DBHYDRO Browser
User’s Guide

November 2017 (revised)
This page intentionally left blank.
# TABLE OF CONTENTS

## 1.0 INTRODUCTION
- DBHYDRO Overview ................................................................. 2
- DBHYDRO Browser ................................................................. 2
- Getting Started ........................................................................ 3

## 2.0 MENU-BASED DATA ACCESS
- Hydrologic and Physical Data .................................................. 6
  - Charting/Graphing .................................................................. 16
  - Batch Mode ........................................................................... 24
  - Groundwater Data .................................................................. 27
  - WQ Sondes (Continuous) Data ................................................ 28
- Water Quality Sample Data ....................................................... 29
- Hydrogeologic Data .................................................................. 37
- Access by Station Name ............................................................ 47
- Access by Site Name .................................................................. 49
- Access by Hydrologic Basin ...................................................... 51
- Real Time Data .......................................................................... 53
- Virtual Globe Access Using KML ............................................... 57
- Web Map Access .................................................................... 62
- Data Processing and Validation Utilities ................................. 74
  - Interval Value Generator ......................................................... 75
  - DCVP Station Id Listing .......................................................... 76
- ET Data and Radar-Based Rainfall Data .................................... 78
- Metadata/Reference Tables ........................................................ 80
- Miscellaneous Items and Reports ............................................. 81
  - New and Discontinued Data Sets ........................................... 82
  - District Daily Rainfall Report ................................................ 84
  - Hydrogeologic Data Loader .................................................... 85
  - Water Budget ......................................................................... 86
  - Nutrient Load Computation Application ............................... 87
  - Nearby Station Look-up ......................................................... 88

## 3.0 URL-BASED DATA ACCESS
- Web Services .......................................................................... 89
  - Water Quality Results URLs .................................................. 89
  - Hydrologic Instantaneous and Daily Values URLs ................ 92
  - Hydrographs URLs ................................................................ 93
  - Hydrogeologic Data Summaries ............................................ 95

## 4.0 CONTACT INFORMATION
- Application Enhancements ....................................................... 96
- Training ................................................................................. 96
- Data Requests and Inquiries .................................................... 96

## 5.0 APPENDICES
- Appendix A - Water Quality Report Column Descriptions .......... 97
- Appendix B - Unit Conversions ............................................... 103
- Appendix C - Unit Abbreviations/Symbols .............................. 104
- Appendix D - Acronyms Used in Metadata .............................. 105
1.0 INTRODUCTION

DBHYDRO Overview

DBHYDRO is the South Florida Water Management District's (District or SFWMD) hydrologic, water quality, and hydrogeologic data storage and retrieval system. This system is the source of historical and up-to-date data for the region covered by the District. The District participates in a cooperative data exchange program with other agencies, such as the U.S. Geological Survey, Everglades National Park, U.S. Army Corps of Engineers, Lake Worth Drainage District, and U.S. Department of Agriculture. DBHYDRO allows users to access over 190,000 station-years of data, collected at over 17,000 stations in and around the District’s area of responsibility. DBHYDRO contains hydrologic, water quality, and hydrogeologic data, and stores additional information about the location and context of where and how data are collected. Descriptions are available for most locations, giving the user information on hydrologic basin, latitude, longitude, state plane coordinates, county, section, township, range, and station notes.

One of the more powerful aspects of DBHYDRO is that data can be retrieved in various ways. For example, it is not necessary to know a specific identification number (ID) of a particular station; the database can be scanned to locate all stations that meet certain criteria, such as a given basin, county, or coordinate window. The DBHYDRO database is an important reference for hydrologic, hydrogeologic, and water quality reports and investigations in central and south Florida. The application that allows users to specify search criteria and retrieve data from DBHYDRO is called “DBHYDRO Browser”.

DBHYDRO Browser

The DBHYDRO Browser is a web-based application that allows users to browse the SFWMD’s corporate environmental database, DBHYDRO, using one or more criteria to generate a summary listing of time series. The user can then select one or more time series of interest and have the time series data dynamically displayed in tables or graphs. In addition to using text-based filters, users may also access station data via a web map. Currently, DBHYDRO Browser is tested and supported on Internet Explorer 11.

---

¹ The SFWMD provides copies of data stewarded by other agencies as an enhanced service to its users. The authoritative source of data stewarded by other agencies is the system of record as determined by that particular agency.
Getting Started

Internet access for DBHYDRO is provided at [http://www.sfwmd.gov/dbhydro](http://www.sfwmd.gov/dbhydro).

**DBHYDRO (Environmental Data)**

DBHYDRO is the South Florida Water Management District's corporate environmental database that stores hydrologic, meteorologic, hydrogeologic and water quality data. This database is the source of historical and up-to-date environmental data for the 16 county region covered by the District.

The DBHYDRO Browser allows you to search DBHYDRO, using one or more criteria, and to generate a summary of the data from the available period of record. You can then select data sets of interest and have the time series data dynamically displayed on your screen in tables or graphs. You can also download data to your computer for later use.

- [DBHYDRO Browser Menu](http://www.sfwmd.gov/dbhydro)
- [User's Guide](http://www.sfwmd.gov/dbhydro)
- [Environmental Monitoring Location Maps](http://www.sfwmd.gov/dbhydro) - Use to identify the monitoring location name(s) for the data you are seeking
- [Glossary](http://www.sfwmd.gov/dbhydro)
- [Contact Us](http://www.sfwmd.gov/dbhydro)
- [Request Other Data](http://www.sfwmd.gov/dbhydro)

(Submit only for data not accessible via DBHYDRO)

**DBHYDRO Training:** May 18, 2017 - 9:00 a.m. to 3:30 p.m.

You are invited to the SFWMD’s training course: DBHYDRO Environmental Database. Course participants will learn how to access water level, gate opening, rainfall, water quality and hydrogeologic data. Registration is required for the free, one-day event. Seats are limited; you must be at least 18 to register. [More Information](http://www.sfwmd.gov/dbhydro)

and [Registration Form](http://www.sfwmd.gov/dbhydro).
District employees or any user authenticated on the SFWMD computer network may also start the DBHYDRO Browser by first selecting “Tools and Resources” on the District’s internal portal, then select “Applications”, find “Water Resources”, and click on “DBHYDRO Browser” (as shown below).
The DBHYDRO main menu is shown below. Some options are unavailable to users not authenticated on the District network (i.e., “internal use only”).
2.0 MENU-BASED DATA ACCESS

Hydrologic and Physical Data

Each hydrologic and physical data set is identified in DBHYDRO with a unique time series identifier, known as a dbkey. No two data sets will ever share the same dbkey. For example, a set of instantaneous readings and the mean daily values derived from such readings have two different dbkeys. DBHYDRO uses the term breakpoint data synonymously with instantaneous data. Our cooperative program partner, the USGS, uses the term unit values data.

Multiple data categories may be selected simultaneously; for simplicity, each category is presented separately in this guide.

For example, checking the “Surface Water” checkbox and then clicking on the “Get Data” button leads to the following page:

This screen allows the user to select the filters the user wants to use to query the surface water data. Each search parameter (filter) is hyperlinked to a description of that parameter. For example, clicking on the word "AGENCY" leads to the following help text:
Closing this window returns the user to the “Surface Water Data/Select Search Parameter” menu.

In the following example, the “Agency”, “Data Type”, and “County” parameters have been selected by checking their associated check boxes:
Clicking on the "Submit" button provides the presented information:

![DBHYDRO Browser User's Guide](sfwmd.gov)

In this view, only Data Type, Agency, and County (as requested) and those parameters specific to surface water data are able to be queried. This filtering feature prevents the list of query criteria from getting unnecessarily large and generally keeps the presented information on one page.

Each list of values allows one or more query criteria to be selected using the “CTRL” or “SHIFT” keys in conjunction with the left mouse button.
The criteria fields are filled in by the selection on the lists of values:

In the above example, SFWMD surface water flows in Palm Beach County are selected. At this point, the parameter file may be saved, allowing the selected criteria to be stored in a file on the user’s individual computer or server, such that the criteria may be recalled for future access. This feature is helpful for frequently run queries to minimize keystrokes and mouse events required to obtain data. [Note: The web services URL feature may better suit the needs of users that have frequently repeated database queries.] More information is provided in Section 3.0, URL-Based Data Access.

By checking the box “Show Active Time Series Only”, the user can filter out older data sets if the user is only interested in more recent or active data sets. In the example above, both active and inactive time series are requested because the checkbox is left unchecked.

The user may order (sort) the subsequent output by any of the available output columns. By default, the output will be in “Station” order.

Frequent users may bypass the next screen to more directly retrieve needed data. This is useful if the user knows that the query will return only a few data sets interactively or wants to submit a batch request. To use the bypass feature, select the radio button marked “Get All Data”. In the example provided, the time series list is not bypassed because specific data sets need to be selected. More information on batch requests is provided in Section 2.0, Menu-Based Data Access.
Clicking on the "Submit" button results in the following "Metadata" list:

The user can also click on the heading of any column in order to sort the list by that particular column. The “Station” column is used by default as indicated by the arrow above the column heading. Each of the underlined fields is hyperlinked to additional information that explains its meaning.
For example, clicking on the word "FLOW" in the data type column leads to the following screen, which further details flow data including its units of measure:

DBHYDRO Browser similarly links to additional information for all the other hyperlinked time series attributes.

The “Station” field hyperlink in the previous time series list leads to a screen displaying the station information. For example, clicking on station "C18W_W" leads to this screen:

Then, the user can display a map with this station marked, generate a list of nearby stations, or “Get Time Series Data”. If water quality data is available at the selected station, then a “Get Sample Data” button will be available. If a groundwater well is located at the selected station, then a “Well Info” link will also be available.
Using the C18W_W station example, selecting the "Google Maps" feature provides a map similar to the following:

This feature takes advantage of publicly available map server technology to learn more about the area near the station of interest. The map can be drawn at different scales (zoom in/out) and printed. General directions to the station can also be generated. [Note that the SFWMD does not endorse the use of any particular commercial map server engine or its advertisers.]
Alternatively, by clicking on the “Nearby Station” link at the right end of the row, the user gets a list of other monitoring stations in the vicinity. Such a list may lead the user to other data that did not appear previously because of selected query criteria. The column “Distance (miles)” indicates how close other stations are to the selected station (i.e., C18W_W in this example).

