
</tr>
<tr>
<td>10th Per.</td>
<td>6.0000</td>
<td>10th Percentile predicted 2.9116</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -3.1319 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 594
Number of Predicted Violations 148
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment PAXTF Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment PAXTF  Season: June 11 – Feb 14
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 203 pairs of predictions and observed data, the slope is 1.7917 and the intercept is 8.4654. The R-Squared value for this regression is 0.1778.

LOG10 Regressions of Calibration vs. Observations
Using the 203 pairs of predictions and observed data, the slope is 0.6588 and the intercept is 0.6052. The R-Squared value for this regression is 0.1567.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>24.6573</td>
<td>9.0373</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.4969</td>
<td>0.6092</td>
</tr>
<tr>
<td>Max. observed</td>
<td>76.9000</td>
<td>20.0710</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>21.6304</td>
<td>5.0908</td>
</tr>
<tr>
<td>Median observed</td>
<td>17.7000</td>
<td>8.7428</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>67.7000</td>
<td>17.3940</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.0000</td>
<td>2.4711</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -15.6200 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PAXTF  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment PAXTF  Season: July 1 – Sept 30
(Scatter Plot)
TIDAL FRESH Chlorophyll
Segment PAXTF (Patuxent Tidal Fresh)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 192 pairs of predictions and observed data, the slope is 1.1333 and the intercept is 1.5965. The R-Squared value for this regression is 0.3010.

LOG10 Regressions of Calibration vs. Observations
Using the 192 pairs of predictions and observed data, the slope is 0.5587 and the intercept is 0.4039. The R-Squared value for this regression is 0.2932.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.2167</th>
<th>Mean predicted 5.8415</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.9000</td>
<td>Min. predicted 0.1067</td>
</tr>
<tr>
<td>Max. observed</td>
<td>70.8000</td>
<td>Max. predicted 30.7270</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>11.6831</td>
<td>Std. Dev. predicted 5.6563</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.5000</td>
<td>Median predicted 3.5441</td>
</tr>
<tr>
<td>95th Percentile obs.</td>
<td>28.6000</td>
<td>95th Percentile predicted 18.4610</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>2.0000</td>
<td>10th Percentile predicted 1.2620</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.3752 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment PAXTF  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment PAXTF  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 263 pairs of predictions and observed data, the slope is 0.0301 and the intercept is 4.1425. The R-Squared value for this regression is 0.0089.

LOG10 Regressions of Calibration vs. Observations

Using the 263 pairs of predictions and observed data, the slope is 0.2360 and the intercept is 0.5379. The R-Squared value for this regression is 0.1033.

Statistics (units in 1/m)

Mean observed 4.2772 Mean predicted 4.4799
Min. observed 1.8571 Min. predicted 1.0809
Max. observed 13.0000 Max. predicted 104.5900
Std. Dev. Observed 2.1402 Std. Dev. predicted 6.7263
Median observed 4.3333 Median predicted 3.8580
90th Percentile observed 6.5000 90th Percentile predicted 5.6090
10th Percentile observed 2.6000 10th Percentile predicted 1.8157

Differences (predicted – observed)

Mean difference 0.2027 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment PAXTF  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chesapeake Bay Standard Segment PAXOH

Location Map of Segment PAXOH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 137 pairs of predictions and observed data, the slope is 0.4136 and the intercept is 4.9249. The R-Squared value for this regression is 0.1863.

LOG10 Regressions of Calibration vs. Observations

Using the 137 pairs of predictions and observed data, the slope is 0.4222 and the intercept is 0.5576. The R-Squared value for this regression is 0.2001.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>8.8637</td>
<td>9.5231</td>
</tr>
<tr>
<td>Min.</td>
<td>Min.</td>
</tr>
<tr>
<td>4.75</td>
<td>2.55</td>
</tr>
<tr>
<td>Max.</td>
<td>Max.</td>
</tr>
<tr>
<td>12.7</td>
<td>13.99</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>1.9325</td>
<td>2.0168</td>
</tr>
<tr>
<td>Median</td>
<td>Median</td>
</tr>
<tr>
<td>8.8000</td>
<td>9.4604</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>90th Percentile</td>
</tr>
<tr>
<td>11.6000</td>
<td>12.2590</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>10th Percentile</td>
</tr>
<tr>
<td>6.3500</td>
<td>7.0971</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.6593 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 137
Number of Predicted Violations 2
Number of Observed Violations 2

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment PAXOH  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory  Dissolved Oxygen (mg/l)
Segment PAXOH  Season: Feb 15  –  June 10

(Scatter Plot )
Regression of Calibration vs. Observations\(^1\)

Using the 246 pairs of predictions and observed data, the slope is 0.5860 and the intercept is 2.9616. The R-Squared value for this regression is 0.1992.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 246 pairs of predictions and observed data, the slope is 0.4734 and the intercept is 0.4728. The R-Squared value for this regression is 0.1554.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 7.5436</th>
<th>Mean predicted 7.8195</th>
<th>Min. observed 2.9667</th>
<th>Min. predicted 3.037</th>
<th>Max. observed 14</th>
<th>Max. predicted 11.97</th>
<th>Std. Dev. Observed 2.4006</th>
<th>Std. Dev. predicted 1.8286</th>
<th>Median observed 6.9250</th>
<th>Median predicted 7.9936</th>
<th>90(^{th}) Percentile observed 11.3000</th>
<th>90(^{th}) Percentile predicted 10.0710</th>
<th>10(^{th}) Percentile observed 4.8667</th>
<th>10(^{th}) Percentile predicted 5.2180</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference 0.2759 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 246
Number of Predicted Violations 4
Number of Observed Violations 1

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment PAXOH Season: June 11 – Feb 14

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment PAXOH (Patuxent Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 117 pairs of predictions and observed data, the slope is -0.0819 and the intercept is 23.9108. The R-Squared value for this regression is 0.0009.

LOG10 Regressions of Calibration vs. Observations
Using the 117 pairs of predictions and observed data, the slope is -0.0389 and the intercept is 1.3303. The R-Squared value for this regression is 0.0005.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>22.5735</td>
<td>2.2500</td>
<td>60.4000</td>
<td>14.1554</td>
<td>19.2750</td>
<td>5.2071</td>
<td>17.3480</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.2500</td>
<td>1.8798</td>
<td>26.8150</td>
<td>5.2071</td>
<td>17.3480</td>
<td>9.2355</td>
<td></td>
</tr>
<tr>
<td>Max. observed</td>
<td>60.4000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>14.1554</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median observed</td>
<td>19.2750</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Dev. predicted</td>
<td>5.2071</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median predicted</td>
<td>17.3480</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -6.2548 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PAXOH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment PAXOH  Season: July 1 – Sept 30

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment PAXOH (Patuxent Oligohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 103 pairs of predictions and observed data, the slope is 0.2366 and the intercept is 7.7828. The R-Squared value for this regression is 0.0194.

LOG10 Regressions of Calibration vs. Observations
Using the 103 pairs of predictions and observed data, the slope is 0.3765 and the intercept is 0.4990. The R-Squared value for this regression is 0.0434.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.5000</td>
<td>3.3595</td>
</tr>
<tr>
<td>Max. observed</td>
<td>68.5000</td>
<td>35.2730</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>12.9291</td>
<td>7.6034</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.7000</td>
<td>19.5920</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>39.2000</td>
<td>95th Percentile predicted 32.2910</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>3.1500</td>
<td>10th Percentile predicted 9.6474</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 6.9968 µg/l
Chlorophyll Concentration (ug/l)

Segment PAXOH   Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment PAXOH  Season: March 1 – May 30
(Scatter Plot)
OLIGOHALINE Light Attenuation
Segment PAXOH (Patuxent Oligohaline)
April 1 - Oct 30

Regression of Calibration vs. Observations

Using the 269 pairs of predictions and observed data, the slope is 0.2737 and the intercept is 2.7026. The R-Squared value for this regression is 0.0886.

LOG10 Regressions of Calibration vs. Observations

Using the 269 pairs of predictions and observed data, the slope is 0.4234 and the intercept is 0.3675. The R-Squared value for this regression is 0.1389.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 3.9358</th>
<th>Mean predicted 4.5064</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.8571</td>
<td>2.5929</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>18.3700</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.6690</td>
<td>Std. Dev. predicted 1.8151</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.2500</td>
<td>Median predicted 4.3159</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>6.5000</td>
<td>90th Percentile predicted 5.9698</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>2.6000</td>
<td>10th Percentile predicted 3.1380</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.5706 1/m

1 observed is dependent, predicted is independent
Ke (1/m)

Segment PAXOH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment PAXOH   Season: April 1 – Oct 30
(Scatter Plot)
Chesapeake Bay Standard Segment PAXMH

Location Map of Segment PAXMH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 734 pairs of predictions and observed data, the slope is 0.8991 and the intercept is 0.0107. The R-Squared value for this regression is 0.6417.

LOG10 Regressions of Calibration vs. Observations

Using the 734 pairs of predictions and observed data, the slope is 0.9780 and the intercept is -0.0231. The R-Squared value for this regression is 0.6217.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.5820</th>
<th>Mean predicted 10.6459</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>3.3</td>
<td>2.981</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.8</td>
<td>16.43</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>2.5039</td>
<td>2.2309</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.7000</td>
<td>10.8100</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>12.6000</td>
<td>13.3990</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.2000</td>
<td>7.4799</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.0640 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 734
Number of Predicted Violations 6
Number of Observed Violations 22

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment PAXMH Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1352 pairs of predictions and observed data, the slope is 0.8593 and the intercept is 1.0260. The R-Squared value for this regression is 0.4655.

LOG10 Regressions of Calibration vs. Observations

Using the 1352 pairs of predictions and observed data, the slope is 0.8044 and the intercept is 0.1685. The R-Squared value for this regression is 0.4130.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observation</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.4010</td>
<td>7.4190</td>
</tr>
<tr>
<td>Min.</td>
<td>1.3</td>
<td>1.511</td>
</tr>
<tr>
<td>Max.</td>
<td>15.4</td>
<td>14.98</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.7318</td>
<td>2.1691</td>
</tr>
<tr>
<td>Median</td>
<td>6.8000</td>
<td>7.2765</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.4000</td>
<td>10.3490</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>4.4000</td>
<td>4.7613</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0180 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1352
Number of Predicted Violations 32
Number of Observed Violations 57

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment PAXMH Season: June 11 – Feb 14
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment PAXMH  Season: June 11 – Feb 14
(Scatter Plot )
Regression of Calibration vs. Observations

Using the 582 pairs of predictions and observed data, the slope is 0.8939 and the intercept is 0.5483. The R-Squared value for this regression is 0.6543.

LOG10 Regressions of Calibration vs. Observations

Using the 582 pairs of predictions and observed data, the slope is 0.9366 and the intercept is 0.0395. The R-Squared value for this regression is 0.5853.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.4802</th>
<th>Mean predicted 8.8730</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.7</td>
<td>4.567</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.9</td>
<td>14.93</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.6165</td>
<td>Std. Dev. predicted 2.3675</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.0000</td>
<td>Median predicted 8.1025</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>12.2000</td>
<td>90th Percentile predicted 12.6810</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.3000</td>
<td>10th Percentile predicted 6.3133</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3927 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 582
Number of Predicted Violations 0
Number of Observed Violations 3

---

1 observed is dependent, predicted is independent
Open Water  Dissolved Oxygen (mg/l)
Segment PAXMH  Season: Jan 1 – Dec 31
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
 Segment PAXMH  Season: Jan 1 – Dec 31

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 299 pairs of predictions and observed data, the slope is 0.7756 and the intercept is 0.6384. The R-Squared value for this regression is 0.3618.

LOG10 Regressions of Calibration vs. Observations

Using the 299 pairs of predictions and observed data, the slope is 1.0464 and the intercept is -0.1007. The R-Squared value for this regression is 0.3137.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 4.9156</td>
<td>Mean predicted 5.5147</td>
</tr>
<tr>
<td>Min. observed 0.05</td>
<td>Min. predicted 2.478</td>
</tr>
<tr>
<td>Max. observed 10.5</td>
<td>Max. predicted 10.05</td>
</tr>
<tr>
<td>Std. Dev. Observed 1.9802</td>
<td>Std. Dev. predicted 1.5358</td>
</tr>
<tr>
<td>Median observed 5.2000</td>
<td>Median predicted 5.3546</td>
</tr>
<tr>
<td>90th Percentile observed 7.1000</td>
<td>90th Percentile predicted 7.3961</td>
</tr>
<tr>
<td>10th Percentile observed 2.0000</td>
<td>10th Percentile predicted 3.6210</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.5992 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 299
Number of Predicted Violations 0
Number of Observed Violations 24

---

observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment PAXMH Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment PAXMH Season: May 1 – Sept 30

(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment PAXMH (Patuxent Mesohaline)
Oct 1 - April 30

Regression of Calibration vs. Observations

Using the 276 pairs of predictions and observed data, the slope is 0.5832 and the intercept is 4.8899. The R-Squared value for this regression is 0.5935.

LOG10 Regressions of Calibration vs. Observations

Using the 276 pairs of predictions and observed data, the slope is 0.5241 and the intercept is 0.5238. The R-Squared value for this regression is 0.5951.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Mean observed 10.1861</th>
<th>Mean predicted 9.0807</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.4</td>
<td>Min. predicted 3.638</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15</td>
<td>Max. predicted 14.24</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.0590</td>
<td>Std. Dev. predicted 2.7197</td>
</tr>
<tr>
<td>Median observed</td>
<td>10.4000</td>
<td>Median predicted 9.5268</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>12.7000</td>
<td>90th Percentile predicted 12.6200</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>7.6000</td>
<td>10th Percentile predicted 5.2743</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -1.1054 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 276
Number of Predicted Violations 0
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment PAXMH Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment PAXMH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 284 pairs of predictions and observed data, the slope is 1.0603 and the intercept is 1.3381. The R-Squared value for this regression is 0.2226.

LOG10 Regressions of Calibration vs. Observations
Using the 284 pairs of predictions and observed data, the slope is 1.0080 and the intercept is 0.0180. The R-Squared value for this regression is 0.2636.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>13.5593</td>
<td>11.5262</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.9000</td>
<td>4.5906</td>
</tr>
<tr>
<td>Max. observed</td>
<td>41.6000</td>
<td>21.3970</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>7.1406</td>
<td>3.1771</td>
</tr>
<tr>
<td>Median observed</td>
<td>12.3000</td>
<td>11.3265</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>27.7000</td>
<td>17.4410</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.2000</td>
<td>7.3466</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference -2.0332 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PAXMH  Season: July 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 243 pairs of predictions and observed data, the slope is 0.1199 and the intercept is 9.4309. The R-Squared value for this regression is 0.0089.

LOG10 Regressions of Calibration vs. Observations
Using the 243 pairs of predictions and observed data, the slope is 0.1569 and the intercept is 0.7994. The R-Squared value for this regression is 0.0049.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>12.0648 µg/l</td>
<td>21.9668 µg/l</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.4000 µg/l</td>
<td>7.7914 µg/l</td>
</tr>
<tr>
<td>Max. observed</td>
<td>57.6000 µg/l</td>
<td>46.8610 µg/l</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>9.5417 µg/l</td>
<td>7.4885 µg/l</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.4000 µg/l</td>
<td>20.8100 µg/l</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>31.5000 µg/l</td>
<td>38.5690 µg/l</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>3.1000 µg/l</td>
<td>13.5770 µg/l</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 9.9020 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment PAXMH  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (μg/l)
Segment PAXMH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 686 pairs of predictions and observed data, the slope is 0.8950 and the intercept is 0.0184. The R-Squared value for this regression is 0.1318.

LOG10 Regressions of Calibration vs. Observations

Using the 686 pairs of predictions and observed data, the slope is 0.9483 and the intercept is -0.0189. The R-Squared value for this regression is 0.3511.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.4081</td>
<td>1.5527</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.5000</td>
<td>0.6690</td>
</tr>
<tr>
<td>Max. observed</td>
<td>26.0000</td>
<td>4.9003</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.1758</td>
<td>0.4770</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.1818</td>
<td>1.4965</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>2.1667</td>
<td>2.0646</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.7222</td>
<td>1.0229</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1447 1/m

---

1 observed is dependent, predicted is independent
Segment PAXMH  Season: April 1 – Oct 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment PAXMH  Season: April 1 – Oct 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 544 pairs of predictions and observed data, the slope is 0.7618 and the intercept is 1.6553. The R-Squared value for this regression is 0.3358.

LOG10 Regressions of Calibration vs. Observations

Using the 544 pairs of predictions and observed data, the slope is 0.7862 and the intercept is 0.1894. The R-Squared value for this regression is 0.3004.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>9.6511</td>
<td>10.4953</td>
</tr>
<tr>
<td>Min. observed</td>
<td>4.4</td>
<td>6.328</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.6</td>
<td>13.79</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.8536</td>
<td>1.4098</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.8000</td>
<td>10.5570</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>12.3000</td>
<td>12.3470</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>7.1667</td>
<td>8.5410</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.8442 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 544
Number of Predicted Violations 0
Number of Observed Violations 2

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment POTTF  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment POTTF  Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1170 pairs of predictions and observed data, the slope is 0.7946 and the intercept is 0.6744. The R-Squared value for this regression is 0.4832.

LOG10 Regressions of Calibration vs. Observations

Using the 1170 pairs of predictions and observed data, the slope is 0.7697 and the intercept is 0.1722. The R-Squared value for this regression is 0.3926.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.1964</td>
<td>9.4669</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.9</td>
<td>Min. predicted</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.1</td>
<td>4.434</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2889</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.6000</td>
<td>Median predicted</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.9000</td>
<td>90th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>5.7000</td>
<td>10th Percentile predicted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.0026</td>
</tr>
<tr>
<td></td>
<td>9.1746</td>
<td>12.5540</td>
</tr>
<tr>
<td></td>
<td>7.1219</td>
<td>7.1219</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.2705 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1170
Number of Predicted Violations 0
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment POTTF Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment POTTF  Season: June 11 – Feb 14
(Scatter Plot)
TIDAL FRESH Chlorophyll
Segment POTTF (Potomac Tidal Fresh)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 338 pairs of predictions and observed data, the slope is 0.1773 and the intercept is 13.8865. The R-Squared value for this regression is 0.0187.

LOG10 Regressions of Calibration vs. Observations
Using the 338 pairs of predictions and observed data, the slope is 0.3311 and the intercept is 0.7204. The R-Squared value for this regression is 0.0489.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>17.9969</td>
<td>23.1834</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.3316</td>
<td>3.3451</td>
</tr>
<tr>
<td>Max. observed</td>
<td>105.9100</td>
<td>91.5260</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>15.4149</td>
<td>11.8753</td>
</tr>
<tr>
<td>Median observed</td>
<td>14.7392</td>
<td>20.6880</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>53.0796</td>
<td>42.9280</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>4.2557</td>
<td>10.8920</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 5.1865 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment POTTF  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations\textsuperscript{1}
Using the 271 pairs of predictions and observed data, the slope is 0.3060 and the intercept is 3.5879. The R-Squared value for this regression is 0.0771.

