COLUMBIA RIVER BASIN
RESTORATION PROGRAM

EPA

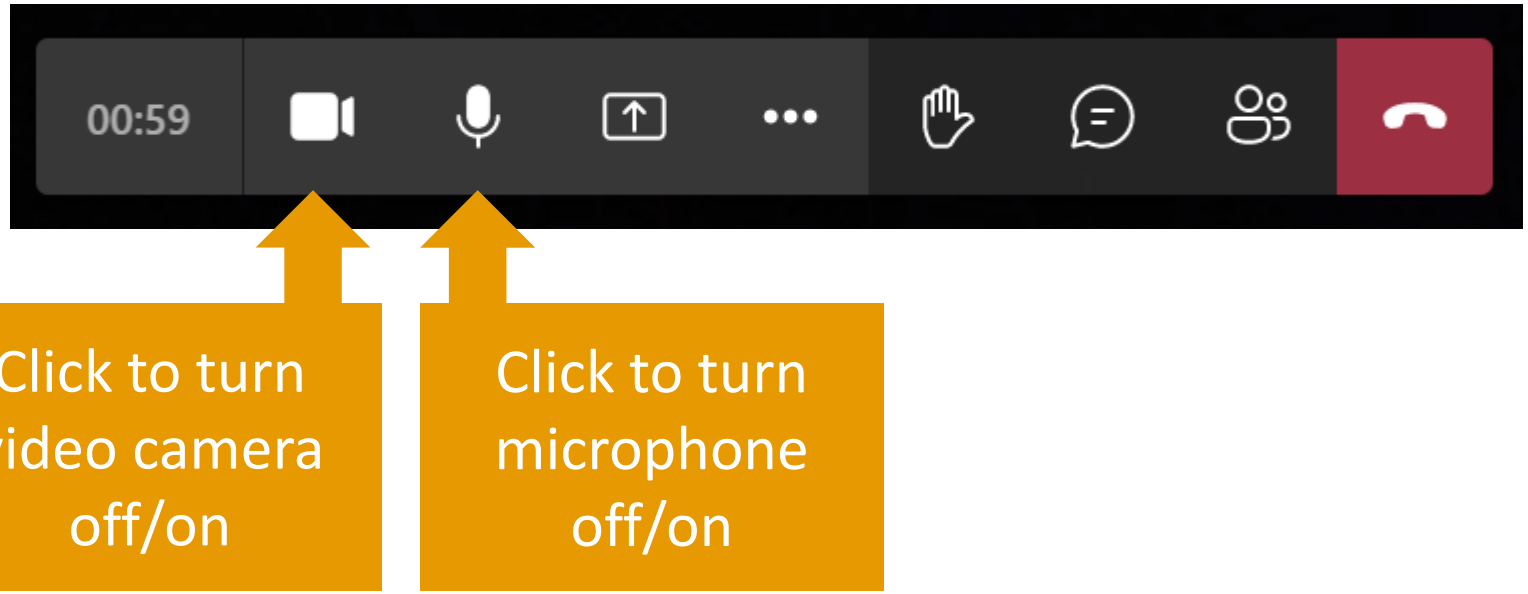
Columbia River Basin Restoration Program Toxics Monitoring Subgroup Meeting

SEPTEMBER 26, 2023 | 10:30 – 12:30 PM PACIFIC

AGENDA

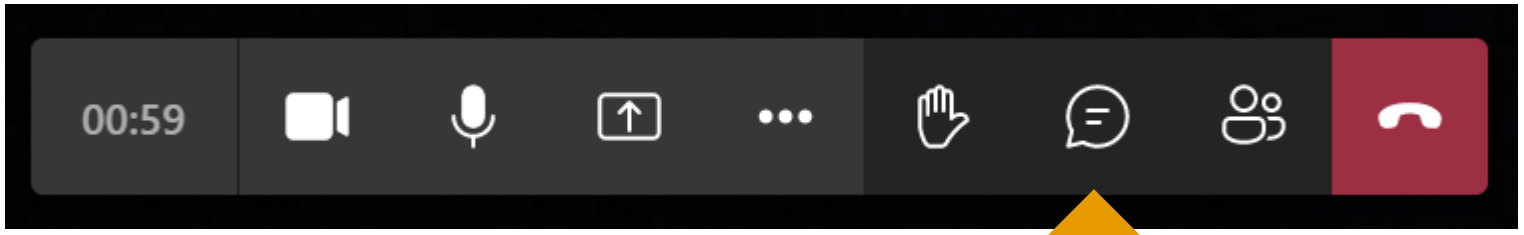
10:30—10:40 AM	WELCOME & INTRODUCTIONS
10:40—10:55 AM	WQX 101 • Brief overview, orientation to online resources
10:55—11:20 AM	CRB TOXICS MONITORING DASHBOARD(S) • Background and initial ideas, get feedback on utility and potential features
11:20—11:35 AM	ASK THE AUDIENCE • How best to report on fish tissue toxicity data and criteria to measure it against
11:20—12:20 PM	LIGHTNING TALKS • 3 presentations, Q&A after each

MS TEAMS TIPS



Please turn camera and mic off when not speaking.

INTRODUCTIONS



Click chat icon and introduce yourself – name and affiliation

TYPE QUESTIONS OR COMMENTS IN SLIDO

Join at slido.com
#ToxMon

Multiple-choice poll

Pumpkin spice - delicious or disgusting?

0 2 0

delicious!

75 %

disgusting!

25 %

What's the worst Halloween candy?

019

Overview of Water Quality Exchange and Water Quality Portal

CRBRP Toxics Monitoring Subgroup

September 26, 2023

Jill Fullagar

EPA R10 Assessment Program and Data Management Coordinator

206-553-2582

Fullagar.jill@epa.gov

Slides courtesy of Adam Griggs, Water Data Integration Branch, EPA HQ

What Is WQX?

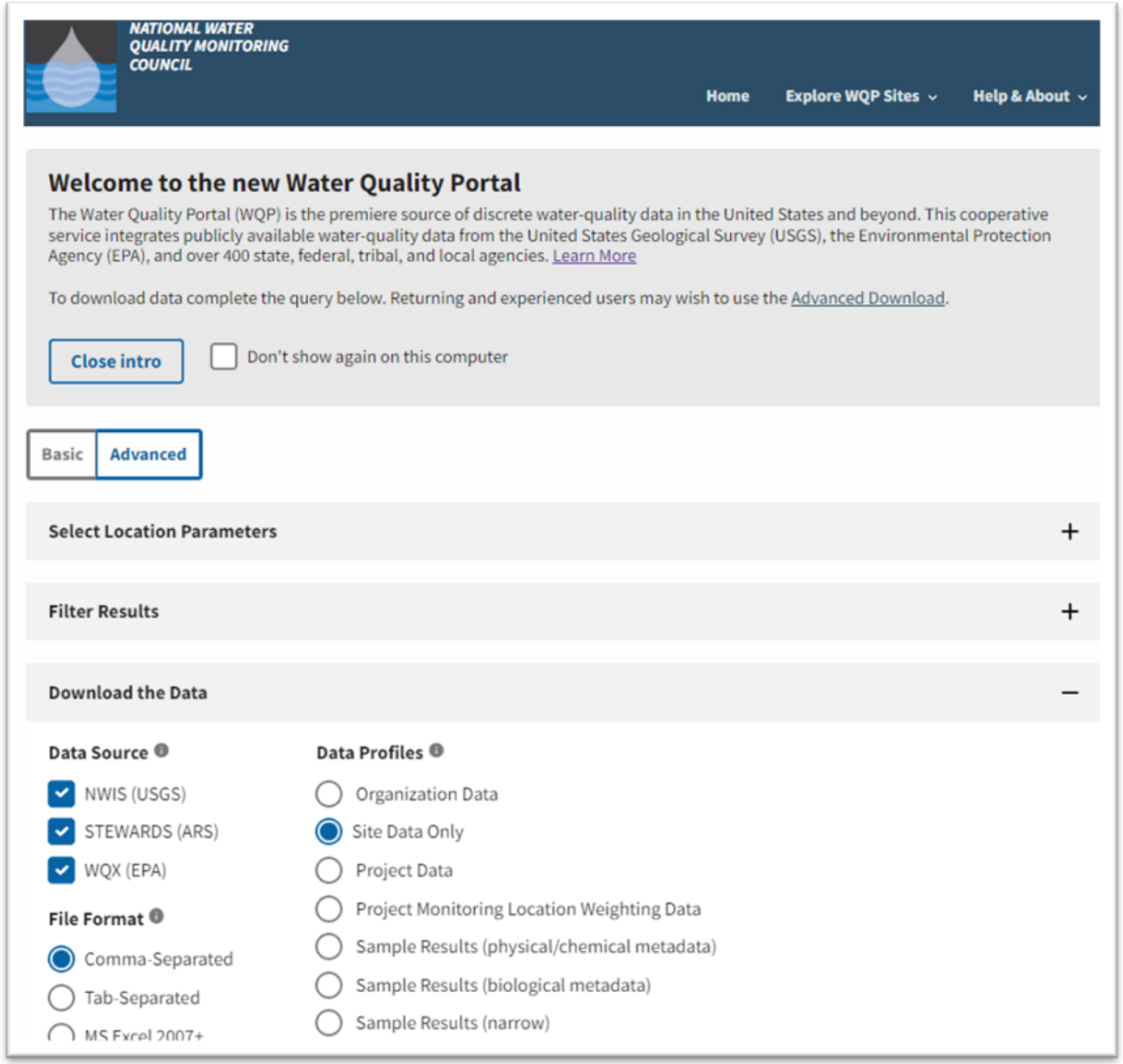
It is a standardized data format and submission database

- WQX is a ‘standardized’ based approach for sharing water quality monitoring data of various types
- WQX defines a common data model for communicating water quality data (sample data)
- Designed to be automated
- The structure of partner data systems doesn’t matter, so long as they can map data to WQX standards
- Many ways to prepare and submit data to WQX: including direct submissions, WQXWeb, and 3rd party apps

Water Quality Portal

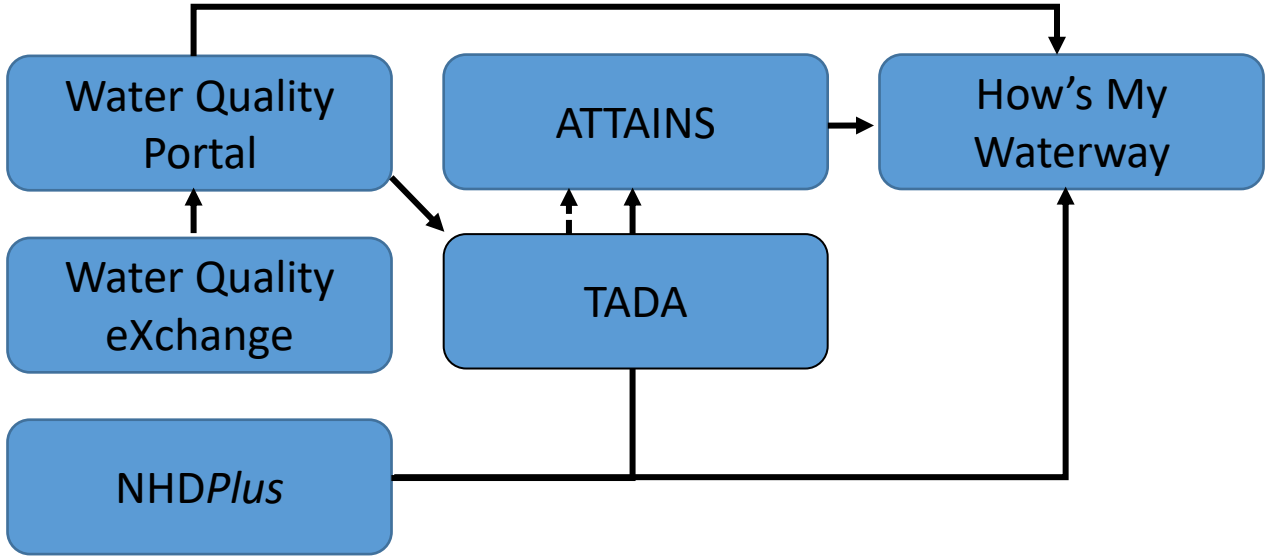
- *Operated under An Interagency Cooperative agreement (USGS & EPA)*

- Serves data from USGS, EPA, USDA, NPS in a standard WQX format
- # WQP: Data from >1,600 organizations
- # WQP: >410m records from >1m sites
- Serves data of all water types
- Includes a Graphical User Interface (GUI) & Web Services
- One of our integrated systems (IOW HUB)
- Data Services can directly power analytics like those in HMW
- Growing number of internal/external tools built on top of this primary data source

