Virginia Chesapeake Bay Water Quality Monitoring Program: Phytoplankton and Picoplankton Component

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Harold Marshall
Originator: Old Dominion University
Publication_Date: 20000101
Title:
Virginia Chesapeake Bay Water Quality Monitoring Program: Phytoplankton and Picoplankton Component
Edition: Unknown
Geospatial_Data_Presentation_Form: database
Publication_Information:
Publication_Place: Annapolis, Maryland United States
Publisher: US EPA Chesapeake Bay Program
Other_Citation_Details:
Unknown
Online_Linkage: www.chesapeakebay.net
Larger_Work_Citation:
Citation_Information:
Originator: Jacqueline Johnson
Publication_Date: 20080301
Title:
Chesapeake Bay Program Plankton Database
Edition: Version 3.0
Geospatial_Data_Presentation_Form: database
Publication_Information:
Publication_Place: Annapolis, MD
Publisher: US EPA Chesapeake Bay Program
Other_Citation_Details:
None
Online_Linkage: www.chesapeakebay.net

Description:

Abstract:

Phytoplankton and Picoplankton taxon distributions were obtained from replicate surface and lower water column composite samples at 15 station, sampled monthly from January- December in Virginia. Stations were located to characterize phytoplankton composition and abundance in the lower bay, Bay mouth system, Virginia tributaries and southern branch of the Elizabeth River. Sampling of tributary stations did not begin until January 1986. Sampling in the Elizabeth river did not begin until January of 1989. Sampling at station SBE2 in the Elizabeth River was discontinued in January 1998.

Purpose:

The Commonwealth of Virginia, in cooperation with the US EPA Chesapeake Bay Program, has monitored plankton species abundance and composition in the Virginia Chesapeake Bay mainstem and tributaries since 1985. The current program is designed to give comprehensive spatial and temporal information on phytoplankton. Sampling is performed in conjunction with the Virginia zooplankton and water quality monitoring programs.

Supplemental_Information:

STATION NAMES AND DESCRIPTIONS
CB6.1-Main Channel, Mid-Bay
CB6.4-Main Channel, Mid-Bay
CB7.3E-Eastern Shore Channel, Southern End
CB7.4-Baltimore Channel, Bay Mouth
LE3.6-Off Mouth of Rappahannock River
WE4.2-Off Mouth of York River
LE5.5-Off Mouth of James River
SBE2 -South Branch Elizabeth River
SBE5-South Branch Elizabeth River, Off VEPCO
TF3.3-Rappahannock River, Buoy N40
RET3.1-Rappahannock River, N Buoy R10
TF4.2-Pamunkey River, Off White House
RET4.3-York River, Buoy C57
TF5.5- James River, Red Buoy 107
RET5.2-James River, Off Swann's Point

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19850101
Ending_Date: 20071231

Currentness_Reference:

ground condition

Status:

Progress: Complete
Maintenance_and_Update_Frequency: Biannually

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -77.2936
East_Bounding_Coordinate: -75.9222
North_Bounding_Coordinate: 37.9947
South_Bounding_Coordinate: 36.7697

Keywords:

Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Phytoplankton
Theme_Keyword: Water Quality
Theme_Keyword: Water
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Elizabeth River
Place_Keyword: James River
Place_Keyword: Virginia
Place_Keyword: Chesapeake Bay
Place_Keyword: York River
Place_Keyword: Rappahannock River
Stratum:
Stratum_Keyword_Thesaurus: None
Stratum_Keyword: Water Column
Temporal:
Temporal_Keyword_Thesaurus: None
Temporal_Keyword: Monthly
Temporal_Keyword: Bimonthly
Access_Constraints: None
Use_Constraints:
Dataset credit required
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data Manager
Contact_Address:
Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
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State_or_Province: Maryland
Postal_Code: 21403
Country: USA
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Contact_Voice_Telephone: 410-267-5729
Contact_Facsimile_Telephone: 410-267-5777
Contact_Electronic_Mail_Address: jjohnson@chesapeakebay.net
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact Instructions:
unavailable
Data_Set_Credit:
US EPA Chesapeake Bay Program, Virginia Department of Environmental Quality, Data Originators at Old Dominion University
Security_Information:
Security_Classification_System: None
Security_Classification: None
Security_Handling_Description: None