LOG10 Regressions of Calibration vs. Observations\textsuperscript{1}
Using the 271 pairs of predictions and observed data, the slope is 0.4027 and the intercept is 0.4002. The R-Squared value for this regression is 0.1560.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.8362</td>
<td>7.3474</td>
</tr>
<tr>
<td>Min</td>
<td>0.2246</td>
<td>0.4277</td>
</tr>
<tr>
<td>Max</td>
<td>39.6114</td>
<td>31.2270</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>5.3032</td>
<td>4.8107</td>
</tr>
<tr>
<td>Median</td>
<td>4.4856</td>
<td>6.8514</td>
</tr>
<tr>
<td>95\textsuperscript{th} Percentile</td>
<td>16.7000</td>
<td>14.8450</td>
</tr>
<tr>
<td>10\textsuperscript{th} Percentile</td>
<td>1.4000</td>
<td>1.8829</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.5112 µg/l

\textsuperscript{1} observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment POTTF  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing the cumulative frequency distribution of Chlorophyll concentration over the specified season. The x-axis represents the percent of the population, and the y-axis shows the simulated and observed Chl (ug/l) concentrations.]
Chlorophyll Concentration (ug/l)
Segment POTTF Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 917 pairs of predictions and observed data, the slope is 0.3423 and the intercept is 1.2498. The **R-Squared** value for this regression is 0.1932.

LOG10 Regressions of Calibration vs. Observations

Using the 917 pairs of predictions and observed data, the slope is 0.3858 and the intercept is 0.2690. The **R-Squared** value for this regression is 0.1878.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 2.3749</th>
<th>Mean predicted 3.2866</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.8667</td>
<td>0.6543</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>Max. predicted 27.8490</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.6262</td>
<td>Std. Dev. predicted 2.0880</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.8571</td>
<td>Median predicted 2.7701</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>3.2500</td>
<td>90th Percentile predicted 5.2192</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.3000</td>
<td>10th Percentile predicted 1.6869</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.9117 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment POTTF  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)
Segment POTTF  Season: April 1 – Oct 30
(Scatter Plot)
Chesapeake Bay Standard Segment POTOH

Location Map of Segment POTOH within the Chesapeake Bay Model Grid

Chesapeake Bay Program
Regression of Calibration vs. Observations\(^1\)

Using the 354 pairs of predictions and observed data, the slope is 0.3876 and the intercept is 4.6939. The R-Squared value for this regression is 0.2105.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 354 pairs of predictions and observed data, the slope is 0.5097 and the intercept is 0.4434. The R-Squared value for this regression is 0.2295.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>90(^{th}) Percentile observed</th>
<th>10(^{th}) Percentile observed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9.2234</td>
<td>2.8</td>
<td>13.4</td>
<td>1.7942</td>
<td>9.1500</td>
<td>11.8000</td>
<td>7.1000</td>
</tr>
<tr>
<td>Mean predicted</td>
<td>11.6871</td>
<td>6.591</td>
<td>17.01</td>
<td>2.1240</td>
<td>11.8735</td>
<td>14.4270</td>
<td>8.9527</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 2.4638 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 354
Number of Predicted Violations 0
Number of Observed Violations 3

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment POTOH Season: Feb 15 – June 10
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment POTOH Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 706 pairs of predictions and observed data, the slope is 1.1098 and the intercept is -2.3104. The R-Squared value for this regression is 0.6888.

LOG10 Regressions of Calibration vs. Observations

Using the 706 pairs of predictions and observed data, the slope is 1.2150 and the intercept is -0.2821. The R-Squared value for this regression is 0.6472.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.8684</td>
<td>9.1721</td>
</tr>
<tr>
<td>Min.</td>
<td>3</td>
<td>4.928</td>
</tr>
<tr>
<td>Max.</td>
<td>16.7</td>
<td>16.43</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2252</td>
<td>1.6641</td>
</tr>
<tr>
<td>Median</td>
<td>7.2000</td>
<td>8.8794</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.6000</td>
<td>11.7950</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.7000</td>
<td>7.4222</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.3037 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 706
Number of Predicted Violations 0
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment POTOH  Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment POTOH  Season: June 11 – Feb 14

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment POTOH (Potomac Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 149 pairs of predictions and observed data, the slope is -0.3470 and the intercept is 11.7729. The R-Squared value for this regression is 0.0015.

LOG10 Regressions of Calibration vs. Observations
Using the 149 pairs of predictions and observed data, the slope is 0.3310 and the intercept is 0.5295. The R-Squared value for this regression is 0.0107.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.8011</td>
<td>8.5651</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.7971</td>
<td>4.9008</td>
</tr>
<tr>
<td>Max. observed</td>
<td>209.5600</td>
<td>18.7260</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>17.9377</td>
<td>2.0136</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.4912</td>
<td>8.3529</td>
</tr>
<tr>
<td>95th Percentile obs.</td>
<td>24.4230</td>
<td>12.5900</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>2.8121</td>
<td>6.3791</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference -0.2361 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment POTOH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment POTOH  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations\(^1\)
Using the 130 pairs of predictions and observed data, the slope is 0.1321 and the intercept is 3.3303. The R-Squared value for this regression is 0.0405.

LOG10 Regressions of Calibration vs. Observations\(^1\)
Using the 130 pairs of predictions and observed data, the slope is 0.2358 and the intercept is 0.3980. The R-Squared value for this regression is 0.0535.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>95th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>5.2277</td>
<td>0.3208</td>
<td>40.6196</td>
<td>6.9929</td>
<td>2.7739</td>
<td>18.3696</td>
<td>1.0580</td>
<td>14.3665</td>
<td>1.3812</td>
<td>49.7780</td>
<td>10.6602</td>
<td>10.7835</td>
<td>35.0890</td>
<td>3.7610</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 9.1389 µg/l

\(^1\) observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment POTOH Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment POTOH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 347 pairs of predictions and observed data, the slope is 0.6018 and the intercept is 1.0087. The R-Squared value for this regression is 0.2459.

LOG10 Regressions of Calibration vs. Observations

Using the 347 pairs of predictions and observed data, the slope is 0.5773 and the intercept is 0.2175. The R-Squared value for this regression is 0.2204.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 2.5281</th>
<th>Mean predicted 2.5246</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.5652</td>
<td>Min. predicted 1.0874</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>Max. predicted 7.6920</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.3072</td>
<td>Std. Dev. predicted 1.0771</td>
</tr>
<tr>
<td>Median observed</td>
<td>2.1667</td>
<td>Median predicted 2.2166</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>4.3333</td>
<td>90th Percentile predicted 3.6998</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.3000</td>
<td>10th Percentile predicted 1.6313</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0035 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment POTOH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment POTOH  Season: April 1 – Oct 30

(Scatter Plot)
Location Map of Segment POTMH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 161 pairs of predictions and observed data, the slope is 0.5504 and the intercept is 2.9528. The R-Squared value for this regression is 0.5598.

LOG10 Regressions of Calibration vs. Observations

Using the 161 pairs of predictions and observed data, the slope is 0.6100 and the intercept is 0.3409. The R-Squared value for this regression is 0.5529.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.0597</th>
<th>Mean predicted 11.0945</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.5</td>
<td>3.472</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.4</td>
<td>17.14</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.9524</td>
<td>Std. Dev. predicted 2.6539</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.2000</td>
<td>Median predicted 11.4570</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.5750</td>
<td>90th Percentile predicted 14.2480</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.2000</td>
<td>10th Percentile predicted 7.4872</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 2.0348 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 161
Number of Predicted Violations 3
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment POTMH  Season: Feb 15 - June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations

Using the 356 pairs of predictions and observed data, the slope is 0.7133 and the intercept is 1.6865. The R-Squared value for this regression is 0.4276.

LOG10 Regressions of Calibration vs. Observations

Using the 356 pairs of predictions and observed data, the slope is 0.6214 and the intercept is 0.3187. The R-Squared value for this regression is 0.3406.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.0438</td>
<td>7.5109</td>
</tr>
<tr>
<td>Minimum observed</td>
<td>0.9</td>
<td>1.721</td>
</tr>
<tr>
<td>Maximum observed</td>
<td>14.1</td>
<td>14.71</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.3861</td>
<td>2.1876</td>
</tr>
<tr>
<td>Median observed</td>
<td>6.3000</td>
<td>7.5437</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>10.5000</td>
<td>90th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>4.6000</td>
<td>10th Percentile predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.4672 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 356
Number of Predicted Violations 11
Number of Observed Violations 4

---

1 observed is dependent, predicted is independent
Migratory  Dissolved Oxygen (mg/l)

Segment POTMH  Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment POTMH Season: June 11 – Feb 14
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1387 pairs of predictions and observed data, the slope is 0.7885 and the intercept is 1.9034. The R-Squared value for this regression is 0.6234.

LOG10 Regressions of Calibration vs. Observations

Using the 1387 pairs of predictions and observed data, the slope is 0.8341 and the intercept is 0.1616. The R-Squared value for this regression is 0.5581.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.8526</th>
<th>Mean predicted 8.8137</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.07</td>
<td>2.784</td>
</tr>
<tr>
<td>Max. observed</td>
<td>16.2</td>
<td>17.57</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.6647</td>
<td>2.6684</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.6000</td>
<td>8.1915</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>12.4000</td>
<td>12.8330</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>5.6200</td>
<td>5.8533</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0389 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1387
Number of Predicted Violations 3
Number of Observed Violations 18

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment POTMH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

Graph showing the cumulative frequency distribution for Dissolved Oxygen (D.O.) levels in mg/l, with percent of population on the x-axis and D.O. levels on the y-axis.
Open Water Dissolved Oxygen (mg/l)
Segment POTMH Season: Jan 1 – Dec 31

(Scatter Plot)
Regression of Calibration vs. Observations\textsuperscript{1}

Using the 712 pairs of predictions and observed data, the slope is 0.5508 and the intercept is 1.4628. The R-Squared value for this regression is 0.2143.

LOG10 Regressions of Calibration vs. Observations\textsuperscript{1}

Using the 712 pairs of predictions and observed data, the slope is 0.3717 and the intercept is 0.3451. The R-Squared value for this regression is 0.0655.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>0.0099</td>
</tr>
<tr>
<td>Max. observed</td>
<td>10.9</td>
<td>11.32</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.6390</td>
<td>2.2179</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.0458</td>
<td>4.3210</td>
</tr>
<tr>
<td>90\textsuperscript{th} Percentile</td>
<td>7.3500</td>
<td>7.3627</td>
</tr>
<tr>
<td>10\textsuperscript{th} Percentile</td>
<td>0.2000</td>
<td>1.5627</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.5114 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 712
Number of Predicted Violations 77
Number of Observed Violations 193

\textsuperscript{1} observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment POTMH Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment POTMH Season: May 1 – Sept 30

(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment POTMH (Potomac Mesohaline)
Oct 1 - April 30

Regression of Calibration vs. Observations

Using the 688 pairs of predictions and observed data, the slope is 0.5407 and the intercept is 4.6683. The R-Squared value for this regression is 0.5016.

LOG10 Regressions of Calibration vs. Observations

Using the 688 pairs of predictions and observed data, the slope is 0.5021 and the intercept is 0.5193. The R-Squared value for this regression is 0.4290.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1</td>
<td>2.637</td>
</tr>
<tr>
<td>Max. observed</td>
<td>16.1</td>
<td>15.22</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.2213</td>
<td>2.9097</td>
</tr>
<tr>
<td>Median</td>
<td>9.4050</td>
<td>8.8593</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>12.1000</td>
<td>12.7020</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.5333</td>
<td>4.7527</td>
</tr>
</tbody>
</table>

Mean difference -0.6732 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 688
Number of Predicted Violations 10
Number of Observed Violations 6

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment POTMH Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment POTMH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 110 pairs of predictions and observed data, the slope is 0.2608 and the intercept is 2.5123. The R-Squared value for this regression is 0.0591.

LOG10 Regressions of Calibration vs. Observations

Using the 110 pairs of predictions and observed data, the slope is 0.0265 and the intercept is 0.5288. The R-Squared value for this regression is 0.0006.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 3.2811</th>
<th>Mean predicted 2.9480</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>Min. predicted 0.001</td>
</tr>
<tr>
<td>Max. observed</td>
<td>8.2</td>
<td>Max. predicted 9.24</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.3989</td>
<td>Std. Dev. predicted 2.2361</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.2650</td>
<td>Median predicted 3.0032</td>
</tr>
<tr>
<td>90th Percentile obs.</td>
<td>6.4000</td>
<td>90th Percentile predicted 5.6543</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>0.1000</td>
<td>10th Percentile predicted 0.0609</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3331 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l.

Number of predicted and observed pairs 110
Number of Predicted Violations 23
Number of Observed Violations 28

---

1 observed is dependent, predicted is independent
Deep Channel Dissolved Oxygen (mg/l)
Segment POTMH Season: May 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Dissolved Oxygen (mg/l)
Segment POTMH Season: May 1 – Sept 30

(Scatter Plot )
DEEP CHANNEL  **Dissolved Oxygen**  
Segment POTMH (Potomac Mesohaline)  
Oct 1 - April 30

**Regression of Calibration vs. Observations**

Using the 80 pairs of predictions and observed data, the **slope** is 0.4904 and the **intercept** is 5.5160. The **R-Squared** value for this regression is 0.6278.

**LOG10 Regressions of Calibration vs. Observations**

Using the 80 pairs of predictions and observed data, the **slope** is 0.3956 and the **intercept** is 0.6453. The **R-Squared** value for this regression is 0.6032.

**Statistics (units in mg/l)**

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.8</td>
<td>2.367</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.67</td>
<td>14.24</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.0310</td>
<td>3.2816</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.5750</td>
<td>7.6866</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.7500</td>
<td>90th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.7000</td>
<td>10th Percentile predicted</td>
</tr>
</tbody>
</table>

**Differences (predicted – observed)**

Mean difference -1.4850 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 80  
Number of Predicted Violations 6  
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Deep Channel  Dissolved Oxygen (mg/l)
Segment POTMH  Season: Oct 1 – April 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel  Dissolved Oxygen (mg/l)
Segment POTMH    Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 192 pairs of predictions and observed data, the slope is 0.7002 and the intercept is -0.3000. The R-Squared value for this regression is 0.3926.

LOG10 Regressions of Calibration vs. Observations

Using the 192 pairs of predictions and observed data, the slope is 1.0389 and the intercept is -0.2420. The R-Squared value for this regression is 0.4171.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 2.4058</th>
<th>Mean predicted 3.8644</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>Min. predicted 0.0116</td>
</tr>
<tr>
<td>Max. observed</td>
<td>7.7</td>
<td>Max. predicted 10.29</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2154</td>
<td>Std. Dev. predicted 1.9824</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.9337</td>
<td>Median predicted 3.6348</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>5.9000</td>
<td>90th Percentile predicted 6.7248</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.1000</td>
<td>10th Percentile predicted 1.4423</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.4586 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 192
Number of Predicted Violations 11
Number of Observed Violations 73

\(^1\) observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)

Segment POTMH  Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment POTMH  Season: May 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 180 pairs of predictions and observed data, the slope is 0.5401 and the intercept is 4.8137. The R-Squared value for this regression is 0.5985.

LOG10 Regressions of Calibration vs. Observations

Using the 180 pairs of predictions and observed data, the slope is 0.4718 and the intercept is 0.5575. The R-Squared value for this regression is 0.5587.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.4852</th>
<th>Mean predicted 8.6493</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.19</td>
<td>Min. predicted 2.884</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.7</td>
<td>Max. predicted 14.28</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.9678</td>
<td>Std. Dev. predicted 2.8186</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.7000</td>
<td>Median predicted 8.7508</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.8325</td>
<td>90th Percentile predicted 12.3135</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.7500</td>
<td>10th Percentile predicted 4.7708</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.8360 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l. In the Deep Channel Anoxic designated use, the final criteria will likely allow seasonal anoxic, and no DO minimum will be established for the May 1 to September 30 period.

Number of predicted and observed pairs 180
Number of Predicted Violations 3
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Deep Channel Anoxic Dissolved Oxygen (mg/l)
Segment POTMH Season: Oct 1 – April 30

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 178 pairs of predictions and observed data, the slope is 0.9904 and the intercept is 2.9979. The R-Squared value for this regression is 0.0921.

LOG10 Regressions of Calibration vs. Observations
Using the 178 pairs of predictions and observed data, the slope is 0.3764 and the intercept is 0.6474. The R-Squared value for this regression is 0.0364.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean predicted</td>
<td>9.2680</td>
<td>Min. predicted</td>
<td>3.8957</td>
<td>Std. Dev. predicted</td>
<td>3.5099</td>
<td>Max. predicted</td>
<td>23.8150</td>
<td>Median predicted</td>
<td>8.4254</td>
</tr>
<tr>
<td>Mean observed</td>
<td>12.1770</td>
<td>Min. observed</td>
<td>1.7971</td>
<td>Max. observed</td>
<td>67.4086</td>
<td>Median observed</td>
<td>9.1104</td>
<td>95th Percentile observed</td>
<td>35.7353</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.1104</td>
<td>95th Percentile predicted</td>
<td>16.2830</td>
<td>Mean difference</td>
<td>-2.9090 µg/l</td>
<td>Mean predicted</td>
<td>9.2680</td>
<td>Min. predicted</td>
<td>3.8957</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>35.7353</td>
<td>95th Percentile predicted</td>
<td>16.2830</td>
<td>Mean difference</td>
<td>-2.9090 µg/l</td>
<td>Mean predicted</td>
<td>9.2680</td>
<td>Min. predicted</td>
<td>3.8957</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>3.9936</td>
<td>10th Percentile predicted</td>
<td>5.4366</td>
<td>Mean difference</td>
<td>-2.9090 µg/l</td>
<td>Mean predicted</td>
<td>9.2680</td>
<td>Min. predicted</td>
<td>3.8957</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.9090 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment POTMH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment POTMH  Season: July 1 – Sept 30
(Scatter Plot)
MESOHALINE Chlorophyll
Segment POTMH (Potomac Mesohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 163 pairs of predictions and observed data, the slope is 0.0781 and the intercept is 13.3420. The R-Squared value for this regression is 0.0017.

LOG10 Regressions of Calibration vs. Observations
Using the 163 pairs of predictions and observed data, the slope is 0.1146 and the intercept is 0.8522. The R-Squared value for this regression is 0.0034.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>14.8347</td>
<td>19.1028</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.4992</td>
<td>4.0636</td>
</tr>
<tr>
<td>Max. observed</td>
<td>108.0282</td>
<td>47.8680</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>18.6598</td>
<td>9.7890</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.8249</td>
<td>15.6710</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>58.0138</td>
<td>38.6020</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.1787</td>
<td>9.1144</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 4.2681 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment POTMH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment POTMH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 418 pairs of predictions and observed data, the slope is 0.9288 and the intercept is 0.2143. The R-Squared value for this regression is 0.5128.

