

MD DNR Vertical Water Quality Profiler Project 2022 - Fishing Bay

Metadata also available as - [[Parseable text](#)] - [[XML](#)]

Metadata:

- [Identification Information](#)
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- [Spatial Data Organization Information](#)
- [Spatial Reference Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

Identification Information:

Citation:

Citation Information:

Originator:

Maryland Department of Natural Resources, Resource Assessment Service (MD DNR RAS)

Publication Date: 20230202

Title:

MD DNR Vertical Water Quality Profiler Project 2022 - Fishing Bay

Geospatial Data Presentation Form: Spatial dataset

Description:

Abstract:

Water quality was monitored at a site in Fishing Bay, a tidal embayment on Maryland's lower eastern shore of the Chesapeake Bay. A vertical profiling system (YSI 6951), equipped with a YSI (6600V2) data sonde, was used to sample seven environmental parameters: water temperature, specific conductance, dissolved oxygen concentration, oxygen percent saturation, pH, turbidity, and fluorescence. Salinity and chlorophyll were derived from specific conductance and fluorescence, respectively. Depth below the water surface was also recorded with each set of sonde readings. Profiles were conducted hourly, with measurements recorded at approximate 0.5-1.0 meter depth intervals throughout the entire water column. Total depth at this station measured between 3.5-5.0 meters.

Purpose:

The 2022 MD DNR Vertical Water Quality Profiler Project characterized the vertical and temporal variability of water quality at a single site (station XCH8085) in Fishing Bay. Data from the project will be used to support a pilot assessment of the full range of dissolved oxygen criteria for a Chesapeake Bay water quality segment.

During the 2022 monitoring season, the MD DNR Shallow Water Monitoring Program deployed two additional continuous monitors at locations upstream and downstream of the vertical profiler. The additional monitors were positioned at a fixed depth 0.3 meters above the bay bottom and collected readings every 15 minutes. The upstream site was identified by station name XDH2399. The downstream site was initially named XCH5196, and then renamed XCH6891 after the station was relocated in November 2022. Together, data from these additional monitors and the vertical profiler help to characterize the temporal and spatial variability of water quality within Fishing Bay.

Supplemental Information:

Prior to performing each hourly profile, the profiler data sonde collected water quality readings while resting in a parked position at 1.0 meter depth. The hourly 1.0m depth readings from the profiler sonde are reported as part of the MD DNR Continuous Water Quality Monitoring Project for 2022. The data collected at the upstream and downstream continuous monitoring sites in Fishing Bay are also included in

the MD DNR Continuous Water Quality Monitoring Project. Citation information for the 2022 MD DNR Continuous Water Quality Monitoring Project is provided in the Cross Reference portion of this metadata record.

Site visits were conducted following the protocols of the MD DNR Shallow Water Monitoring Program. Detailed descriptions of the field procedures can be found in the following documentation:

1) "MDDNR Continuous Water Quality Monitoring Project Metadata" for 2022 can be found using publication type 'Metadata' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website <<https://eyesonthebay.dnr.maryland.gov/eyesonthebay/stories.cfm>>

2) "Quality Assurance Project Plan for the Maryland Department of Natural Resources, Chesapeake Bay Shallow Water Quality Monitoring Program, for the period July 1, 2022 - June 30, 2023", can be found using publication type 'Quality Assurance Project Plan' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website <https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/SWM_QAPP_2022_2023_Draft_v7.pdf>

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20220425

Ending_Date: 20230102

Currentness_Reference: Ground condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.025500

East_Bounding_Coordinate: -76.025500

North_Bounding_Coordinate: 38.299667

South_Bounding_Coordinate: 38.299667

Keywords:

Theme:

Theme_Keyword_Thesaurus:

