Submitting Data via WQX

WQX/STORET Workshop for Tribes

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What is WQX?

- WQX defines the framework by which EPA compiles water quality monitoring data (physical, chemical and biological) that are collected by a number of entities via a shared schema.

- The schema allows for anybody to share data regardless of what the original source of the data is.
  - **Organizations**
  - **Projects**
  - **Monitoring Locations**
  - **Activities/Results**

What is WQX??

- An internet and data standards based way to submit data to the STORET Warehouse
- Uses the standards and technology of the National Environmental Information Exchange Network
- Users have automated "Nodes" or "Node Clients" to submit data from their databases
- Users can use WQX Web to submit data
- Data format is the WQX Schema
- http://www.epa.gov/storet/wqx.html

Exchange Network

- WQX is one of many media "flows" on the Exchange Network
- Grants available to all organizations that wish to submit via WQX
  - States; Tribes
  - Have various goals – basic capacity to mentoring
- WQX gets over 20 proposals every year (more than any other flow in OW)

WQX: What are the tools you need?

- Exchange Network Node or Node Client
  - IT support and capacity
- WQX Schema
  - Definition of how the xml should be created
- WQX Data Exchange Template (DET)
  - Definition of all WQX data elements and business rules
- WQX Flow Configuration Document (FCD)
  - Definition of the Exchange Network services that must be employed to submit data via WQX
- WQX Domain Values (Exchange Network service)
  - Valid values that much match WQX in order to avoid errors
- http://www.exchangenetwork.net/exchanges/water/wqx.htm

Environmental Information
e**X**change
Network

Search

the
exchange network

the network is powering up...it's a better way

archives   contacts   faqs   calendar

water quality exchange

Status: In Production

data exchange description

The Water Quality Exchange (WQX) allows Network partners to share ambient water quality data with the U.S. EPA. The WQX System includes the following types of data: the physical conditions in the environment at the time of a site visit; the chemical and bacteriological make-up of the water sampled; and chemical analyses of fish tissue collected. WQX represents the next evolution for EPA's STORET model for sharing water quality data. EPA will transition away from a distributed database model towards the Exchange Network model for the sharing of data. This transition is expected to be fully completed in 2009. This release of WQX constitutes a major component of that transition. Planning is underway for future data flows to accommodate biological (i.e. population abundance data) and habitat data. For more information on WQX and the future of STORET, please visit the website of U.S. EPA's Office of Water.

implementation resources

The WQX documentation package has been received and reviewed by the NTG Conformance Committee. The Committee has deemed the schema and supporting flow documentation acceptable for use on the Exchange Network. The WQX data exchange is currently in version 1.0. The following links are to implementation resources for this most recent version.

Navigation (left sidebar)

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sign up for network email alerts today!

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Printer friendly page

WQX Schema

- Common set of XML data elements and business rules that everyone uses when submitting data
- Database independent – XML can be created out of any type of database
- Insert / Update vs. Delete Schema
- WQX v1.0 → Based on Environmental Analysis, Sampling and Results (ESAR) data standard
- WQX v2.1 → No data standard like there was with physical / chemical

WQX schema v1.0

- The physical conditions in the environment at the time of a site visit.

- The chemical and bacteriological make-up of the water sampled.