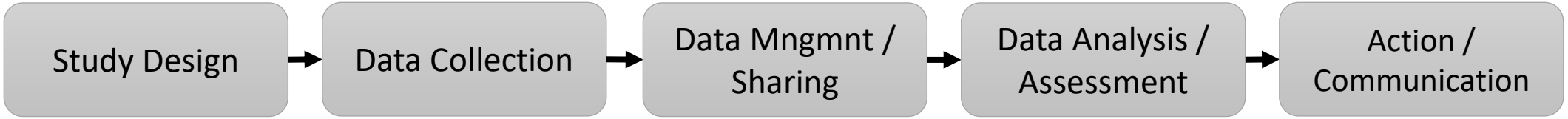


Lifecycle of Data and WDIB Data Systems

Online CWA Data Systems



Lifecycle of Data



How's My Waterway

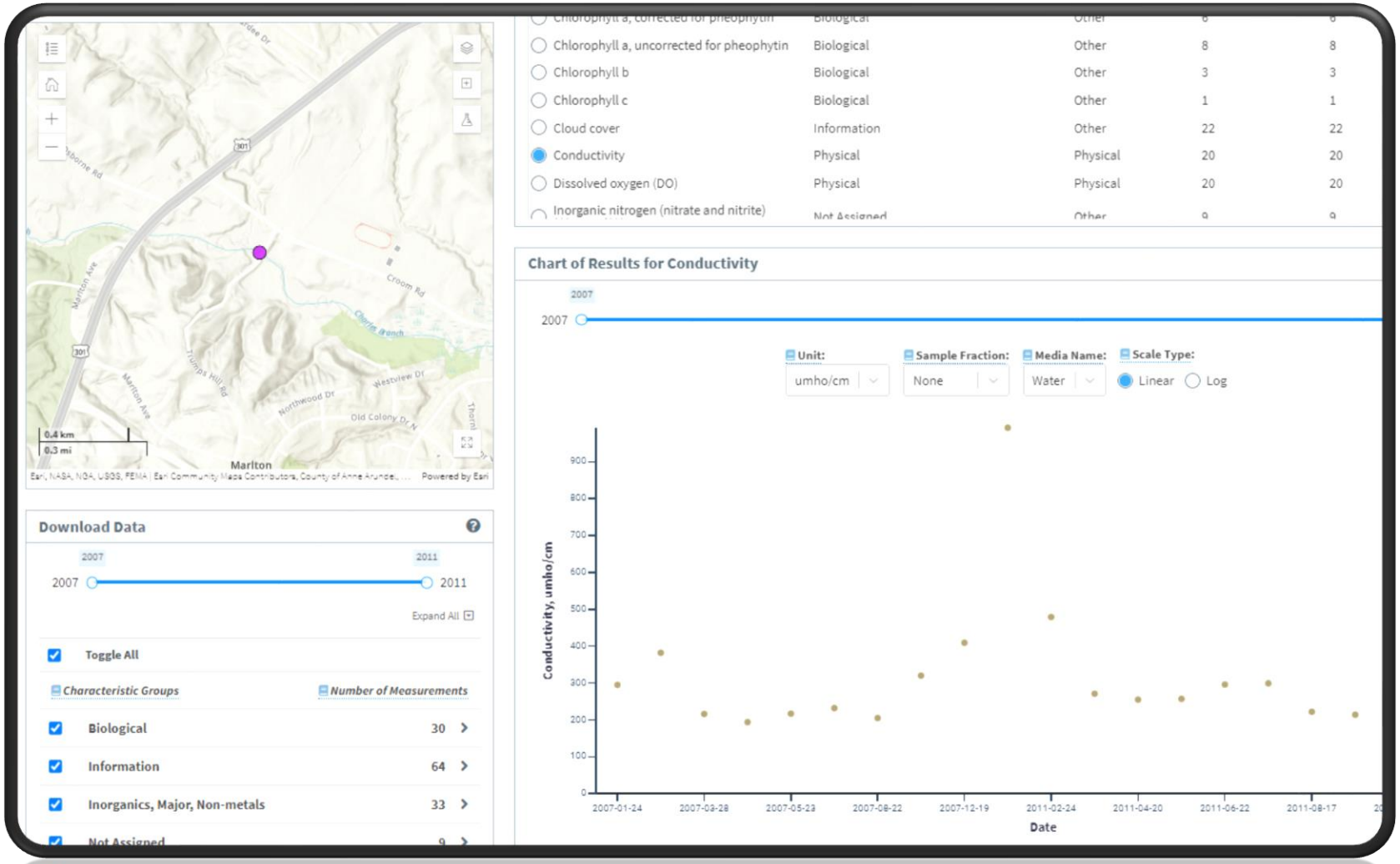
Serving Public Information

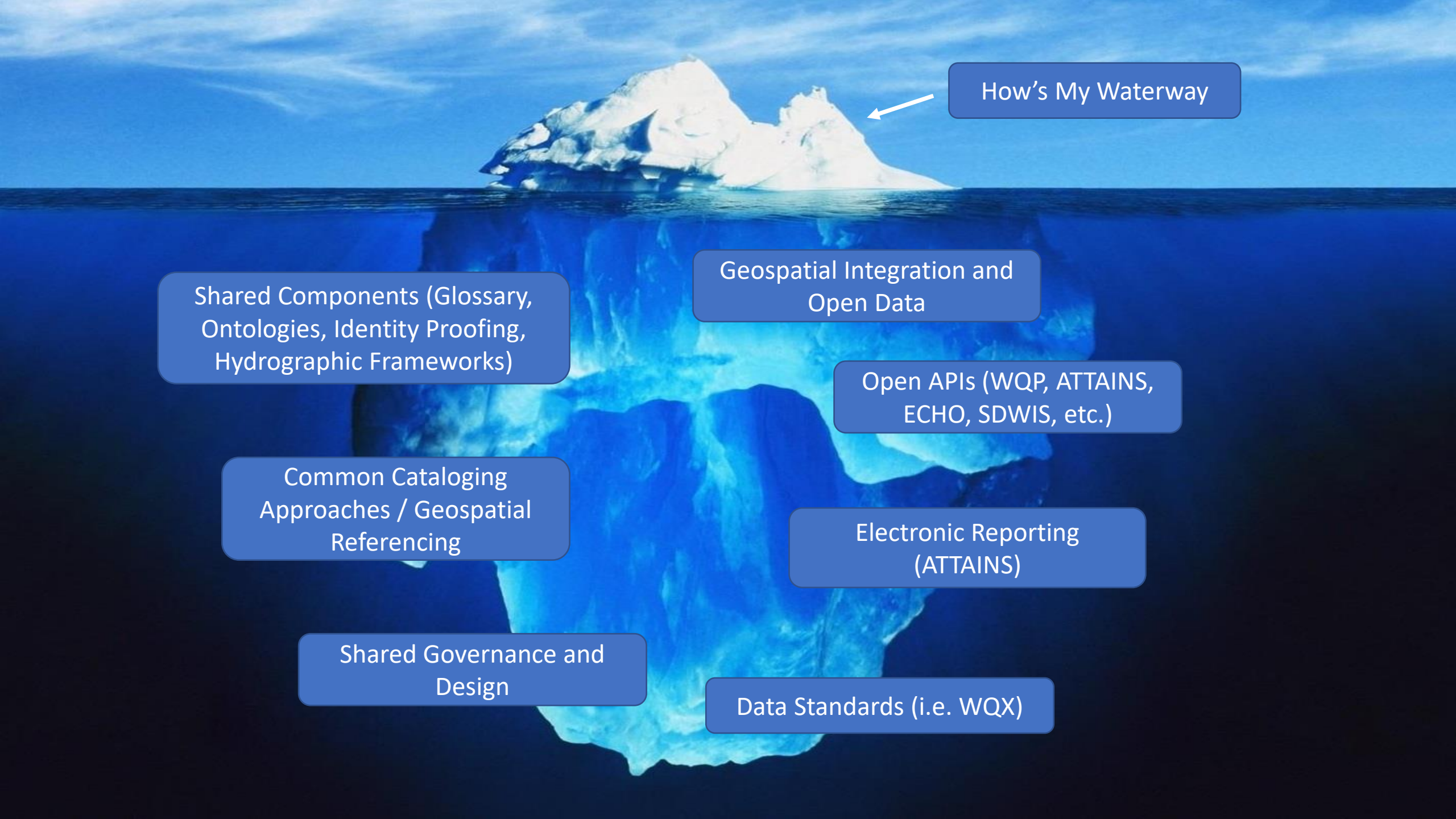
Powered by open data and web services

Accesses, interprets, and displays data from over a dozen sources

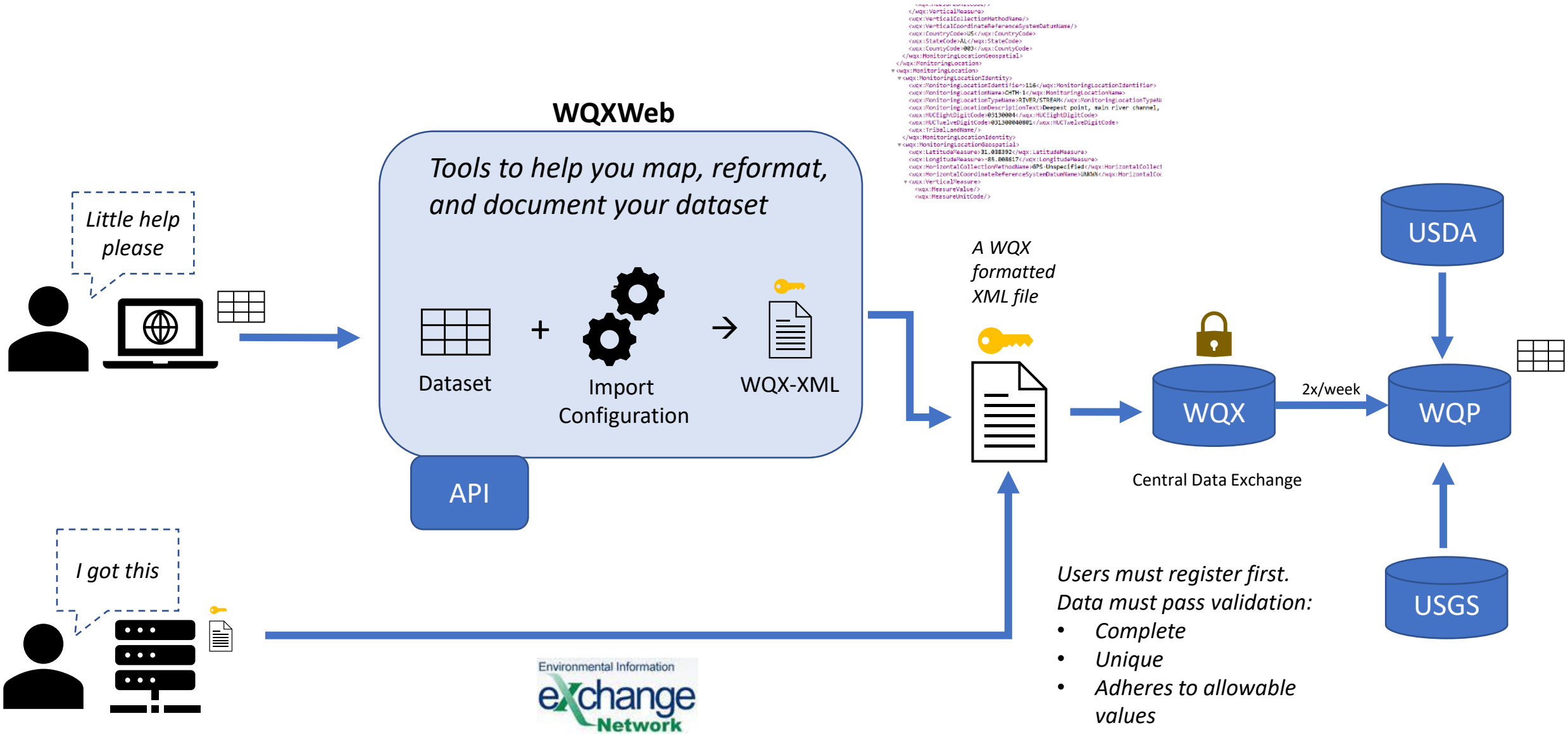
Including ATTAINS, and the WQP among many others

https://mywaterway.epa.gov



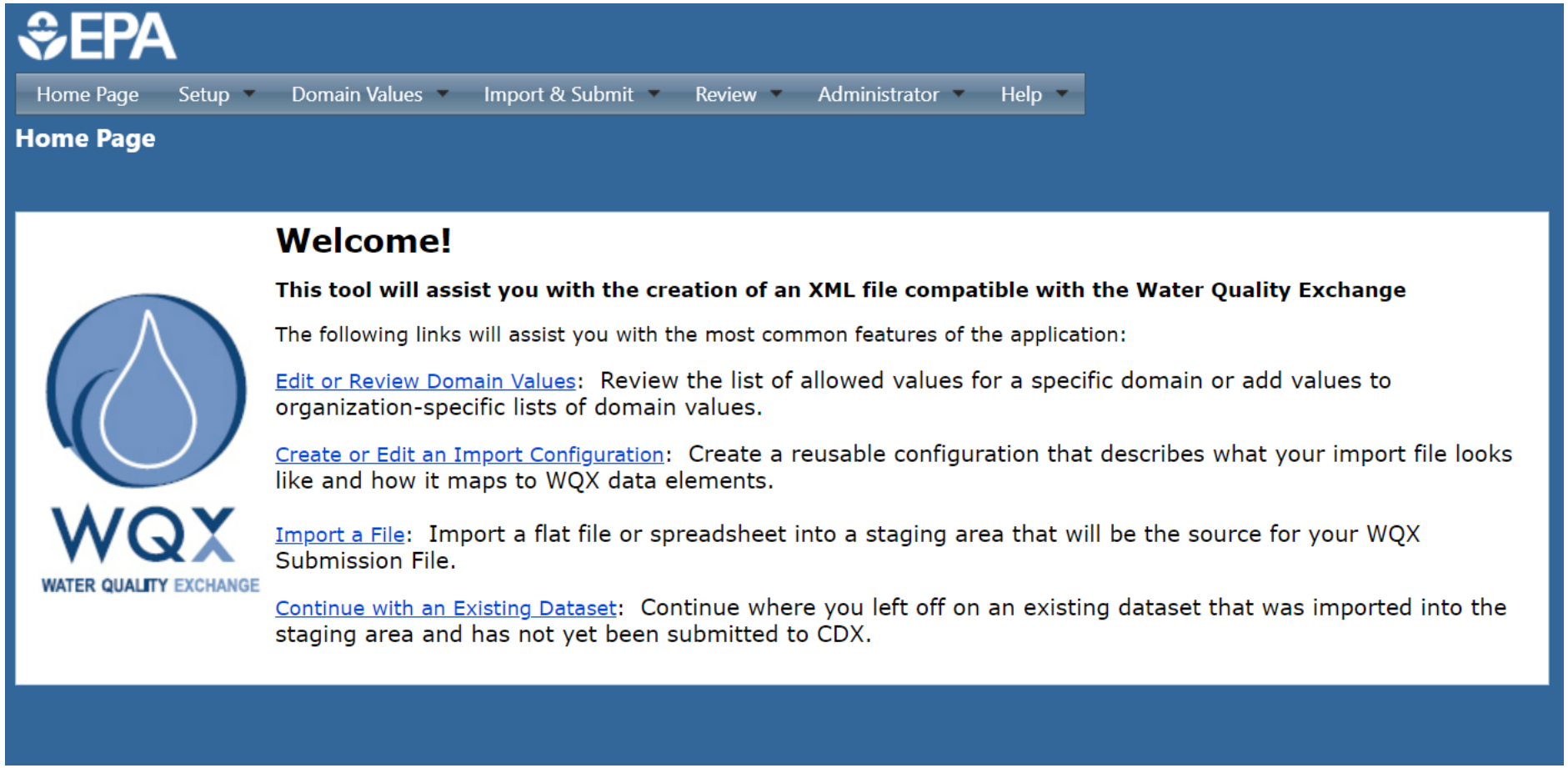

How's My Waterway
Shared Components (Glossary, Ontologies, Identity Proofing, Hydrographic Frameworks)
Geospatial Integration and Open Data
Open APIs (WQP, ATTAINS, ECHO, SDWIS, etc.)
Common Cataloging Approaches / Geospatial Referencing
Electronic Reporting (ATTAINS)
Shared Governance and Design
Data Standards (i.e. WQX)

Pathways to WQX and the Portal



What is WQXWeb?