Global Change Master Directory (GCMD). 2022. GCMD Keywords, Version 15.2, Greenbelt, MD: Earth Science Data and Information System, Earth Science Projects Division, Goddard Space Flight Center (GSFC), National Aeronautics and Space Administration (NASA). [URL (GCMD Keyword Forum Page): <<https://forum.earthdata.nasa.gov/app.php/tag/GCMD+Keywords>>]

Theme_Keyword:

Earth Science > Biosphere > Ecosystems > Marine Ecosystems > Estuary

Theme_Keyword:

Earth Science > Biosphere > Ecological Dynamics > Ecosystem Functions > Primary Production

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Surface Water > Surface Water Chemistry

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Surface Water > Surface Water Processes/Measurements > Water Depth

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > Chlorophyll Concentrations

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > Conductivity

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Gases > Dissolved Oxygen

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > pH

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > Turbidity

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > Water Temperature

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > Saline Concentration

Theme_Keyword:

Earth Science > Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Characteristics > Eutrophication

Place:

Place_Keyword_Thesaurus: Producer Defined

Place_Keyword: United States of America

Place_Keyword: United States

Place_Keyword: Maryland

Place_Keyword: Chesapeake Bay

Place_Keyword: Fishing Bay

Place_Keyword: Dorchester County

Place_Keyword: USA

Place_Keyword: MD

Temporal:

Temporal_Keyword_Thesaurus: Producer Defined

Temporal_Keyword: 2022

Temporal_Keyword: 2023

Access_Constraints: None

Use_Constraints:

Acknowledgement of the MD Department of Natural Resources, Resource Assessment Service as a data source would be appreciated in products developed from these data.

Point_of_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Mark Trice

Contact_Organization:

Maryland Department of Natural Resources, Resource Assessment Service

Contact_Position: Program Chief, Water Quality Informatics

Contact_Address:

Address_Type: Mailing and physical address

Address: Tawes State Office Building, 580 Taylor Avenue, D-2

City: Annapolis

State_or_Province: MD

Postal_Code: 21401

Contact_Voice_Telephone: 410 260-8630

Contact_Electronic_Mail_Address:

mark.trice_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Browse_Graphic:

Browse_Graphic_File_Name:

MD DNR Continuous Monitoring Project 2022 Station Map can be found using publication type 'map' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website
<https://eyesonthebay.dnr.maryland.gov/contmon/stn_map/Cmon_stns_2022.jpg>

Browse_Graphic_File_Description:

Map title: "Maryland Department of Natural Resources Shallow Water Monitoring: Continuous Monitoring Stations 2022". The vertical profiler is listed as "PRO: Fishing Bay - Profiler" (Station XCH8085).

Browse_Graphic_File_Type: JPG

Data_Set_Credit:

Maryland Department of Natural Resources, Resource Assessment Service staff maintained the profiler and the data sondes, and processed the data. The project was made possible with funding provided by The State of Maryland and the National Oceanic and Atmospheric Administration Chesapeake Bay Program Office.

Cross_Reference:

Citation_Information:

Originator:

Maryland Department of Natural Resources, Resource Assessment Service

Publication_Date: 20230302

Title: MD DNR Continuous Water Quality Monitoring Project 2022

Geospatial_Data_Presentation_Form: Spatial dataset

Online_Linkage:

MD DNR Continuous Water Quality Monitoring Project data for 2022, including the hourly records collected at the Fishing Bay vertical profiler and the data collected at the upstream and downstream continuous monitoring stations in Fishing Bay, are available through the Continuous Monitoring Data page of the Eyes on the Bay website
<<https://eyesonthebay.dnr.maryland.gov/contmon/ContinuousMonitoring.cfm>>. Access sonde data by following website instructions.

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

MD DNR followed specific procedures to ensure that the Vertical Water Quality Profiler Project design was properly implemented and managed with sufficient accuracy, precision, and detection limits. Accuracy (closeness to the true value) of collected data was controlled and assured by the proper use, calibration and maintenance of field equipment for the measurement of physical and chemical parameters.