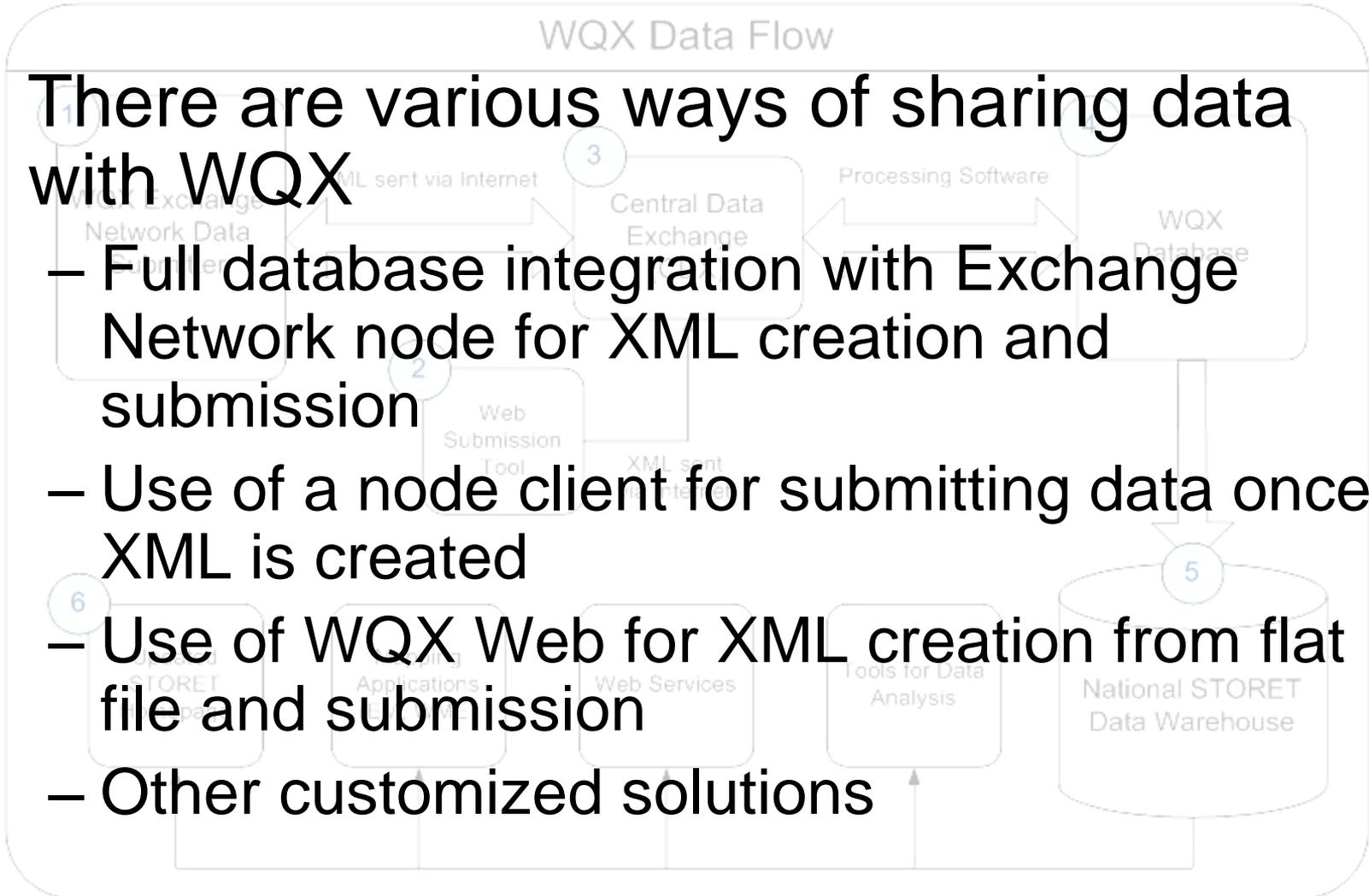- Chemical analyses of fish tissue collected.

WQX schema v2.1

- Biological Taxon Abundance data, including population census, frequency class, group summaries, and individual results

- Reference site information

- Toxicity data

- Habitat Assessment scores and their related metric scores

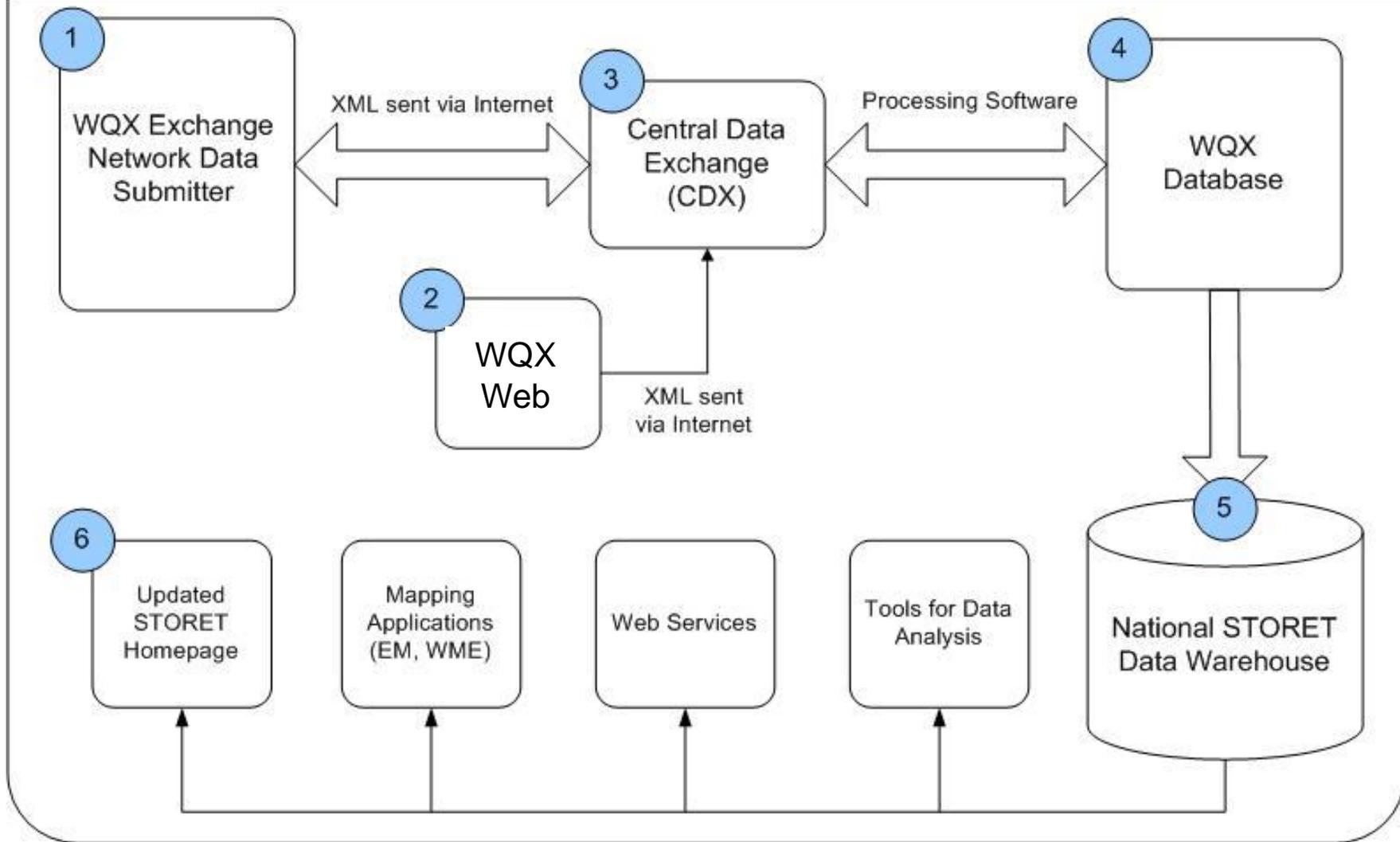- Biological Index scores and their related metric scores

