# Jamaica Bay Water Quality Data Visualization and Access Tool User Guide

January 27, 2017

### Introduction

This document provides guidance on how to use the Jamaica Bay Water Quality Data (JBWQD) interactive online tool for data visualization and access. Additional information on why and how the database and tool were developed can be found in the *About* and *Documentation* sections of the JBWQD Web site.

### Open a Web browser and go to the home page at: http://www.ciesin.columbia.edu/jbwq

The points displayed on the map represent the spatial distribution of available water quality data for Jamaica Bay. On initial load, *Sampling Locations* will be selected under *Choose Data Layer* on the right side of the screen. These mapped points indicate where samples were collected and measurements were made. The points displayed by selecting *Grouped Locations* represent predefined groupings of sampling locations. *Grouping Boundaries* (under *Overlays*) show how the sampling locations are currently grouped. They will fade a few seconds after loading or refreshing the home page. Click on the checkbox next to *Grouping Boundaries* to display or remove them. The point colors represent the *number of measurements* (ranging from least to greatest) that are available for particular sampling locations or groupings. *Forthcoming* points represent locations or groupings with measurements that have yet to be added to the interactive online database, but that are available for download in a spreadsheet (csv and xls formats) by using the *Download ALL Data* function described below.



## How to Cite Data and Images Obtained from the JBWQD Tool

When using data or images obtained from the JBWQD online tool—for example, in a publication, report, or presentation—the recommended citation is:

City University of New York (CUNY) Brooklyn College, Center for International Earth Science Information Network (CIESIN) Columbia University, New York City Department of Environmental Protection (NYCDEP), National Park Service (NPS). 2017. *Jamaica Bay Water Quality Database*. Palisades, NY: CIESIN, Columbia University. http://www.ciesin.columbia.edu/jbwq. Accessed DAY MONTH YEAR.

The elements contained in the recommended citation can be reorganized for compliance with a particular reference style that is specified by a publisher.

## How to Navigate the JBWQD Tool Home Page

Along the horizontal navigation bar at the top of the home page are the following links:

- Explore/Download
- About
- Documentation
- Partners
- Contact Us
- Help
- E (Printing Tips)

Click on **About** to open a page that provides information on the purpose of the JBWQD Tool, the institutional partners and project team involved in its development, current data availability, the recommended citation for data and images obtained from the database and tool, and the source of project funding.

Click on **Documentation** to open a page that: provides detailed metadata on the data sources; defines four *Parameter Groups*; and provides technical information, including the application architecture diagram.

Click on *Partners* to open a page that lists the institutional partners involved in the development of the JBWQD Tool and provides links to their Web sites.

Click on *Contact Us* to open a window that provides users with an email address for sending questions and feedback to the project team: jbwq@ciesin.columbia.edu.

Click on *Help* to open a page that provides a link to download this User Guide in PDF format.

Click on the **Printing Tips** icon to open a window that provides guidance on how to preview map layouts and print maps.

On the right side of the home page, the *Layers/Legend* panel provides options to choose *data layers*, *overlays* and *base maps*. This panel also contains a legend, titled *Number of measurements*, that display point symbols ranging from the *greatest* to the *least number of measurements* as well as symbols that represent *Forthcoming* measurements and *No Results*. Each measurement refers to a set of parameters measured during a single sampling event, distinguished by a specific date, time, and sampling location. To display the locations of measurements—made before 2001 and after 2011—that have yet to be added to the interactive online database for selection, filtering, and charting, select *Forthcoming Locations* under *Overlays*. The *No Results* point symbols appear only when using the Filter/Visualize/Download option described below.

Under *Choose Base Map*, the user has the option to select the *ArcGIS Ocean Bathymetry* background, which displays channels and other variations in underwater depth, or the *OpenStreetMap* background, which emphasizes terrestrial features such as roads, buildings, and parks.

The Layers/Legend panel can be minimized (hidden) by clicking on the right-facing arrow located in the

bottom right corner of the screen Layers/Legend . To reopen the Layers/Legend panel, click on the left-facing arrow Layers/Legend.

