Using the New Water Quality Portal

A Watershed Academy Webcast

Tuesday, October 23, 2012
1:00pm – 3:00pm Eastern

Instructors:
Susan Holdsworth, Chief, U.S. EPA’s Monitoring Branch and Co-Chair of the National Water Quality Monitoring Council
Nate Booth, Lead Architect, Center for Integrated Data Analysis, U.S. Geological Survey, Madison, WI
Charles Kovatch, WQX and STORET Team Leader, U.S. EPA’s Monitoring Branch

Webcast Logistics

• To Ask a Question – Type your question in the “Questions” tool box on the right side of your screen and click “Send.”

• To report any technical issues (such as audio problems) – Type your issue in the “Questions” tool box on the right side of your screen and click “Send” and we will respond by posting an answer in the “Questions” box.
Topics for Today’s Webcast

• **Introduction:** The new Water Quality Portal and the Water Quality Exchange

• **Demonstration:** Accessing water quality data from the Water Quality Portal

• **Demonstration:** Using the Water Quality Exchange to put data into the Water Quality Portal

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Using the New Water Quality Portal

Susan Holdsworth, EPA and Mike Yurowitz, USGS co–chairs
Nate Booth, USGS Center for Integrated Data Analysis
Charles Kovatch, EPA Office of Wetlands, Oceans and Watersheds
“Working with the National Water Quality Monitoring Council (NWQMC), [USGS and EPA] will develop a geospatial internet based query tool. This tool should be designed to facilitate the greatest possible sharing of data from all sources to all users…”

Benefits of the Portal

- Reduces effort to use other data sources
  - Collecting data from multiple sources
  - Combining into common format
  - Deliver in single file
- Leverages and protects investments in monitoring data
  - Common data elements emerging from monitoring community
  - Marketplace of what, when and where for monitoring
- Supports water quality based decision making
  - Comparison to water quality standards
  - Identify hot spots
  - Develop protection and restoration plans
  - Modeling expected changes
What’s next today

- Nate Booth, USGS will lead you through a demonstration of the portal and show some applications of the data
- Charles Kovatch, EPA will show you how to add your data to the portal through the Water Quality eXchange

How you can help

- Use the portal, use the data
  - This webinar is being recorded, so you can refer to it later
  - The portal has a user guide available from the web
- Add more data through the Water Quality eXchange
  - Visit the tutorials for detailed instructions beyond those provided in this webinar
- Provide us feedback on likes and suggested improvements
Questions?

Water Quality Portal

Search over 150 million water-quality data records from States, Tribal Partners, USEPA, and USGS
Portal Description and Capabilities

- Includes water-quality data from federal, state and tribal partners through the USGS NWIS & EPA STORET systems
- Based on WQX data format and convention (Water Quality Exchange)
- Organized to support broad regional and national assessments
- Updated every night from NWIS; every week from STORET

Water Quality Portal

The WQP integrates water-quality data from the USGS National Water Information System (NWIS) and the EPA STORage and RETrieveal (STORET) Data Warehouse.
### Water Quality Portal

**Query data**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Country:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>State:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>County:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>Country: US:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>City:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>Location:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>Point location:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>Distance from:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>Sounding box:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>North:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>West:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>South:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
<tr>
<td>East:</td>
<td>select</td>
<td>select</td>
<td>select</td>
</tr>
</tbody>
</table>

| SITE PARAMETERS  |                  |                  |                  |
| Site Type:       | select           | select           | select           |
| Organization ID:  | select           | select           | select           |
| Site ID:         | select           | select           | select           |
| HUC:             | select           | select           | select           |

| SAMPLING PARAMETERS |                  |                  |                  |
| Sample Media:      | select           | select           | select           |
| Characteristic Group: | select         | select           | select           |
| Characteristics:   | select           | select           | select           |
| Date range:        | select           | select           | select           |

**DOWNLOAD**

- Select databases: All databases, USGS NAWQA only, EPA STORET only
- Select date: As of yesterday, sample results only