WQXWeb is the web application that allows users to import, manipulate, validate, and upload their datasets to WQX.



How is data Organized in the WQX Schema?

It can be helpful to think of the data as being stored in levels

…or related tables of information

*When you register

Your WQX Organizational Account

Org ID	Org Name
001	Minnesota Depart
002	Kentucky Departm
003	University of Was

*Table 1

All Project Info

Prjct ID	Project Name
001	Cyano Monitoring
002	Probabalistic mon
003	Trends Program

*Table 2

Unique Locations

Loc ID	Location Name
001	Deep Blue Lake
002	Muddy Run
003	Fishing Creek

*Table 3

All Activities and Results

Activity ID	Prjct ID*	Loc ID	Sample Date	Activity Type	Characteristic	Value	Unit	Sample Collection Method
001	002	003	4/23/2020	Sample-Routine	TSS	7.6	SU	Grab Sample Method
002	002	003	4/23/2020	Field Msr/Obs	Temperature	19.1	Deg C	Field Probe Method
002	002	003	4/23/2020	Field Msr/Obs	Conductivity	236	µS/cm	Field Probe Method

Step 1. Register for a WQX Account

How to Sign up for a CDX/WQXWeb account

1. Email the WQX team to Request a WQX Web account

The email address is: wqx@epa.gov

First name

Middle name

Last name

Prefix (Mr./Mrs./Ms)

WQX Organization ID

WQX Organization Name

Mailing Address 1
Mailing Address 2
City
State
Zip/Postal Code
E-mail Address
Phone Number

EPA United States Environmental Protection Agency

Search EPA.gov

Environmental Topics | Laws & Regulations | Report a Violation | About EPA

Related Topics: Water Data and Tools

CONTACT US

WQX Web Account Registration

How to Gain Access to WQX Web

Access to WQX web occurs through EPA's portal for environmental data, the Central Data Exchange (CDX). This process involves registration of two accounts: one with CDX to verify your identity and allow you access to the WQX web application and one with the WQX team that will allow you to submit data to EPA for your specific organization. After registration of these two accounts, the process of accessing WQX web through CDX is seamless and only requires one login step. The WQX team will help guide you through registration and field any questions you may have along the way.

Registration Steps for CDX and WQX Web

1. Email the WQX team to Request a WQX Web account

To begin the process of setting up your WQX Web account, please provide the following information in an email to the WQX Team. The email address is: wqx@epa.gov

- First name
- Middle name
- Last name
- Prefix (Mr./Mrs./Ms)
- WQX Organization ID
- WQX Organization Name
- Mailing Address 1
- Mailing Address 2
- City
- State
- Zip/Postal Code
- E-mail Address
- Phone Number

Does my Organization have an ID registered with WQX?

All Organizations submitting data through WQX Web require a WQX Organization ID that is unique from any previous STORET Org IDs. Using the appropriate Organization ID is incredibly important in order to maintain consistency and decrease the chance of data duplication or deletion. If you are unsure if your organization has a WQX ID, the best way to find out is to search the Water Quality Portal EXT under the "**Organization ID**" field. See this video tutorial all about how to search for this information: **Coming Soon**. If you are still unsure if your organization has a registered ID, ask the WQX team to assist you.

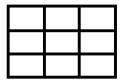
If you need to set up a WQX Organization ID, please contact the WQX help desk by email (wqx@epa.gov). We will ask that you provide us with the following information in order to set up the Organization ID:

- WQX Organization ID of your choice (can be up to 30 characters long)
- WQX Organization Name
- Your contact information as outlined above

How to Register Page: https://www.epa.gov/waterdata/wqx-web-account-registration

Step 2. Choose Your Path

WQX Web Templates

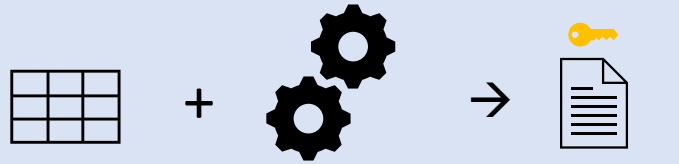


Full adoption of the WQX standard

- ‘Stacked’ format
- WQX fields
- WQX allowable values
- Simple 1:1 import configuration w/ no edits necessary

WQXWeb

Tools to help you map, reformat, and document your dataset



Import Configurations

Lean on the import configuration to transform your data

- Work with a stacked or matrix style data format
- Add your missing metadata elements through the IC
- Apply transformations to your dataset to achieve the standard

Step 3. Assemble Your Data / Understand What's Needed

When you submit data to WQXWeb, you submit three tables, one each for Projects, Locations, and Activities/Results.

All Project Info

Prjct ID	Project Name
001	Cyano Monitoring
002	Probabalistic mon
003	Trends Program

Project ID
Project Name
Project Description

All Location Info

Loc ID	Location Name
001	Deep Blue Lake
002	Muddy Run
003	Fishing Creek

Location ID
Location Name
Location Type
Coordinates
Location Method

All Result-level Info and metadata

Activity ID	Sample Date	Characteristic	Value	Unit
003	5/3/2012	pH	7.6	SU
003	5/3/2012	Temperature	19.1	Deg C
003	5/3/2012	Conductivity	236	µS/cm

Sample Media
Start Date
Collection Method
Collection Equipment
Characteristic Name
*Other reqmnts

Result Value
Result Unit
Result Status
Analytical Methods
Result Value Type

What are the Data Requirements for WQX?

Available Fields

- The "Data Exchange Template"
- Web Templates – "All ResultElements"
- Within the Import Config Module

Allowable Values

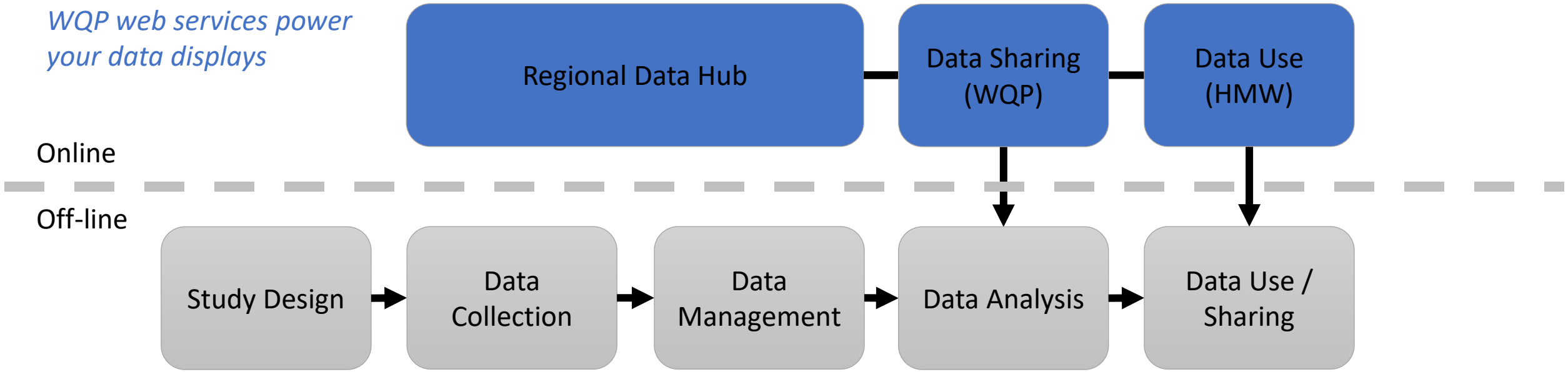
- The WQX Domain List / Service
- The WQXWeb application
- Built into the Excel templates

Rules & Requirements

- Business Rules
- Required Fields
- Flow Configuration Document

How can partnerships, technology, and the internet help us solve these challenges?

Doesn't require a database, simply organize and share the data to WQX, and let WQP web services power your data displays



WQX Basic Resources

Topic Area	Resource Links
Open Water Data Resources / Links	Water Quality Exchange (WQX) [Data In] The Water Quality Portal (WQP) [Data Out] How's My Waterway (HMW) [Info Out] Central Data Exchange (CDX) [Data Held] Exchange Network (Node Submissions to CDX)
WQX Nuts and Bolts	Upload Resources Page Glossary of Terms Business Rules Data Exchange Template (List of Available Elements) Domain Service (Acceptable Values)
Using WQX – Getting Started	Introduction to WQX, WQX Web, and WQP (5 min video) Quick WQX Web User Guide (PDF Guide) User Guide Version 3.0 for Water Quality Exchange Web Getting Started with WQX Web: How to Gain Access WQX Web Basics – Two-part session--Day 1 WQX Web Basics – Two-part session--Day 2
Using WQX – Templates	Water Quality Exchange Web Template User Guide | US EPA Link to Web Templates Web Templates Overview Video
Using WQX – Import Configurations	WQX Web Import Configuration Options Translations via Expert Mode
Using WQX – Best Practices	Best Practices for Sharing Benthics Data WQX Metals Best Practices Guide WQX Nutrients Best Practices Guide
Using WQX - Other	Water Quality eXchange Factsheet Common Errors Resolution WQX Program Information

Helpdesk/Support/Training

- The helpdesk can be reached at WQX@epa.gov M-F 8am-5pm Eastern
- You can also call 1-800-424-9067 to leave a voicemail
- Monthly User Call
- Several user guides
- Best-practice manuals
- Instructional videos on Youtube
- Access one-on-one support from WQX contractors
- Contact Jill Fullagar for additional assistance at Fullagar.jill@epa.gov or 206-553-2582

EPA Columbia River Basin Restoration Program

Toxics Monitoring Subgroup
Quarterly Meeting
September 26, 2023

Ashley Zanolli and Katia Rar
US EPA Region 10

Columbia River Basin Restoration Program Vision Statement

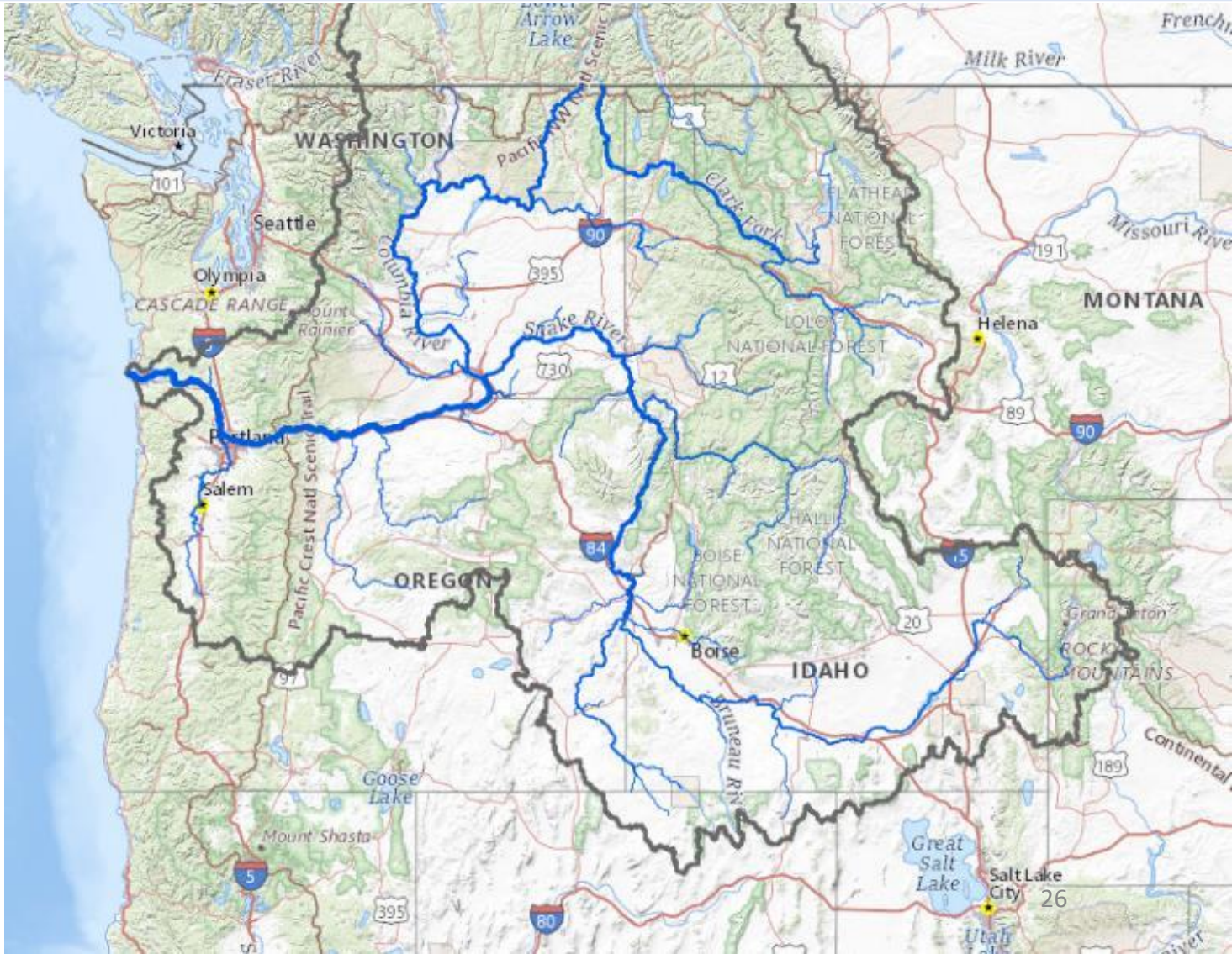
"The EPA Columbia River Basin Restoration Program –through the implementation of CWA Section 123 –will be a catalyst for basin wide toxics reduction work efforts; enabling communities to access unimpaired watersheds with healthy fish and wildlife and quantifiable toxics reductions in fish, wildlife and water."

