

Introduction to WRDB

Harpeth River water quality model

C. York

02/25/2021

- General overview of WRDB
- Elements of a WRDB project
 - Station table
 - PCode table
 - Results table
 - CCode / RCode validation tables
- Summary of WRDB utilities
 - Export data
 - Report generation
 - Graphing
 - GIS utility

- Designed to process and manage ambient monitoring data for model development
- WASP v8 designed to store input data in WRDB
- Possess add-ins that facilitate calibration
 - e.g., WRDB-Graph
- LSPC input data are stored in MS Access database, not WRDB

Water Resources Database 6.1

Introduction

In 1993, the [Georgia Environmental Protection Division](#) (EPD) initiated design of the Water Resources Database (WRDB) to address the imposing data management challenges presented by the Chattahoochee River Modeling Project. These challenges included a vast amount of data to be handled, a wide variety of data types to be accommodated, and a diversity of information sources each providing important data often in incompatible formats. These circumstances were further complicated by factors like: insufficient in-house expertise in the technical aspects of database design; a general lack of success with the effective use of existing national databases; and, the fact that expected WRDB users possessed an assortment of professional specialties and a variety of software skill levels.

As software development progressed, it soon became clear that the WRDB could easily serve a host of general data management needs beyond those of this particular modeling project. Accordingly, the WRDB was recast as a general-purpose instrument for addressing a variety of everyday data management problems typically faced by environmental practitioners. The U.S. Environmental Protection Agency (Region IV) provided funds to support its development as a general-purpose tool. Beginning in 2009, the Panama Canal Authority also began supporting WRDB enhancements including those which ultimately lead to the development of WRDB 6.0.

WRDB is a Microsoft Windows application utilizing the .Net Framework. It consists of low-level libraries used by a variety of applications (WRDB, Graph, GIS, etc.) and both a Windows client or Web user interface. WRDB supports many popular database backends including Access, SQLite, Oracle, SQL Server, and MySQL and can be used by individuals, work groups, or enterprises.

This web site was developed to introduce WRDB concepts and provide a convenient location for downloading the latest version of the software and documentation. The software was developed by Dr. Lloyd Chris Wilson, P.E., of [Wilson Engineering](#) in St. Louis, Missouri. If you are not associated with Georgia EPD, Region IV EPA, or the Panama Canal Authority, please contact Dr. Wilson for information on software development and support options.

Acknowledgements:

With his unique understanding of EPD's data needs, Dr. Burke provided significant guidance throughout the design of the computational code and user interface. His valuable contributions are acknowledged. In addition, Mr. Paul Lamarre of EPD is acknowledged as the contract administrator for many of the projects, and for his careful testing of the software.

[Region IV EPA](#) supported much of the development of this software either directly or through grants to GaEPD. Mr. Jim Greenfield and Mr. Tim Wool provided helpful direction and feedback.

[Tetra Tech, Inc.](#), has been a strong proponent and contributor to the overall development of WRDB. Mr. Brian Watson and many other staff members are gratefully acknowledged.

The Autoridad del Canal de Panamá ([Panama Canal Authority](#)) provided valuable financial support for WRDB versions 5.1 and 6.0. Mr. Iván Domínguez was the project manager and also directed development of enterprise features added in WRDB 6.0; his contributions as well as those of his staff and management are gratefully acknowledged.

WE
Wilson Engineering • 596 Wetherby Terrace Drive • Ballwin, Missouri 63021 • 314/650-0023 • www.wileng.com

<http://www.wrdb.com/>

- Repository for WASP input data
 - LSPC input data are stored in MS Access database
 - LSPC output data are stored in WRDB
- Repository for WASP calibration data
- WASP input and calibration data can be stored in separate WRDB files
 - Minimizes file size
 - Faster data queries
- WASP input database has three separate working tables
 - WASP weather (only need a subset of stations used in LSPC)
 - LSPC model output (preprocessed with Excel macro)
 - Point source data (facilities, springs, w. withdrawals, etc)

Elements of WRDB project

- Working Tables: A single project can have multiple working tables 
- Master Tables: We typically do not use them
- Support Tables:
 - Station table: Includes metadata for sampling locations
 - Parameter table (PCode): Includes parameter metadata (units & names)

WRDB 6.1 - FFrk_WASP_Input in WRDB Project Workspace

File Edit Select Output Window Help

Open Prefs Explr New Work Mstr Alt Supt ExtData Entry Del Impt SB19 Dwn WQI All Rng Ac

Lspc [Working Table]

| Station ID | Date/Time | PCode | LEW | Depth | Acy | CCode | S | L | Q | R | Result | Val | Trk ID |
|-------------|------------------|---------|-----|-------|-----|-------|---|---|---|---|----------|-----|--------|
| LSPC-101-RO | 01/01/2006 00:00 | TN_LOAD | | | | | | | | | 2,542.20 | | |
| LSPC-101-RO | 01/01/2006 00:00 | TN | | | | | | | | | 0.99390 | | |
| LSPC-101-RO | 01/01/2006 00:00 | NH3 | | | | | | | | | 0.03677 | | |
| LSPC-101-RO | 01/01/2006 00:00 | NO3 | | | | | | | | | 0.61 | | |
| LSPC-101-RO | 01/01/2006 00:00 | DON | | | | | | | | | 0.35 | | |
| LSPC-101-RO | 01/01/2006 00:00 | TP_LOAD | | | | | | | | | 2,348.97 | | |
| LSPC-101-RO | 01/01/2006 00:00 | TP | | | | | | | | | 0.91832 | | |
| LSPC-101-RO | 01/01/2006 00:00 | DIP | | | | | | | | | 0.43 | | |
| LSPC-101-RO | 01/01/2006 00:00 | DOP | | | | | | | | | 0.49 | | |
| LSPC-101-RO | 01/01/2006 00:00 | BOD1 | | | | | | | | | 1.02 | | |
| LSPC-101-RO | 01/01/2006 00:00 | DO | | | | | | | | | 8.61686 | | |
| LSPC-101-RO | 01/01/2006 00:00 | SOLID1 | | | | | | | | | 24.98 | | |
| LSPC-101-RO | 01/01/2006 00:00 | FLOW | | | | | | | | | 29.60... | | |
| LSPC-101-RO | 01/01/2006 00:00 | TEMP | | | | | | | | | 13.28 | | |
| LSPC-101-RO | 01/02/2006 00:00 | TN_LOAD | | | | | | | | | 2,863.48 | | |
| LSPC-101-RO | 01/02/2006 00:00 | TN | | | | | | | | | 1.08490 | | |
| LSPC-101-RO | 01/02/2006 00:00 | NH3 | | | | | | | | | 0.04014 | | |
| LSPC-101-RO | 01/02/2006 00:00 | NO3 | | | | | | | | | 0.66 | | |
| LSPC-101-RO | 01/02/2006 00:00 | DON | | | | | | | | | 0.38 | | |
| LSPC-101-RO | 01/02/2006 00:00 | TP_LOAD | | | | | | | | | 1,712.36 | | |
| LSPC-101-RO | 01/02/2006 00:00 | TP | | | | | | | | | 0.64879 | | |