**Download tabular data:**
- Format: Comma-separated, Tab-separated
- File size: 3,856 rows and 65,040 bytes
- Download: Convert to PDF

**Download map data:**
- Format: HTML, TileMap KML
- Map: Site data on Google Maps
- Size: 630 bytes
- Include the query in the map.
### Water Quality Portal

#### Query data

**LOCATION**
- Country: [select]
- State: [select]
- County: [select]

**Point location**
- North: [select]
- East: [select]

**Bounding box**
- North: [select]
- East: [select]

**SITE PARAMETERS**
- Site Type: [select]
- Organization ID: [select]
- Site ID: [select]
- HUC: [select]

**SAMPLING PARAMETERS**
- Sample Media: [select]
- Characteristic Group: [select]
- Characteristics: [select]
- Date range: From [select] To [select]

**DOWNLOAD**
- Select databases: [All databases, USGS NAWQA only, EPA STORM only]
- Download tabular data: File format: 
  - CSV
  - Tab-separated
  - MS Excel (Excel 2003 and earlier versions have a limit of 65,536 rows. If your download exceeds this limit, only the first 65,536 rows will open.)

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- Export Sites
- Export Results
Sites Retrieval

<table>
<thead>
<tr>
<th>Organization Identifier</th>
<th>USGS-OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Formal Name</td>
<td>USGS Oregon Water Science Center</td>
</tr>
<tr>
<td>Monitoring Location Identifier</td>
<td>USGS-452601122470701</td>
</tr>
<tr>
<td>Monitoring Location Name</td>
<td>FANNO CREEK AT TIEDEMAN AVE</td>
</tr>
<tr>
<td>Monitoring Location Type Name</td>
<td>Stream</td>
</tr>
<tr>
<td>Monitoring Location Description Text</td>
<td>CWS 3840051</td>
</tr>
<tr>
<td>HUC Eight Digit Code</td>
<td>17090001</td>
</tr>
<tr>
<td>Drainage Area</td>
<td>23.2</td>
</tr>
<tr>
<td>Drainage Area Unit</td>
<td>sq mi</td>
</tr>
<tr>
<td>Latitude</td>
<td>45.4336778</td>
</tr>
<tr>
<td>Longitude</td>
<td>-122.7853417</td>
</tr>
<tr>
<td>Country Code</td>
<td>US</td>
</tr>
<tr>
<td>State Code</td>
<td>41</td>
</tr>
<tr>
<td>County Code</td>
<td>67</td>
</tr>
</tbody>
</table>

Map output from the Water Quality Portal for all sites in the Portland, Oreg. area that have been sampled since 2005. The pink dots represent STORET and the blue dots represent NWIS sites.

Download map data:
- KML (Keyhole Markup Language - this is available for sites only)
### Sample Result Retrieval

<table>
<thead>
<tr>
<th>ActivityMediaName</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>ActivityStartDate</td>
<td>4/25/2011</td>
</tr>
<tr>
<td>ActivityStartTime/Time</td>
<td>16:15:00</td>
</tr>
<tr>
<td>ActivityStartTime/TimeZoneCode</td>
<td>PDT</td>
</tr>
<tr>
<td>ProjectIdentifier</td>
<td>971196816</td>
</tr>
<tr>
<td>ActivityConductingOrganizationText</td>
<td>U.S. Geological Survey-Water Resources Discipline</td>
</tr>
<tr>
<td>MonitoringLocationIdentifier</td>
<td>USGS-452601122470701</td>
</tr>
<tr>
<td>ActivityCommentText</td>
<td>A-1220318 TPCN Volumes: 1- 15.20mL 2- 17.30mL 3- 16.50mL L-1220318 Date on FCC 4/26/11, HydrologicCondition Rising Stage HydrologicEvent Storm CharacteristicName Nitrogen ResultSampleFractionText Suspended ResultMeasureValue</td>
</tr>
<tr>
<td>ResultMeasure/MeasureUnitCode</td>
<td>mg/l</td>
</tr>
<tr>
<td>ResultValueTypeName</td>
<td>actual</td>
</tr>
<tr>
<td>USGSCode</td>
<td>49570</td>
</tr>
<tr>
<td>ResultAnalyticalMethod/MethodIdentifier</td>
<td>COMB7</td>
</tr>
<tr>
<td>ResultAnalyticalMethod/MethodName</td>
<td>TPN, GF/F, combustion</td>
</tr>
<tr>
<td>LaboratoryName</td>
<td>USGS-National Water Quality Lab, Denver, CO</td>
</tr>
<tr>
<td>AnalysisStartDate</td>
<td>5/19/2011</td>
</tr>
<tr>
<td>DetectionQuantitationLimitTypeText</td>
<td>Long Term Method Detection Level</td>
</tr>
<tr>
<td>DetectionQuantitationLimitMeasure/MeasureValue</td>
<td>0.017 mg/l</td>
</tr>
</tbody>
</table>
Example Data Retrieval

