

Managing Ambient Water Quality Data in Rhode Island

Presentation to the RIEMC

November 22, 2006

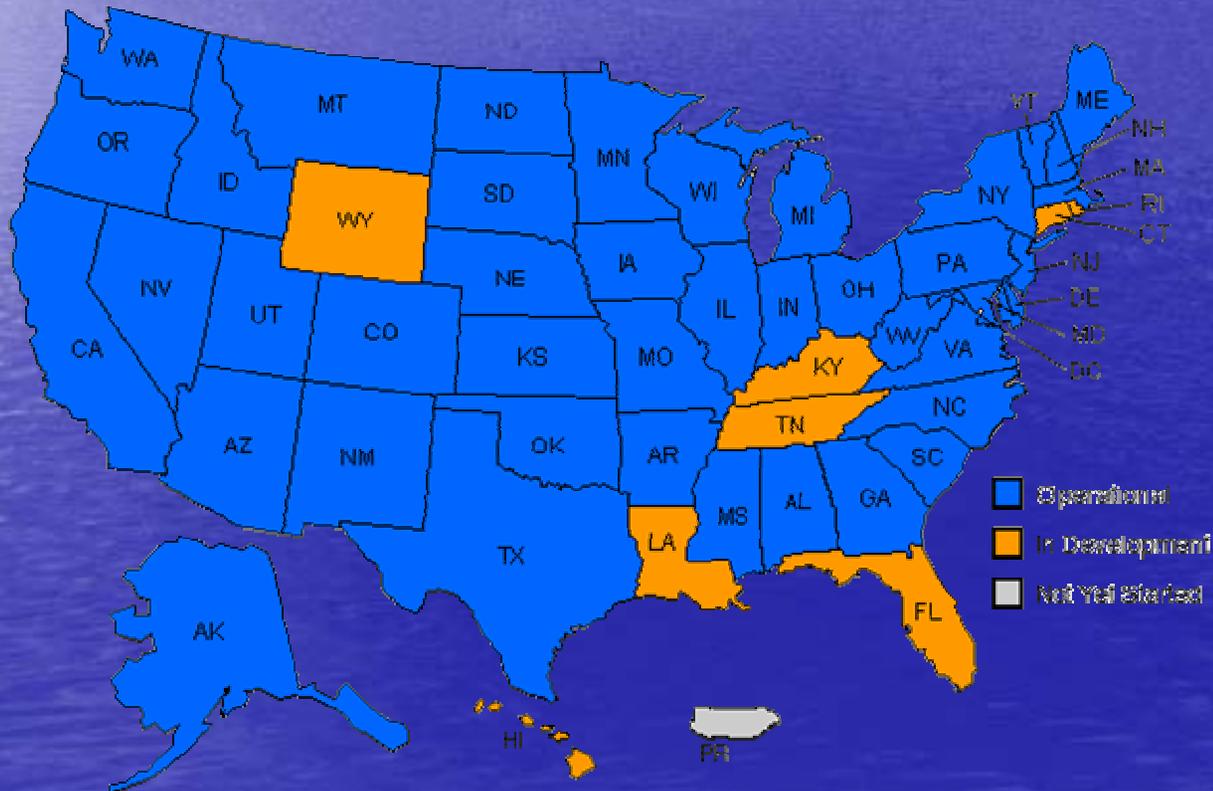
What RIDEM has been doing

- Creating an improved ambient water quality database housed at RIDEM – RIWQUAL
 - Upgraded from MSACCESS to SQL SVR 2000
- Will be connected to a Node built in RI which will provide XML Data Transfer to STORET

What is XML?

- Extensible Markup Language
 - A data trading language
 - XML is to data as HTML is to web pages
 - Universally understandable by computers
 - Used extensively in online banking transactions
 - Secure and safe

How many states are doing this?



Why? Because the EPA systems are changing

- STORET is going away to be replaced by the Water Quality Exchange (WQX)
- EPA has built a Central Data Exchange to make transactions for data over the web
- EPA has funded 50 states to build Nodes to exchange data
- RIDEM has received \$250,000 of federal funding to connect our state systems to EPA through the CDX

What type of data does EPA collect?