It is important to note that station locations are determined by various methods, each with its own inherent accuracy capabilities. Therefore, some coordinates and distances displayed may only be approximate.
The user must click on the "Back" button twice in the browser to return to the “Time Series Listing” page, where one or more data sets for display can be selected.

In the example below, data is selected for "G304E_C", using the data set with recorder type "PREF" - an abbreviation for preferred. Preferred data sets undergo an additional level of quality assurance (QA) by District staff. It is recommended that "PREF" data are used if available in the user’s query.

Up to 100 rows of metadata will be displayed on each page. Data from different pages must be retrieved separately. Alternatively, the user can refine the query so that fewer metadata rows are displayed to fit on one page. In this case, scroll down and click on the “Get Data” button that is displayed at the bottom of the screen.

<table>
<thead>
<tr>
<th>Cost</th>
<th>Unit</th>
<th>Station</th>
<th>Group</th>
<th>Date/Time</th>
<th>Data Type</th>
<th>Start Date</th>
<th>End Date</th>
<th>Strat</th>
<th>Count</th>
<th>Sub ID</th>
<th>Lat1</th>
<th>Lon1</th>
<th>X Coord</th>
<th>Y Coord</th>
<th>Basem</th>
<th>Short</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

It should be noted that “Clear All” and “Select All” buttons can be used to expedite the time series selection process. “Clear All” removes check marks from all the checked time series. “Select All” selects or checks all the time series data records. Notably, data sets that have no data are not selectable. A data set might not contain data because it has merely been registered in preparation of receiving data but has not yet received any data. Again, a parameter file also may be saved at this time.
Once the “Get Data” button is pressed, the date range selection and format selection screen is now displayed:

This screen allows the user to select the desired period of record for the data set and plot it on a chart. As indicated above, the “Chart” and “Online” radio buttons have been selected. There are thirteen different output report formats (names) and five different output destinations. Note: Not all combinations of Report Format and Destination are valid, but the user is informed of invalid combinations when attempted.

When the date range choice is “User Specified”, the default start date is the earliest start date in the time series list. The default end date is the most recent end date in the list. Therefore, the default is the entire period of record for all data listed. The dates in the Start Date and End Date fields are ignored when a fixed date range such as “Today and previous 2 days” is selected from the pull-down list.
Charting/Graphing

Clicking on the "Chart" button under “Destination” results in the following type of graph:

This graph is generated directly from the database, ensuring that the user’s results are updated with the most recent data. The graph may be printed to any available printer.

The resulting chart URL date text can be edited to regenerate a graph covering a different date range. Chart URLs may be bookmarked and reused directly from the user’s web browser without navigating to the DBHYDRO menu. Subsequent iterations of a chart URL will retrieve the most recent data. Hydrographs are created for each selected time series. Individual axes are created for each data type.

Clicking on the "Back" button on the user’s browser and clicking on the tabular data option allows the user to choose from several formats. The example below indicates that the user is ready to retrieve data in a “Month - Year Matrix” tabular report.
The “Month - Year Matrix” fits one year of data to a single page in matrix format, where columns are shown in months and rows are in days. The “One Value Per Row” format is a single column output in which each value appears on its own line. The “Multiple Daily Values Per Row” format is a multi-column output in which the values for multiple time series appear on a single line corresponding to a single date.
The example below displays results in a monthly format, with one year to a page. Monthly summary statistics are at the bottom of each year.

This output can be saved explicitly as a .txt file using “File” \(\rightarrow\) “Save As”, or the user may choose “Edit” \(\rightarrow\) “Select All” and copy and paste the information into another application.
The file can also be saved in comma separated value (.csv) format and opened in a program such as Notepad or a spreadsheet program (e.g., Microsoft Excel):

![Image of a spreadsheet program](image)

When saving the file, the user’s operating system (e.g., Microsoft Windows) will know that the user wants this file associated with Microsoft Excel if it is saved with a .csv extension.
An example of the “One Value Per Row” format is as follows:

<table>
<thead>
<tr>
<th>Station ID</th>
<th>Daily Date</th>
<th>Data Value</th>
<th>Description Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>01064</td>
<td>24-JUL-2010</td>
<td>43.30</td>
<td>24-JUL-2010</td>
</tr>
<tr>
<td>01064</td>
<td>25-JUL-2010</td>
<td>150.45</td>
<td>25-JUL-2010</td>
</tr>
<tr>
<td>01064</td>
<td>26-JUL-2010</td>
<td>150.71</td>
<td>26-JUL-2010</td>
</tr>
<tr>
<td>01064</td>
<td>27-JUL-2010</td>
<td>150.71</td>
<td>27-JUL-2010</td>
</tr>
<tr>
<td>01064</td>
<td>28-JUL-2010</td>
<td>150.71</td>
<td>28-JUL-2010</td>
</tr>
<tr>
<td>01064</td>
<td>29-JUL-2010</td>
<td>150.71</td>
<td>29-JUL-2010</td>
</tr>
<tr>
<td>01064</td>
<td>30-JUL-2010</td>
<td>150.71</td>
<td>30-JUL-2010</td>
</tr>
</tbody>
</table>

Links to quality codes and data processing annotations made during the QA process are located at the bottom of the listing.

The “Multiple Daily Values Per Row” format (not shown) provides for multiple simultaneous time series values to be displayed on the same row (date/time stamp). Users can chart multiple time series in the browser or, with some additional manual effort, the user may graph multiple time series on the same graph in Excel.

SHEF .E Format (not shown) provides data in Standard Hydrologic Exchange (SHEF) .E Format. SHEF has been developed jointly by the National Weather Service and U.S. Army Corps of Engineers, and is a documented set of rules for coding of data in a form for both visual and computer recognition.

South Florida Water Management District flow data is considered positive when flowing from the headwater station to tailwater station. Headwater and tailwater stations typically are named with _H and _T suffixes respectively. The Google Earth interface shows relative locations of headwater and tailwater stations and is therefore helpful in determining the compass direction for which flow is considered positive. Positive flow direction for data from other agencies may need to be confirmed with the respective agencies. For instance, the USGS NWIS database may have more complete station descriptions than what is in DBHYDRO.
The user can also run special statistical summary reports as follows:

- Duration Curve, Histogram, and Cumulative Distribution
- Daily Norms
- Month-by-Month Summary
- Composite Monthly Summary
- Year-by-Year Summary
- Period of Record Summary
- Maximum and Minimum Values and their Dates

Charts of the duration curve, histogram, and cumulative distribution statistical analyses can also be generated by selecting the corresponding report format, as exemplified in the following graphs, respectively:
Below is an example of the Composite Monthly Summary:

After clicking on the Submit button the following report is generated:

This report can be useful to detect seasonal trends in the data.

The user is encouraged to examine all the available formats and outputs in order to customize for specific reporting needs.
Batch Mode

Checking “Batch” as the “Run Mode” on the Query Date Selection page allows the user to retrieve large data sets in an off-line manner. Any retrieval that takes longer than five minutes to run interactively will be subject to a standard time out by the system and will need to be run as a batch submittal. Most batch jobs are executed immediately.

As shown in the above example, batch jobs will be received by entering the user’s email address and clicking the “Submit” button.
The user will receive a confirmation that the user’s request was received (as exemplified below). Importantly, the user should record the data request id in the event of a problem with email notification or file download.

The user will receive an email similar to the following:

From: datamgmt
Sent: Thursday, March 28, 2013 9:56 AM
To: Doe, John
Subject: DBHYDRO batch request 3098530

Your data request 3098530 is processed and ready for download.
Your search criteria for this request was:
Enter value for request_id: 3098530

start_date : 20070101
end_date : 20080930
dbkey : 00319
station : s5a%
category : SW

Please click on hyper link below to get your file.
http://my.sfwmd.gov/dbhydro_files/dbhydro_3098530.zip

The email will contain a hyperlink that will allow the user to download the file via FTP when the data request is complete. If the user’s email is not received within 60 minutes, then District staff should contact the SFWMD IT Help Desk at 561-682-6080. Non-
District users may contact DBHYDRO Technical Support staff at 561-686-8800 ext. 4594.

The user’s file may have been created and be waiting for the user to download it. The user may have success downloading the file by editing the standard download URL by entering the user’s data request ID immediately before the .zip: e.g., http://my.sfwmd.gov/dbhydro_files/dbhydro_3098530.zip
Groundwater Data

Checking "Groundwater" from the main menu leads to the following screen:

![Groundwater Data Screen]

The search parameters for groundwater data vary only slightly from surface water data search parameters.
WQ Sondes (Continuous) Data

Checking the “WQ Sondes” check box from the main menu takes the user to the following page:

Data from continuously deployed water quality probes (sondes) are accessed here. These data are also accessible from the “Water Quality Data” menu → “Deployed Sonde Data”, or the user can query by station or site name.
Water Quality Sample Data

These data are from field and/or laboratory analyses of water samples, biological tissue, sediments, or other environmental samples. Data are approved, quality-assured data that may be published.

Checking "Get Sample Data" from the main menu leads to the following screen:

Most water quality queries have similar characteristics, so the interface for water quality has been designed to facilitate the most frequently encountered queries.

A “Deployed Sonde” option is available for access to continuously measured water quality parameters (sondes), providing a user interface similar to that of Hydrologic and Physical Data.

The Lab Data On-Line Environmental Chemistry Analyst System (OLECAS) is available to network-authenticated users for reports on recently analyzed data and its comparisons to historical trends. OLECAS can help detect anomalies in data that may be investigated timely for possible analytical rework before the sample holding time expires. Holding times are the length of time a sample can be stored after collection without significantly affecting the analytical results.
A typical project-based query is described below. Clicking on “Project” from the water quality menu leads to this screen in which the user can type in a project code, OR select one or more project codes from the list of values and then click on the “Next” button.