LOG10 Regressions of Calibration vs. Observations

Using the 418 pairs of predictions and observed data, the slope is 0.8235 and the intercept is 0.0780. The R-Squared value for this regression is 0.5637.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.3033</td>
<td>1.1726</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.4063</td>
<td>0.4328</td>
</tr>
<tr>
<td>Max. observed</td>
<td>6.5000</td>
<td>5.2452</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.8366</td>
<td>0.6450</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.0833</td>
<td>0.9052</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>2.1667</td>
<td>90th Percentile predicted 1.9365</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.6500</td>
<td>10th Percentile predicted 0.6322</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.1308 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment POTMH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment POTMH  Season: April 1 – Oct 30

(Scatter Plot)
MIGRATORY **Dissolved Oxygen**  
Segment RPPTF (Rappahannock Tidal Fresh)  
Feb 15 - June 10

**Regression of Calibration vs. Observations**

Using the 394 pairs of predictions and observed data, the **slope** is 0.5331 and the **intercept** is 3.8936. The **R-Squared** value for this regression is 0.1708.

**LOG10 Regressions of Calibration vs. Observations**

Using the 394 pairs of predictions and observed data, the **slope** is 0.5546 and the **intercept** is 0.4278. The **R-Squared** value for this regression is 0.1571.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.4342</th>
<th>Mean predicted 10.3931</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>6</td>
<td>5.714</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.28</td>
<td>13.38</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7885</td>
<td>Std. Dev. predicted 1.3864</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.3000</td>
<td>Median predicted 10.4900</td>
</tr>
<tr>
<td>90(^{th}) Percentile observed</td>
<td>11.8000</td>
<td>90(^{th}) Percentile predicted 12.1890</td>
</tr>
<tr>
<td>10(^{th}) Percentile observed</td>
<td>7.1000</td>
<td>10(^{th}) Percentile predicted 8.5106</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 0.9588 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 394  
Number of Predicted Violations 0  
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment RPPTF  Season: Feb 15 – June 10
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment RPPTF  Season: Feb 15 – June 10
(Scatter Plot )
Regression of Calibration vs. Observations

Using the 619 pairs of predictions and observed data, the slope is 0.7655 and the intercept is 1.7354. The R-Squared value for this regression is 0.4121.

LOG10 Regressions of Calibration vs. Observations

Using the 619 pairs of predictions and observed data, the slope is 0.4874 and the intercept is 0.4898. The R-Squared value for this regression is 0.2312.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.6087</th>
<th>Mean predicted 8.9792</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.3</td>
<td>Min. predicted 0.8244</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.8</td>
<td>Max. predicted 12.97</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.1026</td>
<td>Std. Dev. predicted 1.7632</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.2000</td>
<td>Median predicted 8.7521</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.7000</td>
<td>90th Percentile predicted 11.6610</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.3000</td>
<td>10th Percentile predicted 7.0952</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3706 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 619
Number of Predicted Violations 4
Number of Observed Violations 0

\[1 \text{ observed is dependent, predicted is independent}\]
Migratory Dissolved Oxygen (mg/l)

Segment RPPTF Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment RPPTF Season: June 11 – Feb 14

(Scatter Plot)
TIDAL FRESH Chlorophyll
Segment RPPTF (Rappahannock Tidal Fresh)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 102 pairs of predictions and observed data, the slope is -1.3682 and the intercept is 38.2938. The R-Squared value for this regression is 0.0479.

LOG10 Regressions of Calibration vs. Observations
Using the 102 pairs of predictions and observed data, the slope is -0.8804 and the intercept is 2.1659. The R-Squared value for this regression is 0.0487.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>23.3811</td>
<td>10.8999</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>4.1279</td>
</tr>
<tr>
<td>Max. observed</td>
<td>107.7000</td>
<td>19.4990</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>17.7033</td>
<td>2.8316</td>
</tr>
<tr>
<td>Median observed</td>
<td>21.9500</td>
<td>10.7110</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>49.4354</td>
<td>15.9000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.4500</td>
<td>7.6908</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference -12.4812 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment RPPTF  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment RPPTF  Season: July 1 – Sept 30
(Scatter Plot)
**TIDAL FRESH Chlorophyll**
Segment RPPTF (Rappahannock Tidal Fresh)
March 1 - May 30

**Regression of Calibration vs. Observations**
Using the 117 pairs of predictions and observed data, the **slope** is 0.2076 and the **intercept** is 2.5796. The **R-Squared** value for this regression is 0.0204.

**LOG10 Regressions of Calibration vs. Observations**
Using the 117 pairs of predictions and observed data, the **slope** is 0.3978 and the **intercept** is 0.2216. The **R-Squared** value for this regression is 0.1119.

**Statistics** (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
<th>Min. observed</th>
<th>Min. predicted</th>
<th>Max. observed</th>
<th>Max. predicted</th>
<th>Std. Dev. Observed</th>
<th>Std. Dev. predicted</th>
<th>Median observed</th>
<th>Median predicted</th>
<th>95th Percentile observed</th>
<th>95th Percentile predicted</th>
<th>10th Percentile observed</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
</table>

**Differences** (predicted – observed)

Mean difference 4.4883 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment RPPTF  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment RPPTF  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 272 pairs of predictions and observed data, the slope is 0.4074 and the intercept is 1.2794. The R-Squared value for this regression is 0.1246.

LOG10 Regressions of Calibration vs. Observations

Using the 272 pairs of predictions and observed data, the slope is 0.5458 and the intercept is 0.1931. The R-Squared value for this regression is 0.1871.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 2.5923</th>
<th>Mean predicted 3.2229</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.3939</td>
<td>0.6276</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>9.1714</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.4828</td>
<td>1.2848</td>
</tr>
<tr>
<td>Median observed</td>
<td>2.6000</td>
<td>3.1963</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>4.3333</td>
<td>4.5912</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.0000</td>
<td>1.6796</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.6306 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment RPPTF  Season: April 1 – Oct 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment RPPTF  Season: April 1 – Oct 30
(Scatter Plot)
Chesapeake Bay Standard Segment RPPOH

Location Map of Segment RPPOH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 63 pairs of predictions and observed data, the slope is 0.5388 and the intercept is 3.5967. The R-Squared value for this regression is 0.4352.

LOG10 Regressions of Calibration vs. Observations

Using the 63 pairs of predictions and observed data, the slope is 0.5449 and the intercept is 0.4304. The R-Squared value for this regression is 0.4063.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.0641</td>
</tr>
<tr>
<td>Min.</td>
<td>5.8</td>
</tr>
<tr>
<td>Max.</td>
<td>13.1</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.6987</td>
</tr>
<tr>
<td>Median</td>
<td>9.1000</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.2000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.9000</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.0837 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 63
Number of Predicted Violations 1
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment RPPOH Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment RPPOH Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 107 pairs of predictions and observed data, the slope is 1.0498 and the intercept is -0.1009. The R-Squared value for this regression is 0.5141.

LOG10 Regressions of Calibration vs. Observations

Using the 107 pairs of predictions and observed data, the slope is 0.8778 and the intercept is 0.1236. The R-Squared value for this regression is 0.4346.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.0502</td>
</tr>
<tr>
<td>Min.</td>
<td>5</td>
</tr>
<tr>
<td>Max.</td>
<td>13.6</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.1043</td>
</tr>
<tr>
<td>Median</td>
<td>7.4300</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.6000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.0400</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.2859 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 107
Number of Predicted Violations 0
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment RPPOH  Season: June 11 – Feb 14
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment RPPOH Season: June 11 – Feb 14

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment RPPOH (Rappahannock Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations¹
Using the 49 pairs of predictions and observed data, the slope is 0.1694 and the intercept is 9.8630. The R-Squared value for this regression is 0.0063.

LOG10 Regressions of Calibration vs. Observations¹
Using the 49 pairs of predictions and observed data, the slope is 0.1386 and the intercept is 0.9237. The R-Squared value for this regression is 0.0069.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>12.0173</td>
<td>12.7149</td>
</tr>
<tr>
<td>Min. observed</td>
<td>4.5604</td>
<td>4.8452</td>
</tr>
<tr>
<td>Max. observed</td>
<td>40.6507</td>
<td>19.3030</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>6.0958</td>
<td>2.8532</td>
</tr>
<tr>
<td>Median observed</td>
<td>10.0677</td>
<td>13.0320</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>22.5000</td>
<td>16.5970</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.2798</td>
<td>8.9338</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.6976 µg/l

¹ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment RPPOH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment RPPOH  Season: July 1 – Sept 30
(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment RPPOH (Rappahannock Oligohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 48 pairs of predictions and observed data, the slope is 0.1496 and the intercept is 4.1001. The R-Squared value for this regression is 0.0432.

LOG10 Regressions of Calibration vs. Observations
Using the 48 pairs of predictions and observed data, the slope is 0.2958 and the intercept is 0.4380. The R-Squared value for this regression is 0.0756.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>95th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.8095</td>
<td>1.0000</td>
<td>50.0000</td>
<td>7.3754</td>
<td>5.0837</td>
<td>15.5000</td>
<td>1.9000</td>
<td>18.1075</td>
<td>2.7471</td>
<td>41.2290</td>
<td>10.2427</td>
<td>15.6225</td>
<td>37.8400</td>
<td>8.0805</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 11.2980 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment RPPOH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment RPPOH  Season: March 1 – May 30
(Scatter Plot)
OLIGOHALINE Light Attenuation
Segment RPPOH (Rappahannock Oligohaline)
April 1 - Oct 30

Regression of Calibration vs. Observations

Using the 119 pairs of predictions and observed data, the slope is 0.2777 and the intercept is 2.2331. The R-Squared value for this regression is 0.0132.

LOG10 Regressions of Calibration vs. Observations

Using the 119 pairs of predictions and observed data, the slope is 0.2239 and the intercept is 0.4534. The R-Squared value for this regression is 0.0078.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>3.2204</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.8667</td>
</tr>
<tr>
<td>Max. observed</td>
<td>8.6667</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.5715</td>
</tr>
<tr>
<td>Median observed</td>
<td>2.6000</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>5.2000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>1.7333</td>
</tr>
<tr>
<td></td>
<td>3.5553</td>
</tr>
<tr>
<td></td>
<td>2.5175</td>
</tr>
<tr>
<td></td>
<td>6.6988</td>
</tr>
<tr>
<td></td>
<td>0.6491</td>
</tr>
<tr>
<td></td>
<td>3.4676</td>
</tr>
<tr>
<td></td>
<td>4.3140</td>
</tr>
<tr>
<td></td>
<td>2.8321</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3349 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment RPPOH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke ($1/m$)

Segment RPPOH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment RPPMH

Location Map of Segment RPPMH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations\(^1\)

Using the 379 pairs of predictions and observed data, the slope is 0.4223 and the intercept is 5.0011. The R-Squared value for this regression is 0.5591.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 379 pairs of predictions and observed data, the slope is 0.3973 and the intercept is 0.5961. The R-Squared value for this regression is 0.5173.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.9500</td>
<td>9.3515</td>
</tr>
<tr>
<td>Min. observed</td>
<td>5.1</td>
<td>0.884</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.45</td>
<td>20.77</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7998</td>
<td>3.1868</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.0700</td>
<td>9.0513</td>
</tr>
<tr>
<td>90(^{th}) Percentile observed</td>
<td>11.2500</td>
<td>90(^{th}) Percentile predicted</td>
</tr>
<tr>
<td>10(^{th}) Percentile observed</td>
<td>6.5000</td>
<td>10(^{th}) Percentile predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.4015 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 379
Number of Predicted Violations 29
Number of Observed Violations 0

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment RPPMH Season: Feb 15 – June 10
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)

Segment RPPMH  Season: Feb 15 – June 10

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 673 pairs of predictions and observed data, the slope is 0.6754 and the intercept is 3.0422. The R-Squared value for this regression is 0.5084.

LOG10 Regressions of Calibration vs. Observations

Using the 673 pairs of predictions and observed data, the slope is 0.5001 and the intercept is 0.4865. The R-Squared value for this regression is 0.4099.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>Mean predicted</td>
</tr>
<tr>
<td>Min. observed</td>
<td>Min. predicted</td>
</tr>
<tr>
<td>Max. observed</td>
<td>Max. predicted</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Median</td>
<td>Median</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>90th Percentile</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>10th Percentile</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5974</td>
<td>6.7443</td>
</tr>
<tr>
<td>3.32</td>
<td>0.4642</td>
</tr>
<tr>
<td>13.9</td>
<td>17.47</td>
</tr>
<tr>
<td>2.2437</td>
<td>2.3686</td>
</tr>
<tr>
<td>6.8900</td>
<td>6.5919</td>
</tr>
<tr>
<td>11.5000</td>
<td>9.4065</td>
</tr>
<tr>
<td>5.3200</td>
<td>4.0142</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.8531 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 673
Number of Predicted Violations 42
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment RPPMH Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment RPPMH  Season: June 11 - Feb 14
(Scatter Plot)
Regression of Calibration vs. Observations\(^1\)

Using the 2324 pairs of predictions and observed data, the slope is 0.7679 and the intercept is 1.8224. The R-Squared value for this regression is 0.6505.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 2324 pairs of predictions and observed data, the slope is 0.7548 and the intercept is 0.2300. The R-Squared value for this regression is 0.5953.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.4259</td>
<td>8.5988</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.25</td>
<td>1.61</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.91</td>
<td>20.31</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.3568</td>
<td>2.4752</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.1475</td>
<td>8.1450</td>
</tr>
<tr>
<td>90(^{th}) Percentile</td>
<td>11.8300</td>
<td>12.0480</td>
</tr>
<tr>
<td>10(^{th}) Percentile</td>
<td>5.5600</td>
<td>5.8488</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1729 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 2324
Number of Predicted Violations 28
Number of Observed Violations 6

\(^1\) observed is dependent, predicted is independent
Open Water  Dissolved Oxygen (mg/l)
Segment RPPMH  Season: Jan 1 - Dec 31
Cumulative Frequency Distribution - PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment RPPMH Season: Jan 1 – Dec 31
(Scatter Plot)
DEEP WATER **Dissolved Oxygen**
Segment RPPMH (Rappahannock Mesohaline)
May 1 - Sept 30

**Regression of Calibration vs. Observations**¹

Using the 814 pairs of predictions and observed data, the **slope** is 0.7572 and the **intercept** is 1.0840. The **R-Squared** value for this regression is 0.5221.

**LOG10 Regressions of Calibration vs. Observations**¹

Using the 814 pairs of predictions and observed data, the **slope** is 0.7838 and the **intercept** is 0.1430. The **R-Squared** value for this regression is 0.4869.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>4.4772</td>
<td>4.4813</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.1</td>
<td>Min. predicted</td>
</tr>
<tr>
<td>Max. observed</td>
<td>11.1</td>
<td>Max. predicted</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2300</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.7600</td>
<td>Median predicted</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>7.1529</td>
<td>90th Percentile</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>1.3000</td>
<td>10th Percentile</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 0.0041 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 814
Number of Predicted Violations 76
Number of Observed Violations 117

---

¹ observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment RPPMH  Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment RPPMH Season: May 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 806 pairs of predictions and observed data, the slope is 0.6317 and the intercept is 4.0361. The R-Squared value for this regression is 0.6738.

LOG10 Regressions of Calibration vs. Observations

Using the 806 pairs of predictions and observed data, the slope is 0.5856 and the intercept is 0.4467. The R-Squared value for this regression is 0.7018.

Statistics (units in mg/l)

Mean observed 9.4092  Mean predicted 8.5054  
Min. observed 2.87  Min. predicted 2.354  
Max. observed 15.2  Max. predicted 14.48  
Std. Dev. Observed 2.1442  Std. Dev. predicted 2.7861  
Median observed 9.5575  Median predicted 8.6557  
90th Percentile observed 11.9000  90th Percentile predicted 12.1030  
10th Percentile observed 6.6700  10th Percentile predicted 4.6393

Differences (predicted – observed)

Mean difference -0.9038 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 806  
Number of Predicted Violations 22  
Number of Observed Violations 3

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment RPPMH  Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment RPPMH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations ¹
Using the 333 pairs of predictions and observed data, the slope is 0.2050 and the intercept is 7.5811. The R-Squared value for this regression is 0.0138.

LOG10 Regressions of Calibration vs. Observations ¹
Using the 333 pairs of predictions and observed data, the slope is 0.1941 and the intercept is 0.7777. The R-Squared value for this regression is 0.0112.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 9.6309</td>
<td>Mean predicted 9.9999</td>
</tr>
<tr>
<td>Min. observed 1.0000</td>
<td>Min. predicted 3.1826</td>
</tr>
<tr>
<td>Max. observed 31.0000</td>
<td>Max. predicted 19.4520</td>
</tr>
<tr>
<td>Std. Dev. Observed 5.1767</td>
<td>Std. Dev. predicted 2.9633</td>
</tr>
<tr>
<td>Median observed 8.3731</td>
<td>Median predicted 9.3922</td>
</tr>
<tr>
<td>95th Percentile observed 20.4095</td>
<td>95th Percentile predicted 14.8030</td>
</tr>
<tr>
<td>10th Percentile observed 4.2333</td>
<td>10th Percentile predicted 6.4433</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3690 µg/l

¹ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment RPPMH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment RPPMH  Season: July 1 – Sept 30

(Scatter Plot)
MESOHALINE Chlorophyll
Segment RPPMH (Rappahannock Mesohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 292 pairs of predictions and observed data, the slope is 0.2518 and the intercept is 7.5781. The R-Squared value for this regression is 0.0730.

LOG10 Regressions of Calibration vs. Observations
Using the 292 pairs of predictions and observed data, the slope is 0.4785 and the intercept is 0.3655. The R-Squared value for this regression is 0.0891.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>13.3948</td>
<td>23.1010</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>2.8563</td>
</tr>
<tr>
<td>Max. observed</td>
<td>97.3000</td>
<td>83.5990</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>14.1348</td>
<td>15.1627</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.5664</td>
<td>18.7070</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>36.9314</td>
<td>58.0240</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.7000</td>
<td>10.2650</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 9.7062 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment RPPMH  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
MESOHALINE \textbf{Light Attenuation} \\
Segment RPPMH (Rappahannock Mesohaline) \\
April 1 - Oct 30

\textbf{Regression of Calibration vs. Observations}$^1$

Using the 801 pairs of predictions and observed data, the \textbf{slope} is 1.1380 and the \textbf{intercept} is -0.0209. The \textbf{R-Squared} value for this regression is 0.5742.

\textbf{LOG10 Regressions of Calibration vs. Observations}$^1$

Using the 801 pairs of predictions and observed data, the \textbf{slope} is 0.9899 and the \textbf{intercept} is 0.0209. The \textbf{R-Squared} value for this regression is 0.6618.