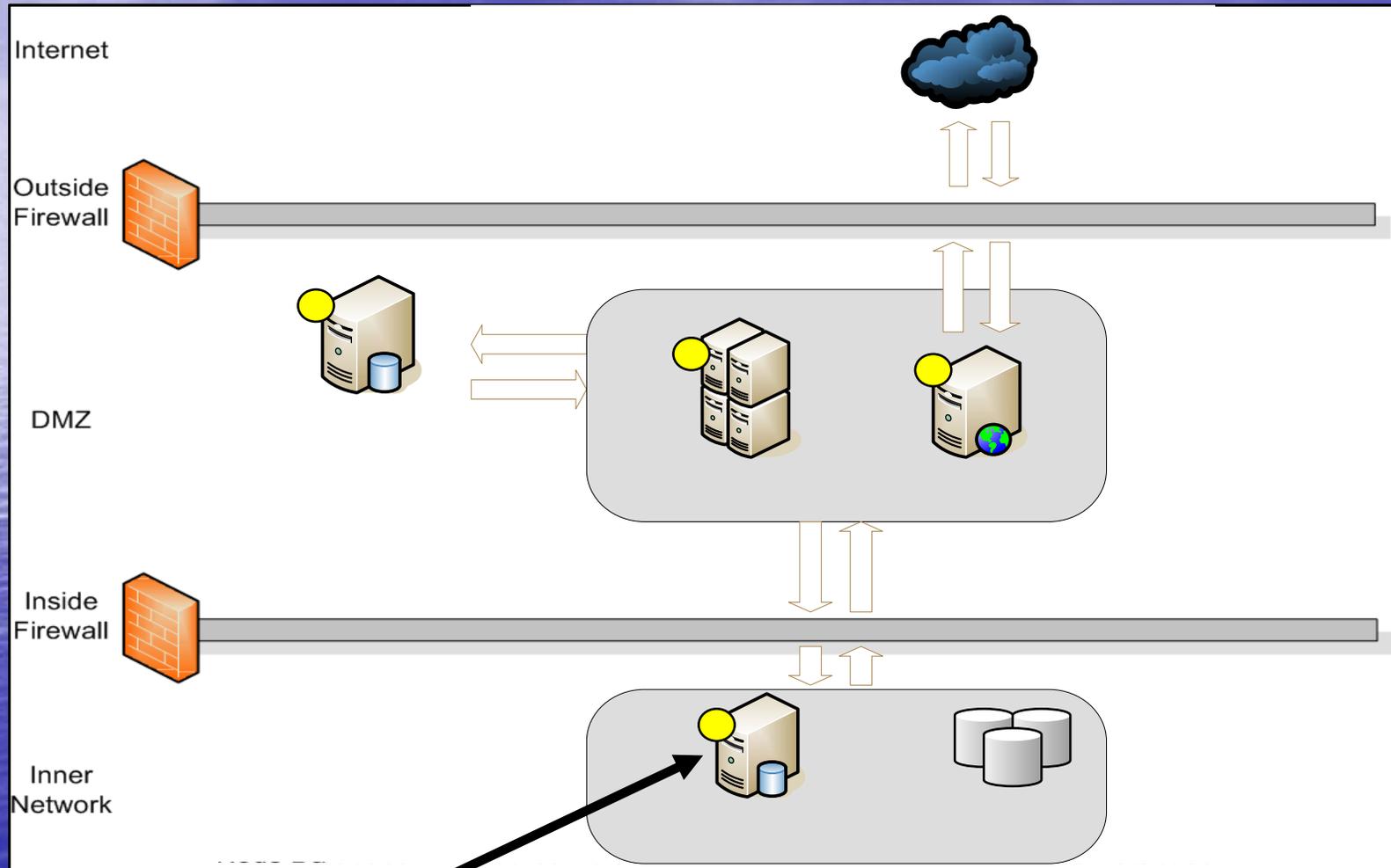


Who exchanges data with EPA?