Hint: Click on any item in the list. Then, quickly type the next letters of the project code and the cursor will “jump” to that item in the list. This “jumping” feature is common to all lists and is helpful if only the leading portion of the text is known.
A list of all the stations for which data has been collected under the given project(s) is provided. Stations of interest may be selected. The user then clicks on the “Next” button.
Data can be filtered by test name (and associated test number), collection method, and matrix. The user will need to provide a date range for the query. [Note that the begin date of 1950 serves as a placeholder to ensure the entire period of record will be retrieved by default.] The user then clicks on the “Next” button.
The user will then click on “Full Report (all attributes)” from the list of available reporting types:

![DBHYDRO Browser User's Guide](image)

Note: “Full Report” includes both sample-level and result-level comments. To exclude data flagged for exclusion in some mandated agency reports check the box for “Exclude Flagged Data”. To exclude field quality control data check the box “Exclude Field Quality Control Data”. Refer to the appendices for definitions of all columns displayed in the full report.
Subsequently, the following report is returned to the user’s web browser:

![DBHYDRO Browser User's Guide](image)

The following report is returned to the user’s web browser:

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Station ID</th>
<th>Sample ID</th>
<th>First Trigger Date</th>
<th>Collection Date</th>
<th>Sample Type/M</th>
<th>Collection Method</th>
<th>Depth/M</th>
<th>Test Number/Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1BC</td>
<td>A10300</td>
<td>0002</td>
<td>03-FEB-1989 12:00</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0011</td>
<td>10-FEB-1989 10:15</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0018</td>
<td>15-FEB-1989 11:15</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0118</td>
<td>24-FEB-1989 13:17</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0002</td>
<td>03-MAR-1989 13:15</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0102</td>
<td>09-MAR-1989 12:40</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0049</td>
<td>15-MAR-1989 11:15</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0140</td>
<td>21-MAR-1989 10:35</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0149</td>
<td>04-APR-1989 12:30</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
<tr>
<td>A1BC</td>
<td>A10307</td>
<td>0177</td>
<td>13-APR-1989 09:30</td>
<td>SAMP G</td>
<td>0.06 SW</td>
<td>23</td>
<td>RR1</td>
<td></td>
</tr>
</tbody>
</table>

Definitions for the report columns are provided in Appendix A. Codes for remarks, validation level, sampling purpose, and data investigation are available via hyperlinks at the bottom of each report.

Other water quality searches work in a similar manner.

Selecting a file for output, rather than displaying results on the screen, is useful for large data sets. The fixed-format file and comma-delimited file (.csv) options are useful for importing into a spreadsheet application, while the .pdf file output can be used for distributing read-only versions.

Each station visit (indicated by date collected) is considered a “trip”. A single trip may involve the collection of one or more samples (sample ids). Each sample may be analyzed for one or more analytes (test names/test numbers).

Cross-tab reports exclude qualifiers. **Users do so at their own peril.**

The Station Summary Report provides period of record statistics based on a number of assumptions and criteria. These assumptions and criteria are as follows:
1) Flagged data and field quality control (QC) data are filtered out always. Flag must be null. Sample_type_new must be ‘SAMP’.
2) The report only considers results for samples collected on or after January 1, 1991; the implementation of Data Validation in Florida Administrative Code 62-160.
3) The report applies a conservative philosophy to the statistical summaries. The approach is conservative, that is to possibly bias the resulting statistical quantity toward a greater (larger) value by having no statistical treatment of values below detection. In a sample population if we have two results say: 0.5 being below detect and 0.1 not below detect, the MIN will be reported as <0.5 here not 0.1 because <0.5 could be less than 0.1 also. This is what we mean by being conservative. Some analysts like to use one half of the MDL when a value is below detection. In this report here the MDL itself is used.

SFWMD stores values below detection as -1*MDL (a rather unique practice but it is the present state). The remark code U also tells us the result was below detect. In some rare cases there is no U in the remark code and the value is less than the MDL. Test numbers 65, 256, 258, 319, and 978 can have legitimate values below zero so they are treated as exceptions.

Logic for MIN of a sample population:
Excluding the test numbers 65, 256, 258, 319, and 978, if the sign of the value of minimum magnitude is negative it means the minimum value is below detection, therefore prefix it with '<' sign. Use the absolute value of the least negative (closest to zero) result. For test numbers 65, 256, 258, 319, and 978 simply use the minimum.

Logic for MAX of the sample population:
Excluding the test numbers 65, 256, 258, 319, and 978, if the sign of the value with maximum absolute value is negative it means the maximum value is below detection, therefore prefix it with '<' sign. Use the absolute value of the least negative (closest to zero) result. For test numbers 65, 256, 258, 319, and 978 simply use the minimum.

Logic for AVG (MEAN):
Excluding the test numbers 65, 256, 258, 319, and 978, if the sign of the minimum value in the sample population is negative or the remark code has a 'U' it means the resulting summary is affected, therefore prefix it with '<' sign. Use the AVG of the absolute values. For test numbers 65, 256, 258, 319, and 978 simply use the AVG.

Logic for STDDEV:
Do not give extra consideration to BDL data. Without further knowledge of the distribution one cannot imply the standard deviation. Standard deviation uses only the value.

Logic for MEDIAN:
Excluding the test numbers 65, 256, 258, 319, and 978. Use median of absolute values. The floor and ceiling records are defined as the record(s) in the middle of the ordered sample population. The floor record and ceiling record may have to be interpolated between and this is taken care of by the MEDIAN function. If either the floor or ceiling record, or both, is BDL the median value should have a '<' (less than sign) prefixed. For test numbers 65, 256, 258, 319, and 978 simply use the median.

NBDL
Keep track of the number of values below detection by counting values < 0 or containing U in the remark code except for test numbers 65, 256, 258, 319, and 978.
MDL STATEMENT
Identify a change in MDLs by comparing the min mdl to the max mdl. If not equal it means mdls varied thru time or one or more reported mdls was null. If min and max MDL are equal then mdls were the same for all results. If MDLs changed thru time it implies our methods changed and typically methods get more precise thru time. Users are directed to retrieve the actual results to see the details of how MDLs changed thru time.

MDLs_USED
Lists the various MDL's used in the sample population (including null when the MDL cannot be determined).
Hydrogeologic Data

Clicking on the “Get Data” button from the Hydrogeologic Data main menu takes the user to the following page:

While the search parameters look similar to those in the Groundwater Data menu, queries under Hydrogeologic Data direct the user to well construction specifications as well as geophysical, hydraulic, lithologic, and multimedia data.

Once the user has chosen the search criteria, the browser directs the user to a page that displays that criteria and allows the user to submit or save the user’s parameters to a file.

Use of aquifer as a criterion will result in exclusion of hydrogeologic information from wells that do not have monitoring. Use with care. Consider using a range of total depths instead.
In the example below, a query was done to select all wells in Palm Beach County with total depths between 300 and 400 feet.

The user can check “County” and “Total Depth” as the search parameters, and then click on the “Submit” button.
The next screen allows the user to select the specific county or counties and specify the range of total depth.

Then, the user clicks on the “Submit” button to proceed to the Output Parameters Selection screen.
This screen allows the user to select the report format and output.

In this example, the Location Details report is chosen.
The report for “Output Format” “Location Details” (shown below) returns a table with names, locations, and hyperlinks for construction and multimedia data when available.

The Location Details report is wide and users may have to scroll to the right to view links to screen, and multimedia information. There is also a link to an associated map. Multimedia may include any kind of document (.pdf, .doc, .xls, etc…) including scanned field notes, driller reports and logs, photographs, ftp links, and links to other web sites.
The “Well Construction Details” report for the “Output Format” option on the “Output Parameters Selection” screen, as shown previously on page 44, offers a different display format and shows casing and screen details when they are available, instead of showing links only. The screen detail section of this report includes links to monitoring data.

Both the “Well Construction Details” and the “Location Details” options have links to multimedia data when available.
The Hydrogeologic Data Summary Report (below) shows all the different types of data available for each well appearing in the query. The Hydrogeologic Data Summary Report format provides highlighted links to the different data types offered in the hydrogeologic section of DBHYDRO.

The link to Time Series data is visible when the user scrolls to the right (screenshot shown below). This link brings up a list of all the time series data available for this station including water quality and hydrologic data.
If lithologic details are available, clicking on the “Yes” link under Lithologic data type produces a detailed lithologic description as shown below (e.g., Station W-12425). This information can be saved to a text file (save as .txt) through the web browser file menu.

<table>
<thead>
<tr>
<th>Min. Depth (feet)</th>
<th>Max. Depth (feet)</th>
<th>Primary Rock</th>
<th>% Primary Rock</th>
<th>Primary Color</th>
<th>Induration</th>
<th>% Porosity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>DARK YELLOWISH ORANGE</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>30</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>DARK YELLOWISH ORANGE</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>45</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>60</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>80</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>100</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>125</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>150</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>135</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>140</td>
<td>SAND [QUARTZ]</td>
<td></td>
<td>YELLOWISH GRAY</td>
<td>UNCONSOLIDATED</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Clicking on the Hydrogeologic Data Summary Report “Yes” link under the Geophysics data type takes the user through a series of screens that allow the user to create a file in Log ASCII Standard (LAS) format. LAS is a standard file format, created by the Canadian Well Logging Society, to store wellbore log information. Well logging is used to characterize subsurface stratigraphy in a wellbore.

Common curves found in a LAS file include gamma ray logging, sonic logging, or resistivity logging.