\textbf{Statistics} (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 1.6512</th>
<th>Mean predicted 1.4693</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.3611</td>
<td>Min. predicted 0.4671</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>Max. predicted 5.6760</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.3415</td>
<td>Std. Dev. predicted 0.8933</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.1818</td>
<td>Median predicted 1.1837</td>
</tr>
<tr>
<td>90$^{\text{th}}$ Percentile observed</td>
<td>3.2500</td>
<td>90$^{\text{th}}$ Percentile predicted 2.9961</td>
</tr>
<tr>
<td>10$^{\text{th}}$ Percentile observed</td>
<td>0.6190</td>
<td>10$^{\text{th}}$ Percentile predicted 0.6426</td>
</tr>
</tbody>
</table>

\textbf{Differences} (predicted – observed)

Mean difference -0.1818 1/m

$^1$ observed is dependent, predicted is independent
Ke (1/m)

Segment RPPMH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations

Using the 113 pairs of predictions and observed data, the slope is 0.9412 and the intercept is 2.5497. The R-Squared value for this regression is 0.3983.

LOG10 Regressions of Calibration vs. Observations

Using the 113 pairs of predictions and observed data, the slope is 0.7344 and the intercept is 0.3392. The R-Squared value for this regression is 0.4386.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.4050</td>
<td>6.2211</td>
</tr>
<tr>
<td>Min. observed</td>
<td>5.08</td>
<td>2.853</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.495</td>
<td>9.858</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.8998</td>
<td>1.2739</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.1300</td>
<td>6.0011</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.1000</td>
<td>7.7548</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.2000</td>
<td>4.6264</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.1838 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 113
Number of Predicted Violations 22
Number of Observed Violations 0

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment MPNTF  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment MPNTF Season: Feb 15 – June 10

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 182 pairs of predictions and observed data, the slope is 1.0090 and the intercept is 2.0729. The R-Squared value for this regression is 0.7153.

LOG10 Regressions of Calibration vs. Observations

Using the 182 pairs of predictions and observed data, the slope is 0.6817 and the intercept is 0.3777. The R-Squared value for this regression is 0.6348.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
<th>Min. observed</th>
<th>Min. predicted</th>
<th>Max. observed</th>
<th>Max. predicted</th>
<th>Std. Dev. Observed</th>
<th>Std. Dev. predicted</th>
<th>Median observed</th>
<th>Median predicted</th>
<th>90th Percentile observed</th>
<th>90th Percentile predicted</th>
<th>10th Percentile observed</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference -2.1192 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 182
Number of Predicted Violations 42
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment MPNTF  Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)

Segment MPNTF Season: June 11 – Feb 14

(Scatter Plot)
TIDAL FRESH Chlorophyll
Segment MPNTF (Mattaponi Tidal Fresh)
July 1 - Sept 30

**Regression of Calibration vs. Observations**
Using the 50 pairs of predictions and observed data, the slope is 0.1905 and the intercept is 3.7309. The R-Squared value for this regression is 0.0204.

**LOG10 Regressions of Calibration vs. Observations**
Using the 50 pairs of predictions and observed data, the slope is 0.1772 and the intercept is 0.5812. The R-Squared value for this regression is 0.0177.

**Statistics (units in µg/l)**

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.9171</td>
</tr>
<tr>
<td>Min.</td>
<td>1.0000</td>
</tr>
<tr>
<td>Max.</td>
<td>16.7462</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.9436</td>
</tr>
<tr>
<td>Median</td>
<td>4.1199</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>9.4198</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.2000</td>
</tr>
</tbody>
</table>

**Differences (predicted – observed)**
Mean difference 1.3102 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment MPNTF  Season: July 1 - Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment MPNTF  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 49 pairs of predictions and observed data, the **slope** is -0.1303 and the **intercept** is 3.4182. The **R-Squared** value for this regression is 0.0210.

LOG10 Regressions of Calibration vs. Observations

Using the 49 pairs of predictions and observed data, the **slope** is -0.0539 and the **intercept** is 0.5865. The **R-Squared** value for this regression is 0.0047.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed Values</th>
<th>Predicted Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>2.8676</td>
<td>4.2244</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>0.4402</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.8000</td>
<td>10.8330</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>2.1169</td>
<td>2.3515</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.1000</td>
<td>3.6876</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>3.8000</td>
<td>95th Percentile predicted 7.5496</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.0000</td>
<td>10th Percentile predicted 1.0837</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 1.3568 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment MPNTF  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment MPNTF  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 109 pairs of predictions and observed data, the slope is 0.0157 and the intercept is 1.2435. The R-Squared value for this regression is 0.0218.

LOG10 Regressions of Calibration vs. Observations

Using the 109 pairs of predictions and observed data, the slope is 0.0419 and the intercept is 0.3345. The R-Squared value for this regression is 0.0186.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.8125</td>
<td>0.6221</td>
</tr>
<tr>
<td>Max. observed</td>
<td>2.6000</td>
<td>24.8950</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>0.2972</td>
<td>2.7918</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.3000</td>
<td>1.9263</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>1.6250</td>
<td>3.0902</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.9286</td>
<td>1.0607</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.1858 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment MPNTF  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment MPNTF  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment MPNOH

Location Map of Segment MPNOH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 315 pairs of predictions and observed data, the slope is 0.7036 and the intercept is 2.9807. The R-Squared value for this regression is 0.4497.

LOG10 Regressions of Calibration vs. Observations

Using the 315 pairs of predictions and observed data, the slope is 0.4957 and the intercept is 0.4992. The R-Squared value for this regression is 0.4147.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.9187</td>
<td>7.0179</td>
</tr>
<tr>
<td>Min. observed</td>
<td>4.42</td>
<td>1.533</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.81</td>
<td>9.927</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.9380</td>
<td>1.8471</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.8400</td>
<td>7.3166</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>10.4800</td>
<td>8.9992</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>5.4000</td>
<td>4.4820</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.9009 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 315
Number of Predicted Violations 22
Number of Observed Violations 6

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment MPNOH  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment MPNOH  Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 548 pairs of predictions and observed data, the slope is 1.0958 and the intercept is 0.4305. The R-Squared value for this regression is 0.5970.

LOG10 Regressions of Calibration vs. Observations

Using the 548 pairs of predictions and observed data, the slope is 0.7853 and the intercept is 0.2264. The R-Squared value for this regression is 0.4939.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean predicted</td>
<td>5.5777</td>
<td>2.393</td>
<td>11.1</td>
<td>1.7339</td>
<td>5.3995</td>
<td>3.5302</td>
<td></td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.9649 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 548
Number of Predicted Violations 23
Number of Observed Violations 6

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment MPNOH  Season: June 11 – Feb 14
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

Graph showing the cumulative distribution of dissolved oxygen (D.O.) levels over the percent of the population.
Migratory Dissolved Oxygen (mg/l)
Segment MPNOH Season: June 11 – Feb 14
(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment MPNOH (Mattaponi Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations\(^1\)
Using the 54 pairs of predictions and observed data, the slope is 0.5145 and the intercept is 5.9122. The R-Squared value for this regression is 0.0510.

LOG10 Regressions of Calibration vs. Observations\(^1\)
Using the 54 pairs of predictions and observed data, the slope is 0.5660 and the intercept is 0.4537. The R-Squared value for this regression is 0.0815.

Statistics (units in \(\mu g/l\))

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.6760</td>
<td>9.2588</td>
</tr>
<tr>
<td>Min.</td>
<td>1.8000</td>
<td>3.9850</td>
</tr>
<tr>
<td>Max.</td>
<td>25.4000</td>
<td>14.1210</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>5.4774</td>
<td>2.4030</td>
</tr>
<tr>
<td>Median</td>
<td>9.7113</td>
<td>9.4576</td>
</tr>
<tr>
<td>95(^{th}) Percentile</td>
<td>23.3625</td>
<td>13.5980</td>
</tr>
<tr>
<td>10(^{th}) Percentile</td>
<td>4.5000</td>
<td>6.0319</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -1.4172 \(\mu g/l\)

\(^1\) observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment MPNOH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment MPNOH  Season: July 1 – Sept 30

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment MPNOH (Mattaponi Oligohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 51 pairs of predictions and observed data, the slope is 0.3212 and the intercept is 0.9174. The R-Squared value for this regression is 0.1039.

LOG10 Regressions of Calibration vs. Observations
Using the 51 pairs of predictions and observed data, the slope is 0.5562 and the intercept is 0.0796. The R-Squared value for this regression is 0.1257.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Mean observed</th>
<th>Mean predicted</th>
<th>Min. observed</th>
<th>Min. predicted</th>
<th>Max. observed</th>
<th>Max. predicted</th>
<th>Std. Dev. Observed</th>
<th>Std. Dev. predicted</th>
<th>Median observed</th>
<th>Median predicted</th>
<th>95th Percentile observed</th>
<th>95th Percentile predicted</th>
<th>10th Percentile observed</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference 4.7399 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment MPNOH  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment MPNOH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations\(^1\)

Using the 123 pairs of predictions and observed data, the slope is 0.5953 and the intercept is 2.0330. The R-Squared value for this regression is 0.0561.

LOG10 Regressions of Calibration vs. Observations\(^1\)

Using the 123 pairs of predictions and observed data, the slope is 0.5648 and the intercept is 0.3333. The R-Squared value for this regression is 0.1004.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>3.4188</td>
<td>2.3279</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.1818</td>
<td>1.3831</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>5.6233</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>1.5361</td>
<td>0.6113</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.2500</td>
<td>2.1859</td>
</tr>
<tr>
<td>90(^{th}) Percentile observed</td>
<td>5.2000</td>
<td>90(^{th}) Percentile predicted 3.1246</td>
</tr>
<tr>
<td>10(^{th}) Percentile observed</td>
<td>2.1667</td>
<td>10(^{th}) Percentile predicted 1.7637</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -1.0909 1/m

\(^1\) observed is dependent, predicted is independent
Ke (1/m)

Segment MPNOH  Season: April 1 – Oct 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment MPNOH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment PMKOH

Location Map of Segment PMKOH within the Chesapeake Bay Model Grid

RET4.1

0 0.5 1 2 3 4 Miles

Chesapeake Bay Program
MIGRATORY **Dissolved Oxygen**  
Segment PMKOH (Pamunkey Oligohaline)  
Feb 15 - June 10

Regression of Calibration vs. Observations

Using the 192 pairs of predictions and observed data, the **slope** is 0.7616 and the **intercept** is 2.1330. The **R-Squared** value for this regression is 0.4585.

LOG10 Regressions of Calibration vs. Observations

Using the 192 pairs of predictions and observed data, the **slope** is 0.6185 and the **intercept** is 0.3695. The **R-Squared** value for this regression is 0.4244.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.9921</td>
<td>7.6935</td>
</tr>
<tr>
<td>Min. observed</td>
<td>4.3</td>
<td>2.366</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.9</td>
<td>10.45</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.8513</td>
<td>1.6460</td>
</tr>
<tr>
<td>Median</td>
<td>7.8900</td>
<td>7.9446</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>10.5100</td>
<td>9.6196</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.6900</td>
<td>5.7466</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference -0.2986 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 192  
Number of Predicted Violations 14  
Number of Observed Violations 5

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment PMKOH  Season: Feb 15 – June 10
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment PMKOH Season: Feb 15 – June 10

(Scatter Plot)
MIGRATORY Dissolved Oxygen
Segment PMKOH (Pamunkey Oligohaline)
June 11 - Feb 14

Regression of Calibration vs. Observations

Using the 331 pairs of predictions and observed data, the slope is 1.1123 and the intercept is -0.3694. The R-Squared value for this regression is 0.6016.

LOG10 Regressions of Calibration vs. Observations

Using the 331 pairs of predictions and observed data, the slope is 0.9200 and the intercept is 0.0779. The R-Squared value for this regression is 0.5252.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 6.4489</th>
<th>Mean predicted 6.1301</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.5</td>
<td>2.984</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.8</td>
<td>11.42</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.4073</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.5200</td>
<td>5.8666</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>10.7300</td>
<td>90th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>4.0200</td>
<td>4.0475</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3187 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 331
Number of Predicted Violations 15
Number of Observed Violations 7

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment PMKOH  Season: June 11 – Feb 14

Cumulative Frequency Distribution — PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment PMKOH Season: June 11 – Feb 14

(Scatter Plot)
Regression of Calibration vs. Observations¹
Using the 52 pairs of predictions and observed data, the slope is 0.4592 and the intercept is 9.0082. The R-Squared value for this regression is 0.0241.

LOG10 Regressions of Calibration vs. Observations¹
Using the 52 pairs of predictions and observed data, the slope is 0.3567 and the intercept is 0.7663. The R-Squared value for this regression is 0.0336.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>12.5251</td>
<td>7.6584</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.0000</td>
<td>3.8233</td>
</tr>
<tr>
<td>Max. observed</td>
<td>29.0718</td>
<td>12.3770</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>5.3367</td>
<td>Std. Dev. predicted 1.8031</td>
</tr>
<tr>
<td>Median observed</td>
<td>11.3718</td>
<td>Median predicted 7.6353</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>23.0510</td>
<td>95th Percentile predicted 11.1210</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>7.0626</td>
<td>10th Percentile predicted 5.7107</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -4.8667 µg/l

¹ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PMKOH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations
Using the 49 pairs of predictions and observed data, the slope is 0.2476 and the intercept is 3.5294. The R-Squared value for this regression is 0.0126.

LOG10 Regressions of Calibration vs. Observations
Using the 49 pairs of predictions and observed data, the slope is 0.2283 and the intercept is 0.5192. The R-Squared value for this regression is 0.0138.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>2.3124</td>
</tr>
<tr>
<td>Max. observed</td>
<td>29.0069</td>
<td>11.0710</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>4.6394</td>
<td>2.0999</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.8000</td>
<td>6.8266</td>
</tr>
<tr>
<td>95th Percentile obs.</td>
<td>12.8089</td>
<td>10.5770</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>1.4000</td>
<td>3.9237</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.7638 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PMKOH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment PMKOH  Season: March 1 – May 30
(Scatter Plot)
OLIGOHALINE Light Attenuation
Segment PMKOH (Pamunkey Oligohaline)
April 1 - Oct 30

Regression of Calibration vs. Observations¹

Using the 119 pairs of predictions and observed data, the slope is 0.8687 and the intercept is 1.4027. The R-Squared value for this regression is 0.0814.

LOG10 Regressions of Calibration vs. Observations¹

Using the 119 pairs of predictions and observed data, the slope is 0.7974 and the intercept is 0.1991. The R-Squared value for this regression is 0.1180.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 4.1247</th>
<th>Mean predicted 3.1333</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.8571</td>
<td>Min. predicted 2.0069</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>Max. predicted 6.1600</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>1.7969</td>
<td>Std. Dev. predicted 0.5900</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.7143</td>
<td>Median predicted 3.0594</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>6.5000</td>
<td>90th Percentile predicted 3.8247</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>2.1667</td>
<td>10th Percentile predicted 2.4641</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.9914 1/m

¹ observed is dependent, predicted is independent
Ke (1/m)

Segment PMKOH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment PMKOH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment PMKTF

Location Map of Segment PMKTF within the Chesapeake Bay Model Grid

TF4.2

0.51  2  3  4 Miles
Regession of Calibration vs. Observations

Using the 195 pairs of predictions and observed data, the slope is 0.9295 and the intercept is 1.4222. The R-Squared value for this regression is 0.3251.

LOG10 Regressions of Calibration vs. Observations

Using the 195 pairs of predictions and observed data, the slope is 0.8084 and the intercept is 0.2138. The R-Squared value for this regression is 0.3169.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.9916</td>
<td>7.0674</td>
</tr>
<tr>
<td>Min. observed</td>
<td>3</td>
<td>3.391</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.19</td>
<td>9.851</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>2.0372</td>
<td>1.2496</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.9000</td>
<td>7.1229</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>10.3700</td>
<td>9.0009</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.5000</td>
<td>5.6277</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.9241 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 195
Number of Predicted Violations 6
Number of Observed Violations 5

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment PMKTF  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment PMKTF  Season: Feb 15 – June 10

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 330 pairs of predictions and observed data, the slope is 0.6881 and the intercept is 2.9448. The R-Squared value for this regression is 0.4247.

LOG10 Regressions of Calibration vs. Observations

Using the 327 pairs of predictions and observed data, the slope is 0.3742 and the intercept is 0.5760. The R-Squared value for this regression is 0.2897.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 6.9016</th>
<th>Mean predicted 5.7500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.9</td>
<td>Min. predicted -2.304</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.9</td>
<td>Max. predicted 12.51</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.6153</td>
<td>Std. Dev. predicted 2.4768</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.9000</td>
<td>Median predicted 5.6191</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.2350</td>
<td>90th Percentile predicted 9.1939</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>4.3300</td>
<td>10th Percentile predicted 3.0964</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -1.1516 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 330
Number of Predicted Violations 48
Number of Observed Violations 3

---

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment PMKTF  Season: June 11 – Feb 14
(Scatter Plot )
Regression of Calibration vs. Observations
Using the 54 pairs of predictions and observed data, the slope is 0.2014 and the intercept is 5.0420. The R-Squared value for this regression is 0.0079.

LOG10 Regressions of Calibration vs. Observations
Using the 54 pairs of predictions and observed data, the slope is 0.1411 and the intercept is 0.6800. The R-Squared value for this regression is 0.0038.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>6.5834</td>
<td>7.6520</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>2.9350</td>
</tr>
<tr>
<td>Max. observed</td>
<td>17.4565</td>
<td>13.0260</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>4.4257</td>
<td>1.9512</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.8220</td>
<td>7.6335</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>16.8001</td>
<td>10.3920</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.1000</td>
<td>4.7314</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.0687 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PMKTF  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment PMKTF  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 52 pairs of predictions and observed data, the slope is 0.1309 and the intercept is 2.0042. The R-Squared value for this regression is 0.0423.

LOG10 Regressions of Calibration vs. Observations
Using the 52 pairs of predictions and observed data, the slope is 0.1371 and the intercept is 0.4363. The R-Squared value for this regression is 0.0452.

Statistics (units in µg/l)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>2.7093</td>
<td>Mean predicted</td>
<td>5.3869</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>Min. predicted</td>
<td>0.1655</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0830</td>
<td>Max. predicted</td>
<td>10.1160</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7098</td>
<td>Std. Dev. predicted</td>
<td>2.6857</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.1000</td>
<td>Median predicted</td>
<td>5.3780</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>3.1000</td>
<td>95th Percentile predicted</td>
<td>9.3898</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.0000</td>
<td>10th Percentile predicted</td>
<td>1.6292</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 2.6776 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PMKTF  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment PMKTF  Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 118 pairs of predictions and observed data, the **slope** is 0.0618 and the **intercept** is 1.6033. The **R-Squared** value for this regression is 0.0555.