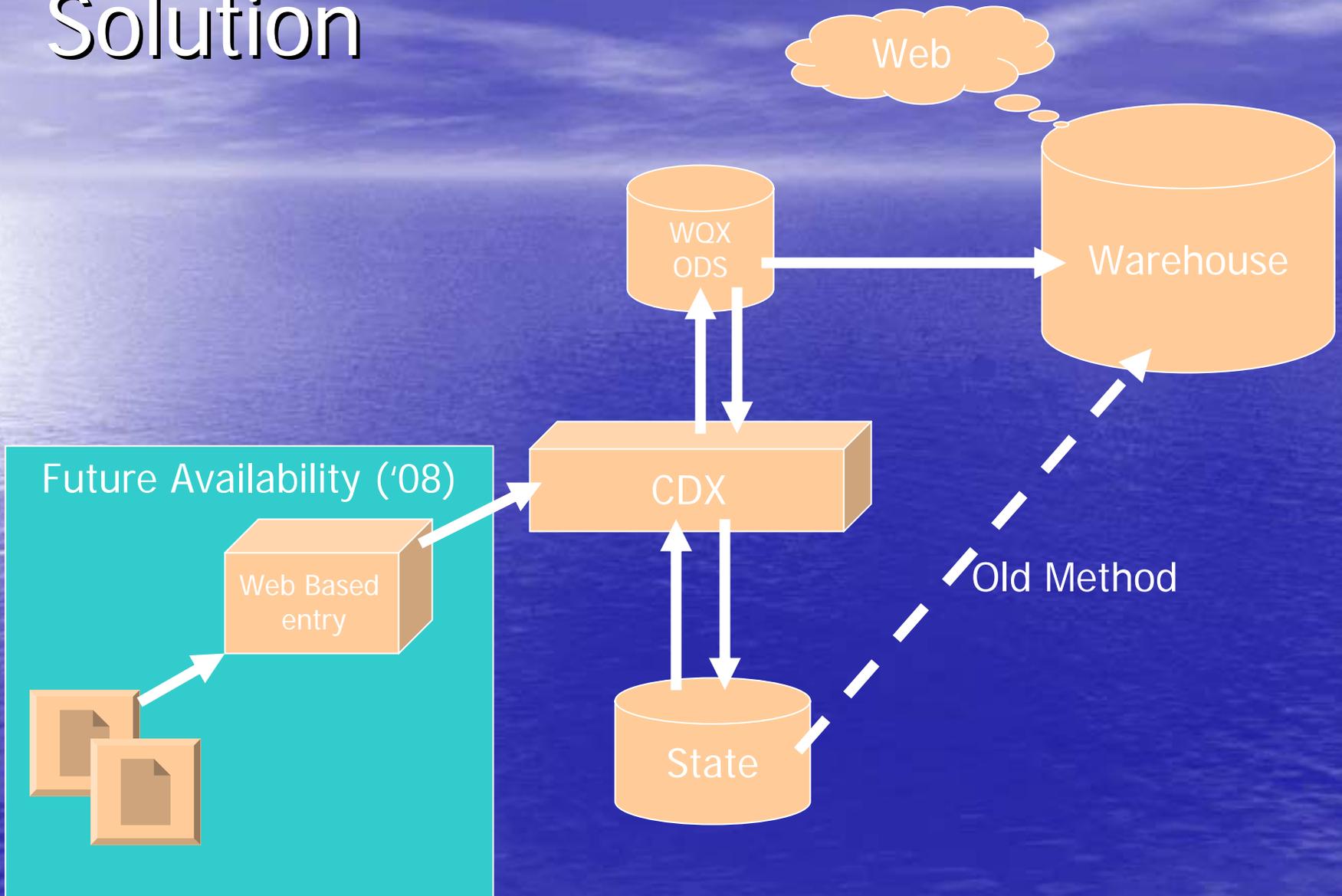
- National Park Service
- States
- USGS
- Pesticide Regulation Departments
- Volunteer Organizations
- National Sierra Club etc...

Negotiations with NOAA

RI Solution



Solution



What are the benefits?

- Functions as data warehouse for the State that we do not need to pay to maintain
- STORET/WQX already has web access tools that will be maintained by EPA
- Ambient data can be shared and housed by multiple agencies across the nation
- No need to “produce” data requests from the public or other agencies

More benefits...