Help Options Show first 1000 records

Support Table Browser

Stations PCodes Branches Groups Validation Criteria Tracking Journal

| Station ID | Station Name | Station Type | Data Freq | Latitude | Longitude | Elevation | HUC | Branch ID | River Mile | Re ID | Dr Area | Ag |
|------------|-----------------------------------|--------------|-----------|-----------|------------|-----------|-----|-----------|------------|-------|---------|----|
| 0987 | KENTUCKY SOLITE CORP | WITHDRAWAL | | 38.03551 | -85.71773 | <Null> | | | <Null> | | 0 | |
| 1020 | PERSIMMON RIDGE GOLF CLUB | WITHDRAWAL | | 38.298054 | -85.438068 | <Null> | | | <Null> | | 0 | |
| 1090 | PERSIMMON RIDGE GOLF CLUB | WITHDRAWAL | | 38.29806 | -85.43861 | <Null> | | | <Null> | | 0 | |
| 1093 | GOLF DEVELOPMT CO QUAIL CHASE | WITHDRAWAL | | 38.10361 | -85.63472 | <Null> | | | <Null> | | | |
| 1257 | POLO FIELDS GOLF COURSE/GC DEVELP | WITHDRAWAL | | 38.258898 | -85.44313 | <Null> | | | <Null> | | | |
| 1258 | POLO FIELDS GOLF COURSE/GC DEVELP | WITHDRAWAL | | | 0 | 0 | | | <Null> | | | |
| 1264 | ACTION LANDSCAPE INC | WITHDRAWAL | | 38.19787 | -85.55856 | <Null> | | | <Null> | | | |
| 1315 | MIDLAND TRAIL GOLF CLUB | WITHDRAWAL | | 38.22611 | -85.47472 | <Null> | | | <Null> | | | |
| 1353 | ROGERS GROUP INC BULLITT CO STONE | WITHDRAWAL | | 38.03639 | -85.67806 | <Null> | | | <Null> | | | |