COLUMBIA RIVER BASIN RESTORATION ACT

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

Congress passed the **Columbia River Basin Restoration Act** in 2016, which amended the Clean Water Act by creating **Section 123** and directed EPA to:

1. establish a **Working Group** representative of states, tribal governments, and other entities in the Basin; and
2. establish a **Columbia River Basin Restoration Grant Program** to support voluntary actions to reduce and assess toxics throughout the Basin.



FUNDING ASSISTANCE

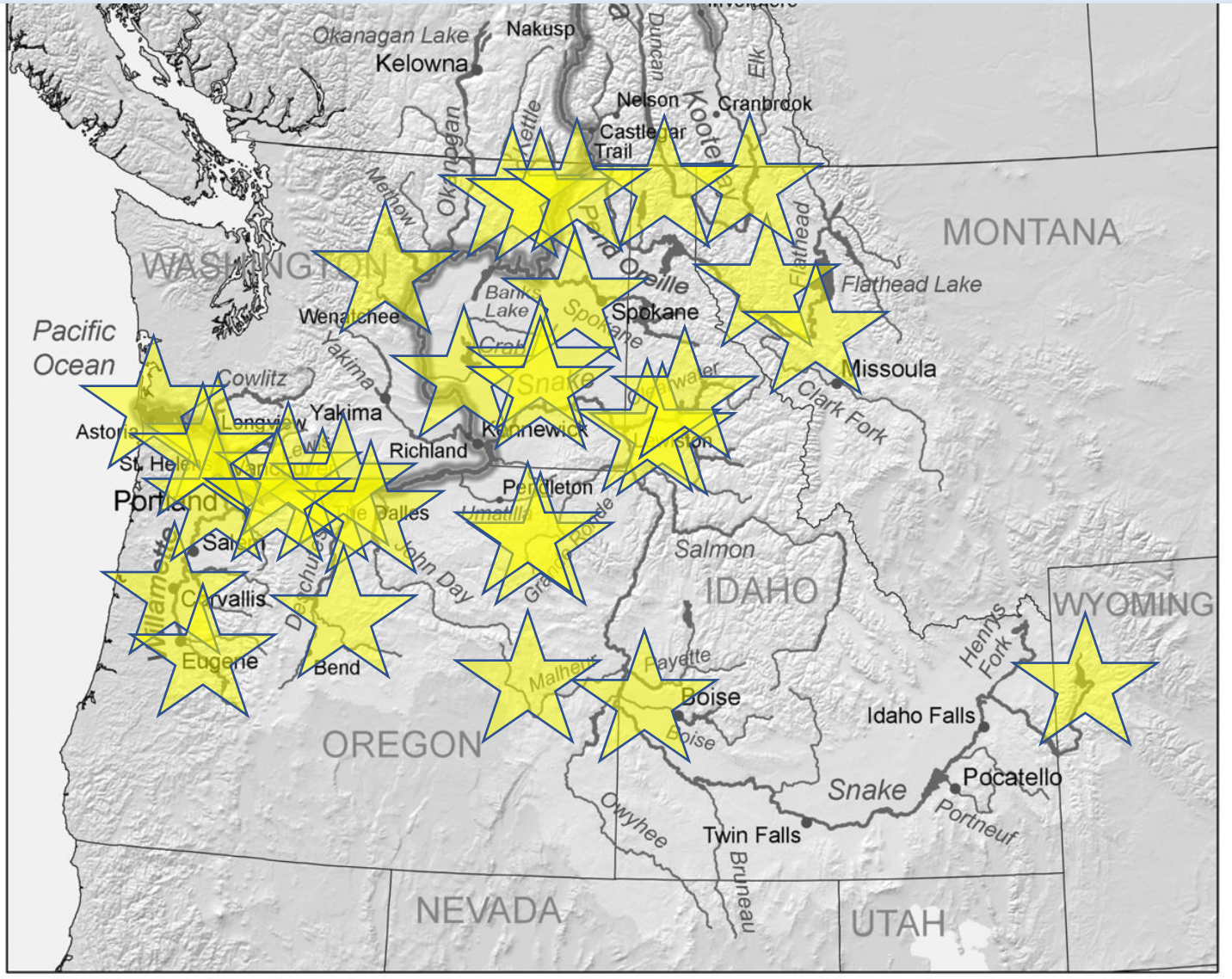
COLUMBIA RIVER BASIN
RESTORATION PROGRAM

2020: $2.1M for 14 awards

2022: $6.9M for 25 awards

2023:

- **$14.5M for tribal program implementation grants**
- **$56.5M for toxics reduction lead grants**
- **TBD for Monitoring RFA**



PROJECT CATEGORIES AND FUNDING PRIORITIES

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

Project Categories (CWA Section 123)

1. Eliminating or reducing pollution
2. Cleaning up contaminated sites
3. Improving water quality
4. Monitoring to evaluate trends
5. Reducing runoff
6. Protecting habitat
7. Promoting citizen engagement or knowledge

Program Funding Priorities

1. Agriculture best practices
2. Green infrastructure
3. Pollution prevention
4. Clean-up actions
5. Community education and outreach
6. Monitoring and assessment

TOXICS MONITORING SUBGROUP (link)

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

Purpose: A community of practice to share information on monitoring and leverage activities within and outside of EPA funded grants

TOP MANAGEMENT OR SCIENCE QUESTIONS

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

April 28, 2022 TMS Feedback on top questions for a CRB Toxics Data Dashboard:

- Spatial map to identify regions of concern, areas of low probability of adverse impacts from toxics, areas of inconclusive data
- Spatial and temporal trends – e.g., are concentrations of an analyte increasing or decreasing through time at a particular location?
- What are the data gaps (by parameter, location, analyses)?
- Are the values comparable
- Is this an area of concern that needs extra monitoring?
- Is this a potential contaminant source area?
- What are toxics contaminants above aquatic life and human health benchmarks?
- What are the hazard quotients or potential health risks?
- Who has done similar monitoring that I can seek out for advice before I start my project?

MONITORING DASHBOARD(S)

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

Audience: Monitoring experts and implementers who want results from toxics monitoring

2023-2024

- Determine management questions.
- Identify TMS Matrix fields for inclusion.

2024

- Visualize relevant TMS Matrix data using Geospatial dashboard.

2025-2026

- Attempt to integrate WQX to help address TMS questions. Feasibility [TBD]

MONITORING DASHBOARD(S)

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

Possible path forward?

TMS Monitoring Projects Dashboard

Timeline: 2023-2024
Purpose:
- Visualize TMS Matrix data

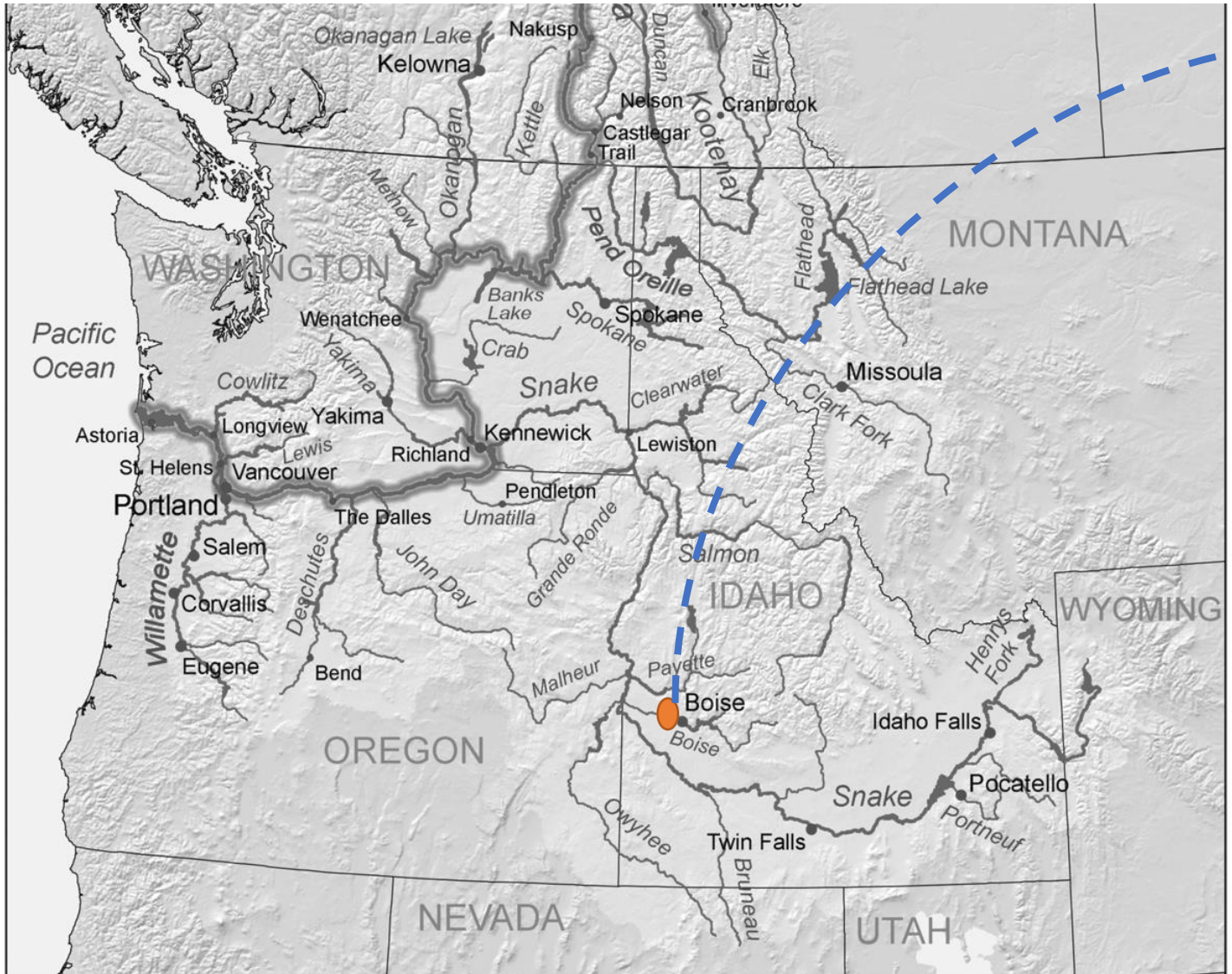
CRB Monitoring Data Dashboard**

Timeline: 2025-2026
Purpose:
- Attempt to integrate WQX data with filters that help address TMS questions

**Potential to combine dashboards in the future. Feasibility TBD.

EXAMPLES OF MATRIX DATA FOR POTENTIAL INCLUSION IN A MONITORING DASHBOARD

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

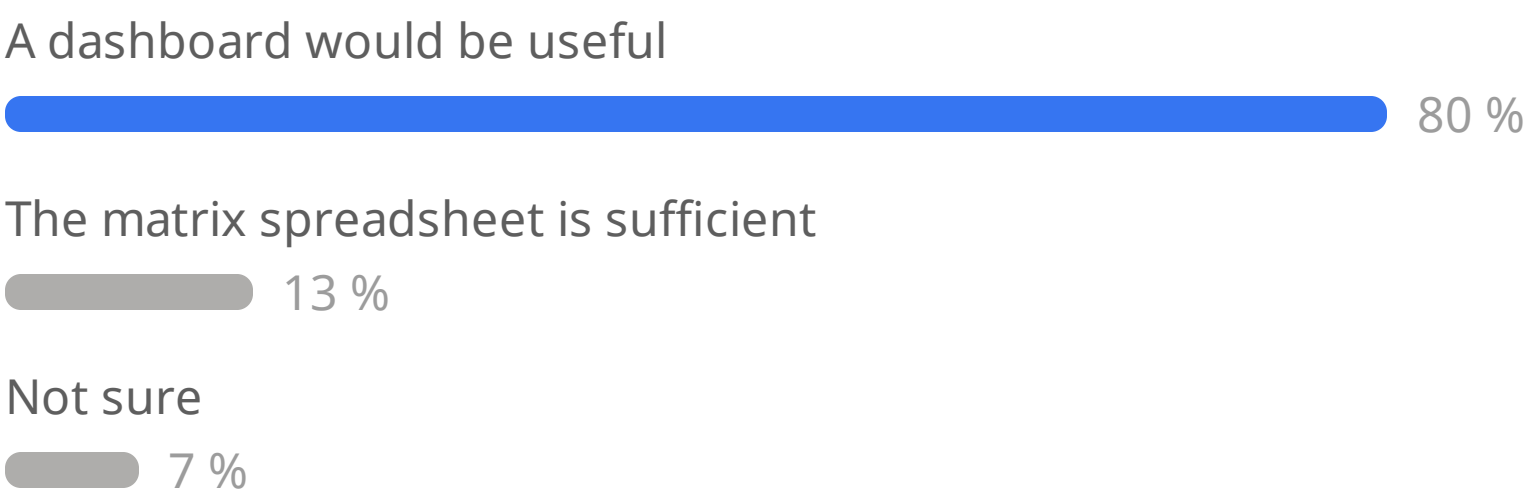


- **Monitoring location** (county/state, mainstem or tributary, location description)
- **Lead** (entity type, funder, grant ID, and principal investigator contact info)
- **Project title and purpose**
- **Parameters monitored** (ex. Hg – metal – tier 1 EPA prioritization – not a persistent organic pollutant)
- **Media sampled** (ex. surface water, sediment, crayfish, fish tissue, etc.)
- **Sampling information** (frequency, number of sites, method, start/end date)
- **Reference value** for chemical concentration data comparison
- **Primary source pathway** being investigated
- **Potential mitigation solution**

Multiple-choice poll

Should we pursue building a dashboard to access and display toxics monitoring project information or is the matrix spreadsheet sufficient?