Native_Data_Set_Environment:
Relational Database
Cross_Reference:
Citation_Information:
Originator: Jacqueline Johnson
Publication_Date: 20000101
Publication_Time: Unknown
Title:
2000 Users' Guide to Chesapeake Bay Program Biological and Living Resources Data
Edition: Version 1
Publication_Information:
Publication_Place: Annapolis, MD
Publisher: USEPA CHESAPEAKE BAY PROGRAM OFFICE
Other_Citation_Details:
Unknown
Online_Linkage: ftp.chesapeakebay.net/pub/living_resources/guide2000.pdf

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Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
The principal investigator and laboratory chief for quality assurance routinely check taxon identifications, raw data sheets and other stages of the collection and analysis procedures. In-lab verifications of identification and cell counts are conducted by the re-examination of 5% of the sample concentrates, and with annual comparisons made in split sample analysis involving the Morgan State Phytoplankton Laboratory. Cell counts and identifications comparisons will also be conducted on in-lab QA/QC results coming from checking and comparing results between taxonomist from 5% of samples counted each cruise.
Logical_Consistency_Report:
Not Applicable
Completeness_Report:
DATA ENTRY METHOD: Phytoplankton and picoplankton counts are entered using a program written in BASIC. ASCII format files are then converted into SAS datasets and used for statistical analyses . ASCII format data sets for submittal are exported from the SAS datasets.

DATA VERIFICATION: Double-entry with comparison of two files in SAS. Re-entry until both copies match exactly.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
Station positions (latitudes and longitudes) in data set are approximations of actual positions in the field. Station latitudes and longitudes are input into a Loran-C or GPS receiver and sampling begins when boat reaches preprogrammed coordinates. Loran-C is accurate to +/- 1500 ft. The actual Loran/ GPS coordinates for each sampling event are not currently recorded in data set.

Vertical_Positional_Accuracy:
Quantitative_Vertical_Positional_Accuracy_Assessment:
Vertical_Positional_Accuracy_Value: P_Depth
Vertical_Positional_Accuracy_Explanation:
Determination of upper and lower water column: A pycnocline is established by recording Water
column conductivity immediately before plankton sampling. P_DEPTH is set at 0.5 meters above the
Pycnocline and is used at the cutoff depth between upper and lower water column composite samples. If a station has no pycnocline the water column is divided in to thirds by total depth and the top third of the water column is treated as the upper water column. The pycnocline is determined as follows:

((Bottom Conductivity-Surface Conductivity)/ Bottom Depth)*2= Threshold

if Threshold is less than 500, then the station has no pycnocline if Threshold is greater than 500, then the pycnocline depth is determined to be the first depth at which the conductivity change is greater than the threshold value. Stations with out a pycnocline arbitrarily have the top 1/3 rd of the water column be considered the upper water column and lower 2/3rds is considered the lower water column Units of measurement: Conductivity- uhhos/cm Depth- meters

Lineage:
Source_Information:
Source_Citation:
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Online_Linkage: ftp.chesapeakebay.net
Larger_Work_Citation:
Citation_Information:
Originator: Jacqueline Johnson
Publication_Date: 20080301
Title:
Chesapeake Bay Program Plankton Database
Edition: Version 3.0
Geospatial_Data_Presentation_Form: database

Publication_Information:
Publication_Place: Annapolis, MD
Publisher: US EPA Chesapeake Bay Program
Other_Citation_Details:
None
Online_Linkage: www.chesapeakebay.net
Type_of_Source_Media: digital database file
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19850101
Ending_Date: Present
Source_Currentness_Reference:
ground condition
Source_Citation_Abbreviation:
None
Source_Contribution:
None
Process_Step:
Process_Description:
At each station, composite phytoplankton and picoplankton samples are taken from above and below the pycnocline. After the pycnocline has been determined at each station, two vertical series of five samples equidistance apart depths ate taken between the pycnocline and bottom. Water in each carboy is mixed, then a 500 milliliter sample is taken from each carboy for phytoplankton, and is preserved with five milliliters of Lugol's solution. A 125 milliliter sample is taken from each carboy for picoplankton enumeration, and is preserved with two milliliters of Glutaraldehyde solution. The pre-labeled picoplankton sample bottles are transported back to the laboratory and placed in a refrigerator for analysis. Phytplankton samples are stored at room temperature until analysis. All samples were enumerated using one of the following protocols.