LOG10 Regressions of Calibration vs. Observations

Using the 118 pairs of predictions and observed data, the **slope** is 0.1665 and the **intercept** is 0.3364. The **R-Squared** value for this regression is 0.0893.

**Statistics** (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 1.8410</th>
<th>Min. observed 0.6842</th>
<th>Max. observed 4.3333</th>
<th>Std. Dev. Observed 0.5454</th>
<th>Median observed 1.8571</th>
<th>90th Percentile observed 2.6000</th>
<th>10th Percentile observed 1.3000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean predicted 3.8438</td>
<td>Min. predicted 0.7072</td>
<td>Max. predicted 14.3200</td>
<td>Std. Dev. predicted 2.0777</td>
<td>Median predicted 3.5694</td>
<td>90th Percentile predicted 5.2277</td>
<td>10th Percentile predicted 2.1761</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 2.0028 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment PMKTF  Season: April 1 – Oct 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment PMKTF  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment YRKMH

Location Map of Segment YRKMH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 196 pairs of predictions and observed data, the slope is 0.7650 and the intercept is 1.5922. The R-Squared value for this regression is 0.5076.

LOG10 Regressions of Calibration vs. Observations

Using the 196 pairs of predictions and observed data, the slope is 0.6578 and the intercept is 0.3101. The R-Squared value for this regression is 0.4657.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 7.8678</th>
<th>Min. observed 4.4</th>
<th>Max. observed 12.71</th>
<th>Std. Dev. Observed 1.9100</th>
<th>Median observed 7.9450</th>
<th>90th Percentile observed 10.5000</th>
<th>10th Percentile observed 5.2200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean predicted 8.2033</td>
<td>Min. predicted 2.351</td>
<td>Max. predicted 11.02</td>
<td>Std. Dev. predicted 1.7788</td>
<td>Median predicted 8.4399</td>
<td>90th Percentile predicted 10.1950</td>
<td>10th Percentile predicted 5.8866</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3355 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 196
Number of Predicted Violations 14
Number of Observed Violations 9

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment YRKMH Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)

Segment YRKMH  Season: Feb 15 – June 10

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 344 pairs of predictions and observed data, the **slope** is 1.1503 and the **intercept** is -0.8139. The **R-Squared** value for this regression is 0.6413.

**LOG10 Regressions of Calibration vs. Observations**

Using the 344 pairs of predictions and observed data, the **slope** is 0.9962 and the **intercept** is 0.0035. The **R-Squared** value for this regression is 0.5748.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 6.6124</th>
<th>Mean predicted 6.4562</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>3.1</td>
<td>Min. predicted 2.74</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.68</td>
<td>Max. predicted 12.06</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.3974</td>
<td>Std. Dev. predicted 1.6690</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.8300</td>
<td>Median predicted 6.1563</td>
</tr>
<tr>
<td>90th Percentile obs.</td>
<td>10.6700</td>
<td>90th Percentile predicted 8.7075</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>4.2000</td>
<td>10th Percentile predicted 4.4945</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference -0.1561 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 344
Number of Predicted Violations 4
Number of Observed Violations 3

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment YRKMH  Season: June 11 – Feb 14
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 509 pairs of predictions and observed data, the slope is 0.7800 and the intercept is 1.9486. The R-Squared value for this regression is 0.7299.

LOG10 Regressions of Calibration vs. Observations

Using the 509 pairs of predictions and observed data, the slope is 0.7297 and the intercept is 0.2655. The R-Squared value for this regression is 0.7209.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.4507</td>
</tr>
<tr>
<td>Min.</td>
<td>2.93</td>
</tr>
<tr>
<td>Max.</td>
<td>13.26</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.2261</td>
</tr>
<tr>
<td>Median</td>
<td>6.9700</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>10.8000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>4.9000</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3966 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 509
Number of Predicted Violations 11
Number of Observed Violations 2

---

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment YRKMH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment YRKMH Season: Jan 1 – Dec 31
(Scatter Plot)
MESOHALINE Chlorophyll
Segment YRKMH (York Mesohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 107 pairs of predictions and observed data, the slope is 0.6805 and the intercept is 6.4928. The R-Squared value for this regression is 0.0848.

LOG10 Regressions of Calibration vs. Observations
Using the 107 pairs of predictions and observed data, the slope is 0.4246 and the intercept is 0.6857. The R-Squared value for this regression is 0.0645.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>95th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference -3.0341 µg/l
Chlorophyll Concentration (ug/l)

Segment YRKMH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment YRKMH  Season: July 1 – Sept 30
(Scatter Plot)
**MESOHALINE Chlorophyll**  
Segment YRKMH (York Mesohaline)  
March 1 - May 30

**Regression of Calibration vs. Observations**
Using the 94 pairs of predictions and observed data, the **slope** is 0.5687 and the **intercept** is 2.2951. The **R-Squared** value for this regression is 0.2039.

**LOG10 Regressions of Calibration vs. Observations**
Using the 94 pairs of predictions and observed data, the **slope** is 0.7934 and the **intercept** is 0.0257. The **R-Squared** value for this regression is 0.2035.

**Statistics** (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>11.8873</td>
<td>16.8658</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>4.6341</td>
</tr>
<tr>
<td>Max. observed</td>
<td>38.9092</td>
<td>39.8870</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>9.7080</td>
<td>7.7086</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.3733</td>
<td>15.9975</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>32.9000</td>
<td>30.8160</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.0000</td>
<td>8.6510</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 4.9785 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment YRKMH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment YRKMH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 249 pairs of predictions and observed data, the slope is 0.5841 and the intercept is 1.3354. The R-Squared value for this regression is 0.0891.

LOG10 Regressions of Calibration vs. Observations

Using the 249 pairs of predictions and observed data, the slope is 0.6177 and the intercept is 0.2305. The R-Squared value for this regression is 0.1013.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>90th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>90th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 2.8378</td>
<td>2.5724</td>
<td>1.8912</td>
<td>6.3024</td>
<td>0.5400</td>
<td>2.4506</td>
<td>3.1094</td>
<td>2.0912</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean predicted 2.5724</td>
<td>1.8912</td>
<td>6.3024</td>
<td>0.5400</td>
<td>2.4506</td>
<td>3.1094</td>
<td>2.0912</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.2654 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment YRKMH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment YRKMH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment YRKPH

Location Map of Segment YRKPH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 1518 pairs of predictions and observed data, the slope is 0.7435 and the intercept is 1.9270. The R-Squared value for this regression is 0.7370.

LOG10 Regressions of Calibration vs. Observations

Using the 1518 pairs of predictions and observed data, the slope is 0.7248 and the intercept is 0.2548. The R-Squared value for this regression is 0.6810.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.49</td>
<td>0.8993</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.1</td>
<td>16.42</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.4429</td>
<td>2.8206</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.2950</td>
<td>7.1499</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>10.8800</td>
<td>11.3330</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>4.5100</td>
<td>3.9959</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0091 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1518
Number of Predicted Violations 86
Number of Observed Violations 58

---

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment YRKPH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment YRKPH Season: Jan 1 – Dec 31
(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment YRKPH (York Polyhaline)
May 1 - Sept 30

Regression of Calibration vs. Observations

Using the 573 pairs of predictions and observed data, the slope is 0.5915 and the intercept is 2.2975. The R-Squared value for this regression is 0.3909.

LOG10 Regressions of Calibration vs. Observations

Using the 573 pairs of predictions and observed data, the slope is 0.4743 and the intercept is 0.8636. The R-Squared value for this regression is 0.2914.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>4.7795</td>
<td>4.1959</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.9000</td>
<td>0.7514</td>
</tr>
<tr>
<td>Max. observed</td>
<td>9.8000</td>
<td>8.4410</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.5034</td>
<td>1.5888</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.7900</td>
<td>3.8750</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>6.7030</td>
<td>6.7440</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.7700</td>
<td>2.4410</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.5836 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 573
Number of Predicted Violations 8
Number of Observed Violations 19

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment YRKPH Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment YRKPH Season: May 1 – Sept 30
(Scatter Plot)
DEEP WATER **Dissolved Oxygen**  
Segment YRKPH (York Polyhaline)  
Oct 1 - April 30

**Regression of Calibration vs. Observations**

Using the 609 pairs of predictions and observed data, the **slope** is 0.6009 and the **intercept** is 3.8377. The **R-Squared** value for this regression is 0.6632.

**LOG10 Regressions of Calibration vs. Observations**

Using the 609 pairs of predictions and observed data, the **slope** is 0.5100 and the **intercept** is 1.1024. The **R-Squared** value for this regression is 0.6287.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>8.8256</td>
<td>8.3008</td>
</tr>
<tr>
<td>Min.</td>
<td>Min.</td>
</tr>
<tr>
<td>4.8000</td>
<td>3.0220</td>
</tr>
<tr>
<td>Max.</td>
<td>Max.</td>
</tr>
<tr>
<td>13.0850</td>
<td>13.3500</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>1.8795</td>
<td>2.5472</td>
</tr>
<tr>
<td>Median</td>
<td>Median</td>
</tr>
<tr>
<td>8.7220</td>
<td>8.5800</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>90th Percentile</td>
</tr>
<tr>
<td>11.3800</td>
<td>11.3800</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>10th Percentile</td>
</tr>
<tr>
<td>6.1000</td>
<td>4.5230</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference -0.5248 mg/l

**Violations of Standards**  
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 609  
Number of Predicted Violations 0  
Number of Observed Violations 6

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment YRKPH  Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment YRKPH Season: Oct 1 – April 30

(Scatter Plot)
POLYHALINE Chlorophyll
Segment YRKPH (York Polyhaline)
July 1 - Sept 30

Regression of Calibration vs. Observations\(^1\)
Using the 115 pairs of predictions and observed data, the slope is 0.0929 and the intercept is 6.2525. The R-Squared value for this regression is 0.0057.

LOG10 Regressions of Calibration vs. Observations\(^1\)
Using the 115 pairs of predictions and observed data, the slope is 0.1338 and the intercept is 0.7370. The R-Squared value for this regression is 0.0065.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 7.2841</th>
<th>Mean predicted 11.1023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.0000</td>
<td>5.1797</td>
</tr>
<tr>
<td>Max. observed</td>
<td>20.8622</td>
<td>20.4910</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>3.6680</td>
<td>2.9908</td>
</tr>
<tr>
<td>Median observed</td>
<td>6.4000</td>
<td>10.7780</td>
</tr>
<tr>
<td>95(^{th}) Percentile observed</td>
<td>15.3258</td>
<td>95(^{th}) Percentile predicted 16.1780</td>
</tr>
<tr>
<td>10(^{th}) Percentile observed</td>
<td>3.4547</td>
<td>10(^{th}) Percentile predicted 7.3282</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 3.8182 µg/l

---

\(^1\) observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment YRKPH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment YRKPH  Season: July 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 110 pairs of predictions and observed data, the slope is 0.7212 and the intercept is -3.4210. The R-Squared value for this regression is 0.3550.

LOG10 Regressions of Calibration vs. Observations
Using the 110 pairs of predictions and observed data, the slope is 0.8204 and the intercept is -0.0585. The R-Squared value for this regression is 0.2283.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>14.0702</td>
<td>24.2520</td>
</tr>
<tr>
<td>Min.</td>
<td>1.6000</td>
<td>9.0842</td>
</tr>
<tr>
<td>Max.</td>
<td>105.9000</td>
<td>70.2540</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>14.1449</td>
<td>11.6852</td>
</tr>
<tr>
<td>Median</td>
<td>10.1798</td>
<td>21.5250</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>39.2000</td>
<td>44.7240</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.4410</td>
<td>13.3420</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 10.1818 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment YRKPH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment YRKPH  Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 212 pairs of predictions and observed data, the slope is 0.9671 and the intercept is -0.1830. The R-Squared value for this regression is 0.4433.

LOG10 Regressions of Calibration vs. Observations

Using the 212 pairs of predictions and observed data, the slope is 0.9861 and the intercept is -0.0448. The R-Squared value for this regression is 0.4505.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 1.3037</th>
<th>Mean predicted 1.5372</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.4333</td>
<td>Min. predicted 0.7668</td>
</tr>
<tr>
<td>Max. observed</td>
<td>4.3333</td>
<td>Max. predicted 3.2246</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.6589</td>
<td>Std. Dev. predicted 0.4536</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.0833</td>
<td>Median predicted 1.4807</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>2.1667</td>
<td>90th Percentile predicted 2.1665</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.6500</td>
<td>10th Percentile predicted 1.0045</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.2335 1/m

---

1 observed is dependent, predicted is independent
Segment YRKPH  Season: March – May Sept – Nov
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

Ke (1/m)
Ke (1/m)

Segment YRKPH  Season: March – May Sept – Nov

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 36 pairs of predictions and observed data, the slope is 0.6388 and the intercept is 3.5376. The R-Squared value for this regression is 0.7263.

LOG10 Regressions of Calibration vs. Observations

Using the 36 pairs of predictions and observed data, the slope is 0.6068 and the intercept is 0.4060. The R-Squared value for this regression is 0.6636.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.1307</th>
<th>Mean predicted 8.7559</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>6.59</td>
<td>Min. predicted 5.097</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.25</td>
<td>Max. predicted 14.68</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>1.7447</td>
<td>Std. Dev. predicted 2.3277</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.7225</td>
<td>Median predicted 8.3728</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.6150</td>
<td>90th Percentile predicted 12.1770</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.7600</td>
<td>10th Percentile predicted 6.1074</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3748 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 36
Number of Predicted Violations 0
Number of Observed Violations 0
Open Water Dissolved Oxygen (mg/l)
Segment PIAMH Season: Jan 1 – Dec 31
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment PIAMH Season: Jan 1 – Dec 31
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 6 pairs of predictions and observed data, the slope is 2.0058 and the intercept is -5.3751. The R-Squared value for this regression is 0.2507.

LOG10 Regressions of Calibration vs. Observations

Using the 6 pairs of predictions and observed data, the slope is 1.5816 and the intercept is -0.4656. The R-Squared value for this regression is 0.2959.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed: 10.3056</td>
<td>Mean predicted: 7.8176</td>
</tr>
<tr>
<td>Min. observed: 6.1517</td>
<td>Min. predicted: 6.4702</td>
</tr>
<tr>
<td>Max. observed: 18.5992</td>
<td>Max. predicted: 9.7207</td>
</tr>
<tr>
<td>Median observed: 8.5821</td>
<td>Median predicted: 7.8074</td>
</tr>
<tr>
<td>95th Percentile observed: 18.5992</td>
<td>95th Percentile predicted: 9.7207</td>
</tr>
<tr>
<td>10th Percentile observed: 6.1517</td>
<td>10th Percentile predicted: 6.4702</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.4880 µg/l

\(^{1}\) observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PIAMH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment PIAMH  Season: July 1 – Sept 30

(Scatter Plot)
Mesohaline Chlorophyll
Segment PIAMH (Piankatank Mesohaline)
March 1 - May 30

**Regression of Calibration vs. Observations**
Using the 5 pairs of predictions and observed data, the *slope* is 1.0247 and the *intercept* is -4.3109. The *R-Squared* value for this regression is 0.4884.

**LOG10 Regressions of Calibration vs. Observations**
Using the 5 pairs of predictions and observed data, the *slope* is 1.4711 and the *intercept* is -0.7094. The *R-Squared* value for this regression is 0.5142.

**Statistics (units in µg/l)**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.8537</td>
<td>Mean predicted</td>
</tr>
<tr>
<td>Min. observed</td>
<td>5.0837</td>
<td>Min. predicted</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.3059</td>
<td>Max. predicted</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>4.5677</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>6.1517</td>
<td>Median predicted</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>14.3059</td>
<td>95th Percentile</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.0837</td>
<td>10th Percentile</td>
</tr>
</tbody>
</table>

**Differences (predicted – observed)**

Mean difference 3.9940 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment PIAMH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment PIAMH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 13 pairs of predictions and observed data, the slope is -0.1529 and the intercept is 1.0760. The R-Squared value for this regression is 0.0056.

LOG10 Regressions of Calibration vs. Observations

Using the 13 pairs of predictions and observed data, the slope is -0.0953 and the intercept is 0.3146. The R-Squared value for this regression is 0.0027.

Statistics (units in 1/m)

Mean observed 0.9666 Mean predicted 0.7155
Min. observed 0.7222 Min. predicted 0.5708
Max. observed 1.1818 Max. predicted 0.8735
Std. Dev. Observed 0.1631 Std. Dev. predicted 0.0801
Median observed 1.0000 Median predicted 0.7048
90th Percentile observed 1.1818 90th Percentile predicted 0.8505
10th Percentile observed 0.7222 10th Percentile predicted 0.6262

Differences (predicted – observed)

Mean difference -0.2511 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment PIAMH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing Ke (1/m) vs Percent of Population. The graph displays a cumulative frequency distribution with PAIRED simulated and observed data.](image-url)
Ke (1/m)

Segment PIAMH  Season: April 1 – Oct 30
(Scatter Plot)
Chesapeake Bay Standard Segment MOBPH

Location Map of Segment MOBPH within the Chesapeake Bay Model Grid
OPEN WATER Dissolved Oxygen
Segment MOBPH (Mobjack Bay Polyhaline)
Jan 1 - Dec 31

Regression of Calibration vs. Observations

Using the 1839 pairs of predictions and observed data, the slope is 0.8069 and the intercept is 1.7116. The R-Squared value for this regression is 0.7060.

LOG10 Regressions of Calibration vs. Observations

Using the 1839 pairs of predictions and observed data, the slope is 0.7844 and the intercept is 0.2123. The R-Squared value for this regression is 0.6507.

Statistics (units in mg/l)

Mean observed 8.3179  Mean predicted 8.1870
Min. observed 3.77    Min. predicted 2.476
Max. observed 14.0602  Max. predicted 15
Std. Dev. Observed 1.9920  Std. Dev. predicted 2.0743
Median observed 8.0000  Median predicted 7.6831
90th Percentile observed 11.3000  90th Percentile predicted 11.3290
10th Percentile observed 5.9800  10th Percentile predicted 5.9365

Differences (predicted – observed)

Mean difference -0.1309 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1839
Number of Predicted Violations 3
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)
Segment MOBPH Season: Jan 1 – Dec 31

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 377 pairs of predictions and observed data, the slope is 0.6737 and the intercept is 1.6121. The R-Squared value for this regression is 0.3351.

LOG10 Regressions of Calibration vs. Observations

Using the 377 pairs of predictions and observed data, the slope is 0.7193 and the intercept is 0.2061. The R-Squared value for this regression is 0.2871.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed Values</th>
<th>Predicted Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>5.1972</td>
<td>5.3218</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.05</td>
<td>1.681</td>
</tr>
<tr>
<td>Max. observed</td>
<td>9.195</td>
<td>9.84</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.6607</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.3500</td>
<td>Median predicted 5.1205</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>7.2752</td>
<td>90th Percentile predicted 7.5253</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>2.8000</td>
<td>10th Percentile predicted 3.7469</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1246 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 377
Number of Predicted Violations 2
Number of Observed Violations 12
Deep Water Dissolved Oxygen (mg/l)

Segment MOBPH  Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment MOBPH  Season: May 1 – Sept 30

(Scatter Plot )
DEEP WATER **Dissolved Oxygen**  
Segment MOBPH (Mobjack Bay Polyhaline)  
Oct 1 - April 30

**Regression of Calibration vs. Observations**

Using the 343 pairs of predictions and observed data, the **slope** is 0.5987 and the **intercept** is 3.8895. The **R-Squared** value for this regression is 0.5714.