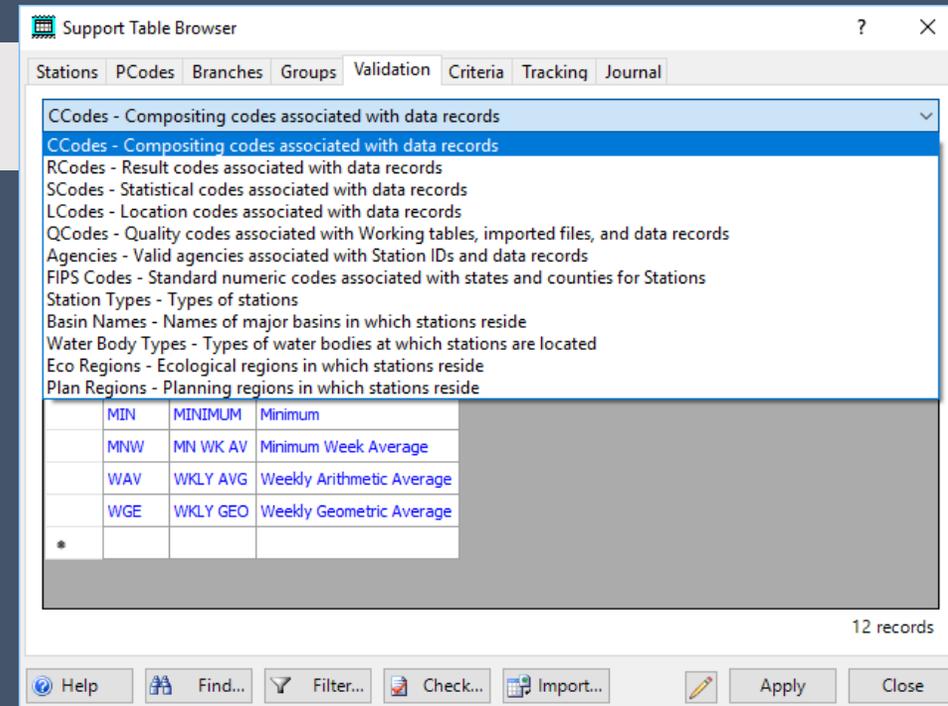
Support Table Browser

Stations PCodes Branches Groups Validation Criteria Tracking Journal

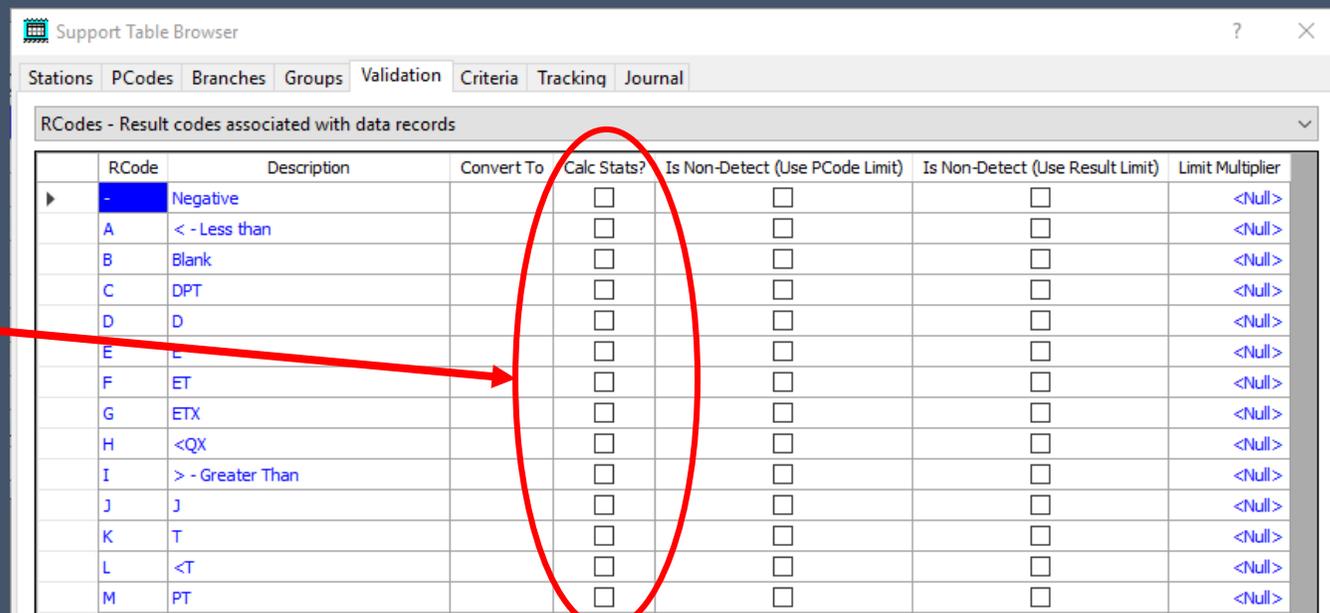
| PCode | Analysis Name | Units | Test Method | Det. Limit | Sig Figs | Min. Limit | Max. Limit | Min. Crit. | Max. Crit. | Updated |
|------------|--------------------------------|------------|-------------|------------|----------|------------|------------|------------|------------|------------------|
| AIR TEMP | AIR TEMP | deg C | | 0 | 2 | <Null> | <Null> | <Null> | <Null> | 07/13/2017 09:10 |
| BOD1 | Biochemical Oxygen Demand | mg/L | | 0 | 2 | <Null> | <Null> | <Null> | <Null> | 07/12/2017 09:26 |
| CBOD5 | BOD 5-day carbonaceous 20deg C | mg/L | | 0 | 5 | <Null> | <Null> | <Null> | <Null> | 07/12/2017 09:20 |
| CHLA | Chlorophyll-a | mg/L | | 0 | 5 | <Null> | <Null> | <Null> | <Null> | 07/12/2017 09:20 |
| CLOUD COVE | CLOUD COVER | proportion | | 0 | 2 | <Null> | <Null> | <Null> | <Null> | 07/13/2017 09:12 |
| DEW POINT | DEW POINT | deg C | | 0 | 2 | <Null> | <Null> | <Null> | <Null> | 07/13/2017 09:10 |
| DIP | Dissolved Inorganic Phosphorus | mg/L | | 0 | 2 | <Null> | <Null> | <Null> | <Null> | 07/12/2017 09:26 |

Validation support tables

- Accessed in 'Validation' tab dropdown
- Remark Code table (RCode): Used to indicate flagged data points
 - e.g., J, U, etc
- CCodes: R4 modelers typically use to indicate back-calculated PCodes
 - e.g, ORGN = TKN – NH₃



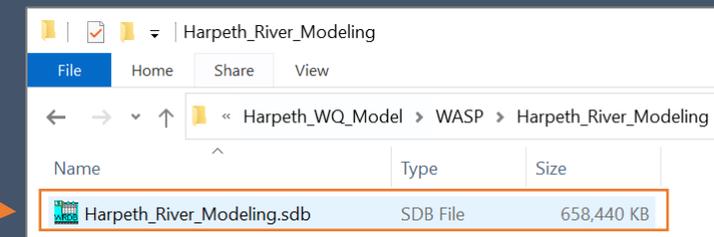
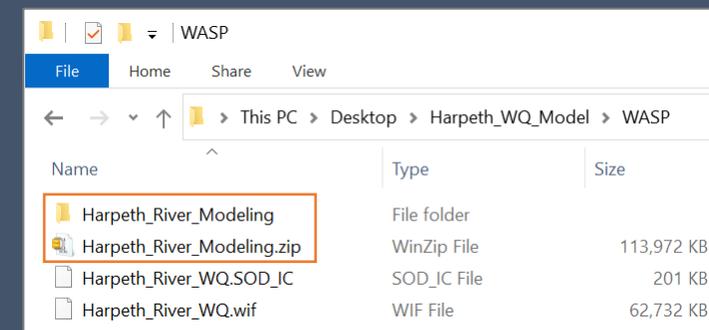
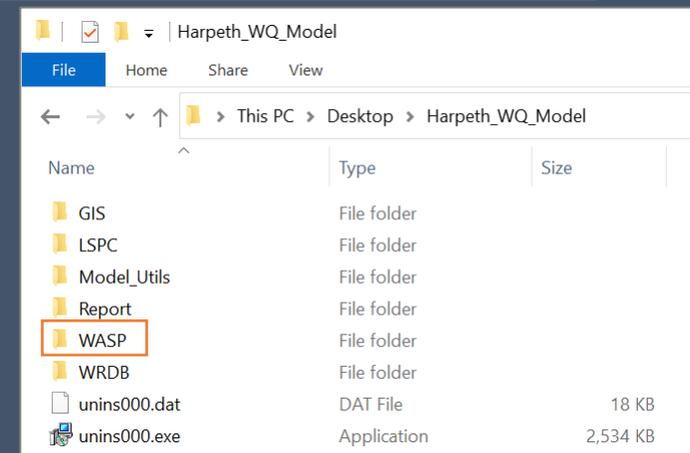
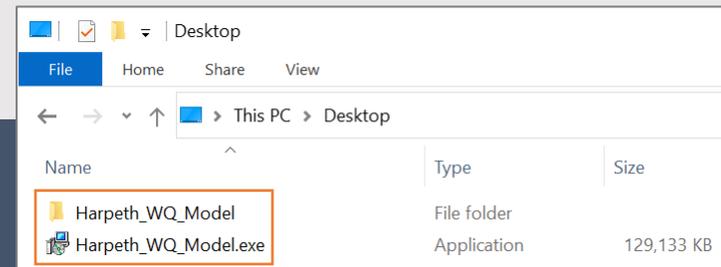
- RCode table has option to exclude flagged records from Calibration graphs and summary statistics
- Allows flagged data to be included in database, but not used in calibration