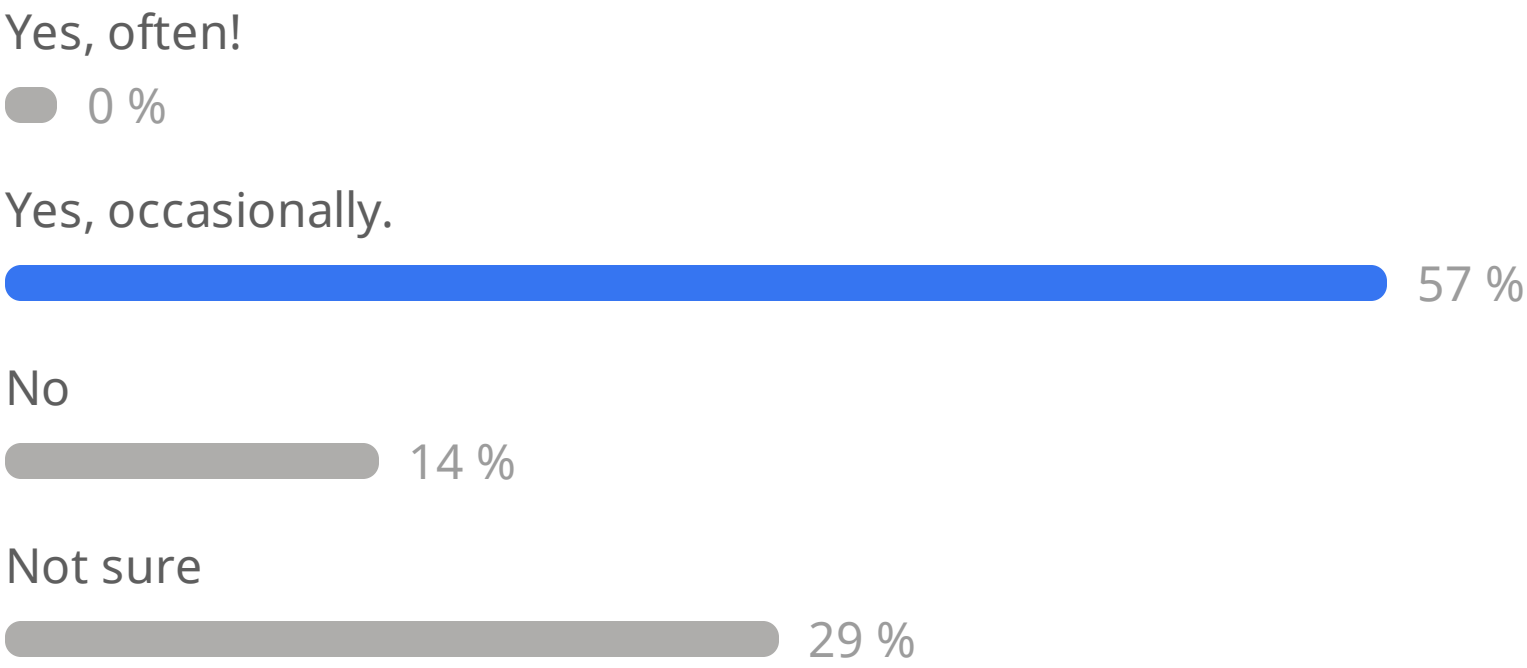
0 1 5



Multiple-choice poll

If we were to build an interactive dashboard to access and display toxics data from WQX, would you use it?

0 1 4



COLUMBIA RIVER BASIN
RESTORATION PROGRAM

Discussion

Raise your hand or type questions/comments in **Slido Q&A** - go to slido.com, enter code ToxMon

What other questions would you want to use a dashboard to address?

What would you want to get out of a geospatial tool that visualizes matrix data?

What other feedback would you like to share?

TOP MANAGEMENT OR SCIENCE QUESTIONS

COLUMBIA RIVER BASIN
RESTORATION PROGRAM

April 28, 2022 TMS Feedback on top questions for a CRB Toxics Data Dashboard:

- Spatial map to identify regions of concern, areas of low probability of adverse impacts from toxics, areas of inconclusive data
- Spatial and temporal trends – e.g., are concentrations of an analyte increasing or decreasing through time at a particular location?
- What are the data gaps (by parameter, location, analyses)?
- Are the values comparable
- Is this an area of concern that needs extra monitoring?
- Is this a potential contaminant source area?
- What are toxics contaminants above aquatic life and human health benchmarks?
- What are the hazard quotients or potential health risks?
- Who has done similar monitoring that I can seek out for advice before I start my project?

“ASK THE AUDIENCE”

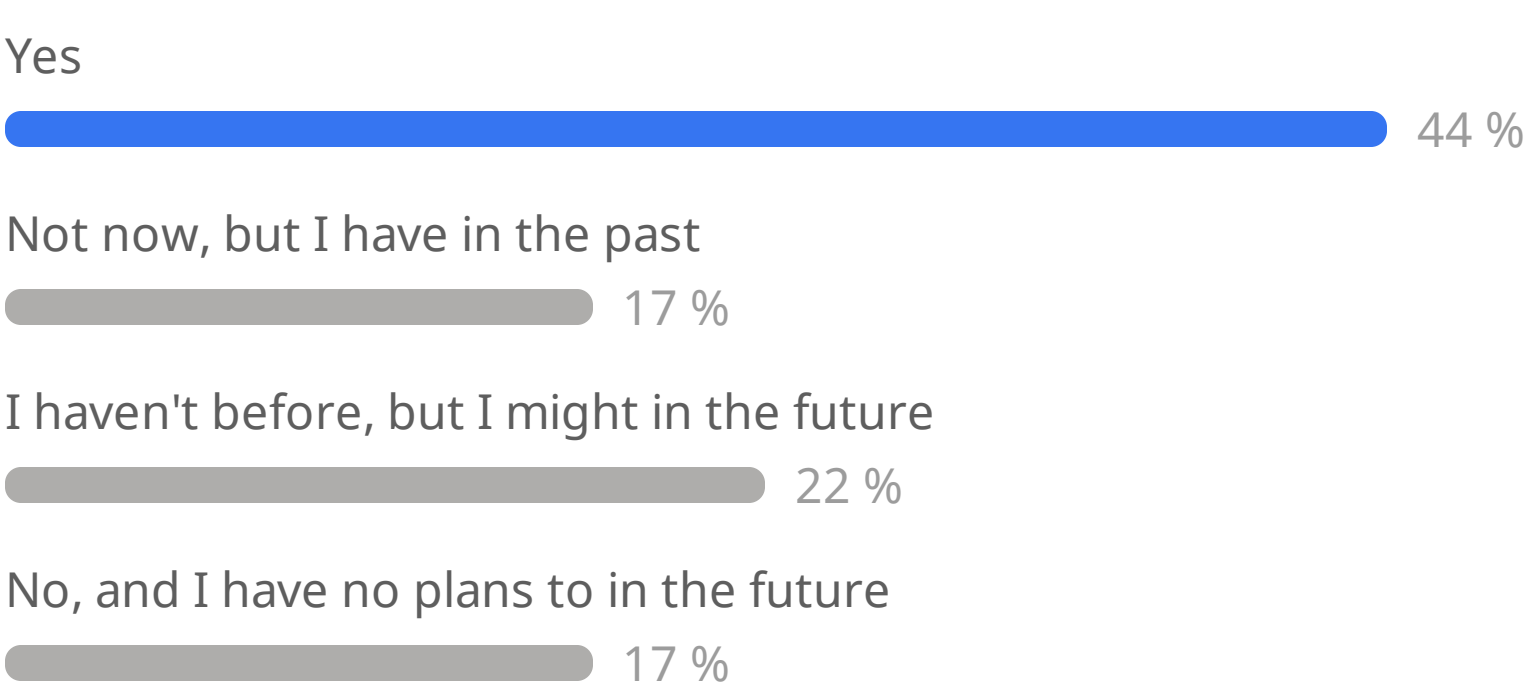
What’s the best way to report fish tissue toxicity data?

What criteria would you measure fish tissue toxicity data against?

Multiple-choice poll

Are you currently collecting fish tissue toxicity data?

0 1 8



“ASK THE AUDIENCE”

What’s the best way to report fish tissue toxicity data?

What criteria would you measure fish tissue toxicity data against?

Raise your hand or
put questions/comments/links to resources in **Slido Q&A** -
go to slido.com, enter code ToxMon

Multiple-choice poll

Do you want to discuss this topic further?

0 1 1

No

0 %

Yes, let's talk about this at the December workshop

45 %

Yes, but December is too late for my needs

0 %

Yes, but it can wait until the spring

55 %

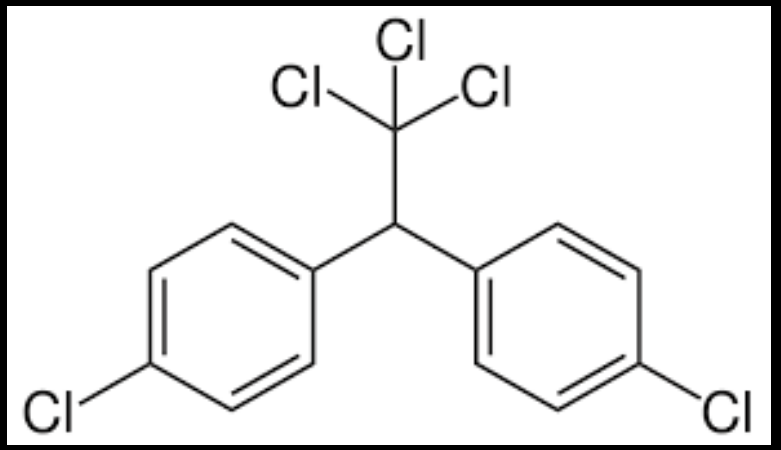
LIGHTNING TALKS

1. Lake Chelan DDT Conceptual Site Model, Clay Patmont (Anchor QEA)

2. PFAS Monitoring at Public Water Systems in Washington State, Stan Hoffman (WA DOH, Office of Drinking Water)

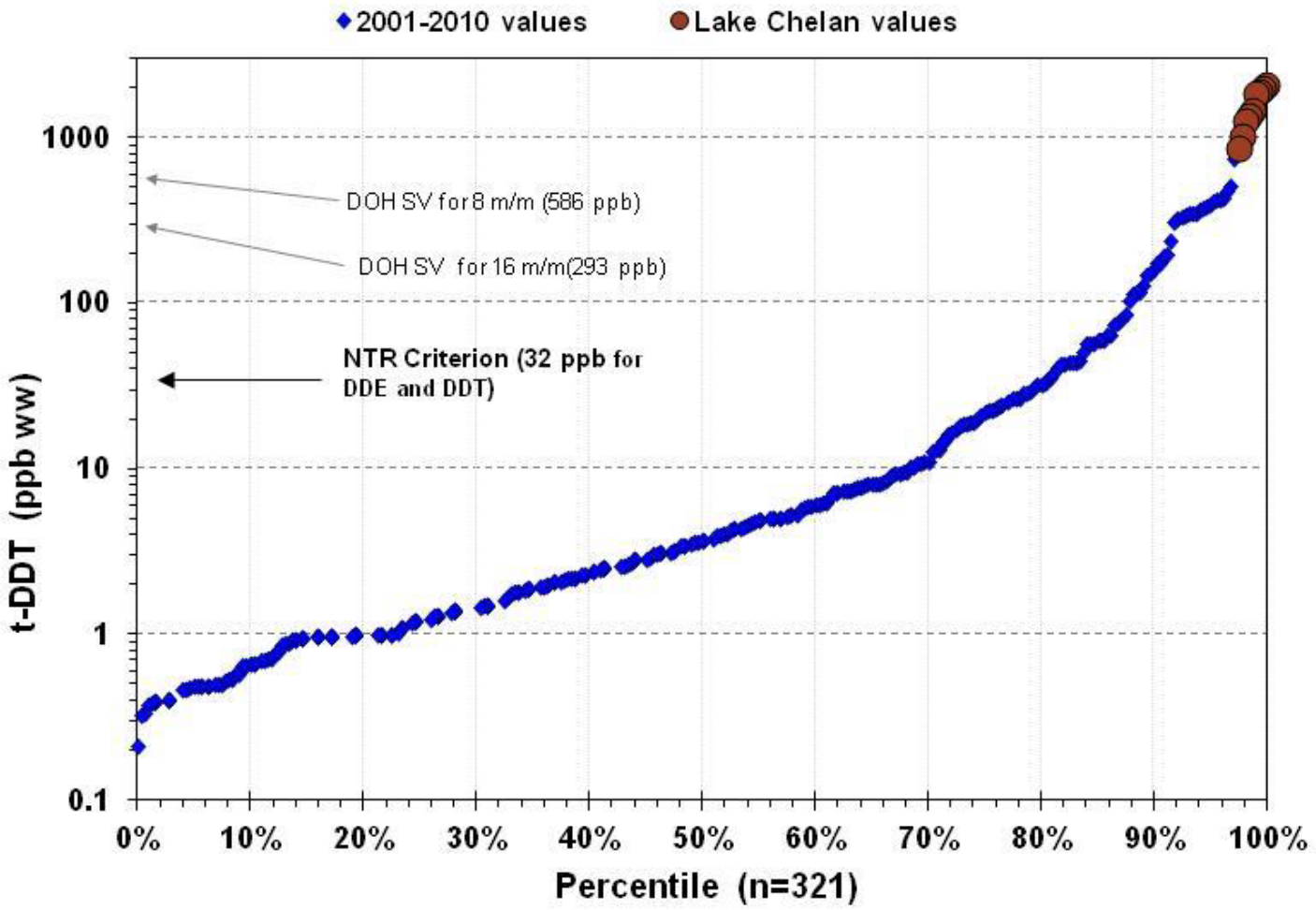
3. [POSTPONED] Development of Tools to Site-specifically Monitor Exposure and Effects of Lead in the Tundra Swan, Mark Jankowski (US EPA)