- RIDEM can offer technical assistance to agencies wishing to house their data in a database
- RIDEM will meet Federal Requirements and meet state needs at the same time
- RIDEM is working on retrieving electronic data directly from the laboratories

What kind of data is stored and exchanged in STORET/WQX

Nationally:

- Water Chemistry (Jan 07)
- Biological/Habitat data (Late 07)

Locally via RIDEM:

- Watershed Watch Data
- URI water chemistry data on rivers and streams (Wright)
- Dissolved Oxygen data – Buoy data for now...more later?
- Water quality data on shellfish growing areas
- TMDL data

Locally via Health and the RIDEM node:

- Bathing beach data
- SDWIS – Safe Drinking Water Information System

How to download data

<http://www.epa.gov/storet/>



The screenshot shows the STORET website interface. At the top right, it says "U.S. Environmental Protection Agency". Below that is the "STORET" logo. A navigation bar includes links for "Recent Additions", "Contact Us", "Print Version", a search box with a "GO" button, and a breadcrumb trail: "EPA Home > Water > Wetlands, Oceans, & Watersheds > Monitoring and Assessing Water Quality > STORET".

The main heading reads: "Welcome to STORET, EPA's largest computerized environmental data system". Below this is a paragraph: "STORET (short for STORage and RETrieval) is a repository for water quality, biological, and physical data and is used by state and local environmental agencies, EPA and other federal agencies, universities, private citizens, and many others. Take a minute to browse around our site or click on the water drop to retrieve monitoring data!"

On the left side, there is a vertical menu with the following items: "About STORET", "Data Owner's Corner", "Updates/Downloads", "Obtaining Water Quality Data", "Useful Internet Links", "Commonly Asked Questions", and "Recent Additions".

In the center, there is a logo featuring a blue water drop with the word "STORET" written across it, and some reeds at the bottom.

On the right side, there is a "Features" box containing the following links: "Download Data", "Future of STORET", "Training", "SIM Software", and "Fact Sheets". A green arrow points to the "Download Data" link.

At the bottom, there is a footer with the following links: "About STORET", "Data Owner's Corner", "Updates and Downloads", "Obtaining Water Quality Data", "Useful Links", and "Commonly Asked Questions".



STORET

[Recent Additions](#) | [Contact Us](#) | [Print Version](#) Search: [GO](#)

[EPA Home](#) > [Water](#) > [Wetlands, Oceans, & Watersheds](#) > [Monitoring and Assessing Water Quality](#) > [STORET](#) > Database Access

About STORET
Data Owner's Corner
Updates/Downloads
Obtaining Water Quality Data
Useful Internet Links
Commonly Asked Questions
Recent Additions

STORET Database Access



STORET data available on the Internet is divided into two separate databases, according to when it was originally supplied to EPA, and to which of our two STORET databases it was originally archived. We refer to the older of these two databases the **STORET Legacy Data Center** (LDC for short), and the more current **Modernized STORET**.

STORET Legacy Data Center

Data supplied to EPA before 1999 were all placed in Legacy STORET. This system, designed in the 1960s, was a pioneer in the long term archival of field water monitoring results.

The Legacy Data Center contains data of undocumented quality. Further, these data are static. The Legacy Data Center does not permit updates, and data here will not change over time. All new data are being entered into Modernized STORET. Because the data do not change over time, it is never necessary to repeat a specific download.

[Browse or Download Legacy STORET Data](#)

Modernized STORET

All data supplied to EPA since January 1, 1999 have been placed in the Modernized STORET System. A full description of the design of this system can be examined on our [ABOUT STORET](#) page.

Modernized STORET is currently receiving new data on a regular basis, and will continue to do so for the foreseeable future. Downloads performed for the same sites may differ over time as a result of the addition of new data by their owners.