Options for Submitting

- There are various ways of sharing data with WQX
  - Full database integration with Exchange Network node for XML creation and submission
  - Use of a node client for submitting data once XML is created
  - Use of WQX Web for XML creation from flat file and submission
  - Other customized solutions

WQX Data Flow

1 WQX Exchange Network Data Submitter

XML sent via Internet

3 Central Data Exchange (CDX)

Processing Software

4 WQX Database

2 WQX Web

XML sent via Internet

6 Updated STORET Homepage

Mapping Applications (EM, WME)

Web Services

Tools for Data Analysis

5 National STORET Data Warehouse

WQX and WQX Web Takeaways

- WQX
  - Requires a node or a node client to submit data over the Exchange Network
  - XML must be already created
  - Uses the Exchange Network NAAS ID for identifying a submitter

- WQX Web
  - Requires an internet connection to submit data over the Exchange Network
  - XML is created from a "flat file"
  - Uses a CDX Web Account ID for identifying a submitter

All data is placed in the STORET Warehouse under your Organization ID on a weekly basis

What does WQX mean for users?

- WQX requires new mechanisms and infrastructure for sharing data (adoption of Exchange Network and WQX standards)

- Distributed STORET database submissions are no longer supported

- Users must "map" their data to the common schema and set up infrastructure for sharing data

- For many Organizations that used Modern (distributed) STORET, WQX requires a new ORG ID until data are migrated

Organization ID and NAAS Accounts

- An Organization Identifier (Org ID) is a unique identifier to identify you within the WQX system and the STORET Warehouse (e.g. YUROK for the Yurok Tribe or 1VTDECWQ for Vermont Dept of Environmental Conservation).

- A NAAS ID is used to identify and authorize users on the Exchange Network – it's usually your email address or the endpoint of your node