Files are delivered in a compressed (.zip) format.
Clicking on the Hydrogeologic Data Summary Report “Yes” link under the Hydraulic data takes the user to a screen showing the aquifer characteristics, test details, and analytical methods employed for any aquifer performance tests associated with the well.
Access by Station Name

Clicking on the "by Station" link from the DBHYDRO Browser main menu brings up the following screen:

On this screen the user can enter the name of the station the user wishes to query. The percent sign (%) can be used as a wild card if the user is unsure of the exact station name. The user may alternatively query by entering latitude-longitude or X-Y coordinates (Note: The SFWMD uses the Florida state plane (feet) NAD83East Zone coordinate system).
In the example below, the query “T%” was entered, yielding the following results:

<table>
<thead>
<tr>
<th>Get Date</th>
<th>Station</th>
<th>Site</th>
<th>Type</th>
<th>Latitude (degrees-minutes-seconds)</th>
<th>Longitude (degrees-minutes-seconds)</th>
<th>X Coord (ft)</th>
<th>Y Coord (ft)</th>
<th>County</th>
<th>Section</th>
<th>Township</th>
<th>Range</th>
<th>Show Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-1</td>
<td>METLAND</td>
<td>39</td>
<td>METLAND</td>
<td>082121.323</td>
<td>803219.175</td>
<td>086622.311</td>
<td>722883.33</td>
<td>Broward</td>
<td>CONSERVATION AREA 2A</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-10G</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251324.435</td>
<td>802657.211</td>
<td>840078.889</td>
<td>825846.17</td>
<td>Miami-Dade</td>
<td>TAYLOR SLOUGH</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-28</td>
<td>CANAL</td>
<td>21</td>
<td>CANAL</td>
<td>251767.425</td>
<td>802637.209</td>
<td>839970.099</td>
<td>80193.744</td>
<td>Miami-Dade</td>
<td>BS1</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-15</td>
<td>5197</td>
<td>32</td>
<td>5197</td>
<td>251794.426</td>
<td>802637.209</td>
<td>839998.019</td>
<td>840004.375</td>
<td>Miami-Dade</td>
<td>BS1</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-2</td>
<td>METLAND</td>
<td>39</td>
<td>METLAND</td>
<td>251436.811</td>
<td>803336.898</td>
<td>790338.226</td>
<td>822995.046</td>
<td>Miami-Dade</td>
<td>TAYLOR SLOUGH</td>
<td>2</td>
<td>58</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-27</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251656.427</td>
<td>802637.21</td>
<td>839999.735</td>
<td>843228.249</td>
<td>Miami-Dade</td>
<td>C-111 COASTAL</td>
<td>20</td>
<td>59</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-2</td>
<td>METLAND</td>
<td>39</td>
<td>METLAND</td>
<td>252451.052</td>
<td>803546.138</td>
<td>789641.802</td>
<td>903983.372</td>
<td>Miami-Dade</td>
<td>TAYLOR SLOUGH</td>
<td>2</td>
<td>58</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-27</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251924.42</td>
<td>802637.208</td>
<td>83992.489</td>
<td>904517.746</td>
<td>Miami-Dade</td>
<td>BS1</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-15</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251608.438</td>
<td>802637.21</td>
<td>84001.43</td>
<td>840041.076</td>
<td>Miami-Dade</td>
<td>C-111 COASTAL</td>
<td>29</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-15</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251517.418</td>
<td>802637.207</td>
<td>839991.367</td>
<td>822598.049</td>
<td>Miami-Dade</td>
<td>BS1</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-45</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251549.429</td>
<td>802637.21</td>
<td>840021.87</td>
<td>337877.053</td>
<td>Miami-Dade</td>
<td>C-111 COASTAL</td>
<td>29</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-28</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>252108.416</td>
<td>802637.207</td>
<td>83988.78</td>
<td>270464.638</td>
<td>Miami-Dade</td>
<td>BS1</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-55</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251516.43</td>
<td>802637.21</td>
<td>840031.142</td>
<td>351513.334</td>
<td>Miami-Dade</td>
<td>C-111 COASTAL</td>
<td>23</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-63</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>25248.431</td>
<td>802637.21</td>
<td>840099.831</td>
<td>332525.78</td>
<td>Miami-Dade</td>
<td>C-111 COASTAL</td>
<td>32</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-70</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251432.432</td>
<td>802637.211</td>
<td>840056.52</td>
<td>822499.24</td>
<td>Miami-Dade</td>
<td>FLORIDA KEYS</td>
<td>2</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-55</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251392.413</td>
<td>802637.211</td>
<td>840098.208</td>
<td>286872.704</td>
<td>Miami-Dade</td>
<td>FLORIDA KEYS</td>
<td>2</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-2</td>
<td>FACILITY</td>
<td>32</td>
<td>FACILITY</td>
<td>644103</td>
<td>802236</td>
<td>802046.814</td>
<td>65466.425</td>
<td>Palm Beach</td>
<td>S 5A</td>
<td>32</td>
<td>43</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-2</td>
<td>FACILITY</td>
<td>32</td>
<td>FACILITY</td>
<td>644103</td>
<td>802236</td>
<td>802046.814</td>
<td>65466.425</td>
<td>Palm Beach</td>
<td>S 5A</td>
<td>32</td>
<td>43</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-2</td>
<td>FACILITY</td>
<td>32</td>
<td>FACILITY</td>
<td>644103</td>
<td>802236</td>
<td>802046.814</td>
<td>65466.425</td>
<td>Palm Beach</td>
<td>S 5A</td>
<td>32</td>
<td>43</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-2</td>
<td>METLAND</td>
<td>39</td>
<td>METLAND</td>
<td>251409.273</td>
<td>803601.619</td>
<td>788058.36</td>
<td>888790.044</td>
<td>Miami-Dade</td>
<td>TAYLOR SLOUGH</td>
<td>11</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-10G</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251256.417</td>
<td>802906.215</td>
<td>82497.469</td>
<td>82956.582</td>
<td>Miami-Dade</td>
<td>FLORIDA KEYS</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
<tr>
<td>11-15G</td>
<td>CANAL</td>
<td>31</td>
<td>CANAL</td>
<td>251228.418</td>
<td>802906.215</td>
<td>826518.273</td>
<td>31819.68</td>
<td>Miami-Dade</td>
<td>FLORIDA KEYS</td>
<td>1</td>
<td>50</td>
<td>Google Map</td>
</tr>
</tbody>
</table>

Each of the station names is hyperlinked to information about that station (see example shown in Section 2.0, Menu-Based Data Access). The user can retrieve data by station through this screen by selecting desired stations and clicking on the “Get Time Series Data” button at the bottom the page for each station of interest.
Access by Site Name

Sites represent a collection of stations. Therefore, the user can gain access to a group of related stations by querying a single site. With this relationship, the site listing will always be shorter than the station listing. Clicking on the "by Site Name" link from the DBHYDRO Browser menu brings up the following screen:

Like the station query screen, on the Site Listing query screen the user can enter the name of the site the user wishes to query, or the user may query by entering latitude-longitude or X-Y coordinates. The percent sign (%) can be used as a wild card if the user is unsure of the exact station name.
In example below, the query “T%” was entered, yielding the following results:

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Site Type</th>
<th>Site Group</th>
<th>Site Priority</th>
<th>Contact Authority</th>
<th>Site Status Code</th>
<th>Site Status Date</th>
<th>Rec Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>16-OC-2001</td>
<td>TAFT PROPERTY NEAR ORLANDO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAFT</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>18-FEB-1992</td>
<td>TAFT INFLOW TO TIFT DRAINWELL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAILF0W1</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAILF1-M1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAILEX</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAILF1-M1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAILC22</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAILF1-M1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM133</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM1B</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM2B2</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM2B3</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM2B4</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM2B5</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM2B6</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAMIRG</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM10R</td>
<td>3</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM11R</td>
<td>3</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM115</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM12M</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM17</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM23</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM36</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM1K</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM1K5</td>
<td>2</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAM37</td>
<td>1</td>
<td>A</td>
<td>01-01-1900</td>
<td>A</td>
<td>01-01-1900</td>
<td>TAMIM CANAL ABOKE 3-33 MB MIAMI BE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Like the station query, each of the site names is hyperlinked to information about that site (see example shown in Section 2.0, Menu-Based Data Access). The user can retrieve data by selecting desired sites and clicking on the “Get Time Series Data” button at the bottom the page for each site of interest.
Access by Hydrologic Basin

Station data can be also accessed by clicking on the “by Hydrologic Basin” link on the DBHYDRO main menu. Basin listings are arranged by alphanumeric grouping, or a basin name can be manually entered.

In this example, the “B” basin grouping was selected, followed by selection of basin name BOGGY CR:
The time series listing is displayed below for all basin BOGGY CR data.
Real Time Data

Click on the “Real Time Data” link from the main menu. This option is presently only available for users whose login credentials have been authenticated on the SFWMD computer network. If the user is a SFWMD employee and the Real Time Data option does not appear, click on the “Login” hyperlink on the user’s page footer.

[SFWMD real time data can also be accessed from www.sfwmd.gov  Science & Data  Real-Time Data. Real-time weather data can also be accessed from Science & Data  Weather]

Real time stages and water control structure operations data are available. For example, to query real time data at the S-155 spillway, check “Site Name” as the user’s search parameter, and click on the “Submit” button.
The user then clicks on site S155 from the list of values and clicks on the “Submit” button.

Subsequently, the user checks off the time series of interest and clicks on the “Get Data” button.
There are six preset date range options. The user may also specify a custom date range. The user selects “Today and previous 2 days” from the Date Range pull down, clicks “Chart” on the “Destination” button, and clicks on the “Submit” button.
A hydrograph with current data is generated and displayed:

This graph shows stage (water levels) and gate openings for the current day and previous two days. The tabular view of this data (One Value Per Row) indicates dates after which each time series is provisional. Provisional data have not yet undergone standard and accepted review procedures.
Virtual Globe Access Using KML

This interface is scheduled for retirement. Users are encouraged to become familiar with the Web Map interface.

Environmental data are geospatial by nature. Accessing such data via maps is more intuitive for many. Google Earth is one such geospatial interface. To access DBHYDRO data using Google Earth, non-District users must first download the free Google Earth software from [http://www.google.com/earth/download/ge/](http://www.google.com/earth/download/ge/) (Note that this access method assumes the user has knowledge of Google Earth software). ArcGIS Earth from Esri is another such free tool. ArcGIS Earth is downloadable from [http://www.esri.com/software/arcgis-earth](http://www.esri.com/software/arcgis-earth).

Access via Google Earth is provided via this URL: [http://my.sfwmd.gov/KMLEXT/CUSTOMKMLS/DBHydro/DBHydroKML/DBHYDRO_KML.kmz](http://my.sfwmd.gov/KMLEXT/CUSTOMKMLS/DBHydro/DBHydroKML/DBHYDRO_KML.kmz).