[Browse or Download Modernized STORET Data](#)

STORET

[Recent Additions](#) | [Contact Us](#) | [Print Version](#) Search: [GO](#)

[EPA Home](#) > [Water](#) > [Wetlands, Oceans, & Watersheds](#) > [Monitoring and Assessing Water Quality](#) > [STORET](#) > [Database Access](#) > Data Warehouse



STORET Data Warehouse

Data refreshed as of October 25, 2006

Query Options

STORET Station Descriptions

[Stations by Geographic Location](#)

[Stations by Organization and Station ID](#)

STORET Regular Results

(Non-Biological Physical and Chemical Result Data)

[Regular Results by Geographic Location](#)

[Regular Results by Station](#)

[Regular Results by Project](#)

STORET Biological Results

[Biological Results by Geographic Location](#)

[Biological Results by Station](#)

[Biological Results by Project](#)

STORET Habitat Results

[Habitat Results by Geographic Location](#)

[Habitat Results by Station](#)

[Habitat Results by Project](#)

[Tell Us What You Think!](#)[Make a Map](#)

Create a map of monitoring locations from STORET using either [EnviroMapper for Water](#) or [Window to My Environment](#).

[Data Logger Results](#)

Download a delimited text file of results reported to STORET from Automated Data Loggers. These results, which cannot yet be downloaded via the query options at the left, will be in the form of a self-extracting compressed file (450K) which may be saved on disk and will expand when executed. In its uncompressed form, this file requires 14.8 MB of disk space.

[Data Quality Documentation](#)

Select from among available reports which document the standards, methods, practices, and other metadata supplied by data owners to document the quality of the monitoring results found in the National STORET Data Warehouse.

* Adobe Acrobat® Reader required.

[Training Exercise](#)

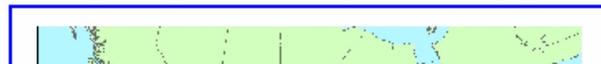
A step-by-step guide for first-time users of the STORET Data Warehouse.

* Adobe Acrobat® Reader required.

[Help](#)

Stations registered in STORET

(Click anywhere on the map to see it enlarged)





STORET

[Recent Additions](#) | [Contact Us](#) | [Print Version](#) Search: **GO**

[EPA Home](#) > [Water](#) > [Wetlands, Oceans, & Watersheds](#) > [Monitoring and Assessing Water Quality](#) > [STORET](#) > Data Warehouse

Regular Results by Geographic Location (stormoda)

Geographic Location

Select a single type of location search that you wish to perform (state/county, latitude/longitude, or HUC). Then enter the corresponding search criteria.

<input checked="" type="radio"/> State/County	State Name <input type="text" value="KENTUCKY"/>	County Name <input type="text" value="JEFFERSON"/>	<input type="button" value="Look Up"/>
<input type="radio"/> Latitude/Longitude (in decimal degrees)	West Limit <input type="text" value="180"/> <input type="button" value="W"/>	North Limit <input type="text" value="90"/> <input type="button" value="N"/>	East Limit <input type="text" value="0"/> <input type="button" value="W"/>
<input type="radio"/> Drainage Basin/HUC	Cataloging Unit <input type="text" value="ALL"/> <input type="button" value="Look Up"/>		

Date

Specify Activity Start Date range(s)

Date Range 1:	<input type="text" value="JAN"/>	<input type="text" value="1"/>	<input type="text" value="1900"/>	To	<input type="text" value="NOV"/>	<input type="text" value="20"/>	<input type="text" value="2006"/>
Date Range 2:	<input 184="" 65="" 923="" 948"="" data-label="Section-Header" text"="" type="text" value="---</input></td></tr></table></div><div data-bbox="/> <h3>Activity Medium</h3>						

Date Range 2: --- -- ---- To ---

Date Range 3: --- -- ---- To ---

Date Range 4: --- -- ---- To ---

Activity Medium

Select one or more Activity Medium

ACTIVITY MEDIUM

Select All
Water
Sediment
Soil
Air
Other

Characteristic

Use the Characteristic Search to create a list of up to 50 Char

Characteristic Search

nitr

Search By

CHARACTERISTIC NAME

Search

Hide Taxonomic Names

Characteristic Name

Nitrogen, Nitrate (NO3) as NO3

Clear Selected

Clear All

Continue

Clear Form

Select One or More Characteristics

Nitrogen, ammonium (NH4)/ammonia (NH3) ratio
Nitrogen, inorganic
Nitrogen, Kjeldahl
Nitrogen, mixed forms (NH3)+(NH4)+organic+(NO2)+
Nitrogen, Nitrate (NO3) as N
Nitrogen, Nitrate (NO3) as NO3
Nitrogen, Nitrite (NO2) + Nitrate (NO3) as N
Nitrogen, Nitrite (NO2) as N
Nitrogen, Nitrite (NO2) as NO2
Nitrogen, organic