**LOG10 Regressions of Calibration vs. Observations**

Using the 343 pairs of predictions and observed data, the **slope** is 0.5703 and the **intercept** is 0.4413. The **R-Squared** value for this regression is 0.5498.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.2563</th>
<th>Mean predicted 8.9639</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4.1294</td>
<td>Min. predicted 4.394</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.4087</td>
<td>Max. predicted 13.92</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7704</td>
<td>Std. Dev. predicted 2.2354</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.2500</td>
<td>Median predicted 9.4187</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.4500</td>
<td>90th Percentile predicted 11.7940</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>7.0650</td>
<td>10th Percentile predicted 5.7484</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference -0.2924 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 343  
Number of Predicted Violations 0  
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)
Segment MOBPH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 230 pairs of predictions and observed data, the slope is 0.1496 and the intercept is 7.4348. The R-Squared value for this regression is 0.0088.

LOG10 Regressions of Calibration vs. Observations
Using the 230 pairs of predictions and observed data, the slope is 0.2105 and the intercept is 0.7457. The R-Squared value for this regression is 0.0150.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>3.0784</td>
</tr>
<tr>
<td>Max. observed</td>
<td>21.2425</td>
<td>20.3960</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>3.9774</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.2316</td>
<td>Median predicted</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>16.4000</td>
<td>95th Percentile predicted</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.8902</td>
<td>10th Percentile predicted</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.5261 µg/l
Chlorophyll Concentration (ug/l)

Segment MOBPH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment MOBPH  Season: July 1 – Sept 30
(Scatter Plot)
POLYHALINE Chlorophyll
Segment MOBPH (Mobjack Bay Polyhaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 208 pairs of predictions and observed data, the slope is 0.2627 and the intercept is 4.3229. The R-Squared value for this regression is 0.0564.

LOG10 Regressions of Calibration vs. Observations
Using the 208 pairs of predictions and observed data, the slope is 0.3546 and the intercept is 0.4735. The R-Squared value for this regression is 0.0386.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed Values</th>
<th>Predicted Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>7.9766</td>
<td>13.9083</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>4.1650</td>
</tr>
<tr>
<td>Max. observed</td>
<td>23.7000</td>
<td>26.5700</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>5.2526</td>
<td>4.7486</td>
</tr>
<tr>
<td>Median observed</td>
<td>6.6661</td>
<td>13.3295</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>19.8000</td>
<td>23.2820</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.4030</td>
<td>8.2018</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 5.9316 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment MOBPH  Season: March 1 – May 30

(Scatter Plot)
POLYHALINE Light Attenuation
Segment MOBPH (Mobjack Bay Polyhaline)
March-May Sept-Nov

**Regression of Calibration vs. Observations**

Using the 356 pairs of predictions and observed data, the *slope* is -0.2424 and the *intercept* is 1.2794. The *R-Squared* value for this regression is 0.0065.

**LOG10 Regressions of Calibration vs. Observations**

Using the 356 pairs of predictions and observed data, the *slope* is -0.1478 and the *intercept* is 0.3406. The *R-Squared* value for this regression is 0.0076.

**Statistics** (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.0208</td>
<td>1.0665</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.4194</td>
<td>0.5077</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>1.8494</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.7253</td>
<td>0.2416</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.9286</td>
<td>1.0419</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>1.4444</td>
<td>1.3985</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.6190</td>
<td>0.7727</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 0.0456 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment MOBPH  Season: March – May Sept – Nov

Cumulative Frequency Distribution — PAIRED Simulated and Observed Data
Chesapeake Bay Standard Segment JMSTF

Location Map of Segment JMSTF within the Chesapeake Bay Model Grid
MIGRATORY Dissolved Oxygen
Segment JMSTF (James Tidal Fresh)
Feb 15 - June 10

Regression of Calibration vs. Observations

Using the 747 pairs of predictions and observed data, the slope is -0.0003 and the intercept is 9.3870. The R-Squared value for this regression is 0.0000.

LOG10 Regressions of Calibration vs. Observations

Using the 747 pairs of predictions and observed data, the slope is 0.0170 and the intercept is 0.9915. The R-Squared value for this regression is 0.0003.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Mean observed 9.3836</th>
<th>Mean predicted 10.5983</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed 5.1</td>
<td>Min. predicted 5.338</td>
</tr>
<tr>
<td>Max. observed 13.6</td>
<td>Max. predicted 19.12</td>
</tr>
<tr>
<td>Std. Dev. Observed 1.7777</td>
<td>Std. Dev. predicted 2.1893</td>
</tr>
<tr>
<td>Median observed 9.6000</td>
<td>Median predicted 10.4770</td>
</tr>
<tr>
<td>90th Percentile observed 11.5200</td>
<td>90th Percentile predicted 13.5800</td>
</tr>
<tr>
<td>10th Percentile observed 6.8000</td>
<td>10th Percentile predicted 7.9931</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.2147 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 747
Number of Predicted Violations 0
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment JMSTF  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment JMSTF  Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 1279 pairs of predictions and observed data, the slope is 0.4167 and the intercept is 4.4986. The R-Squared value for this regression is 0.2299.

LOG10 Regressions of Calibration vs. Observations

Using the 1279 pairs of predictions and observed data, the slope is 0.3782 and the intercept is 0.5820. The R-Squared value for this regression is 0.2184.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.2111</th>
<th>Mean predicted 8.9095</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>3.8</td>
<td>Min. predicted 2.523</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.4</td>
<td>Max. predicted 16.82</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.1572</td>
<td>Std. Dev. predicted 2.4823</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.8200</td>
<td>Median predicted 8.9106</td>
</tr>
<tr>
<td>90\text{th} Percentile observed</td>
<td>11.6000</td>
<td>90\text{th} Percentile predicted 12.0190</td>
</tr>
<tr>
<td>10\text{th} Percentile observed</td>
<td>5.6900</td>
<td>10\text{th} Percentile predicted 5.8226</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.6984 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1279
Number of Predicted Violations 25
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment JMSTF Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment JMSTF  Season: June 11 – Feb 14

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 249 pairs of predictions and observed data, the slope is 0.9450 and the intercept is 4.0157. The R-Squared value for this regression is 0.2615.

LOG10 Regressions of Calibration vs. Observations
Using the 249 pairs of predictions and observed data, the slope is 0.9015 and the intercept is 0.0701. The R-Squared value for this regression is 0.4477.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.4239</td>
</tr>
<tr>
<td>Min.</td>
<td>0.5233</td>
</tr>
<tr>
<td>Max.</td>
<td>136.1000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>20.9240</td>
</tr>
<tr>
<td>Median</td>
<td>14.6667</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>61.4580</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.2000</td>
</tr>
<tr>
<td>Obs. Mean</td>
<td>18.4206</td>
</tr>
<tr>
<td>Obs. Min.</td>
<td>-0.3188</td>
</tr>
<tr>
<td>Obs. Max.</td>
<td>42.8260</td>
</tr>
<tr>
<td>Obs. Std. Dev.</td>
<td>11.3223</td>
</tr>
<tr>
<td>Obs. Median</td>
<td>17.5790</td>
</tr>
<tr>
<td>Obs. 95th Perc.</td>
<td>36.8160</td>
</tr>
<tr>
<td>Obs. 10th Perc.</td>
<td>3.5236</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference -3.0033 µg/l

¹ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment JMSTF  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment JMSTF  Season: July 1 – Sept 30
(Scatter Plot)
TIDAL FRESH Chlorophyll
Segment JMSTF (James Tidal Fresh)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 226 pairs of predictions and observed data, the slope is 0.7008 and the intercept is 3.3499. The R-Squared value for this regression is 0.3617.

LOG10 Regressions of Calibration vs. Observations
Using the 226 pairs of predictions and observed data, the slope is 0.5287 and the intercept is 0.4169. The R-Squared value for this regression is 0.3376.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>10.2838</td>
<td>9.8948</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>0.1265</td>
</tr>
<tr>
<td>Max. observed</td>
<td>60.9000</td>
<td>49.0490</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>12.2353</td>
<td>10.5014</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.4108</td>
<td>5.7351</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>37.9282</td>
<td>95th Percentile predicted 30.5690</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.2000</td>
<td>10th Percentile predicted 0.7689</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.3890 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment JMSTF  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

Graph showing the cumulative frequency distribution of chlorophyll concentration over the segment JMSTF during the season March 1 to May 30, with the x-axis representing the percent of population and the y-axis representing the simulated and observed concentration levels.
Chlorophyll Concentration (ug/l)
Segment JMSTF  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 450 pairs of predictions and observed data, the slope is 0.1071 and the intercept is 1.6712. The R-Squared value for this regression is 0.0758.

LOG10 Regressions of Calibration vs. Observations

Using the 450 pairs of predictions and observed data, the slope is 0.3162 and the intercept is 0.2792. The R-Squared value for this regression is 0.1536.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>90th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>90th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.9934</td>
<td>0.4483</td>
<td>13.0000</td>
<td>0.9319</td>
<td>1.8571</td>
<td>2.9250</td>
<td>1.0000</td>
<td>3.0078</td>
<td>0.8229</td>
<td>37.5580</td>
<td>2.3959</td>
<td>2.4550</td>
<td>4.5260</td>
<td>1.7273</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.0144 /m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment JMSTF  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

Graph showing Ke (1/m) against percent of population.
Ke (1/m)
Segment JMSTF  Season: April 1 – Oct 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 413 pairs of predictions and observed data, the slope is 0.4775 and the intercept is 4.4914. The R-Squared value for this regression is 0.4855.

LOG10 Regressions of Calibration vs. Observations

Using the 413 pairs of predictions and observed data, the slope is 0.4812 and the intercept is 0.5101. The R-Squared value for this regression is 0.4816.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>6.1</td>
<td>3.799</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.18</td>
<td>18.12</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.5819</td>
<td>2.3085</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.3100</td>
<td>10.2380</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.4000</td>
<td>12.4640</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>7.0100</td>
<td>6.9781</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.7441 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 413
Number of Predicted Violations 9
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment JMSOH  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment JMSOH  Season: Feb 15 – June 10
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 697 pairs of predictions and observed data, the slope is 0.6945 and the intercept is 2.7428. The R-Squared value for this regression is 0.6095.

LOG10 Regressions of Calibration vs. Observations

Using the 697 pairs of predictions and observed data, the slope is 0.5620 and the intercept is 0.4285. The R-Squared value for this regression is 0.5371.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>5.11</td>
<td>2.889</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.93</td>
<td>12.62</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.8444</td>
<td>2.0734</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.2500</td>
<td>7.2865</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.0000</td>
<td>10.6110</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>6.1300</td>
<td>4.8925</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.4622 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 697
Number of Predicted Violations 10
Number of Observed Violations 0

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment JMSOH  Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment JMSOH  Season: June 11 – Feb 14

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment JMSOH (James Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 113 pairs of predictions and observed data, the slope is 0.4836 and the intercept is 8.0934. The R-Squared value for this regression is 0.0113.

LOG10 Regressions of Calibration vs. Observations
Using the 113 pairs of predictions and observed data, the slope is 0.4283 and the intercept is 0.6373. The R-Squared value for this regression is 0.0536.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>12.9642</td>
<td>10.0721</td>
</tr>
<tr>
<td>Min. observed</td>
<td>3.1000</td>
<td>4.2015</td>
</tr>
<tr>
<td>Max. observed</td>
<td>122.3000</td>
<td>16.6910</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>12.1955</td>
<td>2.6860</td>
</tr>
<tr>
<td>Median observed</td>
<td>10.8402</td>
<td>10.4630</td>
</tr>
<tr>
<td>95th Percentile obs.</td>
<td>24.5047</td>
<td>14.4540</td>
</tr>
<tr>
<td>10th Percentile obs.</td>
<td>5.8770</td>
<td>6.2994</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.8921 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment JMSOH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment JMSOH  Season: July 1 – Sept 30

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment JMSOH (James Oligohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 99 pairs of predictions and observed data, the slope is 0.5544 and the intercept is 4.8711. The R-Squared value for this regression is 0.1385.

LOG10 Regressions of Calibration vs. Observations
Using the 99 pairs of predictions and observed data, the slope is 0.8059 and the intercept is 0.0791. The R-Squared value for this regression is 0.2107.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>1.0000</td>
<td>2.9905</td>
</tr>
<tr>
<td>Max. observed</td>
<td>82.0000</td>
<td>56.7780</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>12.8253</td>
<td>8.6100</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.1000</td>
<td>11.0770</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>38.5933</td>
<td>36.7810</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>1.8000</td>
<td>6.1714</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.1909 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment JMSOH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations

Using the 263 pairs of predictions and observed data, the slope is 0.6461 and the intercept is 1.1065. The R-Squared value for this regression is 0.2464.

LOG10 Regressions of Calibration vs. Observations

Using the 263 pairs of predictions and observed data, the slope is 0.6770 and the intercept is 0.1921. The R-Squared value for this regression is 0.2639.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>2.8285</td>
<td>2.6653</td>
</tr>
<tr>
<td>Max.</td>
<td>6.5000</td>
<td>6.7204</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.0564</td>
<td>0.8116</td>
</tr>
<tr>
<td>Median</td>
<td>2.6000</td>
<td>2.5345</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>4.3333</td>
<td>3.7345</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>1.6250</td>
<td>1.8915</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.1632 1/m
Ke \((1/m)\)

Segment JMSOH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment JMSOH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment JMSMH

Location Map of Segment JMSMH within the Chesapeake Bay Model Grid

LE5.2

LE5.3
MIGRATORY Dissolved Oxygen
Segment JMSMH (James Mesohaline)
Feb 15 - June 10

Regression of Calibration vs. Observations

Using the 300 pairs of predictions and observed data, the slope is 0.4471 and the intercept is 4.2972. The R-Squared value for this regression is 0.6586.

LOG10 Regressions of Calibration vs. Observations

Using the 300 pairs of predictions and observed data, the slope is 0.4801 and the intercept is 0.4921. The R-Squared value for this regression is 0.6666.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.7181</td>
<td>9.8878</td>
</tr>
<tr>
<td>Min. observed</td>
<td>5.7</td>
<td>3.541</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.74</td>
<td>18.38</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.7388</td>
<td>3.1561</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.4800</td>
<td>9.7870</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.2300</td>
<td>14.0495</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.4000</td>
<td>5.5464</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 1.1698 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 300
Number of Predicted Violations 14
Number of Observed Violations 0

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment JMSMH  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment JMSMH Season: Feb 15 – June 10

(Scatter Plot)
MIGRATORY Dissolved Oxygen
Segment JMSMH (James Mesohaline)
June 11 - Feb 14

Regression of Calibration vs. Observations

Using the 496 pairs of predictions and observed data, the slope is 0.6968 and the intercept is 2.6782. The R-Squared value for this regression is 0.7500.

LOG10 Regressions of Calibration vs. Observations

Using the 496 pairs of predictions and observed data, the slope is 0.5995 and the intercept is 0.3915. The R-Squared value for this regression is 0.6717.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Mean observed 7.4325</th>
<th>Mean predicted 6.8235</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed 3.93</td>
<td>Min. predicted 2.456</td>
</tr>
<tr>
<td>Max. observed 13.55</td>
<td>Max. predicted 15.37</td>
</tr>
<tr>
<td>Std. Dev. Observed 2.0471</td>
<td>Std. Dev. predicted 2.5443</td>
</tr>
<tr>
<td>Median observed 6.7000</td>
<td>Median predicted 6.2605</td>
</tr>
<tr>
<td>90th Percentile observed 10.6600</td>
<td>90th Percentile predicted 10.5470</td>
</tr>
<tr>
<td>10th Percentile observed 5.5500</td>
<td>10th Percentile predicted 4.0672</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.6090 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 496
Number of Predicted Violations 16
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment JMSMH Season: June 11 – Feb 14
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment JMSMH  Season: June 11 – Feb 14

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 668 pairs of predictions and observed data, the slope is 0.5851 and the intercept is 3.0605. The R-Squared value for this regression is 0.7411.

LOG10 Regressions of Calibration vs. Observations

Using the 668 pairs of predictions and observed data, the slope is 0.6052 and the intercept is 0.3661. The R-Squared value for this regression is 0.7272.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 8.0386</td>
<td>Mean predicted 8.5079</td>
</tr>
<tr>
<td>Min. observed  4.68</td>
<td>Min. predicted  3.033</td>
</tr>
<tr>
<td>Max. observed 13.8</td>
<td>Max. predicted 17.85</td>
</tr>
<tr>
<td>Std. Dev. Observed 2.0274</td>
<td>Std. Dev. predicted 2.9828</td>
</tr>
<tr>
<td>Median observed 7.5100</td>
<td>Median predicted 7.7463</td>
</tr>
<tr>
<td>90th Percentile observed 11.1900</td>
<td>90th Percentile predicted 13.1940</td>
</tr>
<tr>
<td>10th Percentile observed 5.8700</td>
<td>10th Percentile predicted 5.2743</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.4693 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 668
Number of Predicted Violations 2
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment JMSMH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing the relationship between percent of population and dissolved oxygen concentration.]
Open Water Dissolved Oxygen (mg/l)
Segment JMSMH Season: Jan 1 – Dec 31
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 110 pairs of predictions and observed data, the slope is 0.0256 and the intercept is 5.8951. The R-Squared value for this regression is 0.0000.

LOG10 Regressions of Calibration vs. Observations
Using the 110 pairs of predictions and observed data, the slope is 0.2577 and the intercept is 0.4944. The R-Squared value for this regression is 0.0165.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.1000</td>
<td>8.0080</td>
</tr>
<tr>
<td>Min.</td>
<td>1.0000</td>
<td>3.5747</td>
</tr>
<tr>
<td>Max.</td>
<td>131.5000</td>
<td>12.8120</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>12.8730</td>
<td>2.1406</td>
</tr>
<tr>
<td>Median</td>
<td>3.9001</td>
<td>7.9067</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>9.6773</td>
<td>11.4680</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.0500</td>
<td>4.9532</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference 1.9080 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment JMSMH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment JMSMH Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 99 pairs of predictions and observed data, the slope is 0.2347 and the intercept is 6.1353. The R-Squared value for this regression is 0.0371.