#### **Map Navigation**

The map display can be fit to the entire project map extent (E), zoomed in (+), and zoomed out (-) using the tools located in the lower right of the map display:



#### Scale Bar

The scale bar in the lower right of the map display is provided in kilometers or meters. It adjusts according to the zoom level.

#### **Map Coordinates**

Map coordinates (latitude and longitude in decimal degrees) are displayed in the lower right of the map, next to the scale bar. The coordinates adjust according to the position of the cursor.

### How to Browse Map for Available Data for Sampling and Grouped Locations

- 1. Under *Choose Data Layer*, select *Grouped Locations*.
- 2. Using your cursor, hover over the points to display boxes labeled *Group Location Summary* that identify each point by name and provide the total number of measurements for that grouping.
- 3. Select a grouped location (e.g. Marine Parkway Bridge). Click on this point to open the *JBWQ Point Data Explorer*. The selected point will turn pink. The *Summary* tab identifies the data sources for this grouped location, the total number of sampling locations in this grouping, the number of sampling locations with measurements, the total number of measurements for the grouping, and the temporal coverage.

Explore / Download	a Bay Water Qua alization and Access	Tool coumentation Partners	Contact Us Help
What would you like to do?			Choose Data Layer
Download Download by Group ALL Data //Parameter/Year //Download	JBWQ Point Data Explorer –	H-L	Samping Locations     Grouped Locations     Overlays     Grouping Boundaries
	Summany Stats Charts Download		Forthcoming Grouped Locations
	Selected Location: Marine Parkway Bridge Sampling Agency(ies): NPS, NYCDEP Total # of Sampling Locations: 10 Zoom to Locations Location(s) with measurements: 4 Total # Measurements: 406 Temporal coverage : 2001-04-17 to 2011-12-14 Chart Water Quality Index for this Grouped Location	Inwood	Choose Base Map
Rockaway Inlet Rockaway Point	Jamaica Bay 23	2 km E + -	Layers/Legend

- 4. Within the JBWQ Point Data Explorer under the Summary tab, click on Zoom to Locations to view the sampling locations with measurements within this grouping. Hover over the points to display boxes that provide the total number of measurements for each sampling location. Click on the point with the greatest number of measurements. This will open the JBWQ Point Data Explorer for this particular sampling location.
- 5. Under the Summary tab of the JBWQ Point Data Explorer, click on Chart Water Quality Index for this Sampling Location to view five time series charts for the Water Quality Index parameters: Secchi disk depth, surface dissolved oxygen, surface total Kjeldahl nitrogen, surface chlorophyll-a, and surface total phosphorus. This will open the JBWQ Chart Window. Use the scroll bar on the right side of the window to view all five charts. By hovering over the data points on the charts, the measurement value and sampling date will be displayed.



- 6. To zoom in to a subset of data points displayed on a chart, **select data for zoom** by placing your cursor on the chart, holding down the *Ctrl* key, and moving the cursor across the chart to select the time period of interest. Once you have made your selection, release the *Ctrl* key to zoom. The *Reset zoom* button enables you to return to the original chart display.
- 7. Click on the three line icon located in the top right of each chart to print the chart or to download it in PNG, JPEG, PDF, or SVG formats.
- 8. Close the *JBWQ Chart Window* by clicking on the "x" located in the top right of the window.
- 9. Next, under *Overlays* in the *Layers/Legend* panel, select *Forthcoming Locations* to show the sampling locations in this grouping that have yet to be added to the interactive online database for selection, filtering, and charting. Data for these *forthcoming locations* (collected before 2001 and after 2011) are provided in the spreadsheet delivered by selecting the *Download ALL Data* option described below.



10. Within the *JBWQ Point Data Explorer* under the *Stats* tab, summary statistics for each parameter are provided for the selected point, whether sampling locations or grouped locations have been selected as the data layer. These summary statistics include temporal coverage, minimum value, maximum value, average value, median value, and standard deviation. To change the parameter, click on the downward facing arrow next to the displayed parameter name. This will open the list of parameters available for the selected point. Note that only numeric parameters will be included in the list.



11. Within the *JBWQ Point Data Explorer* under the *Charts* tab, create time series plots or scatter plots for the sampling location or grouped locations by selecting up to 2 parameters of interest, choosing chart type, and clicking *Submit*.