Select

Cancel

Done



STORET

[Recent Additions](#) | [Contact Us](#) | [Print Version](#) Search: **GO**

[EPA Home](#) > [Water](#) > [Wetlands, Oceans, & Watersheds](#) > [Monitoring and Assessing Water Quality](#) > [STORET](#) > Data Warehouse

Result Search Summary (stormoda)

Number of Results Returned: 194

Search Criteria

State: KENTUCKY

County: JEFFERSON

Activity Start Dates: ALL

Medium: Water

Characteristic(s): Nitrogen, Nitrate (NO3) as NO3

Select 'Back' to modify search criteria and refine your query.
Select 'Continue' to generate a report based on your current selections.
You may customize the content of your report by selecting Data Elements below.

<<Back

Continue>>



Select Data Elements for Report

- | | | |
|---|--|--|
| <input type="checkbox"/> Org ID | <input type="checkbox"/> Actual Activity Lat/Long | <input type="checkbox"/> Converted Result Value |
| <input checked="" type="checkbox"/> Org Name | <input type="checkbox"/> Conv Actual Activity Lat/Long | <input type="checkbox"/> Converted Result Unit |
| <input checked="" type="checkbox"/> Station ID | <input type="checkbox"/> Well Number | <input type="checkbox"/> Result Comment |
| <input type="checkbox"/> Station Name | <input type="checkbox"/> Pipe Number | <input type="checkbox"/> Result Free Text |
| <input checked="" type="checkbox"/> Station Location Info | <input type="checkbox"/> Additional Act Location Info | <input type="checkbox"/> Weight Basis |
| <input checked="" type="checkbox"/> Station Lat/Long | <input checked="" type="checkbox"/> Activity Depth | <input type="checkbox"/> Temperature Basis |
| <input type="checkbox"/> Conv Station Lat/Long | <input checked="" type="checkbox"/> Activity Depth Unit | <input type="checkbox"/> Duration Basis |
| <input type="checkbox"/> Station Types | <input type="checkbox"/> Activity Upper Depth | <input type="checkbox"/> Particle Size Basis |
| <input type="checkbox"/> S/G/O Indicator | <input type="checkbox"/> Activity Rel Depth | <input type="checkbox"/> Distance Measured From |
| <input checked="" type="checkbox"/> Visit Num | <input type="checkbox"/> Activity Lower Depth | <input type="checkbox"/> Distance Measured To |
| <input type="checkbox"/> Visit Start | <input type="checkbox"/> Upr Lwr Depth Unit | <input checked="" type="checkbox"/> Analytical Proc ID |
| <input type="checkbox"/> Visit Stop | <input type="checkbox"/> Sample Collection ID | <input type="checkbox"/> Additional Anal Proc Info |
| <input type="checkbox"/> Trip ID | <input type="checkbox"/> Field Gear ID | <input type="checkbox"/> Lab Remark |
| <input type="checkbox"/> Trip Name | <input type="checkbox"/> Field Gear Config ID | <input type="checkbox"/> Dilution Ind |
| <input checked="" type="checkbox"/> Activity ID | <input type="checkbox"/> Sample Preservation | <input type="checkbox"/> Recovery Ind |
| <input checked="" type="checkbox"/> Activity Start | <input type="checkbox"/> Portable Data Logger | <input type="checkbox"/> Correction Ind |
| <input type="checkbox"/> Activity Stop | <input checked="" type="checkbox"/> Characteristic Name | <input type="checkbox"/> Other Lab Info |
| <input checked="" type="checkbox"/> Activity Medium | <input type="checkbox"/> CAS Num | <input type="checkbox"/> Num of Reps |
| <input type="checkbox"/> Activity Matrix | <input type="checkbox"/> EPA Registry Num | <input type="checkbox"/> Precision |
| <input checked="" type="checkbox"/> Activity Type | <input type="checkbox"/> ITIS Num | <input type="checkbox"/> Bias |
| <input checked="" type="checkbox"/> Activity Category-Rep Num | <input checked="" type="checkbox"/> Sample Fraction | <input type="checkbox"/> Conf Level |
| <input type="checkbox"/> Activity Intent | <input checked="" type="checkbox"/> Value Type | <input type="checkbox"/> Correction for Bias Ind |
| <input type="checkbox"/> Field Set | <input checked="" type="checkbox"/> Statistic Type | <input type="checkbox"/> Result Document/Graphic Name |
| <input type="checkbox"/> Actual Point Type | <input checked="" type="checkbox"/> Result Value as Text | <input type="checkbox"/> Result Document/Graphic URL |
| <input type="checkbox"/> Actual Point Sequence | <input type="checkbox"/> Result Value as Number | <input type="checkbox"/> Activity Document/Graphic Name |
| <input type="checkbox"/> Actual Point Name | <input checked="" type="checkbox"/> Units | <input type="checkbox"/> Activity Document/Graphic URL |