Users should choose “Open” when prompted as shown below:
If Google Earth is installed opening the .kmz file will start Google Earth and present the user an initial view of the monitoring network as shown below.

If Google Earth fails to launch, the user may save the .kmz file to the user’s computer and then drag it into an open Google Earth window.

For best performance, after loading of the DBHYDRO Environmental Monitoring placemarks, the user should first zoom to a specific area of interest then turn on placemarks on the map. Turning on all the placemarks while zoomed out will result in longer page re-display times and a cluttered screen.

These placemarks are loaded into the “Temporary Places” section of Google Earth as Environmental Monitoring and, if prompted, should be discarded upon exiting Google Earth.
In the example below, the map view is zoomed into eastern Palm Beach County. The “Active Flow” placemarks are selected. The placemark identifies the database station corresponding to the S-155 spillway.
Clicking on the “Show Station Information” link leads the user to the station information screen, as discussed in *Section 2.0, Menu-Based Data Access*. The map interface is an alternative way to access to the same DBHYDRO data without navigating through the main DBHYDRO menu pages.
SFWMD watersheds may be added to a Google Earth session by clicking on this hyperlink:
http://my.sfwmd.gov/KMEXT/CUSTOMKMLS/DBHydro/Watersheds/SFWMDWatersheds.kmz

The watershed boundary places pane may be expanded to identify each watershed. By default, the watershed boundaries are turned on.

The watershed labels may be turned on and off as a distinct layer. By default, the watershed labels are turned off.

These watersheds correspond to the “basin” attribute defined for each DBHYDRO station.
Web Map Access

This option is available to all users from the main menu.

At the bottom of the map are the “widgets” to perform specific functions:
Legend Widget

The Legend widget displays the legend for layers that are both visible and in scale. Therefore, the legend is dynamically configured based on what is viewable at the moment.

Legend Widget

Monitoring Stations

Active Hydrometeorologic Stations
- Well
- Flow
- Stage
- Rain
- Weather

Active Water Quality Stations
- Birds
- Fish
- Groundwater
- Sediment
- Surface Water Grab
- Autosampler
- Logged
- Other
The Layer List Widget

The Layer List widget controls which layers are turned on and off. All checkboxes in a layer hierarchy must be checked for that lowest level layer to be visible. Arrows pointing to the right indicate there is additional information to be displayed; either another sub-layer or the symbol for that layer. Each layer has their own visibility scale defined so all layers may not visible at all map scales.

From the image below we see how the Legend List only shows the symbols for the map layers visible.

Selecting a station, by clicking on its symbol on the map, displays a pop-up with information about the station and a link to its data.
Search Widget

The Search widget allows the user to find a station or site based on its name, a structure by name, a NEXRAD cell by Feature Id, a waterbody by name, a watershed by name, a canal by name (or alias) or a county by name. In the example below the choice of the C-6 watershed zooms the map to the watershed, highlights its boundary, and shows all the features turned on and revealed at that scale.
Print Widget

The Print widget provides the capability to save a quality map in a number of formats including PDF and JPG and then print it. Map title, author, and copyright are configurable as are image resolution, size, and extent. Layouts such as portrait or landscape and paper size can be selected from several choices.
Basemap Gallery Widget

The Basemap Gallery widget allows the user to choose from 13 basemaps including imagery. The default basemap is Imagery. Some users find topographic useful. It is easy to switch among basemaps with the basemap widget.
Measure Widget

The Measure widget allows the user to capture point location information and measure both linear distances and areas in a variety of measurement units.
Add Data Widget

The Add Data widget provides the ability to add:
- ArcGIS Online content,
- ArcGIS Server Web Service, services,
- or your own data files to the map.

You can drop or browse for one the following file types:
- a Shapefile (.zip, ZIP archive containing all shapefile files),
- a CSV File (.csv, with address or latitude, longitude and comma, semi-colon or tab delimited),
- a GPX File (.gpx, GPS Exchange Format), or
- a GeoJSON File (.geo.json or .geojson).

A maximum of 1000 features is allowed.
Draw Widget

The Draw widget provides the ability to mark-up the map with points, lines, shapes, and text. Mark-ups are printed when using the Print widget.

Note: The Print widget might want to print layers that are checked but not visible at the present scale.

Please turn off all layers, and their parents, explicitly that you do not want printed before using the print widget.
Save Session Widget

The Save Session widget allows you to save your map. Open the widget and type the name you wish to give the session then click Save. The current map settings are saved. You may save multiple sessions.

You have the option to Save all sessions to your computer. Click Save to File and browse to your desired location.

If you want to open a file click on Load from file and browse to that location.

To edit the session name click on the pencil icon.

To delete the session from the list click on the Delete icon.

To bring a particular saved map into view click on the desired session within the list of saved sessions and click on Load Map.

To recall a previously saved session, select Load from file. Browse to your location. Locate the .zip file. Unzip the file using a program such as WinZip or 7-Zip. Locate the file within the .zip named session.json. Extract session.json to the current directory. This file contains your saved map. Select the file. Open the file. The file was added to your map. Click OK.
Attribute Table Widget

Shorten the list by filtering by the map extent

The number of features in the table is displayed here
Data Processing and Validation Utilities

This option is available on the SFWMD intranet only.

The system in which QA/QC is performed on SFWMD instrument readings is the Data Collection/Validation Preprocessing (DCVP) system. The utilities on this menu are primarily used by District staff that performs QA/QC on instrument readings prior to data archival in DBHYDRO.
Interval Value Generator

Clicking on the “Interval Value Generator” link brings the user to the following screen:

The Interval Value Generator (IVG) program allows the user to generate summarized statistical information from any individual or group of individual DCVP station_ids. Each DCVP station_id is a set of readings from a single sensor or device. The DCVP use of the term “station” is distinct from that used throughout DBHYDRO. One DBHYDRO station may contain multiple DCVP station_ids. IVG can be used to create mean daily values, maximum hourly values, minimum monthly values, etc. The user may define any date range of interest. IVG works with archived, provisional, and real time data. The output may be online or via batch jobs. Batch jobs will send an email notification when complete.
DCVP Station Id Listing

Returning to the Data Processing and Validation Utilities menu affords the user other options. The Data Collection Validation Preprocessing system station reference table may be accessed by clicking on the “DCVP Station Id Listing” link. The selection leads to this screen:

![DCVP Station Id Search Criteria](image)

The user may select all Station Ids (time series) starting with a given character or query by Station Id name (using the % as a wild card), application name (the processing method), parameter code, technician assigned to the station, site name, or agency from whom the data are received.
In the example below, entering the letter “T%” generates a list of all DCVP Station Ids beginning with the letter “T”:

![Station Reference Information Table]

There is an extensive list of DCVP Station Id attributes, several of which are hyperlinked to other related tables to provide additional information about the particular time series. For example, the user can find out the name of the person responsible for the validation of a particular SFWMD data set if there are any questions about the data.
ET Data and Radar-Based Rainfall Data


NEXRAD or Nexrad (Next-Generation Radar) is a network of high-resolution, S-band Doppler weather radars operated by the National Weather Service, an agency of the National Oceanic and Atmospheric Administration within the United States Department of Commerce. Its technical name is WSR-88D (Weather Surveillance Radar, 1988, Doppler). NEXRAD detects precipitation and atmospheric movement or wind. It returns data which when processed can be displayed in a mosaic map, which shows patterns of precipitation and its movement (http://en.wikipedia.org/wiki/NEXRAD, accessed April 5, 2013).

At the District, radar rainfall originates with National Weather Service data and is further gage-adjusted using measured rainfall amounts from the agency’s rain gage monitoring network. As such, this radar rainfall is also called gage-adjusted radar-rainfall (GARR). The application, also known as NEXRAD or NEXRAIN, has its own User’s Guide, which may be accessed from the bottom of the main screen (as shown above) to access the gage-adjusted radar-rainfall. Both map-based and text-based retrievals are available. Map-based retrievals result in thematic maps of rainfall amounts defined by the geographic layer of choice. Text-based retrievals result in data files that may be viewed or imported into other applications.
Further information about Doppler radar is available at http://www.srh.noaa.gov/jetstream/doppler/doppler_intro.htm.
Metadata/Reference Tables

Metadata includes descriptive information about the context, quality, and condition, or characteristics of the data. In the case of DBHYDRO, each of the attributes of a time series or a measurement is such metadata. The domains from which these attributes are drawn are accessible by clicking on the Metadata/Reference Tables option from the main DBHYDRO menu. Upon selection, the following DBHYDRO Metadata screen appears:

![DBHYDRO Metadata Screen]

Clicking on any one of the items displays an up-to-date list of valid values for that particular attribute.
Miscellaneous Items and Reports

The menu items, some limited to SFWMD internal use only, offer other web resources that also may be helpful to users.

New and Discontinued Data Sets
District Daily Rainfall Report
Hydrogeologic Data Loader
Water Budget
Nutrient Load
Vicinity Search
New and Discontinued Data Sets

New data sets are continually added to the database. Monitoring may also be discontinued or changed from one method to another. This feature provides information on such additions or changes to the database.

Clicking on the “New and Discontinued Data Sets” link results in the screen below:

Users may choose from various report types, disciplines, and date ranges of interest. The following screen displays the results of a query of newly created data sets in the surface water discipline:

By clicking on “Other Data Sets at Station” link on the last column at the right side of this data query screen, the user can view what other time series are or have been measured at the station of interest.
All the “headers” for each of the time series at the selected station are displayed:
District Daily Rainfall Report

Several tabbed interfaces to District-wide rainfall data and other web-based climate resources from the “District Daily Rainfall Report” link from the “Miscellaneous Items and Reports” menu are available via this page.
Hydrogeologic Data Loader

The “Hydrogeologic Data Loader” link under the “Miscellaneous Items and Reports” menu is a specialized interface for SFWMD data stewards or other authorized personnel to perform bulk transfers of hydrogeologic data into DBHYDRO.
Water Budget

The “Water Budget” function from the “Miscellaneous Items and Reports” menu is available on the SFWMD intranet only.