The vertical profiler system consisted of a YSI 6951 pontoon platform fitted with a YSI 6960 Controller Assembly and a YSI 6955 Winch Assembly. A YSI 6600V2-4 monitoring sonde was suspended from the vertical profiler to measure water quality.

The YSI 6600V2-4 sonde was configured with the following probes: 6560(conductivity/temperature); 6561(bulb pH) or 6579(tall pH) or 5091(flat pH); 6136(turbidity); 6150ROX (dissolved oxygen); 6025(fluorescence/chlorophyll). Resolution, range and accuracy specifications for the sonde and probes may be obtained from the manufacturer. [<<https://www.yisi.com/products/multi-parameter-sondes>>]

Procedures used to control and assure the accuracy of field measurements consisted of equipment maintenance, calibration of field instruments, and verification of calibrations. In Fishing Bay, challenging environmental conditions (e.g. strong tidal currents) and mechanical failures resulted in the following equipment adjustments and/or repairs: rewiring the sonde cable connections (May 23), increasing the weight of the sonde by adding weight to the sonde probe guard (July 7, August 18), replacing the winch/reel assembly (June 8, November 3), installing a new sonde cable (November 3), installing a new battery (July 27, November 3, November 21), pumping water out of a partially flooded pontoon (November 21), and installing a new solar panel (November 21).

Details of how data acquired with YSI sondes were quality assured and quality controlled may be found in the process description elements in the Lineage portion of this metadata record.

Logical_Consistency_Report:

The Fishing Bay vertical profiler was set to conduct profiles every hour beginning at the top of the hour. Profiles were conducted in a "bottom up" manner, with the first reading for each profile taken approximately 1 meter above the bay bottom. As the instrument rose through the water column, additional readings were taken at 0.5m-1.0m increments. The profiler moved to a new depth about every 2 minutes and a complete profile took approximately 8 minutes to complete.

At initial deployment on April 25, the vertical profiler experienced mechanical problems and was unable to conduct profiles. As a result, the sonde was deployed at a fixed depth approximately 1 foot off the bay bottom and programmed to collect readings every 15 minutes. On May 11, the data sonde was replaced and normal profile operation and data collection began.

The vertical profiler in Fishing Bay was initially programmed to collect readings at 4.0m, 3.0m, 2.0m, 1.0m, and 0.5m. Early site visits determined that the total water depth at the monitoring site was often 4.5m or less. For this reason, on June 8 the instrument was reprogrammed to collect the bottom reading at 3.5m depth. Collection of other profile readings remained at 3.0m, 2.0m, 1.0m, and 0.5m depth.

Although the vertical profiler is programmed to collect profile readings at specific water depths, the actual depths for data collection can vary slightly due to wave action and water currents displacing the sonde in the water column. This was especially true in Fishing Bay, where strong tidal currents made it difficult for the instrument to reach and maintain the programmed depths. To counteract the effects of water currents on the sonde position, a probe guard with a 4 pound weight attached was added to the sonde on July 7. The additional weight, however, caused battery power to drain more quickly, so the 4 pound weight was replaced with a smaller weight on August 18. With the added weight, the depths at which readings were taken were generally within +/- 0.5m of the programmed depth.

During the routine site visit on October 7, the sonde was not exchanged due to connectivity issues with the replacement sonde.

On November 17, the 3.5m reading was dropped from the profile sequence because of the instrument's continued difficulty reaching depth in the strong currents. Also on November 17, the depth stabilization time was changed from 60sec to 10sec. Changing the stabilization time allowed the sonde to stabilize, collect a reading, and move to a new depth more quickly, thus preserving battery power.

Reducing the profile sequence to four readings and shortening the depth stabilization time allowed complete profiles to be conducted in less time. After November 17, a full profile sequence was completed in approximately 4mins. Due to the speed at which the instrument was operating, sequential depths in the profile were often sampled within one minute of each other, resulting in the same timestamp being assigned to readings at different depths.

