# Overview of the STORET Program

WQX/STORET Workshop for Tribes

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# Objectives

- Give folks an introduction to STORET and WQX including:
  - The Monitoring and Assessment program at EPA
  - The National STORET Data Warehouse
  - The Water Quality Exchange (WQX)
- Help folks walk away understanding the basic components and how they apply to you

# EPA's Monitoring and Assessment Program

U.S. ENVIRONMENTAL PROTECTION AGENCY

## Monitoring and Assessing Water Quality

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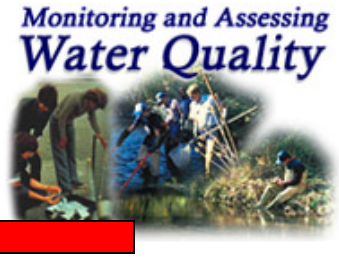
Draft National Lakes Report posted; public comments due January 22, 2010.

Our nation's waters are monitored by state, federal, and local agencies, universities, dischargers, and volunteers. Water quality data are used to characterize waters, identify trends over time, identify emerging problems, determine whether pollution control programs are working, help direct pollution control efforts to where they are most needed, and respond to emergencies such as floods and spills.




- Probability Surveys of the Nation's Waters conducted by the states and EPA
- Water Quality Conditions reported to EPA by the states
- Storing and Managing Water Quality Information through EPA's STORET database
- Mapping and Displaying Water Information through EPA's WATERS website
- Assessing Biological Condition of streams, lakes and estuaries
- Guidance for Volunteer Programs monitoring water quality with trained citizens
- The Volunteer Monitor Newsletter, a forum for citizen volunteer monitors, issued twice yearly
- Outreach and educational materials, including items for children

**Features**

- Draft National Lakes Survey
- Volunteer Monitor, Volume 20, Number 2, Fall 2009. (PDF) (16 pp, 1.3MB, About PDF)
- Seventh National Monitoring Conference, April 25-29, 2010
- Proceedings of the Sixth National Monitoring Conference, 2008
- National Aquatic Resource Surveys
- Submitting and Sharing Water Quality Data
- Electronic Integrated Reporting under Sections 305(b)/303(d) (ATTAINS)
- 2004 Water Quality Report to Congress

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http://www.epa.gov/owow/monitoring/

# National Monitoring Priorities

- Reporting on water quality conditions at national, state, and watershed levels…
  - …through partnering with states, tribes, and other federal agencies
    - WQX and the STORET Data Warehouse
    - National Aquatic Resources Surveys
    - National Water Quality Monitoring Council
- Implementation of the state and tribal monitoring strategies
- Tracking program performance over time

# The STORET Program

- STORET: STOrage and RETrieval of water quality monitoring data

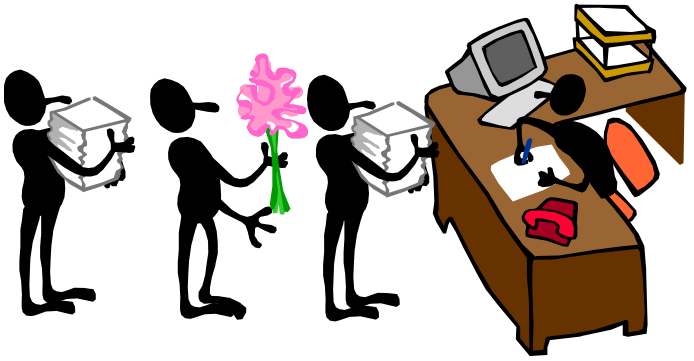
- EPA's STORET Program:
  - promotes sound data management practices
  - stores and maintains water quality data submitted by agencies/groups across the nation in the STORET Data Warehouse

# The National STORET Data Warehouse

- Stores water data of all types (biological, chemical, physical) submitted by states, tribes, watershed groups, other federal agencies, and universities
- Web-enabled: Data are available -- and can be submitted -- using the Web
- Encourages data sharing at a national level

# Who Puts Data in?

- Tribal environmental agencies and groups
- State environmental agencies
- Volunteer groups and watershed organizations
- Universities



# Water Quality Monitoring Data

- Raw monitoring results along with information about
  - Where sample/measurement was collected
  - When it was collected
  - What was collected
  - How it was collected
  - Why it was collected
  - Who collected it

# Glossary of Terms

**Organizations**

- The unique ID and name that identifies data owners in WQX and the STORET Warehouse. Everyone that submits data must have an Organization ID

**Projects**

- A way to group monitoring locations and monitoring activities based on purpose, goals, standards and methods

**Monitoring Locations**

- A specific site where monitoring activities occur. A latitude and longitude are required for all monitoring locations

**Activities and Results**

- Monitoring activities may be water, air, or sediment sample collection, biological specimen catch/trap events, or any measurements or observations obtained at a site. Results are the data measurements.