Select All Clear All Restore Defaults

<<Back

Continue>>





U.S. Environmental Protection Agency

STORET

[Recent Additions](#) | [Contact Us](#) | [Print Version](#) Search: **GO**

[EPA Home](#) > [Water](#) > [Wetlands, Oceans, & Watersheds](#) > [Monitoring and Assessing Water Quality](#) > [STORET](#) > Data Warehouse

Download Results (stormoda)

You have requested to download monitoring Results

The size of your report download is **57.8KB**

[Download your file now...](#)



or, for large files, you may click below to compress before download

[Compress data file now...](#)

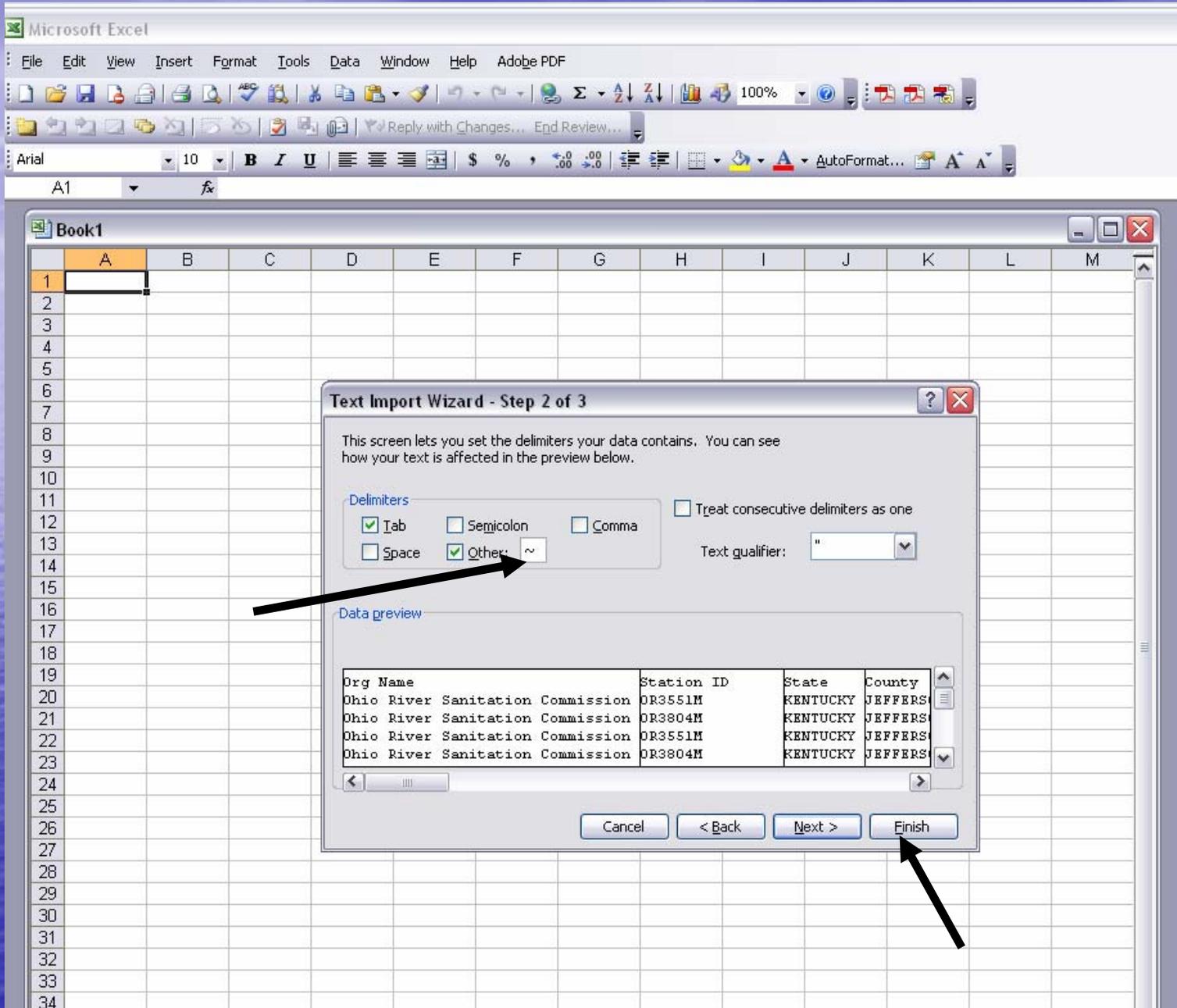
[Help](#)