The primary purpose of this program is to provide comprehensive water budget information for Everglades Stormwater Treatment Areas (STAs). However, the program can be used to develop a water budget for any water body, where daily data are available from DBHYDRO. The program is capable of performing calibration of water budgets for STAs and also for each cell within an STA. The water budget application has its own User’s Guide, which is accessible from the water budget application menu.
Nutrient Load Computation Application

The “Nutrient Load” function from the “Miscellaneous Items and Reports” menu is available to SFWMD staff on the intranet only.

Key features of the nutrient load application include the ability to calculate loads based on flow time series and water quality concentration time series pairings. The outputs of these calculations are not presently stored in DBHYDRO. The nutrient load application has its own User’s Guide, accessible from the application’s menu.
Nearby Station Look-up

By clicking on the “Vicinity Search” link from the “Miscellaneous Items and Reports” menu, the user can find out which stations are near a given station or coordinate. A variable distance in miles may be entered. The output list may be further filtered by discipline and even further by data type.

After clicking on the “Submit” button, a list of stations within the previously specified distance is displayed.
3.0 URL-BASED DATA ACCESS

Web Services

If a user frequently accesses a specific DBHYDRO page, the URL can be saved as a browser bookmark or in any document or other web page as a hyperlink. By embedding these hyperlinks in bookmarks or applications, the user can avoid having to navigate through the DBHYDRO menu or Google Earth.

Users have the ability to create their DBHYDRO URLs by knowing the URL syntax.

Note of caution: A valid URL cannot contain a space. What may appear as spaces (“ ”) in these URL examples are actually underscores (“_”).

Extra note of caution: These URLs may change in the future. In such case, this documentation will be updated.

There are four kinds of DBHYDRO URLs:
- water quality results
- hydrologic instantaneous and daily values
- hydrographs
- hydrogeologic summaries

Water Quality Results URLs

Water quality data access is controlled by:
1) A base URL
2) a series of URL variables with their corresponding values

<table>
<thead>
<tr>
<th>URL variable</th>
<th>Definition</th>
<th>Valid Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>v_where_clause</td>
<td>a text string defining which data are to be retrieved and follows the syntax described in the examples below.</td>
<td>may contain references to project_code, station_id, sample_id, test_number, and date_collected.</td>
</tr>
<tr>
<td>v_target_code</td>
<td>controls the destination of the output.</td>
<td>screen (output as HTML to your browser) file_csv (a comma separated variable format that is Excel-ready) pdf (portable document format)</td>
</tr>
</tbody>
</table>
### URL variable | Definition | Valid Values
--- | --- | ---
**v_report** | used only with the cross-tab base URL and defines which type of cross-tab report to generate | *ctr_1_true* (cross-tab one line per sample)<br>*ctr_w* (cross-tab wide – also better than *ctr_1_true* when using a single test number but still not as complete as the full report)

**v_exc_qc** | This will exclude Field QC results; if not included in the URL, or set to N, the report will contain Field QC results. Optional. | N (default)<br>Y

**v_exc_flagged** | This will exclude Flagged data; if not included in the URL, or set to N, the report will contain flagged data. Optional. | N (default)<br>Y

### Examples

**Querying by Project Code**
The full report for water quality data that have not been flagged can be generated for any project_code (ACMEB in the example below) with the following URL:

```
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+project_code='ACMEB'&v_target_code=screen
```

The plus signs are interpreted as spaces because spaces are not allowed in a URL.

Note: The + signs, representing spaces, may alternatively be encoded as %20 to be properly interpreted by the web server.

**Querying by Station**
The report for water quality data that have not been flagged can be generated for any station (ORF-62 in the example below) with the following URL:

```
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id='ORF-62'&v_target_code=screen
```

**Querying for Multiple Stations**
The report for water quality data that have not been flagged is generated for multiple stations with the following URL:

```
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id+in+('ACRA1','ACRA2')&v_target_code=screen
```

The station list is enclosed by parentheses with each station in single quotes and separated by commas.

**Querying by Test Number**
Here is an URL for querying chemistry results for project ACRA and test numbers 7 and 25 (water temperature and total phosphorus):

```
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+project_code='ACRA'+and+test_number+in+(7,25)&v_target_code=screen
```
Querying by Date Range
The user can restrict date ranges. If the user wants to get data only after a certain date, add after “v_where_clause=where”, the following string:
+date_collected+>+'01-JAN-2010'+and+
as follows:
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+date_collected+>+'01-JAN-2010'+and+station_id+in+('ORF-62','ACRA1')&v_target_code=screen
The user may also use:
+date_collected+<+'01-JAN-2011'+and+
to get data only before a certain date.

Querying by Sample_id
Here is an URL for querying chemistry results having sample_id beginning with P35578:
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+sample_id+like+'P35578%25'&v_target_code=screen
This query may take a minute or more.

Querying Using Wild cards
To display the data for all stations beginning with the characters ACRAWEL:
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id+like+('ACRAWEL%25')&v_target_code=screen
Note: The % wild card character is encoded as %25 so it may be properly interpreted by the web server.

Saving Results to a .csv File
To write the results directly to a .csv file use a target_code of file_csv as shown here:
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+date_collected+>+'01-JAN-2010'+and+station_id+in+('ORF-62','ACRA1')&v_target_code=file_csv

Cross-tab reports exclude qualifiers. Users do so at their own peril.

The crosstab reports have a base URL than the full report and an additional variable v_report. The crosstab report syntax is:
http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_process?v_report=ctr_1_true&v_where_clause=where+test_number=25+and+date_collected+%3e=+'01-JAN-2014'+and+station_id+in+('LOX3')&v_target_code=screen

Note: The v_where_clause variable for water quality results has additional capabilities not documented here. If you find the capabilities described here insufficient please contact the District.
Hydrologic Instantaneous and Daily Values URLs

Hydrologic instantaneous and daily values data access is controlled by:
2) a series of URL variables with their corresponding values

<table>
<thead>
<tr>
<th>URL variable</th>
<th>Definition</th>
<th>valid value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>v_report_type</td>
<td>defines the layout of the report</td>
<td>format6 (one row per value)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>format7 (one row per day - valid for daily values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>only)</td>
</tr>
<tr>
<td>v_period</td>
<td>allows for a date range from today backward in</td>
<td>year (avoid instantaneous dbkeys, use dbkeys of</td>
</tr>
<tr>
<td></td>
<td>time or indicates user-defined explicit</td>
<td>frequency 'DA')</td>
</tr>
<tr>
<td></td>
<td>start and end dates</td>
<td>month (the past 30 days from today)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1week (the past 7 days from today)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3day (the past 3 days from today)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>today (for instantaneous, typically provisional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>data series)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>uspec (user required to specify both v_start_date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and v_end_date)</td>
</tr>
<tr>
<td>v_start_date</td>
<td>required when v_period=uspec</td>
<td>yyyyymmdd (e.g. 20110415) – only valid when</td>
</tr>
<tr>
<td>v_end_date</td>
<td>required when v_period=uspec</td>
<td>yyyyymmdd (e.g. 20110516) – only valid when</td>
</tr>
<tr>
<td>v_target_code</td>
<td>controls the destination of the output</td>
<td>screen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>file_csv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pdf</td>
</tr>
<tr>
<td>v_run_mode</td>
<td></td>
<td>onLine (required)</td>
</tr>
<tr>
<td>v_js_flag</td>
<td></td>
<td>Y (required)</td>
</tr>
<tr>
<td>v_dbkey</td>
<td>the id(s) for the time series</td>
<td>one or more dbkeys separated by ‘/’ (forward slash)</td>
</tr>
</tbody>
</table>

Example

A daily values tabular report is generated for any dbkey (in this example, the dbkey is 15631) and date range with the following URL:


Each input variable name, except for the first one, is preceded by the ampersand character and followed by the equals sign ("=").
Hydrographs URLs

Hydrographs generation is controlled by:
1) A base URL,
   http://my.sfwmd.gov/dbhydroGraph/servlet/DbhydroGraphServlet.do? and
2) a series of URL variables with their corresponding values

<table>
<thead>
<tr>
<th>URL variable</th>
<th>Definition</th>
<th>valid value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>v_report_type</td>
<td>defines the layout of the report</td>
<td>format6 (required variable but ignored....go figure!!)</td>
</tr>
<tr>
<td>v_period</td>
<td>allows for a date range from today backward in time or indicates user-defined explicit start and end dates</td>
<td>year (avoid instantaneous dbkeys, use dbkeys of frequency 'DA'), month (the past 30 days), 1week (the past 7 days), 3day (the past 3 days), today (best for instantaneous data series), uspec (user is required to specify v_start_date and v_end_date)</td>
</tr>
<tr>
<td>v_start_date</td>
<td>required when v_period=uspec</td>
<td>yyyymmd (e.g. 20110415) – only valid when v_period=uspec</td>
</tr>
<tr>
<td>v_end_date</td>
<td>required when v_period=uspec</td>
<td>yyyymmd (e.g. 20110516) – only valid when v_period=uspec</td>
</tr>
<tr>
<td>v_target_code</td>
<td>not applicable because 'screen' is the only option</td>
<td></td>
</tr>
<tr>
<td>v_dbkey</td>
<td>the id(s) for the time series</td>
<td>one or more dbkeys separated by ‘/’ (forward slash)</td>
</tr>
</tbody>
</table>

Examples

A hydrograph of the past 7 days of instantaneous near real-time values from the four gages contributing to the Lake Okeechobee daily average is generated as follows:

http://my.sfwmd.gov/dbhydroGraph/servlet/DbhydroGraphServlet.do?v_report_type=format6&v_period=1week&v_dbkey=IX846/IX865/IX875/IY030

Other options for the period for instantaneous data include ‘3day’ and ‘today’. Increasing the number of dbkeys and the duration will increase the time it takes to generate the graph. Multiple dbkeys are separated by the forward slash ( / ) character.

To generate a hydrograph of the past year of daily stage values from four water level gages on Lake Okeechobee, enter the following URL in the browser:

http://my.sfwmd.gov/dbhydroGraph/servlet/DbhydroGraphServlet.do?v_report_type=format6&v_period=year&v_dbkey=16022/12509/12519/16265
Each input variable name, except for the first one, is preceded by the ampersand character and followed by the equals sign (‘=’).