# How do you put data in?

- All data in the STORET Data Warehouse is submitted through the Water Quality Exchange (WQX) framework

# Today's Status

- Over 45 Tribal organizations have been successful in flowing data using WQX or WQX Web
- About 25 State agencies have been successful in flowing data via WQX or WQX Web since 2007
- The STORET Warehouse contains over 464,000 monitoring locations (places where sampling has taken place)
- The STORET Warehouse contains over 103 million result records

# What is WQX?

- WQX defines the framework by which EPA compiles water quality monitoring data in the STORET Data Warehouse
- WQX is governed by a standardized format, so all data must comply with this format
- The WQX format allows anybody to share data regardless of what the original source of the data was

# Glossary of Terms

**Exchange Network**

- Partnership among States, Tribes, and EPA to exchange environmental information

**WQX**

- Water Quality eXchange – The Water Quality data flow on the exchange network

**WQX Web**

- Web submission tool that utilizes the WQX data flow and framework

**WQX Web Template**

- Excel file that includes the standard data elements to be submitted via WQX Web

**STORET Warehouse**

- The central warehouse for all Water Quality data submitted to the EPA

# Options for submitting data

- Submit the WQX Web excel template file to your regional project officer
- Use web-based tools to manually submit data to EPA
  - WQX Web
  - Other shared solutions
- Build your own tools to manually submit data to EPA
- Build tools using the technology and standards of the Exchange Network to automate data submission to EPA

# The WQX Web Excel Template

- **Two Excel files:**
  - Data dictionary file – Outlines the core WQX data elements needed for submittal of physical and chemical data and their associated formats and valid values
  - Data entry file – Provides a place to enter data into these elements using the right formats and valid values
    - Puts data into a text file format that WQX Web can easily import
- **An optional tool if you're going to use WQX Web**
  - If you have a spreadsheet or database that works for you, keep using it, and you can configure WQX Web to accept your data
- Can be downloaded from the STORET website:
  - http://www.epa.gov/storet/wqx/wqxweb_downloads.html

## WQX Web Data Template—Physical and Chemical Results

This document is intended to serve as a guide to assist water quality data providers in the process of formatting their data in a WQX-compatible format. The various tabs in this document provide template sheets and allowable values lists for the types of information which a data owner must include in order for the data to be successfully stored in WQX/STORET. For more information about STORET, see the EPA's STORET website: About STORET. Information regarding how WQX/STORET organizes data into Projects, Monitoring Locations, Results, etc. can be found in the STORET Concepts page.

There are three types of tabs present in this document. The first tab (highlighted in pink) provides a mechanism for producing text files in a tab delimited format. These text files are prepared automatically to be compatible with the WQX Web tool, which you may use to upload data to the STORET Data Warehouse via EPA's Central Data Exchange (CDX). The export process, contained in this tab, also converts the county name that you refer to in the County field found in the Monitoring Locations tab to the appropriate county code needed by WQX Web.

The tabs in the second group (shaded in light yellow) are intended serve as data formatting templates. That is, these tabs could be shown to a laboratory or other data provider as an example of an Electronic Data Deliverable (EDD). If the lab could format their electronically reported data in a manner similar to the format shown on these tabs then it would be highly likely that the data could be migrated to WQX/STORET with very little intervening data manipulation. Alternatively, these tabs can also be used to enter and format data that is not being provided electronically, such as field data.

The third group of tabs (light green), displays what the appropriate allowable-values are for various fields in WQX/STORET. The listing of acceptable values that WQX STORET requires for a particular element is highlighted in light green.

All information in this document is accurate as of November 5, 2008.