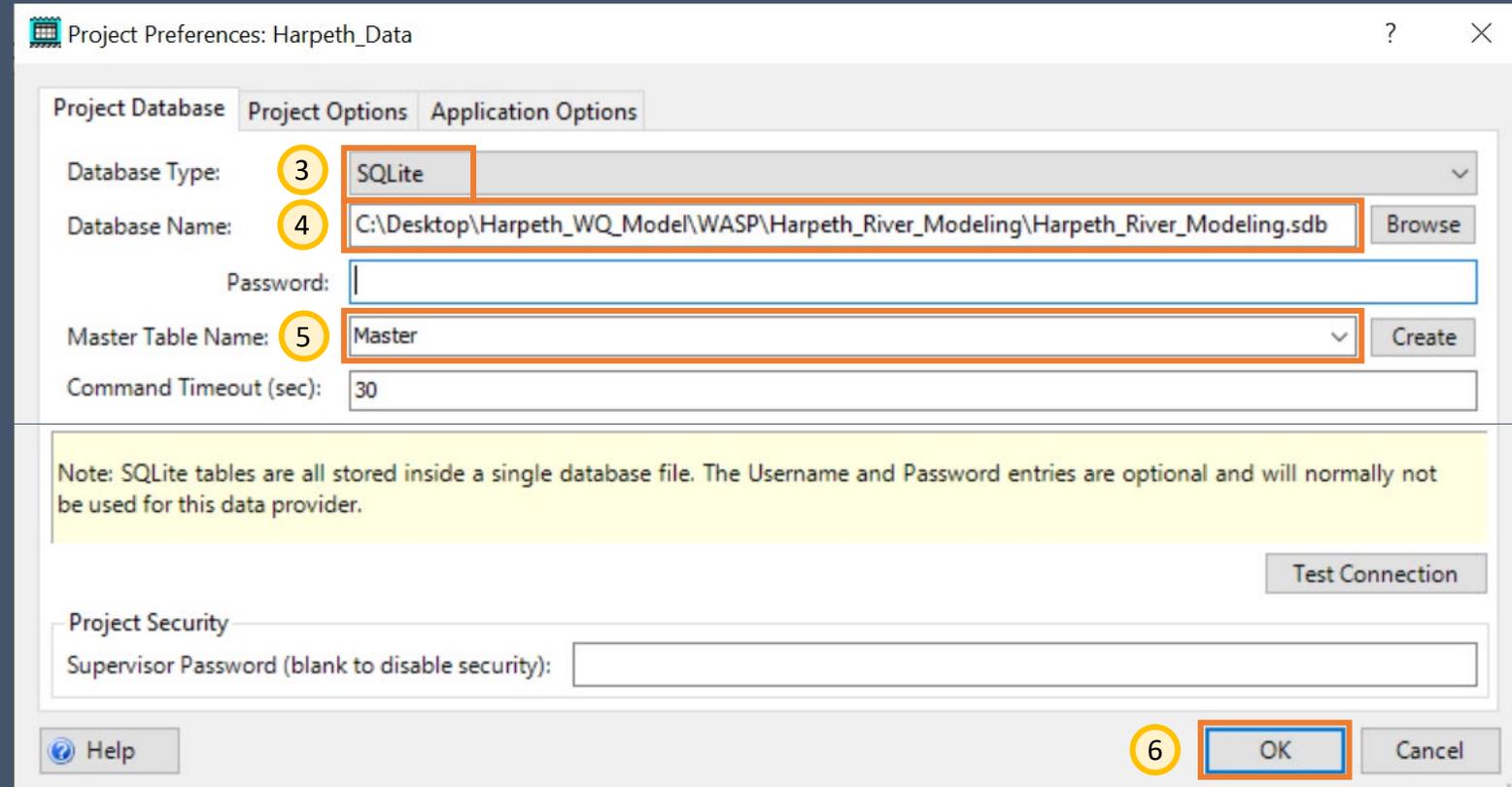
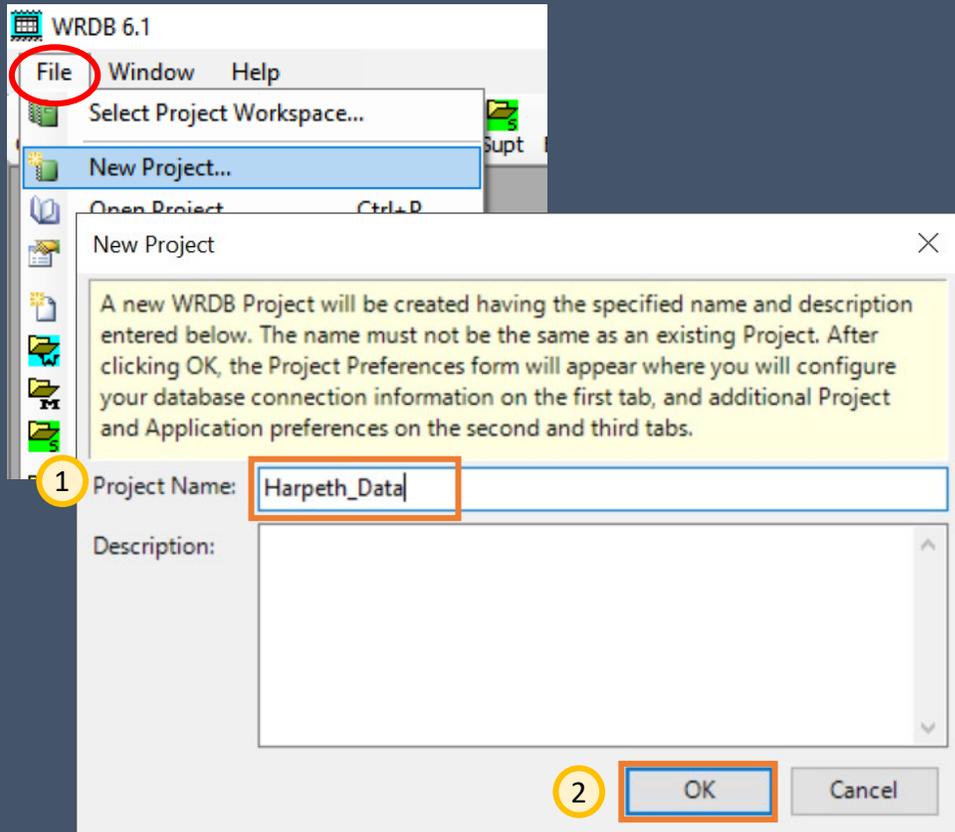
Troubleshooting WRDB