In addition to conducting profiles, the vertical profiler recorded hourly readings at 5 minutes before each hour while the sonde was resting in a parked position. Often, if mechanical issues prevented the instrument from performing profiles, hourly data collection at the parked depth continued, thus creating a more complete data record. Initially, the parked position was set at a depth of 1.0m. On November 17, the parked position was changed to a depth of 3m to better monitor water quality conditions in deeper waters.

On December 25, the vertical profiler was moved off-site without the consent of DNR. Unauthorized person(s) relocated the profiler platform approximately 1.3 nautical miles southeast of the original site (new coordinates: 38.287067, -76.003267). All data collected after December 25 are considered invalid.

Completeness_Report:

At first deployment on April 25, 2022, the vertical profiler was unable to conduct profiles due to mechanical issues. As an alternative setup, the sonde was fixed at a depth approximately 1ft from the bay bottom and configured to collect readings every 15 minutes. Additionally, the sonde was initially calibrated for dissolved oxygen, specific conductance, and temperature only. The instrument operated in this manner -- collecting limited parameters at a fixed depth -- until May 1, when an electrical short caused the profiler to stop logging any data. On May 11, the sonde was replaced and regular profile and hourly data collection began.

Overall, data collection by the vertical profiler was inconsistent throughout the 2022 monitoring season. Strong tidal currents at the monitoring site made it difficult for the instrument to stabilize at the depths set for data collection. The strong currents also contributed to operating issues such as tangling of the sonde cable and

excessive draining of battery power. The persistent mechanical issues and difficult operating conditions resulted in sporadic operation of the profiler throughout the season, with numerous gaps in the data record as a result. Significant data gaps (greater than 1 day) are detailed in the following paragraphs.

May 15-23 and October 15-20: No profiles were conducted and hourly readings were recorded at a depth of approximately 4m. It is presumed that the sonde was either very near or resting directly on the bay bottom during these times, likely due to the sonde striking the bay bottom during a profile sequence. If the sonde hits bottom (as can happen during extreme low tides or windy conditions), the instrument will switch to "standby" mode and stop conducting profiles. In both instances, normal profile operation resumed following a maintenance visit to the site.

May 25 - June 8: A tangled sonde cable likely caused the vertical profiler to stop conducting profiles. No profile or hourly data were collected during this time.

August 1-18: Data collection (profile and hourly) ceased due to an electronic malfunction within the sonde.

October - November: Sporadic operation of the vertical profiler worsened, and numerous data gaps greater than 1 day occurred during this period. It is suspected that bad weather and decreasing daylight in the autumn months prevented the battery from fully recharging, thus interfering with instrument operation.

Profile data collection ended on December 13. During routine maintenance on December 13, a coupling on the winch reel broke, disabling the instrument for vertical profile operation. Instead, the sonde was set at a fixed depth of 3m and hourly data collection continued at the 3m depth.

Hourly data collection ceased on January 2, 2023. In late December, the profiler platform was moved off-site without the consent of DNR. On January 2, 2023, DNR personnel located the instrument approximately 1.3NM SE of the original site and retrieved the sonde from the instrument. A replacement sonde was not deployed.

On January 5, 2023, the vertical profiler platform was removed from the water to prevent damage from winter ice and to perform annual cleaning and maintenance.

Additional profiles may appear in the data record on dates when DNR field biologists exchanged sondes at the profiler site. During field visits, biologists often triggered a profile to be performed in order to test that the instrument was operating properly. Additional profiles may also appear in the data record when profiles were triggered remotely during troubleshooting exercises.

All other sonde attribute values that are missing from the dataset were censored during the data quality control process. Analysts examined the data and masked values that were determined to be unreliable.

Lineage:

Process Step:

Process Description:

SONDE CALIBRATION and POST-CALIBRATION: The Yellow Springs Instrument (YSI) 6600V2-4 data sondes were maintained and calibrated before and after each deployment in accordance with YSI recommendations: [<https://www.ysi.com/>]. Ecowatch™ software (a YSI product) was used to calibrate the instruments.