“I want to download all the stream sites and sampling results in the Big Thompson River Basin (HUC 10190006) where nutrient data were collected from October 1, 2000 to September 30, 2004.”
Portal supporting other tools across the water management community

Holl, Reece, McCullough (2012)
Supported by USGS CDI
National Groundwater Monitoring Network

Grand River Plume Aerial Photography and Model Simulations

Credit: David J. Schwab
Nearshore Modeling Support

Statistical Models in R

Hirsch, DeCicco 2012
Available Documentation & Resources

- Portal and Web Services Guide
- FAQs
- Materials for new data providers
- Training materials available

Future Enhancements

- **Data Integration**
  - Linking with a common river network (NHD)
  - Standardized analytical method metadata (NEMI)
- **Community Support**
  - Highlighting new community tools
  - Monitoring marketplace
- **Other Data Sources**
  - Additional data partners
  - Real-time monitoring
  - Biological and habitat data
- **Geospatial**
  - Mapping Interface
  - NHD based search
Questions?

Using WQX and WQX Web Tools to Share Data through the Water Quality Portal

Charles Kovatch
OW/OWOW
October 23, 2012
Overview

• We have a tool to help you to share water quality data and participate on the Portal.
• Combined, the tool and Portal will increase the value of your data by making it available to multiple users.
• The tool lays out a community standard water data fields to improve water data sharing.

What does the tool do for you?

• Enables you to share data in one format
• Improves interoperability of data systems through the use of standard water monitoring data fields
• Enables you to publish data at a national level
• Increases your ability to use OTHERS data in conjunction with your data, as available in the Portal, for analysis and modeling
• Enables you to manage data in the format that best serves your program needs
What are the Tools?

- **WQX**
  - Water Quality Data eXchange
  - XML Schema that provides standard data elements and file format
  - Intended for high volume data users
- **WQX Web**
  - Water Quality Data eXchange Web Template
  - Is based in MS Excel
  - If you can use a spreadsheet, this is for you

What do the tools do?

- The tools benefit you by:
  - Enabling you to share data in one format
  - Enabling you to publish data at a national level
  - Allowing you to manage data in the format that best serves your program needs
How do the tools work?

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Data Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO collected the sample?</td>
<td>Organization</td>
<td>Friends of the Potomac River</td>
</tr>
<tr>
<td>WHAT was collected?</td>
<td>Chemical Name</td>
<td>Copper</td>
</tr>
<tr>
<td>WHY was it collected?</td>
<td>Project Name</td>
<td>Quarterly Sample</td>
</tr>
<tr>
<td>WHERE was it collected?</td>
<td>Location Name</td>
<td>Memorial Bridge</td>
</tr>
<tr>
<td>Lat/Long</td>
<td></td>
<td>40.594, -98.721</td>
</tr>
<tr>
<td>WHEN was it collected?</td>
<td>Date</td>
<td>July 24, 2012</td>
</tr>
<tr>
<td>HOW was it analyzed?</td>
<td>Method Name</td>
<td>USEPA 123ABC</td>
</tr>
<tr>
<td>WHAT were the results?</td>
<td>Result Value</td>
<td>5</td>
</tr>
<tr>
<td>Result Units</td>
<td></td>
<td>ppm</td>
</tr>
</tbody>
</table>

- The tool benefits you by providing:
  - Structure to capture required data fields
  - A pick-list of common names for chemicals and analytical methods

How does the WQX XML Schema work?