An error may be encountered if there are no data available for the specified period.

Note: If a $\times$ icon appears where the graph should be, refreshing $\mathbb{R}$ the user’s page may solve the problem. The F5 function key also refreshes the screen in Internet Explorer.

To ensure the user will retrieve the most up-to-date data, be sure to clear the user’s web browser cache prior to executing the same URL a second time within the same browser session. In Internet Explorer this is accomplished by accessing ‘Tools’ from the Internet Explorer menu.
Hydrogeologic Data Summaries

Hydrogeologic data summary pages are controlled by:

A base URL,

1) http://my.sfwmd.gov/dbhydroplsql/show_wilma_info.report_process?

and

2) a series of URL variables with their corresponding values

<table>
<thead>
<tr>
<th>URL variable</th>
<th>Definition</th>
<th>valid value(s)</th>
</tr>
</thead>
</table>
| v_output_format | defines the layout of the report                               | list
|                |                                                                  | header
|                |                                                                  | detail
|                |                                                                  | summary
|                |                                                                  | corresponding to the three format choices provided in the web browser application |
| v_station      | station name                                                    | One or more stations separated by the forward slash “/”. No wildcards are allowed here. |

Examples:

http://my.sfwmd.gov/dbhydroplsql/show_wilma_info.report_process?v_output_format=summary&v_os_code=win&v_station=LYTAL-TW
4.0 CONTACT INFORMATION

Application Enhancements

The District’s Enterprise Scientific Data Manager, Brian Turcotte (561-682-6579; bturcott@sfwmd.gov), is the primary point of contact to discuss or suggest areas for improvement. SFWMD employees may also call the IT Help Desk, send an email to the “IT Help Desk”, or log their own Remedy Help Desk requests or software bug reports.

Training

The SFWMD offers Introduction to DBHYDRO training. District employees interested in this course should contact their training coordinator to register and sign up for course number 50015360. Non-District individuals should contact Sharon Peterkin (561-686-8800 x4594; speterk@sfwmd.gov) to reserve a seat in a class.

Data Requests and Inquiries

The District’s Staff Environmental Scientist, Sharon Peterkin (561-686-8800 x4594, speterk@sfwmd.gov), is the primary point of contact to assist users in data acquisition, to report questionable data, or to route data inquiries to the appropriate data steward.
5.0 APPENDICIES

Appendix A - Water Quality Report Column Descriptions

PROJECT CODE
A short identifier given to a collection of samples from a group of related stations. The code identifies project-specific samples. The code is typically derived from the project description. e.g. "ENRP" is the project code for samples collected in the "Everglades Nutrient Removal Project". Codes are listed in the metadata/reference tables listings pages.

STATION ID
Identifies the sampling station name for the water quality data sample collection activity.

SAMPLE ID
Identifies a discrete sample within a project.

FIRST TRIGGER DATE
Populated for autosampler data. Date and time the first sample was triggered to be collected by the autosampler.

COLLECTION DATE
Date and time the sample was collected by the field person.

SAMPLE TYPE NEW
Code that describes the type of sample collected. Samples may either be an environmental sample (regular sample of type "SAMP") or a type of field quality control sample that is collected as a part of a quality assurance program. Codes are listed in the metadata/reference tables listings pages.

COLLECTION METHOD
The method by which the sample was collected. For example, ‘G’ means grab sample. Codes are listed in the metadata/reference tables listings pages.

DEPTH
The depth below the water surface at which the sample was taken.

DEPTH_UNITS
The units of measure of the depth value. Depth units depends on the matrix (e.g., meters for SW and feet for GW are defaults) and applies to both the sampling depth and the Total Depth (Total Depth as a test is reported as SDU, See Depth Units).

MATRIX
A code that represents the type of material being sampled. Codes are listed in the metadata/reference tables listings pages.
| TEST_NUMBER | Numeric code used to identify individual tests within the laboratory. e.g. 25 = TPO4 "Total Phosphorus".
| TEST NAME   | A description of the test performed.
| STORET CODE | The Environment Protection Agency (EPA) legacy 5-character string that uniquely identifies a water quality test.
| METHOD      | The field or laboratory method by which the sample was analyzed.
| MEASURE DATE| The date and time the laboratory analysis was conducted.
| VALUE       | Numeric field which contains the analysis result for a specific test.
| SIGFIG VALUE| The test result shown to no more significant figures than instrumentation actually provides.

**UNCERTAINTY**

The reporting of estimated analytical measurement uncertainty values for all analytes was implemented at the SFWMD Chemistry Laboratory in July 2012. The values entered into DBHYDRO for the District’s laboratory reflect only analytical uncertainty (i.e., without the contributions from field activities). The uncertainty has a probabilistic basis and reflects incomplete knowledge of the quantity. All measurements are subject to uncertainty and a measured value is only complete if it is accompanied by a statement of the associated uncertainty.

The uncertainty value in DBHYDRO has been estimated using the nested hierarchical methodology by Ingersoll (2001) in combination with a mathematical model found in the Eurachem/CITAC (2000) guide on uncertainty. This QC-based nested approach uses the statistical QC data attributed to laboratory measurement activities and does not include uncertainty attributed to field sampling activities. The estimated uncertainty is calculated using the following equation:

\[
u(x) = \sqrt{s_0^2 + (s_1^2x^2)}\]

in which:

- \(u(x)\) is the combined standard uncertainty in the result \(x\).
- \(s_0\) is a constant contribution to the overall uncertainty derived from the procedure to determine the MDL.
$s_1$ is a proportionality constant derived from nested hierarchical methodology by Ingersoll.

Many factors contribute towards deviation from the true value of the measurement including:

- Imperfections in the measuring instrument
- Imperfections in the measurement method
- Operator effects

**MDL**
Method Detection Limit. Is particular to each laboratory and is calculated based on statistical analysis of the results of repeated analyses of the same standard. "The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte....The MDL for an analytical procedure may vary as function of sample type. The procedure requires a complete, specific, and well defined analytical method. It is essential that all sample processing steps of the analytical method be included in the determination of the method detection limit." --- CFR Part 136 Appendix B (revised July 1998)

**PQL**
The smallest concentration of an analyte of interest that can be quantitatively reported with a specific degree of confidence. The practical quantitation limit IS verified for each matrix, technology and analyte. The validity OF the practical quantitation limit is verified by analysis of a quality control sample containing the analytes of concern. For any component for which spiking solutions or quality control samples are not available, the practical quantitation limit is 12 times the standard deviation that is derived from the procedure used to determine the method detection limit, or can be assumed TO be four times the method detection limit.

**RDL**
This value is the Reportable Detection Limit and is the lowest value the analyst has confidence reporting.

**UNITS**
Contains the units in which a test value is reported by the laboratory (SFWMD or contractor) e.g. micro g/L. Ideally, all units for a given test should be reported the same. When a lab gives us different units for a test it should trigger a review of the value so we make sure the data set is consistent with respect to units.
REMARK_CODE
Comprised of zero, one, or more data qualifiers as applied by the lab or project manager. The list of data qualifiers and their meaning, except for PMR and PMF, are approved by Florida DEP. Qualifiers are important factors that any data user should be aware of, and neglecting them is perilous and fails to recognize that they are the single most important tool for data validation. No one should ever use data without reviewing all of the qualifiers (and associated sample qualifier comments) very closely. Qualifier codes are listed in the metadata/reference tables listings pages.

FLAG
Indicates questionable data. eg. "EOV" Extreme Outlier Value based on historical statistics. Flag is <null> unless there is a "fatal" qualifier in the remark code. In such a case the flag is equal to the remark code or contains the value "yes".

RECEIVE DATE
The date the sample was received at the SFWMD laboratory from the field.

LIMS_NUMBER
Unique string generated by the laboratory at sample log in. Used to identify a discrete sample and all results for a sample. e.g. "L345-670"

SOURCE
Identifies the source laboratory of the sample data. e.g. "USGS" indicates data came from the United States Geological Survey.

OWNER
Typically the organization which paid for the analysis.

VALIDATION LEVEL
The degree to which post laboratory data validation occurred. Codes are listed in the metadata/reference tables listings pages.

VALIDATOR
The organization responsible for the post-laboratory validation of the data.

SAMPLING PURPOSE
Code that describes the reason the sample was collected. The purpose of the sample provides context for potential re-use of the data for other purposes.

DATA INVESTIGATION
Indicates whether the data have been subject to additional investigation subsequent to validation. Presence of the indicator helps prevent unnecessary re-investigations of data. Results of investigations are kept on file for future inquiries. Codes are listed in the metadata/reference tables listings pages.
TDEPTH
The total depth of the water column at the location of the sample. This column is a legacy of an older process. Currently total depth is recorded in the table as test (test_number = 99)

DCS
DCS is depth to consolidated substrate. Values are in meters.

SAMPLE TYPE
Two digit number for legacy applications. Information embedded here is contained explicitly in other columns. Indicates sample type e.g. 01=RAIN, 02=WELL. Rendered obsolete by sample_type_new column.

QCTYPE
A legacy code indicating sample is a QC sample otherwise null. e.g. EB = Equipment Blank. Rendered obsolete by sample_type_new column.

DISCHARGE
A code representing a visual observation of flow at the time of sample collection (required only when grab samples are collected). The observation is made from where the sampling personnel stand to collect the sample. There is no requirement to use any procedure to help in the determination of flow such as using sand or a dye to determine flow.
Valid codes are:
0 Undefined, no observation, no sample is collected or EB, FCEB and FB sample types (The code for discharge is recorded as a “0” for coastal sample collection, autosampler collection, rain sample collection, or if no observation is made).
1 Flow
2 No Flow
3 Reverse Flow

UP DWN STREAM
Indicates where a sample was collected with respect to a control structure. If downstream and flowing then higher turbidity may be expected. Codes are 0 = Undefined, 1 = Upstream, 2 = Downstream.

WEATHER CODE
The code for weather is recorded for grab sample collections only and must represent a visual observation of the ambient weather at the time of sample collection. Valid codes are:
0 Autosampler collection, rain sample collection, QC samples (EB, FCEB, and FB) or no observation is made
1 Clear Skies
2 Slight Overcast
3 Medium Overcast
4  Very Overcast
5  Drizzle (Note: measures must be taken to protect sample from contamination and must be documented)
6  Rain (Note: measures must be taken to protect sample from contamination and must be documented)

PROGRAM TYPE
Distinguishes routine monitoring data from experimental data.