-Chesapeake Bay Program Sample Analysis Method PH102- This protocol was sued from July 1985 to July 2004 for phytoplankton enumeration.

Upon return to the laboratory, each 500 ml water sample (fixed with Lugol's solution on station) are preserved with 5 ml of buffered formaldehyde. The 500 ml replicate sample sets are mixed (1000 ml), then 500 ml are withdrawn and allowed to settle undisturbed for 72 hours, the original 500 ml is reduced by careful siphoning to approximately 200-250 ml. The samples are allowed to stand undisturbed for an additional 48 hours and are again siphoned to 20-40 ml concentrates. The final 20-40 ml concentrate is transferred to a previously labeled storage vial, where the label information from the collection bottle has been transferred and verified by the laboratory supervisor. A known volume of the entire concentrate will be placed in an Utermöhl settling chamber for examination with an inverted plankton microscope. If the phytoplankton, and/or silt, density is too great in the final concentrate for clear examination, a known volume of the concentrate is drawn off to provide a sub-sample suitable for analysis. Prior to counting, a work sheet is prepared, where information from the sample vial label is transferred to the raw data sheet and verified. The

microscopic examination will be done at 3 magnifications (Marshall and Alden, 1990). At 300X magnification, a combined random field (10) and minimum cell count (200) procedure will be followed where all taxa are counted to the lowest taxonomic category possible. This examination is repeated at 500x magnification for 10 randomly selected fields. Cells not clearly discernable at the 300x magnification are examined at 600X for identification. All species will be counted at only one of these magnifications. In addition, the entire chamber will be scanned at 125X for recording previously unrecorded larger species in the chamber. All phytoplankton categories will be included in this analysis, including colonies and algal filaments at 300x. Calculations will be made from these data at the different magnifications to determine cell concentrations per unit volume (e.g. cells/l). Identification will be based on internationally accepted identification keys, and checked against voucher specimens (e.g. Chesapeake Bay) that are maintained in the ODU phytoplankton analysis laboratory. Samples are archived for a period of one year. Raw data sheets are kept on file.

-Chesapeake Bay Program Analytical Method Code PH102M - This protocol was sued from July 2004 to for phytoplankton enumeration.

Counting Method 102 was slightly modified in January 2005 for better agreement with the new counting methodology adopted in the Maryland Phytoplankton program. Beginning in 2005, at 600X all cells were indentified using the following categories:
CENTRIC DIATOMS < 10UM
CRYPTOMONAS <10UM
PENNATE DIATOMS< 10UM
UNIDENTIFIED GREEN CELLS 3-5UM
UNIDENTIFIED MICROPHYTOFLAGELLATES <10UM
All other protocol for sample enumeration remained the same.

-Chesapeake Bay Program analytical Method Code PH103
Beginning in October 2005 the counting enumeration method was slightly modified again to be in agreement with the official Chesapeake Bay program technique for phytoplankton enumeration. The final enumeration protocol for the Virginia program is as follows:

(1) At 300X magnification, a minimum of twenty random fields and 200 cells of taxa > 5 microns in largest dimension will be counted. If 200 cells are not tallied in 10 fields, cells in additional fields will be enumerated until 200 cells have been enumerated. All colonies, trichomes, & filaments are counted at this magnification. Very large (>60 Microns) or rare species (less than 1 cell in less than 10 Grids) not counted in this scan.

(2) At 600X magnification, twenty random fields will be counted for taxa >=3 and <=5 microns in diameter. No colonies, trichomes or filaments counted. Again all cells were indentified using the following categories: CENTRIC DIATOM < 10UM, CRYPTOMONAS <10UM, PENNATE DIATOM < 10UM, UNIDENTIFIED GREEN CELLS 3-5UM UNIDENTIFIED MICROPHYTOFLAGELLATES <10UM

(3) At 125X magnification, the entire chamber will be scanned for taxa which were not enumerated at the other two magnifications.