[EPA Home](#) | [Privacy and Security Notice](#) | [Contact Us](#)

Last updated on September 15, 2005
URL: http://iaspub.epa.gov/stormoda/DW_result_hub_custom

Done

Internet



Reply with Changes... Edit Review...

10 B I U [List Icons] \$ % [List Icons] AutoFormat... [List Icons]

fx Org Name

stucky.txt

L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
Activity Start	Activity St	Activity Me	Activity Ty	Activity Ca	Activity De	Activity De	Characteristic Na	Sample Fr	Value Type	Statistic T	Result Val	Units	Analytical Proc	
1/20/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.37	mg/l	-	
1/20/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.39	mg/l	-	
7/22/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		0.91	mg/l	-	
7/22/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		0.82	mg/l	-	
9/22/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		0.97	mg/l	-	
9/22/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		0.85	mg/l	-	
11/10/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.28	mg/l	-	
11/10/1999 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.29	mg/l	-	
1/26/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.69	mg/l	-	
1/26/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.72	mg/l	-	
3/21/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.01	mg/l	-	
3/21/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.11	mg/l	-	
5/18/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.08	mg/l	-	
5/18/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.04	mg/l	-	
7/13/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.47	mg/l	-	
7/13/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.29	mg/l	-	
8/1/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		0.98	mg/l	USEPA	-3%
8/15/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		0.99	mg/l	USEPA	-3%
9/5/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		0.97	mg/l	USEPA	-3%
9/7/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.07	mg/l	-	
9/7/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		0.94	mg/l	-	
10/2/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		0.89	mg/l	USEPA	-3%
10/17/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.6	mg/l	USEPA	-3%
11/1/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.52	mg/l	USEPA	-3%
1/16/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.44	mg/l	-	
1/16/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.06	mg/l	-	
1/16/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.44	mg/l	USEPA	-3%
2/18/2000 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.27	mg/l	USEPA	-3%
1/1/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.8	mg/l	USEPA	-3%
1/17/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.95	mg/l	USEPA	-3%
1/25/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.55	mg/l	-	
1/25/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate		Actual		1.43	mg/l	-	
2/1/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.24	mg/l	USEPA	-3%
2/15/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.85	mg/l	USEPA	-3%
3/1/2001 0:00		Water	Sample	Routine Sample			Nitrogen, Nitrate	Total	Actual		1.34	mg/l	USEPA	-3%

Status

- RIDEM is building a new ambient water quality database for nearly \$130,000.
- RIDEM has hired personnel to support this system
- Coordinating with Department of Health on this project because they need to upload data to EPA as well
- Combining funds with DOH to purchase hardware needed for the Node
- Goal to have our data in STORET/WQX by June of '07

Implications to Outside Partners

- Expect DEM to request documentation of Metadata
- State will be specifying template for receipt of data
- Long-term warehouse function but not intended to replace daily business functions
- An easy way to provide public access
- Basis for web customized interfaces