- Establishes the structure to document a water monitoring sample through standard data fields
- Allows a data owner to use their existing database
- Requires a cross-walk between the database and WQX data standard
- Requires you to review the domain values or pick-list to match your database fields to the WQX schema
  - Is designed for a high volume data owner
  - Requires coding to generate the XML schema
  - Allows for automated machine-to-machine data submission
  - Is a high front end investment and high long term ROI
How does the WQX Web Tool work?

- Establishes the structure to document a water monitoring sample through standard data fields
- Allows a data owner to use their existing database
- Requires a cross-walk between the database and WQX data standard
- Requires you to review the domain values or pick-list to match your database fields to the WQX Web template
- Is designed for a lower volume data owner
- Requires no coding to generate the XML schema
- Allows for manual user-to-machine data submission
- Is a lower front end investment and short term ROI
Data Entry and Data Formatting with WQX Web

Data Entry with WQX Web: Monitoring Location Fields
### Data Entry with WQX Web:
#### Results Fields

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Monitoring Location</th>
<th>Date of Test</th>
<th>Time of Test</th>
<th>Activity Start Date</th>
<th>Activity End Date</th>
<th>Activity Start Time</th>
<th>Activity End Time</th>
<th>Location</th>
<th>Parameter</th>
<th>Characteristic</th>
<th>Result Value</th>
<th>Result Unit</th>
<th>Result Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>12345</td>
<td>Site 1</td>
<td>2023-01-12</td>
<td>10:00</td>
<td>2023-01-12</td>
<td>2023-01-12</td>
<td>10:00</td>
<td>10:00</td>
<td>Site 1</td>
<td>Temp</td>
<td>Water Quality</td>
<td>12.3</td>
<td>°C</td>
<td>Test Lab</td>
</tr>
</tbody>
</table>

### Converting Spreadsheet Data to WQX Web Compatible Format

#### USEPA WQX Web Physical Chemistry Template

- **Export Project**: Document and結構設定/Export Excel/Exportwqx wit
- **Export Monitoring Locations**: Document and結構設定/Export Monitoring, monitoring/Export with...
- **Export Results**: Document and結構設定/Export Results/Export with...

For assistance with using this template, please refer to the USEPA WQX Web site. The examples provided demonstrate how to export data to the WQX format.
What do the tools do? - Review

What do WQX and WQX Web do for you?

- Join 390 federal, states, and tribal agencies and watershed organizations already using the WQX and WQX Web file formats
- Enable quick access to your data in one format and the Water Quality Portal for access to over 150 million records nationally
What do WQX and WQX Web do for you?

• Improve interoperability of data systems through the use of standard water monitoring data fields
• Increase the value of your data by making it available to multiple users through the Water Quality Portal
• Increase your ability to use OTHERS data in conjunction with your data for analysis and modeling

What do WQX and WQX Web do for you?

• Enable you to manage data in the format that best serves your program needs and share data based on common data elements
• Assure that your water data results contain the critical pieces of information to increase the utility of your data for analysis and modeling
• Provide a pick-list of common names for chemicals and analytical methods
User Support and Technical Assistance

- STORET Help Desk
  - 1-800-424-9067
  - STORET@epa.gov
- Monthly User Calls
- STORET List Serve
- Website www.epa.gov/storet

Questions?
Speaker Contact Information

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Monitoring Branch,
US EPA, Office of Wetlands, Oceans, and Watersheds

Next Watershed Academy Webcast

Check back in November for the next Webcast:

“How’s My Waterway” and Other Water Quality Apps

Information will be posted at www.epa.gov/watershedwebcasts
Participation Certificate

If you would like to obtain participation certificates type the link below into your web browser:

http://water.epa.gov/learn/training/wacademy/upload/wawebcast_certificate_102312.pdf

You can type each of the attendees names into the PDF and print the certificates.