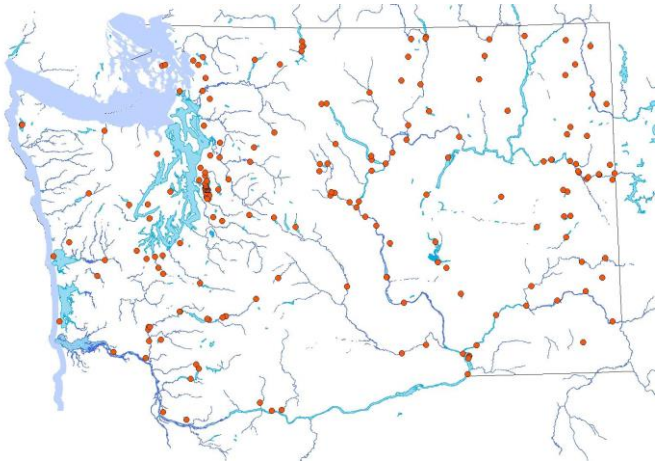
Lake Chelan DDT Conceptual Site Model



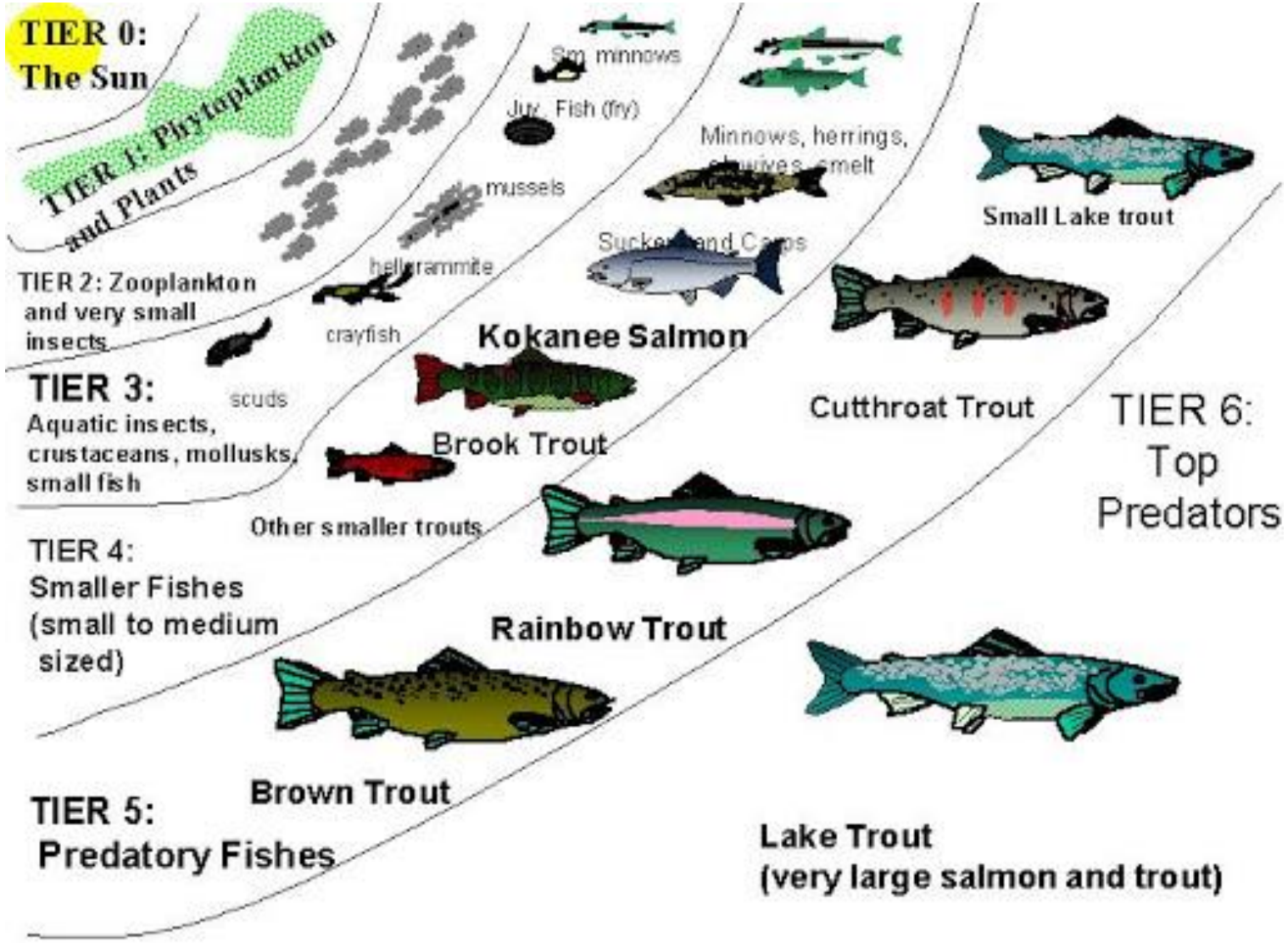
Lake Chelan
Research Institute

Relatively High DDT Levels in Chelan Lake Trout

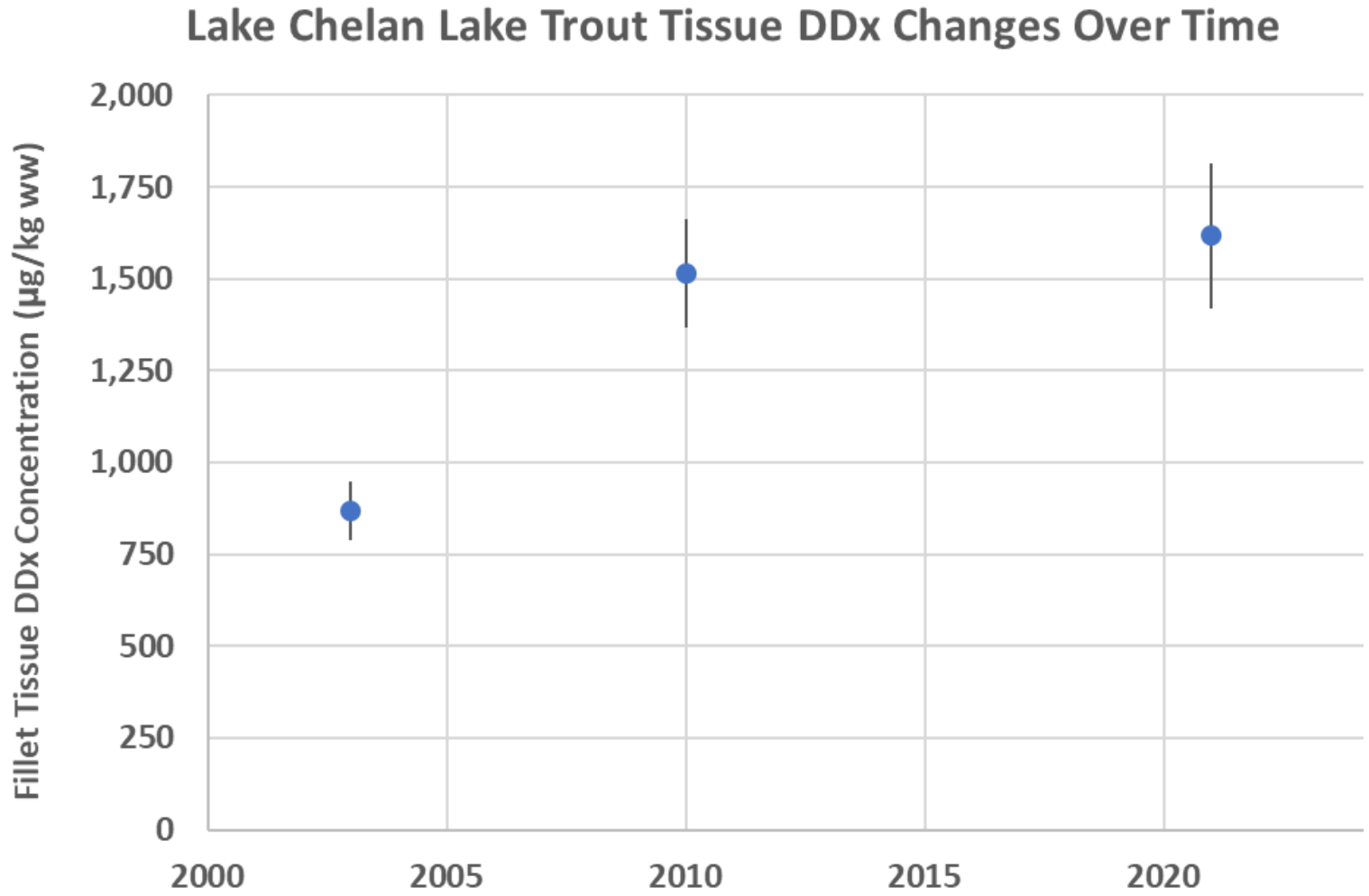




DDT Trophic Biomagnification

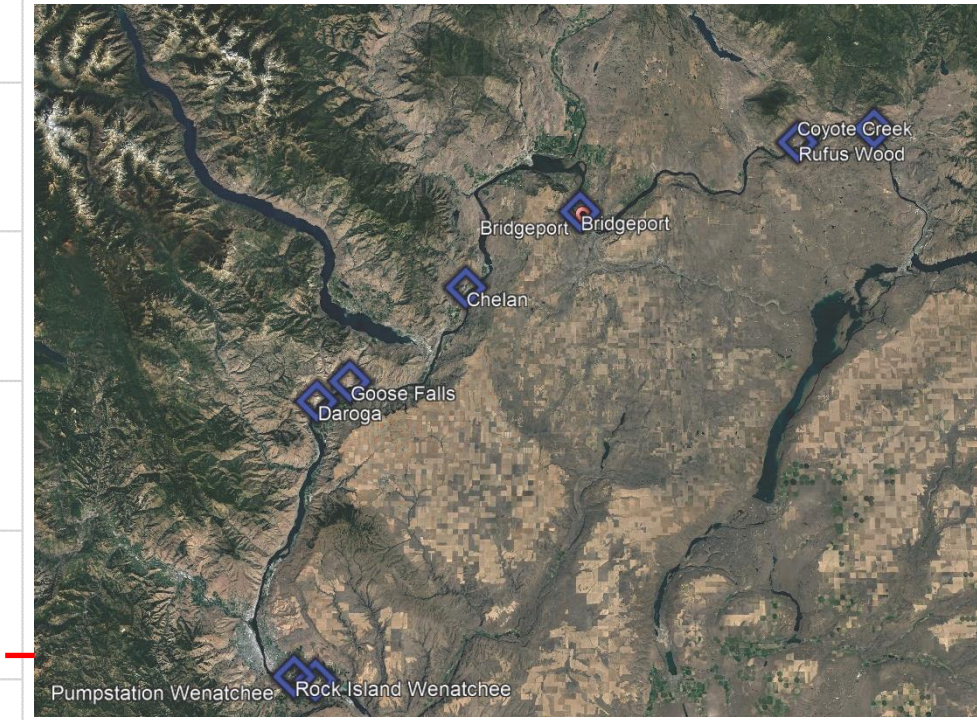


Lake Trout DDT Levels Not Declining

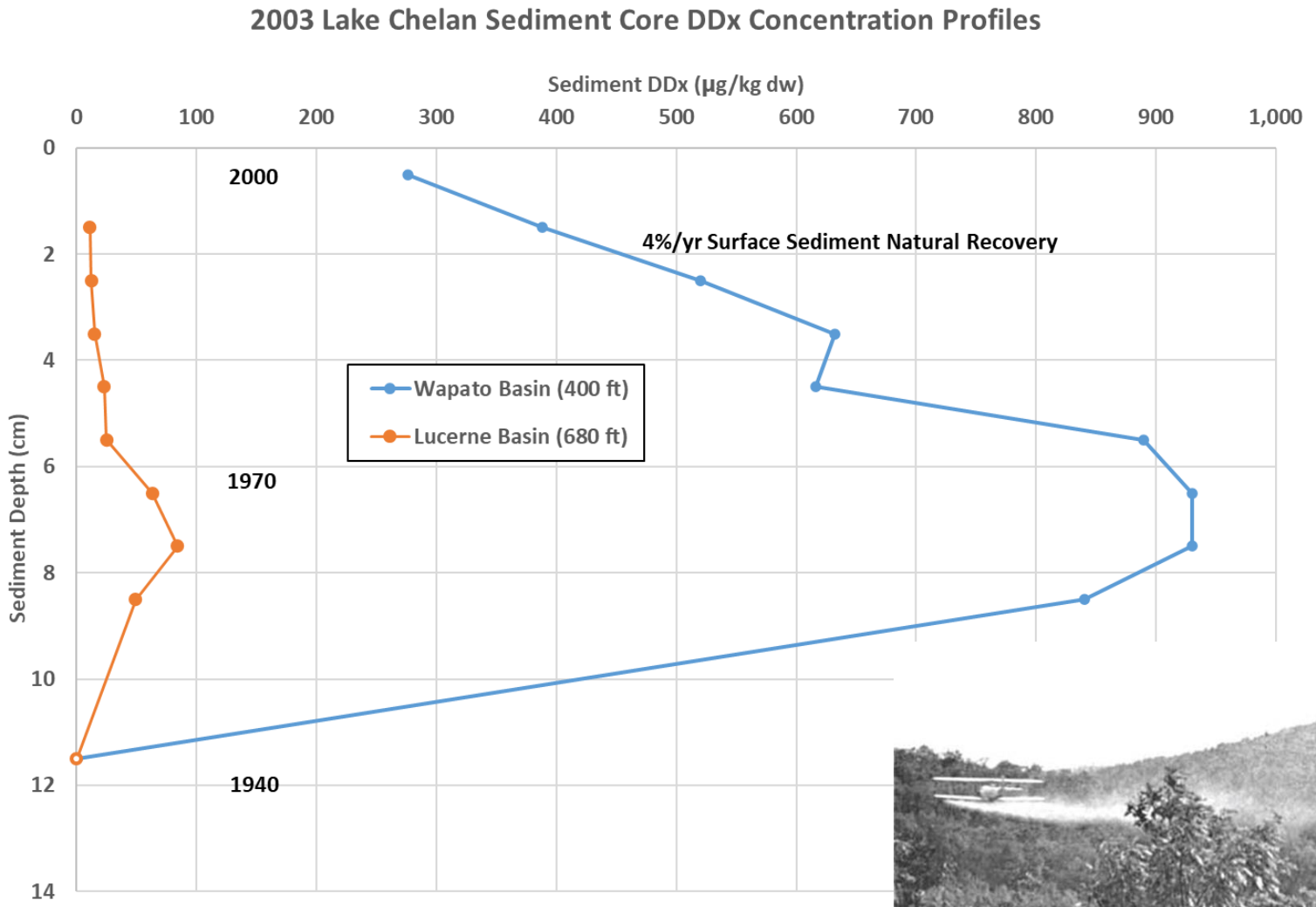


- No measurable decline over past 20 years

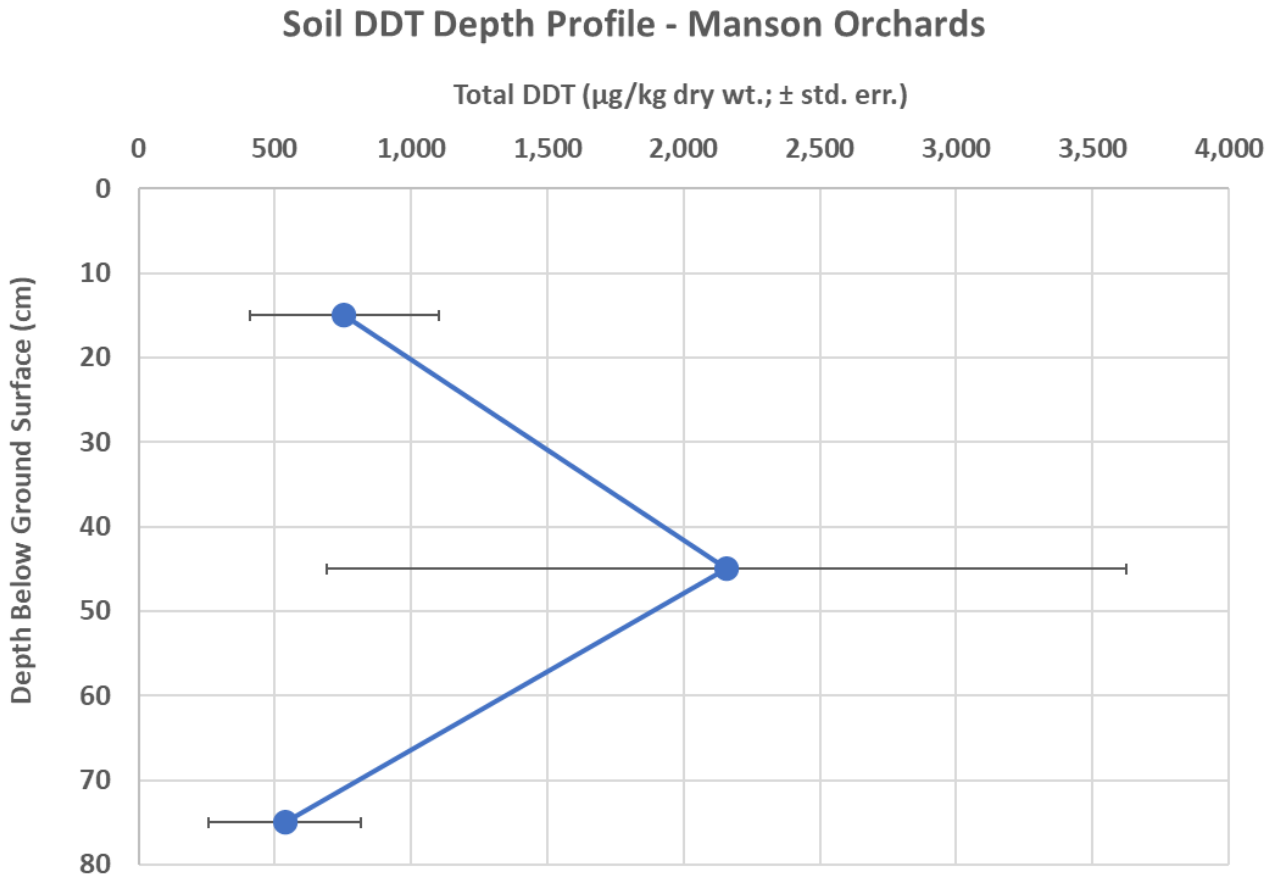
Fish Tissue DDT Profile in Columbia River



DDT Applied to ~12,000 Acres of Orchards from Roughly 1943 to 1973



~80,000 kg of DDT Remain in Orchard Soils
(~2,000 kg DDT remain in Lake Chelan sediments)

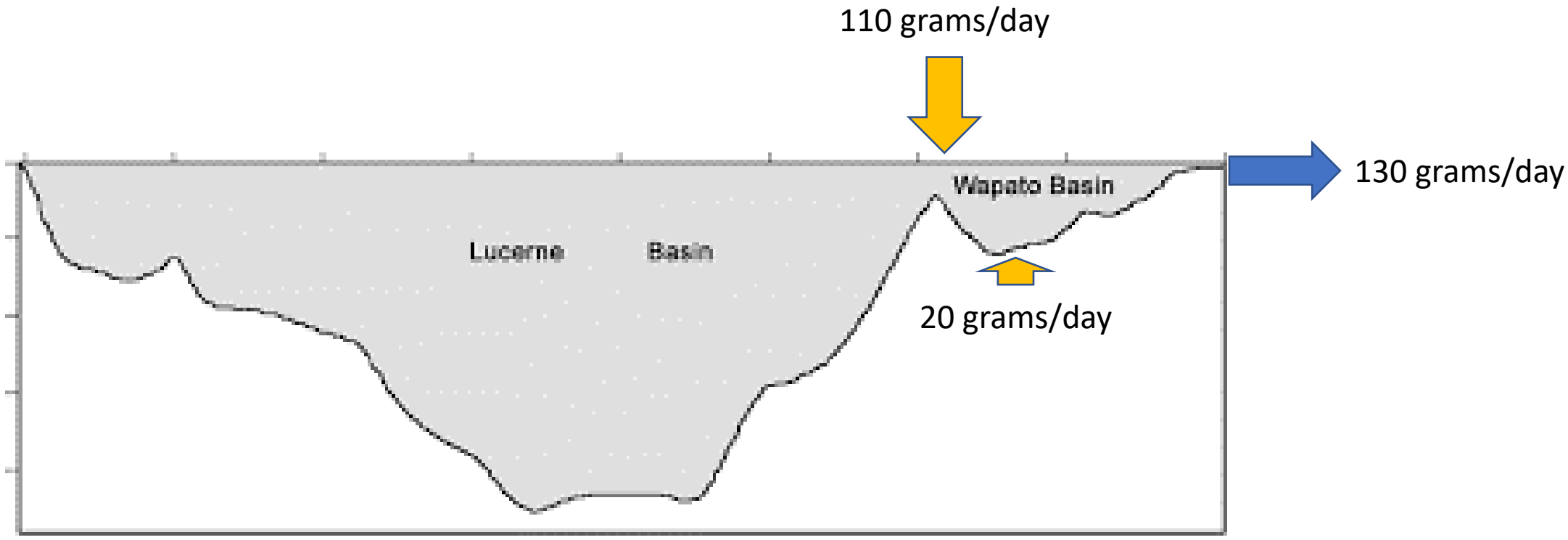


- Ongoing leaching source via drains

Lake Chelan DDT Mass Balance (2002 – 2006)