FIELD MEASUREMENTS: The vertical profiling system consisted of the YSI 6951 pontoon platform fitted with the YSI 6960 Controller assembly and the YSI 6955 Winch assembly. A YSI 6600V2-4 data sonde was suspended from the profiler system to monitor water quality. The monitoring sonde at the profiler site recorded seven water quality parameters at the following depths: 4.0m, 3.0m, 2.0m, 1.0m, and 0.5m. Profiles were conducted every hour, with new depth and parameter readings recorded approximately every 2 minutes. Along with depth, the seven water quality parameters measured were: water temperature, specific conductance (used to calculate salinity), dissolved oxygen concentration, oxygen percent saturation, turbidity (NTU), fluorescence (used to estimate chlorophyll), and pH. For modifications to the vertical profiler setup and operation, please refer to the Logical Consistency Report section of this metadata record.

The YSI 6600V2-4 sonde was configured with the following probes: 6560(conductivity/temperature); 6561(bulb pH) or 6579(tall pH) or 5091(flat pH); 6136(turbidity); 6150ROX(dissolved oxygen);

6025(fluorescence/chlorophyll). The sonde logged data onto a Campbell Scientific CR1000 datalogger, and the data were stored on the CR1000 until retrieval. The station was equipped with a cellular telemetry unit, which allowed data to be accessed remotely and transmitted to a server computer at DNR. Data were retrieved every hour and made available publicly on DNR's web site [<http://www.eyesonthebay.net>].

SONDE DATA CHECKS: The monitoring sonde was retrieved, calibrated, and replaced regularly throughout the monitoring season. For logistical reasons, sonde replacement for the vertical profiler coincided with service visits to the upstream and downstream continuous monitoring sites in Fishing Bay. At each deployment, sondes were replaced with clean, recalibrated units. Dates of sonde replacement in 2022 were: April 25 (initial deployment), May 11, June 14, July 7, July 27, August 18, September 7, September 21, October 6, October 20, November 3, November 21, and December 13. The sonde was removed and not replaced on January 2, 2023. The entire vertical profiler platform was removed from the water on January 5, 2023 to prevent damage from icing and to perform equipment maintenance prior to the next monitoring season.

In the field, before an instrument was replaced, field biologists allowed both the new (freshly calibrated) sonde and the old (deployed) sonde to log simultaneous readings side by side at the same depth. In addition, data were recorded from a discrete instrument - usually a HydroLab sonde. This three-way comparison assured that the "new" and "old" sondes were both reading each parameter within a certain tolerance. The HydroLab reading was used as a "double-check", and since it was a discrete reading, it allowed biologists to watch the display and note whether the parameters were fluctuating or stable.

Data were evaluated using both three-way in-situ comparison results and data from sonde calibrations. The comparison tolerances were as follows for both pre- and post-calibration and in-situ comparisons: Temperature (degrees C) +/- 0.2; Specific Conductance (uS/cm) +/- 5%; Dissolved Oxygen (mg/l) +/- 0.5 mg/l; pH +/- 0.2; Turbidity (NTU) +/- 5% or 5.0 NTU (whichever is greater); Chlorophyll (ug/l)+/- 5% or 5.0 ug/l (whichever is greater). Excessive drift between pre- and post- calibration values of sonde probes, variance from in-situ measurements or probe failures caused data to be flagged. When post-calibration drift exceeded the limits stated above in both the post-calibration and the in-situ comparables, the questionable data were masked within the data set with an error code.