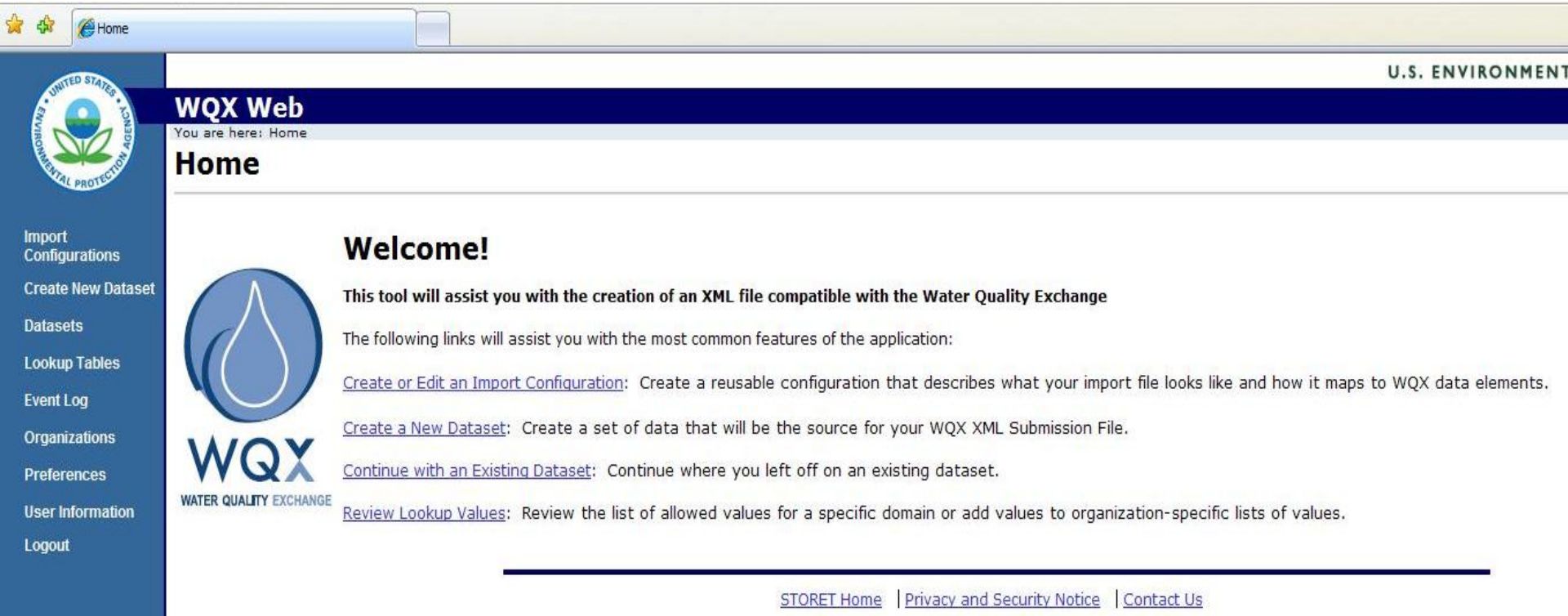
Please note:

- This template is a guide and may be modified by individual users to include additional information.
- Users should consult the Template Data Dictionary (Template_dictionary_WQX_Web_[Date].xls) for explanations about each data element.