-Chesapeake Bay Program Sample Analysis Method PP101
Using a Millipore apparatus, a backing 0.45 um nuclepore filter was wetted with distilled water, was placed on the Millipore stem. Then a 0.20 um nuclepore filer, previously stained in an irgalan black solution was placed over the other filter. Two milliliters of the shaken water sample was added to the filter apparatus. Using a pump, and a maximum vacuum of ten centimeter for mercury, the sample was filtered until the meniscus disappears from the top of the filter. The 0.2 um nucleopore filter was removed and placed immediately on a glass slide previously moistened by breath. A drop of immersion oil was placed at the center of the filter, then covered with a cover slip. The slide is examined immediately with a Zeiss Axioskop epifluorescenct microscope equipped with a 100 watt mercury lamp and a 100X oil immersion objective. The autotrophic picoplankton were counted using a "green" filter set (g546. FT580, LP590). Count are made on replicate samples and averaged. A minimum of 200 cells and a minimum coverage of 20 field is counted on each slide.

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data Manager\Analyst
Contact_Address:
Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
Country: USA
Contact_Voice_Telephone: 1-800-968-7229
Contact_Voice_Telephone: 410-267-5729
Contact_Facsimile_Telephone: 410-267-5777
Contact_Electronic_Mail_Address: jjohnson@chesapeakebay.net
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact Instructions:
unavailable
Process_Step:
Process_Description:
Metadata imported.
Source_Used_Citation_Abbreviation:
C:\DOCUME~1\jjohnson\LOCALS~1\Temp\xml407.tmp
Process_Date: 20081008
Process_Time: 11402100

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Spatial_Data_Organization_Information:
Indirect_Spatial_Reference_Method:
Chesapeake Bay and Its Tidal Tribuaries in the Commonwealth of Virginia.
Direct_Spatial_Reference_Method: Point
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Entity point
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Area point

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Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 30
Longitude_Resolution: 30
Geographic_Coordinate_Units: Decimal degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Horizontal Datum of 1983
Ellipsoid_Name: Geodedic Reference System 80
Semi-major_Axis: 6378206.4
Denominator_of_Flattening_Ratio: 294.98
Vertical_Coordinate_System_Definition:
Depth_System_Definition:
Depth_Datum_Name: Chart datum; datum for sounding reduction
Depth_Resolution: .1
Depth_Distance_Units: meters
Depth_Encoding_Method: Attribute values

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Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
All data
Entity_and_Attribute_Detail_Citation:
6/30/1996- All plankton data was resubmitted to the Chesapeake Bay Program office due to discrepancies in sampling dates between synchronously collected samples. Sampling dates were corrected to field logs and resubmitted to the Data Center. Please do not use data with an R_DATE prior to 06/01/96.

8/31/1995- GMETHOD was changed to 7. Code 7 refers to an unspecified plankton pump. For an extensive gear code list see Table 17, PAGE F-9 APPENDIX F, of the Living Resources Data management plan, 1989. This is a change from GMETHOD code in previous versions of the data set. This does not represent a

change in actual sampling gear.

8/31/1993- LBL all Latin Names and spelling for names have been corrected to the National Oceanographic Data Center accepted spelling.

8/31/1995- CRUISE NUMBERS - BAY012-BAY211 were supplied by the Chesapeake Bay Program office. See the Guide to Living Resources Data Sets for complete listing of Cruise periods.

8/31/1995- SER_NUM Old Dominion University does not use a serial number system for phytoplankton sample tracking so this variable is not available

8/31/1995- P_DEPTH >0.5-<TDEPTH Note this is a composite sample cut off depth. This depth is not the pycnocline depth!

SUMMER 1997 - The Living Resources Data manager supplied salinity zones to the plankton data based on salinity data collected by the Virginia Water Quality Monitoring Program. Values were derived from Water Quality Hydrographic data collected concurrently with the mesozooplankton. If data was not available for the of sampling but was collected within a one week window of sampling date, the water quality data was used to determine a salinity zone. However the salinity zone is marked with an E to denote being estimated.