Process_Date: Unknown

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Kristen Heyer

Contact_Organization:

Maryland Department of Natural Resources, Resource Assessment Service

Contact_Position: Program Manager, Monitoring Field Office

Contact_Address:

Address_Type: mailing and physical address

Address: 1919 Lincoln Drive

City: Annapolis

State_or_Province: Maryland

Postal_Code: 21401

Country: USA

Contact_Voice_Telephone: 410 263-3369

Contact_Electronic_Mail_Address:

Kristen.Heyer_nospam_@maryland.gov[Remove_nospam_for valid email address]

Process_Step:

Process_Description:

DATA REVIEW: Data downloaded from the sonde were subjected to quality assurance/quality control checks to ensure that values outside the range of possibility were identified in the published dataset. Loggernet™ software (a Campbell Scientific product [<https://www.campbellsci.com/>]) was used to download the data collected by the profiler. Using SAS statistical software, the "raw" .txt file of sonde data was queried to select dates that corresponded with each sonde deployment. Also, data columns

were rearranged to achieve a format expected by an Excel® macro used for post-processing. The resulting data file was saved as a .csv file.

Each .csv file of sonde data was then post-processed using the aforementioned Excel® macro. The file was opened and renamed. Rows of data acquired before and after deployment were deleted. Records (if any) were also deleted if instrument error codes indicated invalid data. The macro rearranged columns and inserted error-tracking columns and headings. Macro statements flagged negative values, missing values and highlighted values outside each parameter's normal range. The macro also returned a report summarizing range exceedances. Event and instrument information was appended to each record.

Flagged values were evaluated. Common anomalies included spikes in fluorescence and turbidity, dips in specific conductance, and high dissolved oxygen readings. Instrument post-calibration results, in-situ comparisons with HydroLab readings, and survey crew remarks were used to determine whether sensor values were acceptable.

In cases where data were determined to be unreliable, the reason(s) were documented with error codes and comments. Unreliable data were masked. No data were discarded. Only data considered reliable were published in reports.

MD DNR scientists reviewed profiler monitoring data weekly. If a problem was identified, a field biologist was dispatched to address the issue as soon as possible.

VERIFICATION AND DATA MANAGEMENT: At the end of the monitoring season, DNR data analysts and field biologists conducted additional data QA/QC procedures. All of the data were plotted and outliers and anomalous values were thoroughly researched. Staff compared unusual values to values from nearby sites in the Bay. Weather events were considered, event logs were reviewed and field staff were consulted regarding possible legitimate causes for the values. In cases where values were not considered legitimate, error codes were assigned. All data were retained in the archive data set. After field staff and the Quality Assurance Officer reviewed error flags, the values were masked within the published dataset.

Process_Date: Unknown

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Mark Trice

Contact_Organization:

Maryland Department of Natural Resources, Resource Assessment Service

Contact_Position: Program Chief, Water Quality Informatics

Contact_Address:

Address_Type: mailing and physical address

Address: Tawes State Office Building, 580 Taylor Avenue, D2

City: Annapolis

State_or_Province: Maryland

Postal_Code: 21401

Country: USA

Contact_Voice_Telephone: 410 260-8630

Contact_Electronic_Mail_Address:

mark.trice_nospam_@maryland.gov[Remove_nospam_for valid email address]

Spatial_Data_Organization_Information:

Indirect_Spatial_Reference: Chesapeake Bay, Maryland, USA

Direct_Spatial_Reference_Method: Point

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Geographic:

Latitude_Resolution: 0.0001
Longitude_Resolution: 0.0001
Geographic_Coordinate_Units: Decimal degrees

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio: 298.257

Vertical_Coordinate_System_Definition:

Depth_System_Definition:

Depth_Datum_Name: No correction
Depth_Resolution: 0.001
Depth_Distance_Units: meters
Depth_Encoding_Method: Attribute values

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

This metadata record is a description of a vertical profiler water quality monitoring project in Fishing Bay, a tidal embayment on the eastern shore of the Chesapeake Bay. Water quality data were collected at 0.5-1.0 meter depth intervals at a single station (XCH8085) during 2022.