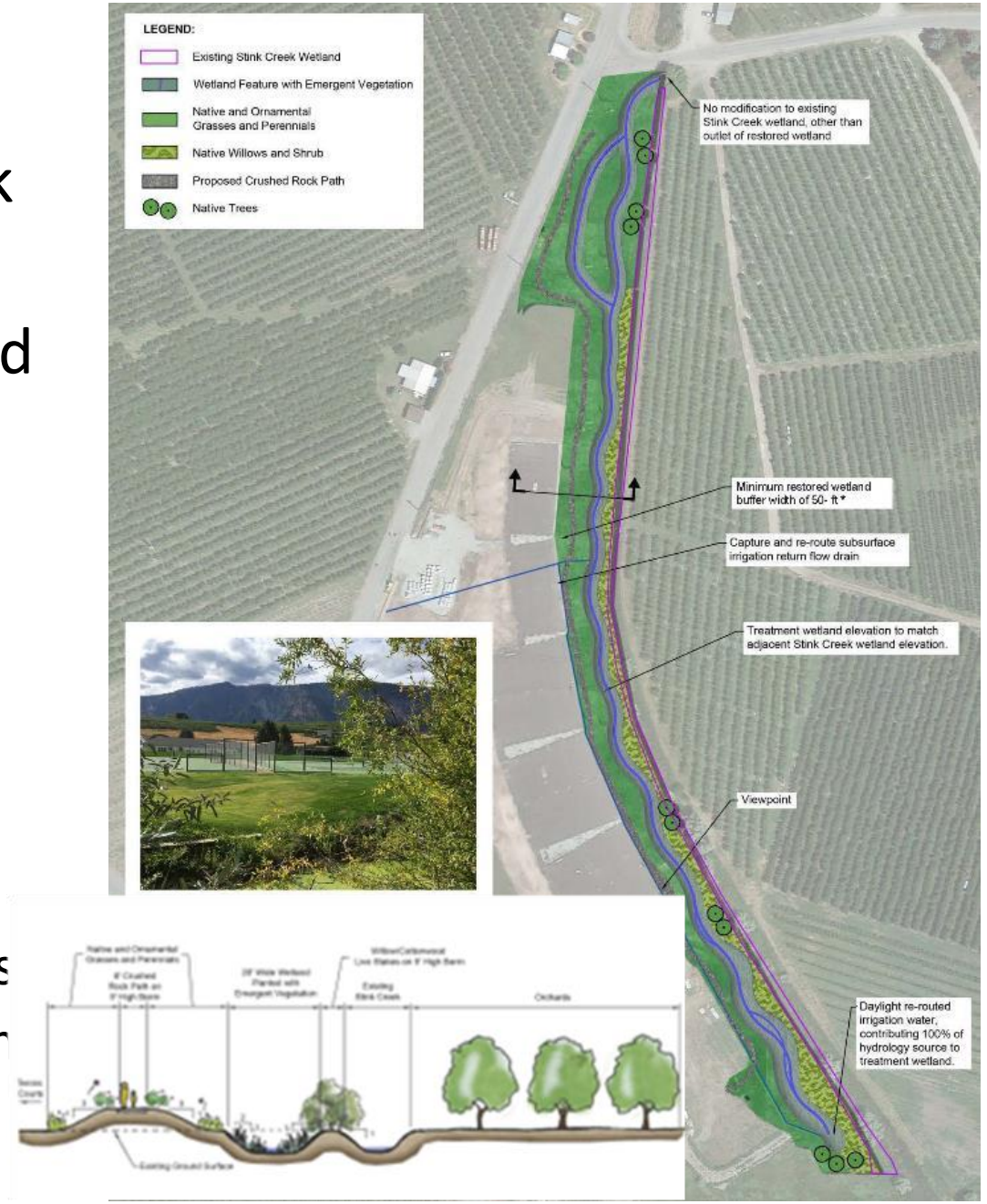
Two DDT sources to surface water (and fish):

1. Ongoing orchard drain, groundwater, and creek discharges (~85%; likely not declining)
2. Surface sediment release (~15%; declining ~4%/year due to lake sedimentation)

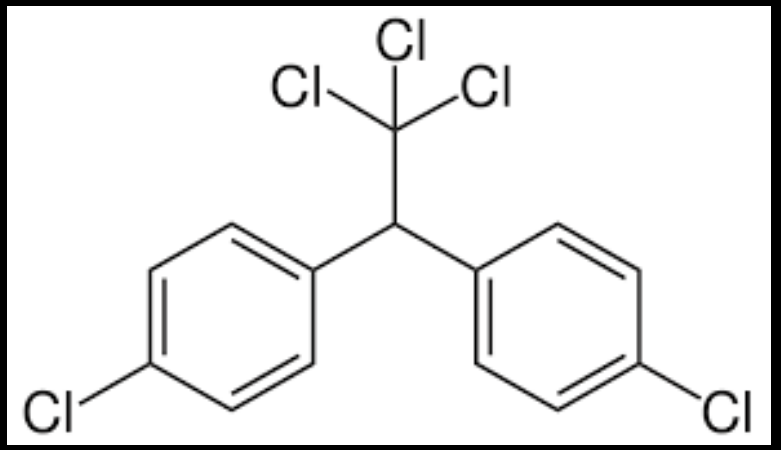


Potential DDT Controls

- Natural recovery will likely not achieve risk reduction goals for >100 years
- Directing drainage through wetlands would sustainably reduce DDT loading 70 to 95%
- Potential DDT treatment demonstration pilot
    - Possible CRBRP funding through Ecology
    - Year 1: Characterize current DDT loading
    - Year 2: Construct 1 to 2-acre prototype wetland
    - Years 3 to 4: Monitor wetland effectivenes
    - Year 5: Expand wetland treatment in basir



Questions?