- When you submit data to WQX, we link your NAAS ID to your ORG ID so that you can submit and access your data
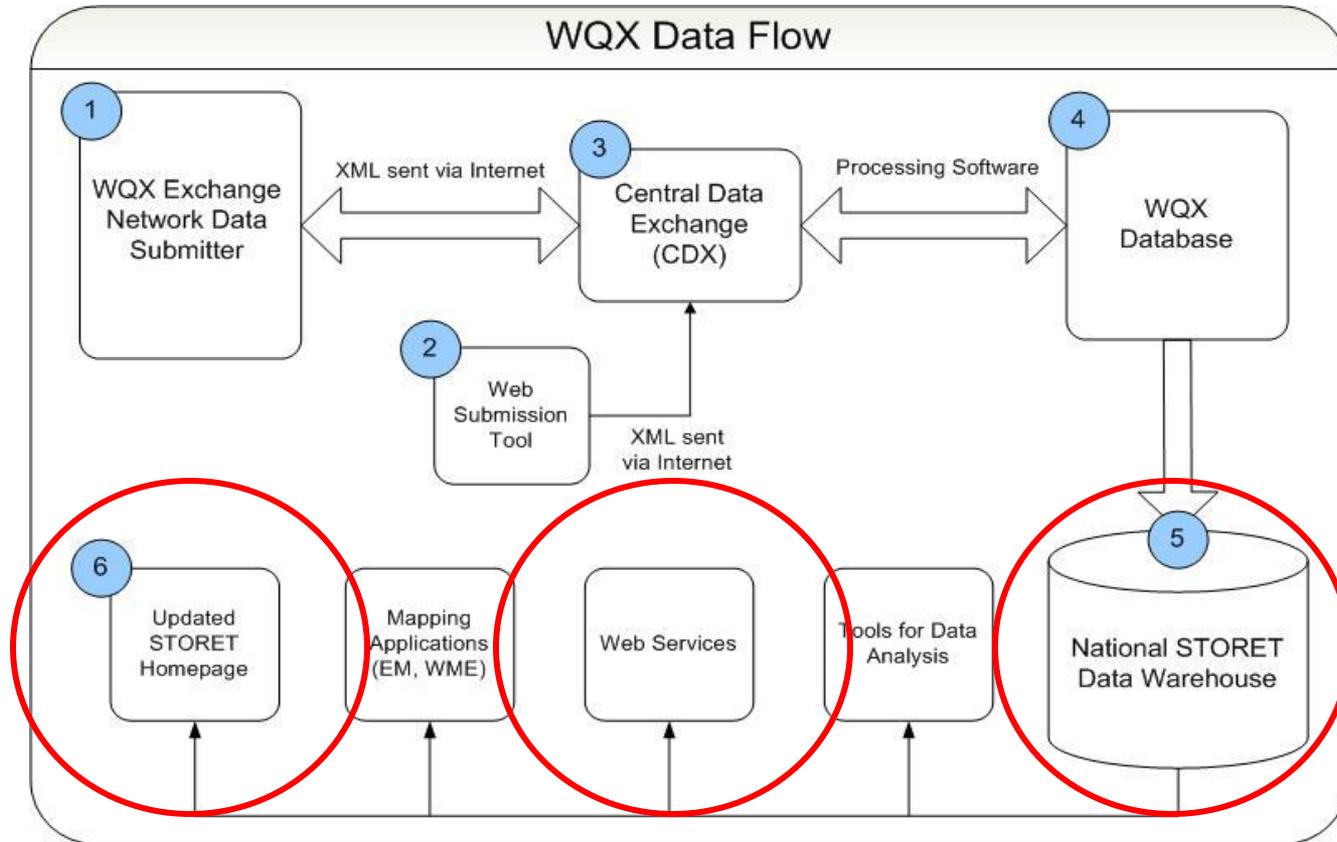
Mapping your source data to WQX schema and valid values

- The largest challenge for users of WQX is mapping their water monitoring data to the WQX schema business rules and domain values
- Key Domain Value Lists:
  - Characteristics
    - WQX standardizes on the EPA Substance Registry System (SRS) for chemical names
    - WQX will maintain candidate names if a chemical name has not been vetted through SRS
  - Taxa Names
    - WQX standardizes on the Integrated Taxonomic Information System (ITIS) for taxa names and rank
    - May need to roll up to lowest ITIS rank name
    - Monitoring program working with ITIS system for updates
  - Please contact us for new requests

Dealing with WQX errors

- The CDX node performs validation that the submitted XML is well formed
- If the file does not pass CDX validation, it does not continue on to WQX for processing
- The WQX processing software checks that files conform to WQX data element formats, business rules and domain values
- Once a file is submitted and has either "failed" or "completed", users can download the following:
  - Original XML file submitted
  - CDX validation report
  - CDX notification file reporting status as either completed or failed
  - WQX processing report summarizing the inserted/updated/deleted data and any encountered errors

Accessing Data

WQX Data Flow

1 WQX Exchange Network Data Submitter

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3 Central Data Exchange (CDX)

Processing Software

4 WQX Database

2 Web Submission Tool

XML sent via Internet

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Warehouse Refreshes

- We conduct a process weekly to push data from the WQX backend database to the STORET Data Warehouse

- All data, except data marked as "Preliminary" under the data element Result Status, is pushed to the Warehouse

Questions

- Contact:
  - The STORET Team: storet@epa.gov
  - 1-800-424-9067
- Or Visit:
- www.epa.gov/storet
- www.epa.gov/storet/wqx.html
- www.exchangenetwork.net/exchanges/water/wqx.htm

General Exchange Network Links

- Highlights on the Exchange Network Wiki http://www.exchangenetworkwiki.com/wiki/index.php/Main_Page

  - http://www.exchangenetworkwiki.com/wiki/index.php/Category:Tribal_Resources

  - http://www.exchangenetworkwiki.com/wiki/index.php/2010_Exchange_Network_National_Meeting