| Potential Issue | Solutions |
|--|--|
| <ul style="list-style-type: none">• Similar to GIS-databases, moving an existing project file requires a remapping of filepath | <ul style="list-style-type: none">• Avoid moving an existing WRDB project |
| <ul style="list-style-type: none">• Certain actions in WRDB cannot be undone (e.g., deleting working tables) | <ul style="list-style-type: none">• Keep a back-up copy of any projects until you are more familiar with the program |
| <ul style="list-style-type: none">• WRDB has lots of pop-up confirmation screens | <ul style="list-style-type: none">• Enable 'Expert Mode' through 'Project Preferences' to minimize pop-up screens |

- Restoring the Harpeth River Modeling SQL Lite database (.sdb)
- Loading database as New Project
- Browse / Query / Plot
- Exporting data to other formats



Building new WRDB project from an existing .sdb



- DB type = SQLite database (.sdb)
- DB name = filepath for existing “Harpeth_River_Modeling.sdb”
- Master Table is required by WRDB (select “Master”), but note, this is not used

Accessing support tables

The screenshot shows the WRDB 6.0 software interface. The main window displays a table of data for 'Npdes [Working Table]'. The 'Validation' tab in the 'Support Table Browser' is highlighted with a red circle. The 'Validation' tab contains a table of support tables with columns for PCode, Analysis Name, Units, Test Method, Det. Limit, Sig Figs, Min. Limit, and Max. Limit.

| PCode | Analysis Name | Units | Test Method | Det. Limit | Sig Figs | Min. Limit | Max. Limit |
|------------|--------------------------------|------------|-------------|------------|----------|------------|------------|
| AIR TEMP | AIR TEMP | deg C | | 0 | 2 | <Null> | <Null> |
| BOD1 | Biochemical Oxygen Demand | mg/L | | 0 | 2 | <Null> | <Null> |
| CBOD5 | BOD 5-day carbonaceous 20deg C | mg/L | | 0 | 5 | <Null> | <Null> |
| CHLA | Chlorophyll-a | mg/L | | 0 | 5 | <Null> | <Null> |
| CLOUD COVE | CLOUD COVER | proportion | | 0 | 2 | <Null> | <Null> |
| DEW POINT | DEW POINT | deg C | | 0 | 2 | <Null> | <Null> |
| DIP | Dissolved Inorganic Phosphorus | mg/L | | 0 | 2 | <Null> | <Null> |
| DO | Oxygen dissolved | mg/L | | 0 | 5 | <Null> | <Null> |
| DON | Dissolved Organic Nitrogen | mg/L | | 0 | 2 | <Null> | <Null> |
| DOP | Dissolved Organic Phosphorus | mg/L | | 0 | 2 | <Null> | <Null> |
| FLOW | Flow in conduit CMS | CMS | | 0 | 5 | <Null> | <Null> |
| NH3 | Nitrogen ammonia total [as N] | mg/L | | 0 | 5 | <Null> | <Null> |
| NO3 | Nitrate | mg/L | | 0 | 2 | <Null> | <Null> |

- Working and support tables can be accessed via the ribbon
- CCode and RCode tables accessed via the 'Validation' tab in pop-up

Summary reports

The screenshot shows the WRDB 6.0 interface. The 'Output' menu is open, and the 'Reports' option is selected. A sub-menu is visible with options like 'Summarize by', 'Sort by', 'Screen by', and 'Custom Reports'. The 'Summarize by Station and Parameter' dialog box is open, displaying a table of data. The table has the following columns: Station, Station Name, PCode, Parameter Name, Units, No. Obs., Mean, Min, Max, First Date, and Last Date. The data rows are as follows:

| Station | Station Name | PCode | Parameter Name | Units | No. Obs. | Mean | Min | Max | First Date | Last Date |
|-----------|------------------------|-------|-------------------------------|-------|----------|----------|---------|----------|------------------|------------------|
| KY0020001 | La Grange STP | FLOW | Flow in conduit CMS | CMS | 605 | 0.03296 | 0.01753 | 0.10673 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0020001 | La Grange STP | NH3 | Nitrogen ammonia total [as N] | mg/L | 605 | 0.47031 | 0.14000 | 10.50000 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0020001 | La Grange STP | NOX | Nitrite plus Nitrate | mg/L | 605 | 15.13158 | 2.11361 | 25.57333 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0020001 | La Grange STP | TN | Nitrogen Total [as N] | mg/L | 605 | 17.49334 | 2.52781 | 29.01000 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0025194 | Jeffersontown WQTC MSD | FLOW | Flow in conduit CMS | CMS | 1,545 | 0.15732 | 0.06527 | 0.78325 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0025194 | Jeffersontown WQTC MSD | NH3 | Nitrogen ammonia total [as N] | mg/L | 1,545 | 0.90229 | 0.05000 | 14.90000 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0025194 | Jeffersontown WQTC MSD | NOX | Nitrite plus Nitrate | mg/L | 1,545 | 8.18503 | 0.20267 | 19.66000 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0025194 | Jeffersontown WQTC MSD | TN | Nitrogen Total [as N] | mg/L | 1,545 | 9.59920 | 0.28800 | 20.00000 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0029416 | McNeely Lake WQTC MSD | FLOW | Flow in conduit CMS | CMS | 1,032 | 0.00434 | 0.00039 | 0.03767 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0029416 | McNeely Lake WQTC MSD | NH3 | Nitrogen ammonia total [as N] | mg/L | 1,032 | 0.60995 | 0.00600 | 7.00000 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0029416 | McNeely Lake WQTC MSD | NOX | Nitrite plus Nitrate | mg/L | 1,032 | 15.61340 | 0.21965 | 24.92020 | 01/01/2000 00:00 | 12/31/2010 00:00 |
| KY0029416 | McNeely Lake WQTC MSD | TN | Nitrogen Total [as N] | mg/L | 1,032 | 20.22678 | 0.28198 | 32.00000 | 01/01/2000 00:00 | 12/31/2010 00:00 |

- Summary reports can be generated based on working table or queried data
- Provides basic summary statistics

Data availability reports

The screenshot shows the WRDB 6.0 interface. The 'Output' menu is open, and 'Data Availability' is selected. The 'Data Availability Report' window displays a chart with the following data series:

| Station - Parameter | Start Date | End Date |
|---------------------|------------|----------|
| 03297845 FLOW | 07/07 | 07/08 |
| 03297845 TN | 07/07 | 07/08 |
| 03297845 TP | 07/07 | 07/08 |
| 03297900 FLOW | 09/26 | 09/26 |
| 03297900 TN | 07/07 | 07/08 |
| 03297900 TP | 07/07 | 07/08 |
| 03297950 FLOW | 07/07 | 07/08 |
| 03297950 TN | 07/07 | 07/08 |
| 03297950 TP | 07/07 | 07/08 |

- Can also generate data availability (inventory) reports to quickly identify data gaps

Data queries

- Data queries can be initiated on the ribbon
- Copy records to Excel by clicking 'Options' → 'Copy Selected Records'
- Don't use 'Ctrl-C' in window; can truncate significant digits

WRDB 6.0 - FFrk_WASP_Input in WRDB Project Workspace

File Edit Select Output Window Help

Open Prefs Explr New Work Mstr Supt ExtData Entry Del Impt SB19 Dwn WQI All Rng Adv SQL Show RptSP RptS RptP Time Dep Scat GIS Expt Save Help

Npdes [Working Table]

| Station ID | Date/Time | PCode | LEW | Depth | Acy | CCode | S | L | Q | R | Result | Val | Trk ID |
|------------|------------------|-------|-----|-------|-----|-------|---|---|---|---|----------|-----|--------|
| KY0020001 | 01/01/2000 00:00 | CBOD5 | | | | | | | | | 12.00000 | | |
| KY0020001 | 01/31/2000 00:00 | CBOD5 | | | | | | | | | 12.00000 | | |
| KY0020001 | 02/01/2000 00:00 | CBOD5 | | | | | | | | | 8.00000 | | |
| KY0020001 | 02/29/2000 00:00 | CBOD5 | | | | | | | | | 8.00000 | | |
| KY0020001 | 03/01/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |
| KY0020001 | 03/31/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |
| KY0020001 | 04/01/2000 00:00 | CBOD5 | | | | | | | | | 7.00000 | | |
| KY0020001 | 04/30/2000 00:00 | CBOD5 | | | | | | | | | 7.00000 | | |
| KY0020001 | 05/01/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |
| KY0020001 | 05/31/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |

Help Options Show first 1000 records Close

Advanced Query

Station ID: IN ('KY0020001', 'KY0025194', 'KY0029416') Assist...

Date-time: ALL Assist...

PCode: IN ('FLOW', 'NH3', 'NOX', 'TN') Assist...

CCode: ALL Assist...

Result: ALL Assist...

More >>

Select from browser and create new result set

Help Save... Show SC

WRDB 6.0 - FFrk_WASP_Input in WRDB Project Workspace

File Edit Select Output Window Help

Open Prefs Explr New Work Mstr Supt ExtData Entry Del Impt SB19 Dwn WQI All Rng Adv SQL Show RptSP RptS RptP Time Dep Scat GIS Expt Save Help

Npdes [Working Table]

| Station ID | Date/Time | PCode | LEW | Depth | Acy | CCode | S | L | Q | R | Result | Val | Trk ID |
|------------|------------------|-------|-----|-------|-----|-------|---|---|---|---|----------|-----|--------|
| KY0020001 | 01/01/2000 00:00 | CBOD5 | | | | | | | | | 12.00000 | | |
| KY0020001 | 01/31/2000 00:00 | CBOD5 | | | | | | | | | 12.00000 | | |
| KY0020001 | 02/01/2000 00:00 | CBOD5 | | | | | | | | | 8.00000 | | |
| KY0020001 | 02/29/2000 00:00 | CBOD5 | | | | | | | | | 8.00000 | | |
| KY0020001 | 03/01/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |
| KY0020001 | 03/31/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |
| KY0020001 | 04/01/2000 00:00 | CBOD5 | | | | | | | | | 7.00000 | | |
| KY0020001 | 04/30/2000 00:00 | CBOD5 | | | | | | | | | 7.00000 | | |
| KY0020001 | 05/01/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |
| KY0020001 | 05/31/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 | | |