02/01/1998- The salinity zones appearing in the 1997 data are provisional. They have not yet been checked against the water quality data for validation. The 1997 Virginia Tributary water quality data will not be delivered to the CBPO until June 1998. After delivery of the water quality data, salinity zones will be confirmed. Salinity zones will be filled in when the corresponding Water Quality monitoring data becomes available.

01/01/1999- Due to the 1998 CBP Living Resources split sampling program it was determined that the there was a nomenclature difference between laboratories in Maryland and Virginia. The species Merismopedia (VA species name) and Agmenellum (MD species name) were determined to be synonymous. After a literature review both states agreed to use the genera designation Merismopedia. Please contact the Living resources data manager for details.

01/01/2000- All Latitudes and Longitudes converted to NAD83 coordinates.

11/01/2001- The phytoplankton laboratory received new microscopes.

Winter 2002- For extensive details in regards to quality assurance issues and data comparability issues between Maryland and Virginia Programs please see the CBP Phytoplankton Split sample portion of the Chesapeake Bay Quality Assurance Program at:

http://www.chesapeakebay.net/qualityassurance.htm

08/11/2005. Note due to contract changes starting in January 1996, station LE5.5 had a coordinate change. This station move was not documented until August 2005. Due to this station relocation, all data collected at the altered location had the station name

changed to LE5.5-W in August 2005.

01/01/2005- All data enumerated using new uniform bay wide counting technique. There will be a significant increase in the number of taxa identified in Maryland samples counted after 1/1/2005. Please be aware of this potential source of step trend in the data.

04/14/2006-Missing Data Report for July-Dec 2005 Data. 1) October 2005- Phytoplankton and picoplankton samples not collected at station CB6.4 due to inclement weather. 2) December 2005- Phytoplankton and picoplankton samples not collected at stations CB6.1, CB7.3e, CB7.4, LE3.6 due to boat malfunctions. 3) August 2005- Phytoplankton sample WE4.2 BP sample leaked. Autotrophic picoplankton count: 324,099,200 cells/liter. 4)October 2005- Picoplankton sample TF4.2 sample leaked.

11/04/2008- In March 2008, CB6.1, CB6.4, LE3.6, and WE4.2 were not collected due to weather. This means that the above and below phytoplankton and picoplankton samples, as well as the productivity were not collected. Also the March LE5.5W was collected on April 1, 2008, due to rescheduling from the same foul weather. During the RET5.2 collection in May, there was a problem with the sampling pump, and the BP samples could not be collected.

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Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data Manager\Analyst
Contact_Address:
Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
Country: USA
Contact_Voice_Telephone: 1-800-968-7229
Contact_Voice_Telephone: 410-267-5729
Contact_Facsimile_Telephone: 410-267-5777
Contact_Electronic_Mail_Address: jjohnson@chesapeakebay.net
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact Instructions:
unavailable
Resource_Description: Downloadable Data
Distribution_Liability:

I, the data requestor, agree to acknowledge the Chesapeake Bay Program and any other agencies and institutions as specified by the Chesapeake Bay Program Office as data providers. I agree to credit the data originators in any publications, reports or presentations generated from this data. I also accept that, although these data have been processed successfully on a computer system at the Chesapeake Bay Program, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data. It is strongly recommended that careful attention be paid to the contents of the data documentation file associated with these data. The Chesapeake Bay Program shall not be held liable for improper or incorrect use of the data described and/or contained herein.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ASCII
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: http:www.chesapeakebay.net
Offline_Option:
Offline_Media: CD-ROM
Recording_Format: ISO 9660
Compatibility_Information:
None
Fees: None
Ordering_Instructions:
All requests for data on media must be made in writing.
Turnaround: 5 Working Days
Custom_Order_Process:
None
Technical_Prerequisites:
None
Available_Time_Period:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 198407101
Ending_Date: Present

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Metadata_Reference_Information:
Metadata_Date: 20000310
Metadata_Review_Date: 20081110
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data

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Contact_Electronic_Mail_Address: jjohnson@chesapeakebay.net
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact Instructions:
unavailable
Metadata_Standard_Name: NBII Content Standard for National Biological Information Infrastructure Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None
Metadata_Use_Constraints:
None
Metadata_Security_Information:
Metadata_Security_Classification_System: None
Metadata_Security_Classification: Unclassified
Metadata_Security_Handling_Description:
None
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

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