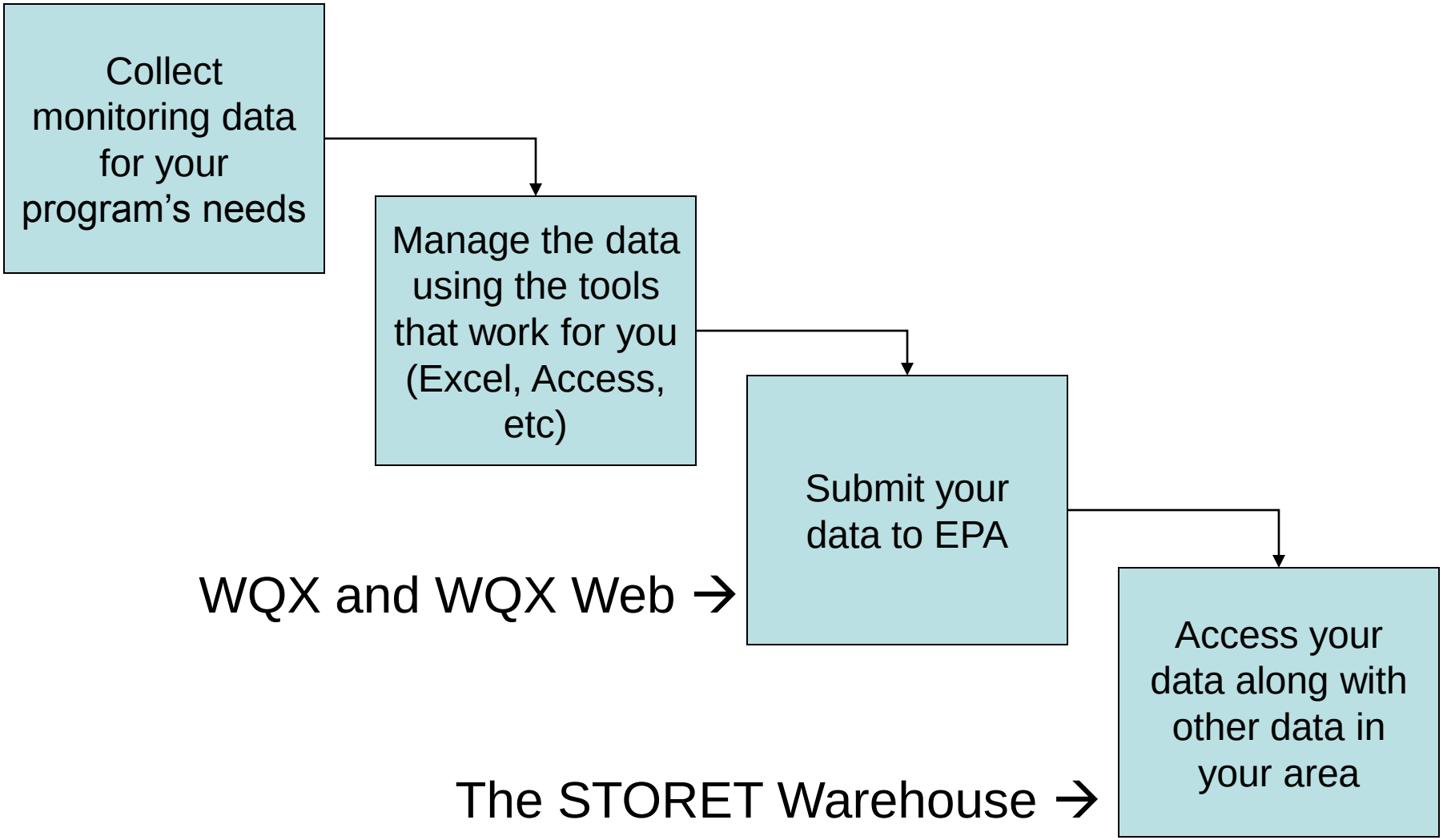
| Tab Name | Description |
|---|---|
| Export | Provides a mechanism to easily export WQX Web compatible tab dleimited text files |
| Projects | A template which can be used to store Project data |
| Monitoring Locations | A template which can be used to store Monitoring Location data |
| Results | A template which can be used to store Results data |
| Allowed Values - Results | Shows what the Allowable Values are for various Result-related data elements |

# The WQX Web submission tool

- Accepts basic input formats (i.e. Excel or Text files)
- Has translations for mapping data to WQX domain values or defaults
- Creates a WQX file that a user can send through WQX



# Overall Data Flow



# Data in the STORET Warehouse

- Data in the STORET Warehouse gets refreshed once a week.
- Data can be accessed through a query tool at www.epa.gov/storet.
- EPA has created other tools for accessing the data in STORET:
  - Enviromapper for Water (http://www.epa.gov/waters/enviromapper/)
  - MyEnvironment (http://www.epa.gov/myenvironment/)
  - Surf Your Watershed (http://cfpub.epa.gov/surf/locate/index.cfm)

# Who uses the data?

- The general public
- Water resource managers
  - Tribes
  - Interstate commissions
  - State agencies
  - EPA and other federal agencies (e.g. USGS, NPS)
  - Universities

# So What?

- STORET and WQX are national systems, not local data management systems
- However, the STORET Warehouse provides a rich **cross-jurisdictional** data source in a single format that can be used for analysis
  - USGS NWIS water quality data is also available in this format
- Data submission can be an efficient process once you've set up the procedures that work for you
- **We are here to help you**

# Web Resources, Support and Contacts

- www.epa.gov/storet
- www.epa.gov/storet/wqx.html
- storet@epa.gov or 1-800-424-9067
- Join the STORET list serve: www.epa.gov/storet/listserv.html
- Kristen Gunthardt – US EPA Office of Water
  - (202) 566-1194
  - gunthardt.kristen@epa.gov