12. Within the JBWQ Point Data Explorer under the Download tab, a preview of representative sample data is provided. Click on the button at the bottom of the Download tab, labeled Download Sampling Location data or Download Location Group data, to download data for the selected sampling location or the grouped locations as a ZIP file. The download may take a few seconds. The ZIP file will contain three files: Parameter Description (csv); Sample Data (csv); and User Selection (txt). The Parameter Description file provides a list of the parameter names, brief parameter descriptions including units of measurement, a column indicating whether or not the data were collected in situ, and brief descriptions of the methods and instrumentation used to collect data, if available. The Sample Data file contains the set of measurements available for the selected sampling location or grouped locations for the period January 1, 2001 – December 31, 2011. The User Selection file contains a summary of the selection made; for example, "Downloaded all data for this location: LOC1027\* within area Marine Parkway Bridge."





# **Explore/Download Options**

The *Explore/Download* feature is organized into three options:

- Download ALL Data
- Download by Group/Parameter/Year
- Filter/Visualize/Download

#### How to Download All Data (1909 to 2013)

Click on *Download ALL Data* to download the ZIP file that includes all the available sample measurements from 1909 to 2013, descriptions of all the measured parameters, and a list of the grouped locations displayed on the map, including the forthcoming locations. Save and open this ZIP file.



The ZIP file provides the spreadsheets in both csv and xls formats.

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File Commands Tools Favorites Options Help									
Add Extract To Test View Delete	Find Wizar	d Info	VirusScan Comment SFX						
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Grouped_Sampling_Locations_2016-11-16.csv	4,173	1,482	Microsoft Excel Comma Separated Values File	11/17/2016 3:12 PM	FA743D79				
Grouped_Sampling_Locations_2016-11-16.xls	32,768	7,498	Microsoft Excel 97-2003 Worksheet	11/17/2016 1:07 PM	9E74F0CC				
BWQD_Parameter_Descriptions_2016-09-28.csv	67,811	5,565	Microsoft Excel Comma Separated Values File	9/27/2016 2:38 PM	E5B10834				
JBWQD_Parameter_Descriptions_2016-09-28.xlsx	80,611	33,787	Microsoft Excel Worksheet	9/28/2016 2:31 PM	2D52616B				
Sampling_Data_All_2016-07-31.csv	4,360,881	909,736	Microsoft Excel Comma Separated Values File	9/18/2016 10:51 AM	576F5B17				
Sampling_Data_All_2016-07-31.xlsx	8,532,269	8,204,915	Microsoft Excel Worksheet	9/16/2016 1:43 PM	3F0354CA				
Total 13,078,513 bytes in 6 files									

### How to Download Data by Group, Parameter, and/or Year

- 1. Under Explore/Download, select Download by Group/Parameter/Year.
- 2. Click on the downward facing arrow next to *Parameters* to open a parameter selection window. To select parameters, click on the checkboxes to the left of the parameter(s) of interest. Note that only numeric parameters are included in this parameter selection list. At the top of the parameter selection window, there is the option to select *All Surface (S)* or *All Bottom (B)* parameters. There is also the option to select one of four *Parameter Groups: Environmental Indicators; Physicochemical Conditions; Trophic State Index; and Water Quality Index*. To clear your selections and start over, click on the *Clear All* button. Close the parameter selection window by clicking on the "X" in the upper right corner. Note that unless otherwise specified, the full set of sampled parameters will be included in the download.



- 3. Select **Grouped Locations** by clicking on group names listed alphabetically. ALL is the default selection. Use *Ctrl+click* to select multiple non-consecutive grouped locations in the list. Use *Shift+click* to select a set of consecutive grouped locations in the list. To make your selections, it may be helpful to hover over the grouped location points on the map to identify them by name. Click on "ALL" at the top of the list to return to the selection of all grouped locations.
- 4. Select Year(s) by dragging the years on the slider to your time period of interest.
- 5. When you are ready to download the selected data, click on the *Generate Download Link* button, then click on *Download data* to download a ZIP file containing: Parameter Description (csv); Sample Data (csv); and User Selection (txt). It may take a few seconds to generate the download link. You will need to regenerate the download link after any changes to selections.