NDEC
The number of digits to the right of the decimal place to be displayed in reports. NDEC is used by sigfig_value.
Appendix B - Unit Conversions

Length
1 meter = 3.281 feet

Area
1 acre = 43,560 square feet

Volume
1 cfs-day = 86,400 cubic feet
1 cubic foot = 7.481 gallons
1 acre-foot = 43,560 cubic feet
1 acre-foot = 325,900 gallons

Temperature
\[ ^\circ \text{Fahrenheit} = \left( ^\circ \text{Celsius} \times \frac{9}{5} \right) + 32 \]
\[ ^\circ \text{Celsius} = \left( ^\circ \text{Fahrenheit} - 32 \right) \times \frac{5}{9} \]
Appendix C - Unit Abbreviations/Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Unit of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>mg/L</td>
<td>milligrams per liter</td>
</tr>
<tr>
<td>ug/L</td>
<td>micrograms per liter</td>
</tr>
<tr>
<td>ng/L</td>
<td>nanograms per liter</td>
</tr>
<tr>
<td>g/cc</td>
<td>grams per cubic centimeter</td>
</tr>
<tr>
<td>uS/cm</td>
<td>microsiemens per centimeter</td>
</tr>
<tr>
<td>ug/kg</td>
<td>micrograms per kilogram</td>
</tr>
<tr>
<td>mm</td>
<td>millimeters</td>
</tr>
<tr>
<td>ft</td>
<td>feet</td>
</tr>
<tr>
<td>ft NAVD88</td>
<td>feet North American Vertical Datum 1988</td>
</tr>
<tr>
<td>ft NGVD29</td>
<td>feet National Geodetic Vertical Datum 1929</td>
</tr>
<tr>
<td>cfs</td>
<td>cubic feet per second</td>
</tr>
</tbody>
</table>
Appendix D - Acronyms Used in Metadata

The acronyms, or abbreviations, below may appear in database text fields including, but not limited to, station descriptions, project descriptions, sample comments, and result comments.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/S or AS</td>
<td>Autosampler</td>
</tr>
<tr>
<td>ACF</td>
<td>Autosampler Composite Flow</td>
</tr>
<tr>
<td>ACODES</td>
<td>Analysis Code</td>
</tr>
<tr>
<td>ACS</td>
<td>American Chemical Society</td>
</tr>
<tr>
<td>ACT</td>
<td>Autosampler Composite Time</td>
</tr>
<tr>
<td>ADT</td>
<td>Autosampler Discrete Time</td>
</tr>
<tr>
<td>ASEB</td>
<td>Autosampler Equipment Blank</td>
</tr>
<tr>
<td>ATF</td>
<td>Autosampler Composite Time Flow</td>
</tr>
<tr>
<td>AFW</td>
<td>Analyte Free Water</td>
</tr>
<tr>
<td>BWF/M</td>
<td>Bi-Weekly Flow or at Least Monthly Collection</td>
</tr>
<tr>
<td>BWRF</td>
<td>Bi-Weekly Recorded Flow</td>
</tr>
<tr>
<td>CCV</td>
<td>Continuing Calibration Verification</td>
</tr>
<tr>
<td>CH/DH</td>
<td>Clean Hands / Dirty Hands</td>
</tr>
<tr>
<td>COC</td>
<td>Chain of Custody</td>
</tr>
<tr>
<td>COND</td>
<td>Specific Conductance</td>
</tr>
<tr>
<td>CR10</td>
<td>Campbell Remote Scientific Data Logger</td>
</tr>
<tr>
<td>DBHYDRO</td>
<td>SFWMD's Water Quality and Hydrological Database</td>
</tr>
<tr>
<td>DCS</td>
<td>Depth to Consolidated Substrate</td>
</tr>
<tr>
<td>DEP</td>
<td>Department of Environmental Protection</td>
</tr>
<tr>
<td>DI</td>
<td>De-Ionized</td>
</tr>
<tr>
<td>DO</td>
<td>Dissolved Oxygen</td>
</tr>
<tr>
<td>DQOs</td>
<td>Data Quality Objectives</td>
</tr>
<tr>
<td>DS</td>
<td>Discharge or flow code</td>
</tr>
<tr>
<td>DVS</td>
<td>Data Validation Section</td>
</tr>
<tr>
<td>EB</td>
<td>Equipment Blank</td>
</tr>
<tr>
<td>EFA</td>
<td>Everglades Forever Act</td>
</tr>
<tr>
<td>EMRP</td>
<td>Environmental Monitoring Review Process</td>
</tr>
<tr>
<td>EMRT</td>
<td>Environmental Monitoring Review Team</td>
</tr>
<tr>
<td>EVPA</td>
<td>Everglades Protection Area</td>
</tr>
<tr>
<td>F</td>
<td>Filter (preservation code)</td>
</tr>
<tr>
<td>FAC</td>
<td>Florida Administrative Code</td>
</tr>
<tr>
<td>FAV</td>
<td>Floating Aquatic Vegetation</td>
</tr>
<tr>
<td>FB</td>
<td>Field Blank</td>
</tr>
<tr>
<td>FCEB</td>
<td>Field Cleaned Equipment Blank</td>
</tr>
<tr>
<td>FD</td>
<td>Field Duplicate</td>
</tr>
<tr>
<td>FDEP</td>
<td>Florida Department of Environmental Protection</td>
</tr>
<tr>
<td>FOC</td>
<td>Field Operations Center</td>
</tr>
<tr>
<td>FPM</td>
<td>Field Project Manager</td>
</tr>
<tr>
<td>FSQM</td>
<td>Field Sampling Quality Manual</td>
</tr>
<tr>
<td>FST</td>
<td>First Sample Trigger</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>ft</td>
<td>feet (measurement)</td>
</tr>
<tr>
<td>FTR</td>
<td>Field Test Report</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>H2SO4</td>
<td>Sulfuric Acid</td>
</tr>
<tr>
<td>HCL</td>
<td>Hydrochloric Acid</td>
</tr>
<tr>
<td>HFDM</td>
<td>Horizon Field Data Manager</td>
</tr>
<tr>
<td>HNO3</td>
<td>Nitric Acid</td>
</tr>
<tr>
<td>HW</td>
<td>Headwater (water level or stage upstream of a structure)</td>
</tr>
<tr>
<td>IC</td>
<td>Initial Calibration</td>
</tr>
<tr>
<td>ICV</td>
<td>Initial Calibration Verification</td>
</tr>
<tr>
<td>ID</td>
<td>Identification</td>
</tr>
<tr>
<td>KCl</td>
<td>Potassium Chloride</td>
</tr>
<tr>
<td>LDO</td>
<td>Luminescent Dissolved Oxygen</td>
</tr>
<tr>
<td>LIMS</td>
<td>Laboratory Information Management System</td>
</tr>
<tr>
<td>LST</td>
<td>Last Sample Trigger</td>
</tr>
<tr>
<td>m</td>
<td>meter (measurement)</td>
</tr>
<tr>
<td>Maint</td>
<td>Maintenance (abbreviation)</td>
</tr>
<tr>
<td>MOSCAD RTU</td>
<td>Motorola SCADA Remote Terminal Unit</td>
</tr>
<tr>
<td>MDL</td>
<td>Method Detection Limit</td>
</tr>
<tr>
<td>NA</td>
<td>Nitric Acid (preservation code)</td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology</td>
</tr>
<tr>
<td>NOB</td>
<td>No Sample Bottle</td>
</tr>
<tr>
<td>PAR</td>
<td>Photosynthetically Active Radiation</td>
</tr>
<tr>
<td>PSR</td>
<td>Pre-login Summary Report</td>
</tr>
<tr>
<td>PVC</td>
<td>Polyvinyl Chloride</td>
</tr>
<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>QC</td>
<td>Quality Control</td>
</tr>
<tr>
<td>QAO</td>
<td>Quality Assurance Officer</td>
</tr>
<tr>
<td>RPD</td>
<td>Relative Percent Difference</td>
</tr>
<tr>
<td>RS</td>
<td>Replicate Sample</td>
</tr>
<tr>
<td>RSD</td>
<td>Relative Standard Deviation</td>
</tr>
<tr>
<td>RTU</td>
<td>Remote Terminal Unit</td>
</tr>
<tr>
<td>SA</td>
<td>Sulfuric Acid (preservation code)</td>
</tr>
<tr>
<td>SAV</td>
<td>Submerged Aquatic Vegetation</td>
</tr>
<tr>
<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
</tr>
<tr>
<td>SDD</td>
<td>Secchi Disk Depth</td>
</tr>
<tr>
<td>SFWMD</td>
<td>South Florida Water Management District</td>
</tr>
<tr>
<td>SSID</td>
<td>Standard Set Identification Number</td>
</tr>
<tr>
<td>SOB</td>
<td>Secchi On Bottom</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>SPR</td>
<td>Sample Problem Report</td>
</tr>
<tr>
<td>SS</td>
<td>Split Sample</td>
</tr>
<tr>
<td>STA</td>
<td>Stormwater Treatment Area</td>
</tr>
<tr>
<td>STS</td>
<td>Science Technician Supervisor</td>
</tr>
<tr>
<td>TD</td>
<td>Total Depth</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>TOC</td>
<td>Technical Oversight Committee</td>
</tr>
<tr>
<td>TW</td>
<td>Tailwater (water level or stage downstream of a structure)</td>
</tr>
<tr>
<td>UD</td>
<td>Reference-to-structure designation code (Upstream/Downstream/Undefined)</td>
</tr>
<tr>
<td>USB</td>
<td>Universal Serial Bus</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compound</td>
</tr>
<tr>
<td>WQB</td>
<td>Water Quality Bureau</td>
</tr>
<tr>
<td>WCA</td>
<td>Water Conservation Area</td>
</tr>
<tr>
<td>WQM</td>
<td>Water Quality Monitoring</td>
</tr>
</tbody>
</table>