Help Options Show first 1000 records Close

Selected from Npdes at 04/05/2018 08:45 (Table)

| Station ID | Date/Time | PCode | LEW | Depth | Acy | CCode | S | L | Q | R | Result | Val | Trk ID |
|------------|------------------|-------|-----|-------|-----|-------|---|---|---|---|---------|-----|--------|
| KY0020001 | 01/01/2000 00:00 | FLOW | | | | | | | | | 0.03098 | | |
| KY0020001 | 01/31/2000 00:00 | FLOW | | | | | | | | | 0.03098 | | |
| KY0020001 | 02/01/2000 00:00 | FLOW | | | | | | | | | 0.03483 | | |
| KY0020001 | 02/29/2000 00:00 | FLOW | | | | | | | | | 0.03483 | | |
| KY0020001 | 03/01/2000 00:00 | FLOW | | | | | | | | | 0.03251 | | |
| KY0020001 | 03/31/2000 00:00 | FLOW | | | | | | | | | 0.03251 | | |
| KY0020001 | 04/01/2000 00:00 | FLOW | | | | | | | | | 0.02817 | | |
| KY0020001 | 04/30/2000 00:00 | FLOW | | | | | | | | | 0.02817 | | |
| KY0020001 | 05/01/2000 00:00 | FLOW | | | | | | | | | 0.02484 | | |
| KY0020001 | 05/31/2000 00:00 | FLOW | | | | | | | | | 0.02484 | | |
| KY0020001 | 06/01/2000 00:00 | FLOW | | | | | | | | | 0.02493 | | |
| KY0020001 | 06/30/2000 00:00 | FLOW | | | | | | | | | 0.02493 | | |
| KY0020001 | 07/01/2000 00:00 | FLOW | | | | | | | | | 0.02208 | | |
| KY0020001 | 07/31/2000 00:00 | FLOW | | | | | | | | | 0.02208 | | |
| KY0020001 | 08/01/2000 00:00 | FLOW | | | | | | | | | 0.02055 | | |
| KY0020001 | 08/31/2000 00:00 | FLOW | | | | | | | | | 0.02055 | | |
| KY0020001 | 09/01/2000 00:00 | FLOW | | | | | | | | | 0.02129 | | |
| KY0020001 | 09/30/2000 00:00 | FLOW | | | | | | | | | 0.02129 | | |
| KY0020001 | 10/01/2000 00:00 | FLOW | | | | | | | | | 0.01906 | | |

SELECT <Data.Fields>, 'JMD' AS Selected_By FROM [Npdes] Dta WHERE Dta.Station_ID IN ('KY0020001', 'KY0025194', 'KY0029416') AND Dta.PCode IN ('FLOW', 'NH3', 'NOX', 'TN') AND (Dta.Owner='JMD' OR Dta.Owner IS NULL)

Help Options Show first 1000 records Close

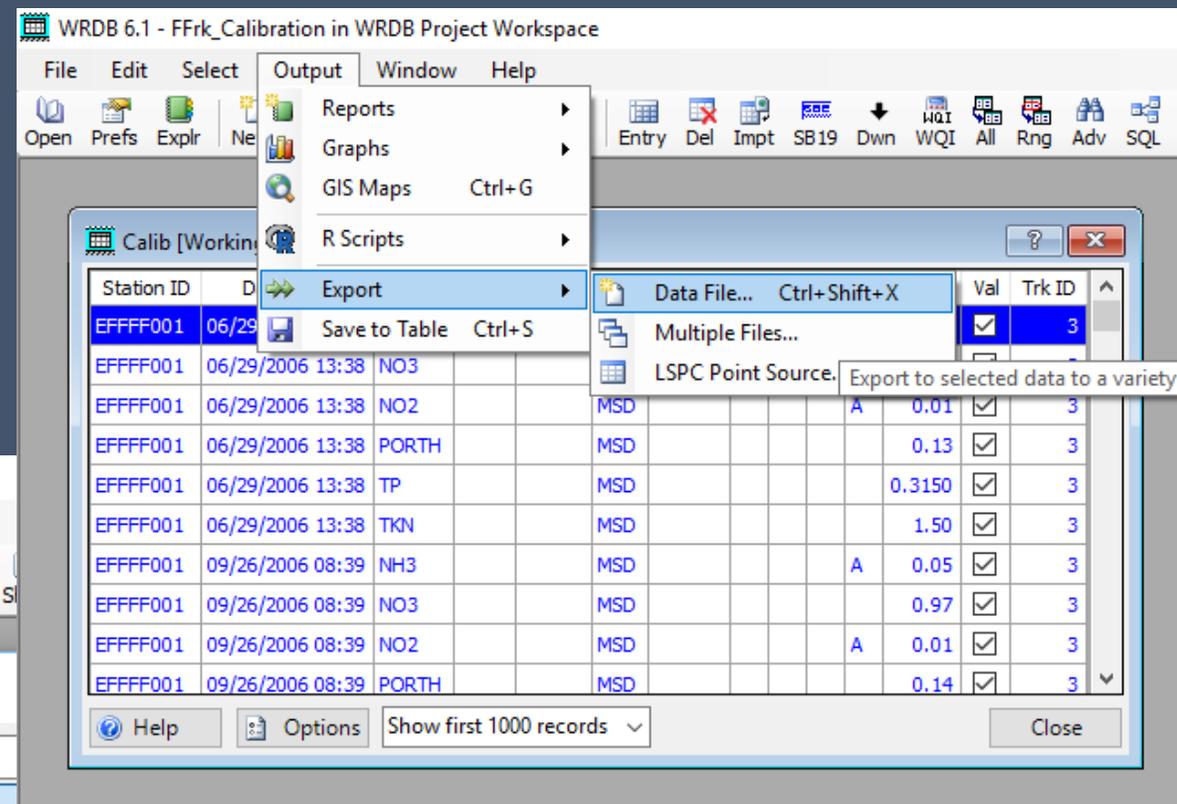
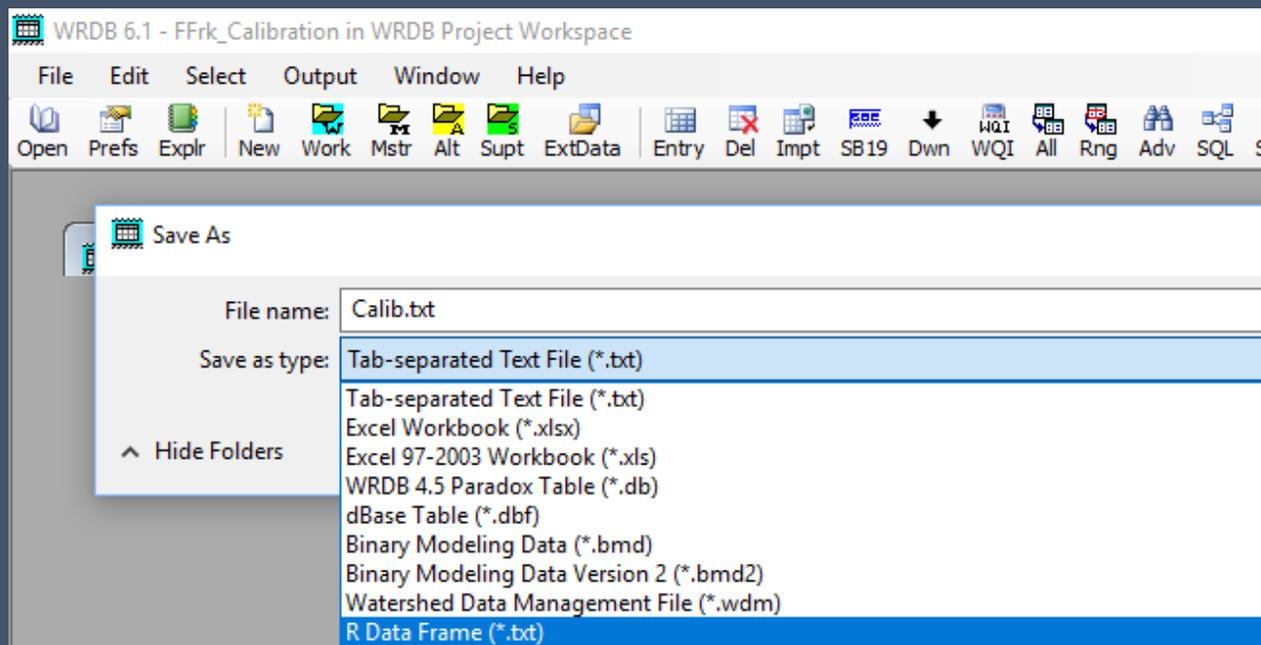
Options