#### How to Filter, Visualize, and Download Data for Sampling or Grouped Locations

- 1. Under Explore/Download, select Filter/Visualize/Download.
- 2. Under Select Filter Criteria, click on the downward facing arrow next to Parameters to open a parameter selection window. To select parameters, click on the checkboxes to the left of the parameter(s) of interest. Note that only numeric parameters are included in this list. At the top of the parameter selection window, there is the option to select one of four Parameter Groups: Environmental Indicators; Physicochemical Conditions; Trophic State Index; and Water Quality Index. To clear your selections and start over, click on the Uncheck All button. Close the parameter selection panel by clicking on the "X" in the upper right corner. Note that unless otherwise specified, all sampled parameters will be included in the filtered results for visualization and/or download.
- 3. Under *Data Source(s)*, you may filter by selecting NPS or NYCDEP. ALL is the default selection. Click on "ALL" at the top of the list to return to the selection of all data sources.
- 4. As explained under *Grouped Locations*, there are three ways to select points for filtering, visualization, and download: 1) click on a single point; 2) use the *select polygon(s)* tool to draw an area of interest on the map and *submit polygon*; and 3) select from the pulldown list of grouped locations.
- 5. Under *Date or Date Range*, using the calendars provided by clicking in the *Start Date* and *End Date* boxes, select a date range between January 1, 2001 and December 31, 2011.

- 6. As you filter the data, you will see the number of "Results" displayed above the Filter/ Visualize/ Download button. This is the number of measurements that fit your filter criteria. Points on the map that display the "No Results" symbol indicate that there are no measurements fitting your filter criteria for these sampling or grouped locations.
- 7. When you filter the data, the JBWQ Data Explorer window will open. It can be minimized by clicking on the minus symbol in the upper right corner of the window. A button labelled Restore Data Explorer will appear. Click on this button in order to restore the JBWQ Data Explorer window.
- 8. Within the *JBWQ Data Explorer*, the *Summary* tab displays a summary of the filtered results: the number of grouped locations, the number of sampling locations, the total number of measurements, and the temporal coverage.
- 9. The *Stats* tab displays summary statistics for the filtered parameters: temporal coverage, minimum value, maximum value, average value, median value, and standard deviation.
- 10. Under the *Charts* tab, create *time series plots* or scatter plots by selecting up to 2 parameters of interest. Use Shift+Click to select up to 2 points on the map for charting. Selecting a third point restarts point selection.
- 11. When you are ready to download the filtered data, in the *Download* tab, click on the *Generate Download Link* button, then click on *Download data* to download a ZIP file containing: Parameter Description (csv); Sample Data (csv); and User Selection (txt). It may take a few seconds to generate the download link.

Jam	aica Bay Water Qu Visualization and Access	ality s Too				
Explore / Download 🔺	About Do	ocumentation	Partn	ers Con	tact Us	Help
What would you like to do? Results: 437 Download Download by Group ALL Data Download by Group ADWNload	A STOP	JBWQ Data Explorer -				
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		2.1	8.81	17.3	0.62	0.11
Click to select a single point on the active layer		1.7	6.72	16.9	0.79	0.09
(click elsewhere on the map to de-select).	Ve Down	1.2	7.82	34.2	0.94	0.08
Select multiple points by drawing polygon(s)		1.5	11.15	22.7	0.58	0.07
around points or select Grouped Locations with		2.0	7.32	3.5	0.67	0.10
items) Polygon and pull-down list selections		2.1	7.60	14.2	0.57	0.48
may be combined, but selecting a single point		1.5	9.66	24.0	0.70	0.13
via click will remove all other points from your		1.5	5.54	3.0	0.07	0.10
filter.	0	1.8	6.57	16.7	0.53	0.13
select polygon(s) cancel polygon(s)		Generate Download Link				
ALL Beach Channel at Beach 98th St Bergen Beach Black Wall Marsh	Jamaica		D	ownload dat	<u>a</u>	
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ROAK	Rockaway	2 km			Layers/	Legend