LOG10 Regressions of Calibration vs. Observations

Using the 99 pairs of predictions and observed data, the slope is 0.5807 and the intercept is 0.1176. The R-Squared value for this regression is 0.0702.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>13.2694</td>
<td>30.3524</td>
</tr>
<tr>
<td>Min.</td>
<td>Min.</td>
</tr>
<tr>
<td>1.0000</td>
<td>9.1717</td>
</tr>
<tr>
<td>Max.</td>
<td>Max.</td>
</tr>
<tr>
<td>78.6475</td>
<td>65.7080</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>Std. Dev. predicted</td>
</tr>
<tr>
<td>15.4341</td>
<td>12.6708</td>
</tr>
<tr>
<td>Median</td>
<td>Median</td>
</tr>
<tr>
<td>6.9153</td>
<td>26.7730</td>
</tr>
<tr>
<td>95&lt;sup&gt;th&lt;/sup&gt; Percentile</td>
<td>95&lt;sup&gt;th&lt;/sup&gt; Percentile</td>
</tr>
<tr>
<td>53.8770</td>
<td>58.1130</td>
</tr>
<tr>
<td>10&lt;sup&gt;th&lt;/sup&gt; Percentile</td>
<td>10&lt;sup&gt;th&lt;/sup&gt; Percentile</td>
</tr>
<tr>
<td>2.5000</td>
<td>16.0740</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 17.0930 µg/l

<sup>1</sup> observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment JMSMH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment JMSMH   Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 267 pairs of predictions and observed data, the slope is 1.0742 and the intercept is -0.0347. The R-Squared value for this regression is 0.4439.

LOG10 Regressions of Calibration vs. Observations

Using the 267 pairs of predictions and observed data, the slope is 0.9617 and the intercept is 0.0222. The R-Squared value for this regression is 0.4402.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.8588</td>
<td>1.7628</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.6190</td>
<td>0.8907</td>
</tr>
<tr>
<td>Max. observed</td>
<td>6.5000</td>
<td>4.0369</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>0.9041</td>
<td>0.5608</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.6250</td>
<td>1.6325</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>3.2500</td>
<td>2.4836</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>1.0400</td>
<td>1.2190</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0960 1/m

---

1 observed is dependent, predicted is independent
Ke \((1/m)\)

Segment JMSMH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment JMSMH  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment JMSPH

Location Map of Segment JMSPH within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 997 pairs of predictions and observed data, the slope is 0.6307 and the intercept is 2.6685. The R-Squared value for this regression is 0.7159.

LOG10 Regressions of Calibration vs. Observations

Using the 997 pairs of predictions and observed data, the slope is 0.6556 and the intercept is 0.3153. The R-Squared value for this regression is 0.6925.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.8995</td>
<td>8.2940</td>
</tr>
<tr>
<td>Min.</td>
<td>3.25</td>
<td>3.039</td>
</tr>
<tr>
<td>Max.</td>
<td>13.8</td>
<td>17.4</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.0478</td>
<td>2.7473</td>
</tr>
<tr>
<td>Median</td>
<td>7.5400</td>
<td>7.6125</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>10.8100</td>
<td>12.2850</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.6000</td>
<td>5.2772</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3945 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 997
Number of Predicted Violations 8
Number of Observed Violations 5

---

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment JMSPH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment JMSPH Season: Jan 1 – Dec 31

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 51 pairs of predictions and observed data, the slope is 0.2107 and the intercept is 2.9797. The R-Squared value for this regression is 0.0324.

LOG10 Regressions of Calibration vs. Observations
Using the 51 pairs of predictions and observed data, the slope is 0.3040 and the intercept is 0.4433. The R-Squared value for this regression is 0.0611.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>4.4095</td>
<td>6.7844</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.4000</td>
<td>3.0047</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.1000</td>
<td>10.2950</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.0507</td>
<td>Std. Dev. predicted 1.7503</td>
</tr>
<tr>
<td>Median observed</td>
<td>3.4461</td>
<td>6.8742</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>9.1000</td>
<td>95th Percentile predicted 9.4652</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.0000</td>
<td>10th Percentile predicted 4.0678</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference 2.3749 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment JMSPH Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations

Using the 44 pairs of predictions and observed data, the slope is 0.1450 and the intercept is 11.2785. The R-Squared value for this regression is 0.0165.

LOG10 Regressions of Calibration vs. Observations

Using the 44 pairs of predictions and observed data, the slope is 0.3779 and the intercept is 0.5553. The R-Squared value for this regression is 0.0375.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean predicted</td>
<td>25.9300</td>
<td>12.2670</td>
<td>63.0980</td>
<td>11.9437</td>
<td>21.7585</td>
<td>47.4410</td>
<td>15.1350</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 10.8923 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (µg/l)

Segment JMSPH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment JMSPH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 93 pairs of predictions and observed data, the slope is 0.4359 and the intercept is 0.5893. The R-Squared value for this regression is 0.2792.

LOG10 Regressions of Calibration vs. Observations

Using the 93 pairs of predictions and observed data, the slope is 0.5261 and the intercept is 0.1398. The R-Squared value for this regression is 0.3045.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.1974</td>
<td>1.3948</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.5417</td>
<td>0.8159</td>
</tr>
<tr>
<td>Max. observed</td>
<td>2.3636</td>
<td>3.3562</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.3940</td>
<td>0.4776</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.0833</td>
<td>1.2449</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>1.7105</td>
<td>2.1983</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.7647</td>
<td>0.9287</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.1974 1/m

---

1 observed is dependent, predicted is independent
Segment JMSPH  Season: March−May Sept−Nov

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment JMSPH  Season: March–May Sept–Nov

(Scatter Plot)
Chesapeake Bay Standard Segment EASMH

Location Map of Segment EASMH within the Chesapeake Bay Model Grid

EE1.1

Miles

0 1.25 2.5 5 7.5 10

Chesapeake Bay Program
Regression of Calibration vs. Observations

Using the 1137 pairs of predictions and observed data, the slope is 0.7714 and the intercept is 2.2753. The R-Squared value for this regression is 0.6071.

LOG10 Regressions of Calibration vs. Observations

Using the 1137 pairs of predictions and observed data, the slope is 0.7419 and the intercept is 0.2605. The R-Squared value for this regression is 0.5303.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.3674</td>
<td>7.8971</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>-0.0644</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.5</td>
<td>14.41</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.7940</td>
<td>2.8220</td>
</tr>
<tr>
<td>Median Observed</td>
<td>8.3500</td>
<td>8.2261</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>11.8000</td>
<td>11.4650</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>5.2000</td>
<td>3.8395</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.4703 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 1137
Number of Predicted Violations 95
Number of Observed Violations 72
Open Water Dissolved Oxygen (mg/l)

Segment EASMH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment EASMH  Season: Jan 1 – Dec 31

(Scatter Plot)
DEEP WATER Dissolved Oxygen
Segment EASMH (Eastern Bay Mesohaline - Eastern Shore)
May 1 - Sept 30

Regression of Calibration vs. Observations

Using the 91 pairs of predictions and observed data, the slope is 0.5559 and the intercept is 1.1559. The R-Squared value for this regression is 0.3122.

LOG10 Regressions of Calibration vs. Observations

Using the 91 pairs of predictions and observed data, the slope is 0.6510 and the intercept is 0.1454. The R-Squared value for this regression is 0.3703.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>2.6899</td>
<td>2.7593</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0</td>
<td>0.0013</td>
</tr>
<tr>
<td>Max. observed</td>
<td>8.1</td>
<td>9.589</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.5305</td>
<td>2.5433</td>
</tr>
<tr>
<td>Median observed</td>
<td>2.0500</td>
<td>2.2539</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>6.4500</td>
<td>6.9767</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.0400</td>
<td>0.1140</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.0694 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 1.7 mg/l.

Number of predicted and observed pairs 91
Number of Predicted Violations 43
Number of Observed Violations 41
Deep Water Dissolved Oxygen (mg/l)

Segment EASMH  Season: May 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)

Segment EASMH Season: May 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 91 pairs of predictions and observed data, the slope is 0.3832 and the intercept is 6.0327. The R-Squared value for this regression is 0.2456.

LOG10 Regressions of Calibration vs. Observations

Using the 91 pairs of predictions and observed data, the slope is 0.2841 and the intercept is 0.7272. The R-Squared value for this regression is 0.1928.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.8858</th>
<th>Mean predicted 7.4459</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.1</td>
<td>1.446</td>
</tr>
<tr>
<td>Max. observed</td>
<td>12.6</td>
<td>12.75</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2530</td>
<td>Std. Dev. predicted 2.9142</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.1500</td>
<td>Median predicted 7.6577</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.4500</td>
<td>90th Percentile predicted 11.1040</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.6000</td>
<td>10th Percentile predicted 2.8008</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -1.4399 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 91
Number of Predicted Violations 12
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Deep Water Dissolved Oxygen (mg/l)

Segment EASMH Season: Oct 1 – April 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Deep Water Dissolved Oxygen (mg/l)
Segment EASMH Season: Oct 1 – April 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 57 pairs of predictions and observed data, the slope is 3.6661 and the intercept is -17.0590. The R-Squared value for this regression is 0.0488.

LOG10 Regressions of Calibration vs. Observations
Using the 57 pairs of predictions and observed data, the slope is 0.5911 and the intercept is 0.4983. The R-Squared value for this regression is 0.0274.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>17.0263</td>
<td>9.2975</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.8000</td>
<td>5.2636</td>
</tr>
<tr>
<td>Max. observed</td>
<td>249.7000</td>
<td>14.6490</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>32.6572</td>
<td>1.9681</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.7000</td>
<td>9.3278</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>37.4000</td>
<td>12.8670</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.4000</td>
<td>6.6922</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -7.7288 µg/l

---

¹ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment EASMH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment EASMH  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 52 pairs of predictions and observed data, the slope is 0.0108 and the intercept is 7.6616. The R-Squared value for this regression is 0.0001.

LOG10 Regressions of Calibration vs. Observations
Using the 52 pairs of predictions and observed data, the slope is 0.0953 and the intercept is 0.7612. The R-Squared value for this regression is 0.0020.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.7904</td>
</tr>
<tr>
<td>Min</td>
<td>1.5000</td>
</tr>
<tr>
<td>Max</td>
<td>30.4000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>5.8569</td>
</tr>
<tr>
<td>Median</td>
<td>5.9500</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>22.1000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.4000</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 4.1580 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment EASMH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment EASMH  Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 130 pairs of predictions and observed data, the slope is 0.2991 and the intercept is 0.6239. The R-Squared value for this regression is 0.0364.

LOG10 Regressions of Calibration vs. Observations

Using the 130 pairs of predictions and observed data, the slope is 0.2831 and the intercept is 0.1933. The R-Squared value for this regression is 0.0316.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>0.8478</td>
<td>0.7489</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.2600</td>
<td>0.4617</td>
</tr>
<tr>
<td>Max. observed</td>
<td>1.6250</td>
<td>1.7311</td>
</tr>
<tr>
<td>Std. Dev. observed</td>
<td>0.2904</td>
<td>0.1852</td>
</tr>
<tr>
<td>Median observed</td>
<td>0.8125</td>
<td>0.6988</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>1.3000</td>
<td>90th Percentile predicted 0.9466</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.5000</td>
<td>10th Percentile predicted 0.5860</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.0990 1/m

1 observed is dependent, predicted is independent
Ke (1/m)

Segment EASMH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke \((1/m)\)

Segment EASMH  Season: April 1 – Oct 30

(Scatter Plot)
MIGRATORY Dissolved Oxygen
Segment CHOOH (Choptank Oligohaline)
Feb 15 - June 10

Regression of Calibration vs. Observations

Using the 130 pairs of predictions and observed data, the slope is 0.5380 and the intercept is 5.1134. The R-Squared value for this regression is 0.4627.

LOG10 Regressions of Calibration vs. Observations

Using the 130 pairs of predictions and observed data, the slope is 0.3257 and the intercept is 0.7004. The R-Squared value for this regression is 0.4233.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.7977</th>
<th>Mean predicted 6.8477</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>5.4</td>
<td>Min. predicted 0.563</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.7</td>
<td>Max. predicted 10.2</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.8307</td>
<td>Std. Dev. predicted 2.3145</td>
</tr>
<tr>
<td>Median Observed</td>
<td>8.5167</td>
<td>Median predicted 7.2866</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.4500</td>
<td>90th Percentile predicted 9.6208</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.4167</td>
<td>10th Percentile predicted 3.9135</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -1.9500 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 130
Number of Predicted Violations 32
Number of Observed Violations 0

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CHOOH Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
MIGRATORY Dissolved Oxygen
Segment CHOOH (Choptank Oligohaline)
June 11 - Feb 14

Regression of Calibration vs. Observations

Using the 253 pairs of predictions and observed data, the slope is 0.7146 and the intercept is 4.0121. The R-Squared value for this regression is 0.3931.

LOG10 Regressions of Calibration vs. Observations

Using the 253 pairs of predictions and observed data, the slope is 0.3534 and the intercept is 0.6581. The R-Squared value for this regression is 0.3206.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 7.7894</th>
<th>Mean predicted 5.2859</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.6333</td>
<td>Min. predicted 0.0016</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.1667</td>
<td>Max. predicted 9.417</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.3040</td>
<td>Std. Dev. predicted 2.0216</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.1667</td>
<td>Median predicted 5.2609</td>
</tr>
<tr>
<td>90\textsuperscript{th} Percentile observed</td>
<td>11.3000</td>
<td>90\textsuperscript{th} Percentile predicted 7.8887</td>
</tr>
<tr>
<td>10\textsuperscript{th} Percentile observed</td>
<td>5.5000</td>
<td>10\textsuperscript{th} Percentile predicted 2.5912</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -2.5035 mg/l

Violations of Standards
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 253
Number of Predicted Violations 49
Number of Observed Violations 2

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)
Segment CHOOGH  Season: June 11 – Feb 14
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CHOONH  Season: June 11 – Feb 14

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment CHOOH (Choptank Oligohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 58 pairs of predictions and observed data, the slope is -0.1406 and the intercept is 30.8484. The R-Squared value for this regression is 0.0013.

LOG10 Regressions of Calibration vs. Observations
Using the 58 pairs of predictions and observed data, the slope is -0.0598 and the intercept is 1.5176. The R-Squared value for this regression is 0.0014.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>29.2862</td>
<td>11.1086</td>
</tr>
<tr>
<td>Min. observed</td>
<td>5.4000</td>
<td>4.6542</td>
</tr>
<tr>
<td>Max. observed</td>
<td>54.6000</td>
<td>16.6080</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>10.3396</td>
<td>2.6864</td>
</tr>
<tr>
<td>Median observed</td>
<td>28.4000</td>
<td>11.0750</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>49.8000</td>
<td>15.9150</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>17.7000</td>
<td>7.8416</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -18.1776 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment CHO00H  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment CHOOGH Season: July 1 – Sept 30

(Scatter Plot)
OLIGOHALINE Chlorophyll
Segment CHOOH (Choptank Oligohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 52 pairs of predictions and observed data, the slope is 0.6974 and the intercept is 4.4717. The R-Squared value for this regression is 0.0903.

LOG10 Regressions of Calibration vs. Observations
Using the 52 pairs of predictions and observed data, the slope is 0.7358 and the intercept is 0.2477. The R-Squared value for this regression is 0.1218.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>2.0000</td>
<td>6.1253</td>
</tr>
<tr>
<td>Max. observed</td>
<td>44.9000</td>
<td>23.0350</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>9.7888</td>
<td>4.2181</td>
</tr>
<tr>
<td>Median observed</td>
<td>12.0000</td>
<td>13.6870</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>34.4000</td>
<td>21.1930</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>4.5000</td>
<td>8.4796</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.4246 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CHO0H Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CHO0H Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 129 pairs of predictions and observed data, the slope is 0.3989 and the intercept is 2.3652. The R-Squared value for this regression is 0.0910.

LOG10 Regressions of Calibration vs. Observations

Using the 129 pairs of predictions and observed data, the slope is 0.4404 and the intercept is 0.3756. The R-Squared value for this regression is 0.0702.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>4.2194</td>
<td>4.6484</td>
</tr>
<tr>
<td>Min. observed</td>
<td>2.1667</td>
<td>3.3698</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>13.6090</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.4220</td>
<td>1.0752</td>
</tr>
<tr>
<td>Median observed</td>
<td>4.3333</td>
<td>4.4423</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>6.5000</td>
<td>5.3349</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>3.2500</td>
<td>3.8903</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.4290 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CHOOH  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CHOOH  Season: April 1 – Oct 30

(Scatter Plot)
Location Map of Segment CHOMH1 within the Chesapeake Bay Model Grid
OPEN WATER **Dissolved Oxygen**
Segment CHOMH1 (Choptank Mesohaline)
Jan 1 - Dec 31

Regression of Calibration vs. Observations

Using the 812 pairs of predictions and observed data, the **slope** is 0.7654 and the **intercept** is 1.9423. The **R-Squared** value for this regression is 0.6189.

LOG10 Regressions of Calibration vs. Observations

Using the 812 pairs of predictions and observed data, the **slope** is 0.7712 and the **intercept** is 0.2183. The **R-Squared** value for this regression is 0.5740.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.6621</td>
<td>8.7788</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.4</td>
<td>2.79</td>
</tr>
<tr>
<td>Max. observed</td>
<td>14.2</td>
<td>15.24</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>2.2604</td>
<td>2.3232</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.3000</td>
<td>8.4356</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.9000</td>
<td>12.1910</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.1000</td>
<td>5.8959</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference 0.1168 mg/l

**Violations of Standards**
Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 812
Number of Predicted Violations 3
Number of Observed Violations 10

---

\(^1\) observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment CHOMH1 Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing cumulative frequency distribution of dissolved oxygen levels over the season Jan 1 – Dec 31 for Segment CHOMH1. The graph compares simulated and observed data.]
Open Water Dissolved Oxygen (mg/l)
Segment CHOMH1  Season: Jan 1 – Dec 31
(Scatter Plot)
Regression of Calibration vs. Observations\(^1\)
Using the 57 pairs of predictions and observed data, the slope is 0.6048 and the intercept is 3.7066. The R-Squared value for this regression is 0.0863.

LOG10 Regressions of Calibration vs. Observations\(^1\)
Using the 57 pairs of predictions and observed data, the slope is 0.8558 and the intercept is 0.1039. The R-Squared value for this regression is 0.2027.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>9.8754</td>
<td>10.1990</td>
</tr>
<tr>
<td>Min.</td>
<td>Min.</td>
</tr>
<tr>
<td>2.5000</td>
<td>6.1339</td>
</tr>
<tr>
<td>Max.</td>
<td>Max.</td>
</tr>
<tr>
<td>38.6000</td>
<td>19.2830</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>5.6900</td>
<td>2.7639</td>
</tr>
<tr>
<td>Median</td>
<td>Median</td>
</tr>
<tr>
<td>8.8000</td>
<td>9.3168</td>
</tr>
<tr>
<td>95(^{th}) Percentile</td>
<td>95(^{th}) Percentile</td>
</tr>
<tr>
<td>18.5000</td>
<td>14.9410</td>
</tr>
<tr>
<td>10(^{th}) Percentile</td>
<td>10(^{th}) Percentile</td>
</tr>
<tr>
<td>4.3500</td>
<td>7.0799</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.3235 µg/l

---

\(^1\) observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CHOMH1  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CHOMH1  Season: July 1 – Sept 30
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 51 pairs of predictions and observed data, the slope is 0.3612 and the intercept is 2.8110. The R-Squared value for this regression is 0.0529.