The data are comprised of the attributes: *SAMPLE_DATE*: date (month/day/year) *SAMPLE_TIME*: Eastern Standard Time, 24 hour format (hour:minutes) *STATION*: station name (text) *SONDE*: sonde identifier (text) *TOTAL_DEPTH*: depth below water surface (meters) *BATT*: battery charge (Volts) *WTEMP*: water temperature (degrees Celsius) *SPCOND*: specific conductance (micro Siemens per centimeter) *SALINITY*: salinity (parts per thousand) *DO_SAT*: dissolved oxygen percent saturation (percent) *DO*: dissolved oxygen (milligrams per liter) *PH*: pH (pH units) *TURB_NTU*: turbidity (Nephelometric Turbidity Units) *FLUOR*: fluorescence (Relative Fluorescence Units) *TCHL_PRE_CAL*: chlorophyll (micrograms per liter) *CHLA*: No data - all data values blank *COMMENTS*: comments (text)

Entity_and_Attribute_Detail_Citation:

The Vertical Water Quality Profiler Project was conducted in a manner consistent with the procedures established for the MD DNR Shallow Water Monitoring Program. Data users who desire very detailed information about data definition, sampling procedures, and data processing are encouraged to refer to the document listed below.

"Quality Assurance Project Plan for the Maryland Department of Natural Resources, Chesapeake Bay Shallow Water Quality Monitoring Program, for the period July 1, 2022 - June 30, 2023", can be found using publication type 'Quality Assurance Project Plan' to search the 'Monitoring News and Reports' page of the Eyes on the Bay website
<https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/SWM_QAPP_2022_2023_Draft_v7.pdf>.

Distribution_Information:

Distributor:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Mark Trice

Contact_Organization:

Maryland Department of Natural Resources, Resource Assessment Service

Contact_Position: Program Chief, Water Quality Informatics

Contact_Address:

Address_Type: mailing and physical address

Address: Tawes State Office Building, 580 Taylor Avenue, D-2

City: Annapolis

State_or_Province: Maryland

Postal_Code: 21401

Country: USA

Contact_Voice_Telephone: 410 260-8630

Contact_Electronic_Mail_Address:

mark.trice_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Resource_Description: Downloadable data

Distribution_Liability:

None of the Maryland Department of Natural Resources (MD DNR) partners or any of their employees, contractors, or subcontractors makes any warranty, expressed or implied, nor assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or data contained within the web site. Reference to any specific commercial products, processes, or services or the use of any trade, firm, or corporation name is for the information and convenience of the public and does not constitute endorsement, recommendation or favoring by MD DNR partners.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: ASCII file, formatted for text attributes, declared format

Format_Information_Content: Vertical profiler monitoring sonde data

File-Decompression_Technique: No compression applied

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name:

[<<https://eyesonthebay.dnr.maryland.gov/contmon/VerticalProfilerData.cfm>>]

Access_Instructions:

Vertical profiler data (sonde data) are available through the vertical profiler data download page of the MD DNR "Eyes on the Bay" website. Access sonde data through the link provided under "Network Resource Name" in this metadata record. A file containing one week of data is approximately 150 kb in size with download times dependent upon computer connection speed.

The complete record of vertical profiler data for 2022, including masked data values, error codes, and comments, can also be obtained from the MD DNR Resource Assessment Service. Contact information is provided in the "Distributor" portion of this metadata record.

Fees: None

Metadata_Reference_Information:

Metadata_Date: 20230302

Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Diana Domotor

Contact_Organization:

Maryland Department of Natural Resources, Resource Assessment Service

Contact_Address:

Address_Type: mailing and physical address

Address: Tawes State Office Building, 580 Taylor Avenue, D2

City: Annapolis

State_or_Province: Maryland

Postal_Code: 21401

Country: USA

Contact_Voice_Telephone: (410) 260-8630

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diana.domotor_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Metadata_Standard_Name: Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Generated by [mp](#) version 2.9.52 on Thu Mar 2 21:25:39 2023