- Find...
- Filter...
- Sort...
- Copy Selected Records
- Paste/Import Records
- Refresh Browser Center
- Show All Owners' Records
- Edit Table Info...
- Display Record Count

Copy previously selected data (using one of the Select Menu features) to the clipboard (this does not copy records from the browser)

Export data

- Can export working tables or data subsets
 - Output → Export
- Export as single file, or multiple files by PCode
- Multiple file formats available



Accessing graph functions

WRDB 6.0 - FFrk_WASP_Input in WRDB Project Workspace

File Edit Select Output Window Help

Open Prefs Explr New Work Mstr Supt ExtData Entry Del Impt SB19 Dwn WQI All Rng Adv SQL Show RptSP RptS RptF Time Dep Scat GIS Expt Save Help

Npdes [Working Table]

| Station ID | Date/Time | PCode | LEW | Depth | Acy | CCode | S | L | Q | R | Result |
|------------|------------------|-------|-----|-------|-----|-------|---|---|---|---|----------|
| KY0020001 | 01/01/2000 00:00 | CBOD5 | | | | | | | | | 12.00000 |
| KY0020001 | 01/31/2000 00:00 | CBOD5 | | | | | | | | | 12.00000 |
| KY0020001 | 02/01/2000 00:00 | CBOD5 | | | | | | | | | 8.00000 |
| KY0020001 | 02/29/2000 00:00 | CBOD5 | | | | | | | | | 8.00000 |
| KY0020001 | 03/01/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 |
| KY0020001 | 03/31/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 |
| KY0020001 | 04/01/2000 00:00 | CBOD5 | | | | | | | | | 7.00000 |
| KY0020001 | 04/30/2000 00:00 | CBOD5 | | | | | | | | | 7.00000 |
| KY0020001 | 05/01/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 |
| KY0020001 | 05/31/2000 00:00 | CBOD5 | | | | | | | | | 6.00000 |

Help Options Show first 1000 records

WRDB-Graph 6.0

File View Draw Graph Tools Help

New Open Save Save As Last Data Close ExtData Copy Paste Refresh Excel Stats Prev Limits All Series Options Draw Table Type Time What? Help

Manage Data Series

Available Data for New Series

Open Tables: [Open] [Close]

Series: [93821_UO - KSDP-Louisville Intern Station] Parameters: [A=TEMP]

1 Series Selected

Add to Left Axis Add to Right Axis

Series Currently in Graph

| Station ID | PCode | Table Name | Show? | X.Axis | Y.Axis | Axis # | Color | Line | Width | Symbol | Size | F/B | Series Label |
|------------|-------|------------|-------|--------|--------|--------|-------|------|-------|--------|------|-----|--------------|
|------------|-------|------------|-------|--------|--------|--------|-------|------|-------|--------|------|-----|--------------|

Select Remove Calculate Bulk...

Station ID: 93821_UO

AIR TEMP - AIR TEMP (deg C)

Date

AIR TEMP at 93821_UO

- WRDB-Graph and GIS functions accessed on ribbon
- WRDB-Graph can be used for calibration

- Based upon open source GIS Tool
 - MapWindow/DotSpatial
 - Same tools in EPA's BASINS
- Can use files from:
 - ArcMap
 - BASINS
 - Other standard GIS files



- Integrates WRDB data w/ spatial data
 - Assess ambient data by location
 - Thematic mapping
 - Number of observations
 - Mean / median / geomean / percentiles
 - Aggregate data across time
 - Day / month
 - Growing season
 - Annual
- Create animations to show parameter changes through space and time