LOG10 Regressions of Calibration vs. Observations
Using the 51 pairs of predictions and observed data, the slope is 0.8325 and the intercept is -0.1057. The R-Squared value for this regression is 0.1019.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>8.1235</td>
<td>14.7077</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.3000</td>
<td>7.0530</td>
</tr>
<tr>
<td>Max. observed</td>
<td>31.1000</td>
<td>25.7430</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>6.0880</td>
<td>3.8778</td>
</tr>
<tr>
<td>Median observed</td>
<td>7.0000</td>
<td>13.6640</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>21.0500</td>
<td>23.0770</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>2.8000</td>
<td>11.1350</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)
Mean difference 6.5841 µg/l

Ⅰ observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment CHOMH1  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment CHOMH1   Season: March 1 – May 30

(Scatter Plot)
Regression of Calibration vs. Observations

Using the 129 pairs of predictions and observed data, the slope is 0.1667 and the intercept is 0.8089. The R-Squared value for this regression is 0.0097.

LOG10 Regressions of Calibration vs. Observations

Using the 129 pairs of predictions and observed data, the slope is 0.1090 and the intercept is 0.2550. The R-Squared value for this regression is 0.0045.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed 0.9313</td>
<td>Mean predicted 0.7339</td>
</tr>
<tr>
<td>Min. observed 0.3095</td>
<td>Min. predicted 0.5056</td>
</tr>
<tr>
<td>Max. observed 1.6250</td>
<td>Max. predicted 1.4903</td>
</tr>
<tr>
<td>Std. Dev. Observed 0.2922</td>
<td>Std. Dev. predicted 0.1728</td>
</tr>
<tr>
<td>Median observed 0.9286</td>
<td>Median predicted 0.6986</td>
</tr>
<tr>
<td>90th Percentile observed 1.3000</td>
<td>90th Percentile predicted 0.9235</td>
</tr>
<tr>
<td>10th Percentile observed 0.5417</td>
<td>10th Percentile predicted 0.5599</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.1974 1/m

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CHOMH1  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing Ke (1/m) vs. Percent of Population]
Ke (1/m)

Segment CHOMH1  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment CHOMH2

Location Map of Segment CHOMH2 within the Chesapeake Bay Model Grid
Regression of Calibration vs. Observations

Using the 67 pairs of predictions and observed data, the slope is 0.8374 and the intercept is 0.7536. The R-Squared value for this regression is 0.4685.

LOG10 Regressions of Calibration vs. Observations

Using the 67 pairs of predictions and observed data, the slope is 0.9180 and the intercept is 0.0460. The R-Squared value for this regression is 0.5155.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 9.6175</th>
<th>Mean predicted 10.5848</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>4</td>
<td>3.625</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.875</td>
<td>14.16</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.9611</td>
<td>1.6029</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.4000</td>
<td>10.7740</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>12.2000</td>
<td>12.2900</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>7.3000</td>
<td>8.0431</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.9673 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 5 mg/l.

Number of predicted and observed pairs 67
Number of Predicted Violations 2
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CHOMH2  Season: Feb 15 – June 10

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Regression of Calibration vs. Observations\(^1\)

Using the 128 pairs of predictions and observed data, the slope is 1.0081 and the intercept is -0.6182. The R-Squared value for this regression is 0.5199.

**LOG10 Regressions of Calibration vs. Observations\(^1\)**

Using the 128 pairs of predictions and observed data, the slope is 0.9229 and the intercept is 0.0428. The R-Squared value for this regression is 0.4633.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 7.9756</th>
<th>Min. observed 0.55</th>
<th>Max. observed 14.6333</th>
<th>Std. Dev. Observed 2.2833</th>
<th>Median observed 7.2833</th>
<th>90(^{\text{th}}) Percentile observed 11.6000</th>
<th>10(^{\text{th}}) Percentile observed 5.6667</th>
<th>Mean predicted 8.5250</th>
<th>Min. predicted 2.352</th>
<th>Max. predicted 13.07</th>
<th>Std. Dev. predicted 1.6332</th>
<th>Median predicted 8.3880</th>
<th>90(^{\text{th}}) Percentile predicted 10.7560</th>
<th>10(^{\text{th}}) Percentile predicted 6.5463</th>
</tr>
</thead>
</table>

**Differences** (predicted – observed)

Mean difference 0.5494 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 128
Number of Predicted Violations 7
Number of Observed Violations 6

---

\(^1\) observed is dependent, predicted is independent
Migratory Dissolved Oxygen (mg/l)

Segment CHOMH2  Season: June 11 – Feb 14

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Migratory Dissolved Oxygen (mg/l)
Segment CHOMH2  Season: June 11 – Feb 14
(Scatter Plot)
Regression of Calibration vs. Observations
Using the 59 pairs of predictions and observed data, the slope is -0.0004 and the intercept is 13.4595. The R-Squared value for this regression is 0.0000.

LOG10 Regressions of Calibration vs. Observations
Using the 59 pairs of predictions and observed data, the slope is -0.0054 and the intercept is 1.0824. The R-Squared value for this regression is 0.0000.

Statistics (units in µg/l)

Mean observed 13.4551 Mean predicted 10.9574
Min. observed 1.8000 Min. predicted 6.5384
Max. observed 51.4000 Max. predicted 15.3010
Std. Dev. Observed 10.5251 Std. Dev. predicted 2.3117
Median observed 9.9500 Median predicted 11.0780
95th Percentile observed 42.7000 95th Percentile predicted 14.7680
10th Percentile observed 4.6000 10th Percentile predicted 7.9405

Differences (predicted – observed)

Mean difference -2.4977 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment CHOMH2  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)

Segment CHOMH2  Season: July 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 54 pairs of predictions and observed data, the slope is 0.3242 and the intercept is 4.2315. The R-Squared value for this regression is 0.0155.

LOG10 Regressions of Calibration vs. Observations
Using the 54 pairs of predictions and observed data, the slope is 0.3605 and the intercept is 0.4278. The R-Squared value for this regression is 0.0138.

Statistics (units in $\mu$g/l)

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>9.1565</td>
<td>15.1908</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.3000</td>
<td>8.6131</td>
</tr>
<tr>
<td>Max. observed</td>
<td>65.2000</td>
<td>32.0490</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>11.0673</td>
<td>4.2490</td>
</tr>
<tr>
<td>Median observed</td>
<td>5.3500</td>
<td>15.3045</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>34.2000</td>
<td>22.2820</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>1.8000</td>
<td>10.5030</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 6.0344 $\mu$g/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (µg/l)
Segment CHOMH2  Season: March 1 – May 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment CHOMH2  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 132 pairs of predictions and observed data, the slope is 0.2330 and the intercept is 1.1150. The R-Squared value for this regression is 0.0209.

LOG10 Regressions of Calibration vs. Observations

Using the 132 pairs of predictions and observed data, the slope is 0.2128 and the intercept is 0.2990. The R-Squared value for this regression is 0.0143.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>1.3917</td>
<td>1.1874</td>
</tr>
<tr>
<td>Min. observed</td>
<td>0.3714</td>
<td>0.7541</td>
</tr>
<tr>
<td>Max. observed</td>
<td>2.6000</td>
<td>3.4392</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>0.4623</td>
<td>0.2868</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.3000</td>
<td>1.1322</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>2.1667</td>
<td>1.4178</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.8667</td>
<td>0.9662</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.2042 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment CHOMH2  Season: April 1 – Oct 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Ke (1/m)

Segment CHOMH2  Season: April 1 – Oct 30

(Scatter Plot)
Chesapeake Bay Standard Segment TANMH

Location Map of Segment TANMH within the Chesapeake Bay Model Grid

Chesapeake Bay Program
Regression of Calibration vs. Observations

Using the 2113 pairs of predictions and observed data, the slope is 0.6649 and the intercept is 3.3832. The R-Squared value for this regression is 0.6061.

LOG10 Regressions of Calibration vs. Observations

Using the 2113 pairs of predictions and observed data, the slope is 0.4856 and the intercept is 0.5172. The R-Squared value for this regression is 0.4698.

Statistics (units in mg/l)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>8.1292</td>
</tr>
<tr>
<td>Min.</td>
<td>1.4</td>
</tr>
<tr>
<td>Max.</td>
<td>13.4</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>2.1926</td>
</tr>
<tr>
<td>Median</td>
<td>7.8750</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.3000</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>5.7000</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference -0.9913 mg/l

Violations of Standards

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 2113
Number of Predicted Violations 31
Number of Observed Violations 8
Open Water Dissolved Oxygen (mg/l)

Segment TANMH  Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

![Graph showing cumulative frequency distribution of Dissolved Oxygen (mg/l) for Segment TANMH during the Jan 1 – Dec 31 season. The graph includes a cumulative distribution chart with simulated and observed data points.](image-url)
Open Water Dissolved Oxygen (mg/l)
Segment TANMH Season: Jan 1 – Dec 31

(Scatter Plot)
MESOHALINE Chlorophyll
Segment TANMH (Tangier Sound Mesohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 105 pairs of predictions and observed data, the slope is 0.1583 and the intercept is 7.7422. The R-Squared value for this regression is 0.0102.

LOG10 Regressions of Calibration vs. Observations
Using the 105 pairs of predictions and observed data, the slope is 0.2568 and the intercept is 0.6982. The R-Squared value for this regression is 0.0341.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
<th>Mean predicted</th>
<th>Min. predicted</th>
<th>Max. predicted</th>
<th>Std. Dev. predicted</th>
<th>Median predicted</th>
<th>95th Percentile predicted</th>
<th>10th Percentile predicted</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference 2.6477 µg/l

---

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment TANMH  Season: July 1 – Sept 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment TANMH Season: July 1 – Sept 30
(Scatter Plot)
MESOHALINE Chlorophyll
Segment TANMH (Tangier Sound Mesohaline)
March 1 - May 30

Regression of Calibration vs. Observations
Using the 101 pairs of predictions and observed data, the slope is 0.5857 and the intercept is 1.4597. The R-Squared value for this regression is 0.1117.

LOG10 Regressions of Calibration vs. Observations
Using the 101 pairs of predictions and observed data, the slope is 0.8859 and the intercept is -0.1268. The R-Squared value for this regression is 0.1411.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Mean predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11.1587</td>
<td>16.5602</td>
</tr>
<tr>
<td>Min.</td>
<td>1.1000</td>
<td>5.9206</td>
</tr>
<tr>
<td>Max.</td>
<td>44.0000</td>
<td>31.8140</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>9.7703</td>
<td>5.5756</td>
</tr>
<tr>
<td>Median</td>
<td>8.2000</td>
<td>16.2590</td>
</tr>
<tr>
<td>95th</td>
<td>30.8500</td>
<td>26.5310</td>
</tr>
<tr>
<td>10th</td>
<td>2.5000</td>
<td>9.2321</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 5.4015 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment TANMH  Season: March 1 – May 30

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Chlorophyll Concentration (ug/l)
Segment TANMH  Season: March 1 – May 30
(Scatter Plot)
Regression of Calibration vs. Observations

Using the 248 pairs of predictions and observed data, the slope is 0.4209 and the intercept is 0.5612. The R-Squared value for this regression is 0.2611.

LOG10 Regressions of Calibration vs. Observations

Using the 248 pairs of predictions and observed data, the slope is 0.4411 and the intercept is 0.1610. The R-Squared value for this regression is 0.2472.

Statistics (units in 1/m)

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.1408</td>
</tr>
<tr>
<td>Min.</td>
<td>0.3023</td>
</tr>
<tr>
<td>Max.</td>
<td>3.2500</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.4384</td>
</tr>
<tr>
<td>Median</td>
<td>1.0833</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>1.6250</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.6500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.3770</td>
<td></td>
</tr>
<tr>
<td>Min.</td>
<td>0.5421</td>
<td></td>
</tr>
<tr>
<td>Max.</td>
<td>3.2158</td>
<td></td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.5322</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>1.2857</td>
<td></td>
</tr>
<tr>
<td>90th Percentile</td>
<td>1.9847</td>
<td></td>
</tr>
<tr>
<td>10th Percentile</td>
<td>0.7560</td>
<td></td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 0.2362 1/m

1 observed is dependent, predicted is independent
Chesapeake Bay Standard Segment POCMH

Location Map of Segment POCMH within the Chesapeake Bay Model Grid

EE3.3

EE3.4

Chesapeake Bay Program
OPEN WATER Dissolved Oxygen
Segment POCMH (Pocomoke Mesohaline)
Jan 1 - Dec 31

Regression of Calibration vs. Observations

Using the 682 pairs of predictions and observed data, the **slope** is 0.8944 and the **intercept** is 1.3037. The **R-Squared** value for this regression is 0.6506.

LOG10 Regressions of Calibration vs. Observations

Using the 682 pairs of predictions and observed data, the **slope** is 0.7823 and the **intercept** is 0.2270. The **R-Squared** value for this regression is 0.5888.

**Statistics** (units in mg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 8.5019</th>
<th>Mean predicted 8.0482</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>3.36</td>
<td>Min. predicted 2.66</td>
</tr>
<tr>
<td>Max. observed</td>
<td>15.4</td>
<td>Max. predicted 13.41</td>
</tr>
<tr>
<td>Std. Dev. Obs.</td>
<td>1.9787</td>
<td>Std. Dev. predicted 1.7844</td>
</tr>
<tr>
<td>Median observed</td>
<td>8.2633</td>
<td>Median predicted 7.7710</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>11.3200</td>
<td>90th Percentile predicted 10.4070</td>
</tr>
<tr>
<td>10th Percentile</td>
<td>6.2667</td>
<td>10th Percentile predicted 6.0424</td>
</tr>
</tbody>
</table>

**Differences** (predicted – observed)

Mean difference -0.4537 mg/l

**Violations of Standards**

Water quality criteria violations estimated by assuming an instantaneous minimum DO standard of 3.5 mg/l.

Number of predicted and observed pairs 682
Number of Predicted Violations 4
Number of Observed Violations 1

---

1 observed is dependent, predicted is independent
Open Water Dissolved Oxygen (mg/l)

Segment POCMH Season: Jan 1 – Dec 31

Cumulative Frequency Distribution – PAIRED Simulated and Observed Data
Open Water Dissolved Oxygen (mg/l)
Segment POCMH  Season: Jan 1 – Dec 31

(Scatter Plot)
MESOHALINE Chlorophyll
Segment POCMH (Pocomoke Mesohaline)
July 1 - Sept 30

Regression of Calibration vs. Observations
Using the 109 pairs of predictions and observed data, the slope is -0.0244 and the intercept is 14.4724. The R-Squared value for this regression is 0.0002.

LOG10 Regressions of Calibration vs. Observations
Using the 109 pairs of predictions and observed data, the slope is -0.0129 and the intercept is 1.1407. The R-Squared value for this regression is 0.0002.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th></th>
<th>Mean observed</th>
<th>Min. observed</th>
<th>Max. observed</th>
<th>Std. Dev. Observed</th>
<th>Median observed</th>
<th>95th Percentile observed</th>
<th>10th Percentile observed</th>
</tr>
</thead>
</table>

Differences (predicted – observed)

Mean difference -0.4923 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)
Segment POCMH  Season: July 1 – Sept 30
Cumulative Frequency Distribution – PAIRED Simulated and Observed Data

Graph showing the cumulative frequency distribution of chlorophyll concentration (ug/l) for Segment POCMH from July 1 to Sept 30. The graph includes simulated and observed data, with the x-axis representing the percent of the population and the y-axis showing the concentration in ug/l.
Chlorophyll Concentration (ug/l)
Segment POCMH  Season: July 1 – Sept 30

(Scatter Plot)
Regression of Calibration vs. Observations
Using the 100 pairs of predictions and observed data, the slope is 0.0982 and the intercept is 9.8221. The R-Squared value for this regression is 0.0107.

LOG10 Regressions of Calibration vs. Observations
Using the 100 pairs of predictions and observed data, the slope is 0.2648 and the intercept is 0.6693. The R-Squared value for this regression is 0.0255.

Statistics (units in µg/l)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean observed</td>
<td>12.0453</td>
<td>22.6510</td>
</tr>
<tr>
<td>Min. observed</td>
<td>1.4098</td>
<td>9.0665</td>
</tr>
<tr>
<td>Max. observed</td>
<td>51.6000</td>
<td>57.5750</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>9.2718</td>
<td>9.7726</td>
</tr>
<tr>
<td>Median observed</td>
<td>9.2836</td>
<td>21.3615</td>
</tr>
<tr>
<td>95th Percentile observed</td>
<td>26.4413</td>
<td>95th Percentile predicted 43.4465</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>3.2250</td>
<td>10th Percentile predicted 12.2460</td>
</tr>
</tbody>
</table>

Differences (predicted – observed)

Mean difference 10.6057 µg/l

1 observed is dependent, predicted is independent
Chlorophyll Concentration (ug/l)

Segment POCMH  Season: March 1 – May 30
(Scatter Plot)
**Regression of Calibration vs. Observations**

Using the 254 pairs of predictions and observed data, the **slope** is 0.5858 and the **intercept** is 0.6731. The **R-Squared** value for this regression is 0.0525.

**LOG10 Regressions of Calibration vs. Observations**

Using the 254 pairs of predictions and observed data, the **slope** is 0.3712 and the **intercept** is 0.2470. The **R-Squared** value for this regression is 0.0441.

**Statistics (units in 1/m)**

<table>
<thead>
<tr>
<th></th>
<th>Mean observed 1.7086</th>
<th>Mean predicted 1.7674</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. observed</td>
<td>0.4194</td>
<td>Min. predicted 0.8797</td>
</tr>
<tr>
<td>Max. observed</td>
<td>13.0000</td>
<td>Max. predicted 3.9911</td>
</tr>
<tr>
<td>Std. Dev. Observed</td>
<td>1.2595</td>
<td>Std. Dev. predicted 0.4928</td>
</tr>
<tr>
<td>Median observed</td>
<td>1.6250</td>
<td>Median predicted 1.6965</td>
</tr>
<tr>
<td>90th Percentile observed</td>
<td>2.6000</td>
<td>90th Percentile predicted 2.3766</td>
</tr>
<tr>
<td>10th Percentile observed</td>
<td>0.8125</td>
<td>10th Percentile predicted 1.2345</td>
</tr>
</tbody>
</table>

**Differences (predicted – observed)**

Mean difference 0.0589 1/m

---

1 observed is dependent, predicted is independent
Ke (1/m)

Segment POCMH  Season: April 1 – Oct 30
(Scatter Plot)