Lake Chelan
Research Institute

Washington State Department of HEALTH

PFAS MONITORING AT PUBLIC WATER SYSTEMS

Office of Drinking Water

PFAS Pronunciation

- PFAS – is the umbrella term for PFOS, PFOA, PFHxS, PFNA, PFBS.

- PFAS are per- and polyfluoroalkyl substances.
- PFAS sounds like “PEA-fass”.

- PFOS is perfluorooctane sulfonic acid, a kind of PFAS.
- PFOS sounds like “PEA-foss”.

What is Required of Public Water Systems

- All Public Water Systems will monitor for PFAS between 2023 and 2025.
  - Except most Transient Non-Community Systems.
- Samples are collected after all treatment but before entry to distribution.
- EPA Methods 533 or 537.1 are both allowed – water systems pick.
- UCMR 5 Systems can use UCMR data.
- Detections require follow-up monitoring.
- Tier 2 public notification for confirmed State Action Level exceedances.

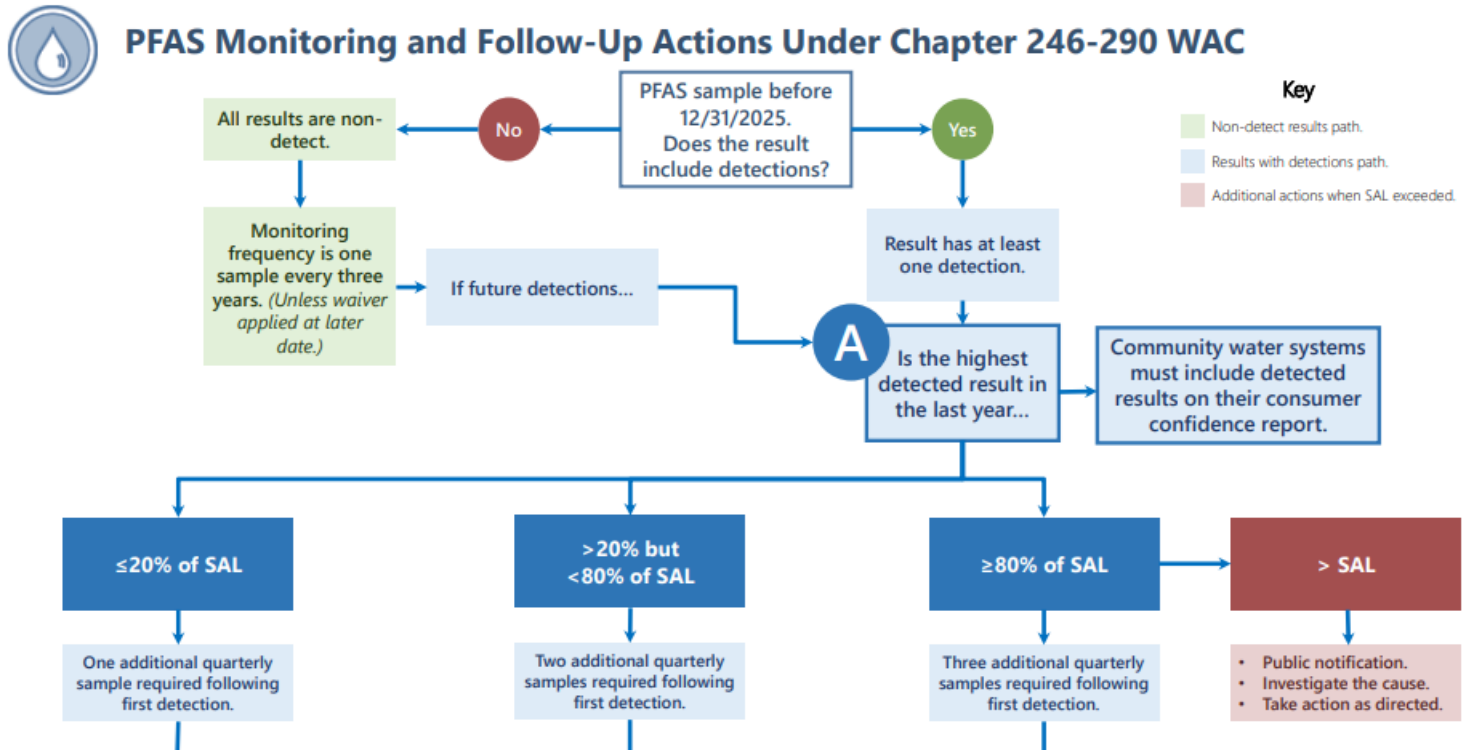
PFAS State Action Levels

State Action Levels

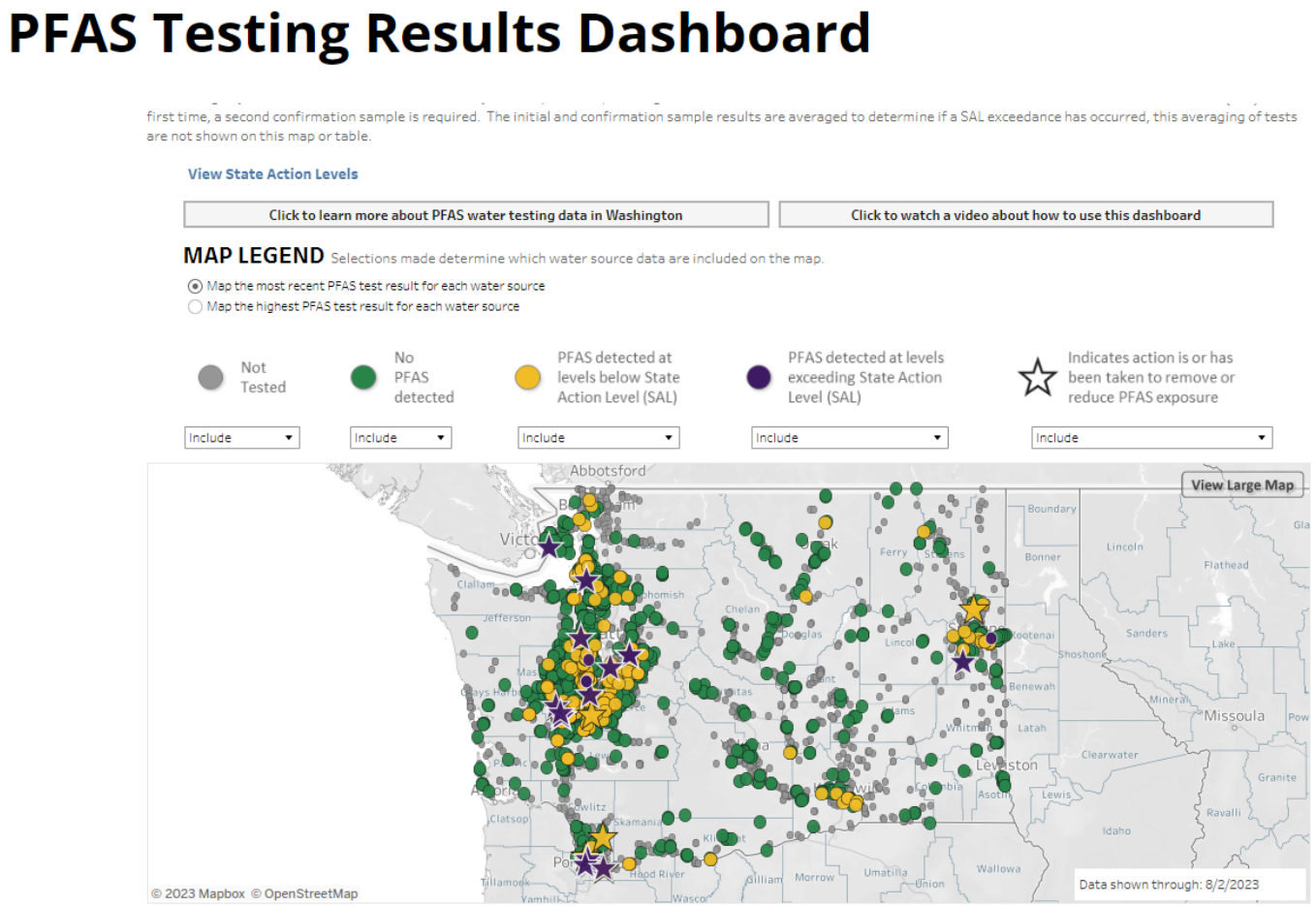
The SALs represent the maximum level in tap water that DOH considers to be without health concern for long-term consumption in daily drinking water, including by sensitive groups.

Specific PFAS Contaminant	State Action Level (parts per trillion)
PFOA	10
PFOS	15
PFNA	9
PFHxS	65
PFBS	345

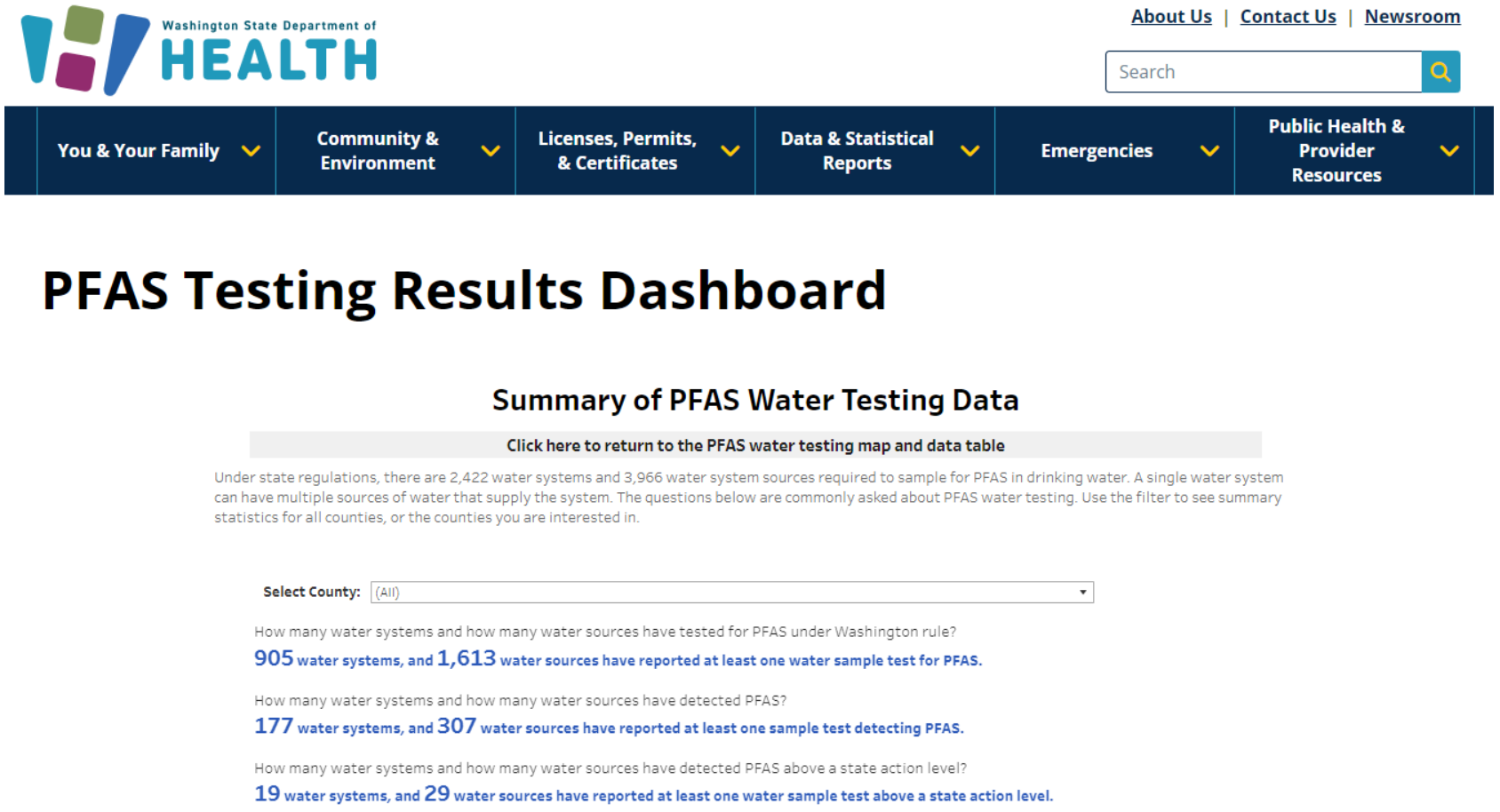
PFAS Sampling: Follow-up Actions



What Sampling Shows



Summary Data



WINTER WORKSHOP

December 5, 2023

9:00 AM – 4:30 PM PT

Portland, OR / Virtual

Workshop Focus

Task 1. Identify data gaps and areas of synergy for sampling and data management

Task 2. Develop recommendations for common collection and analytical methods to enable cross-project data comparisons


Image: Gary Lloyd-Rees

THANKS FOR JOINING US!

Questions? Want to join the TMS distribution list?
Email us at gs-crbtoxmon@usgs.gov