COLUMBIA RIVER BASIN
RESTORATION PROGRAM

EPA USGS

Columbia River Basin Restoration Program Toxics Monitoring Subgroup Meeting

December 5, 2023 | 9:00 AM – 12:15 PM PACIFIC

MS TEAMS TIPS

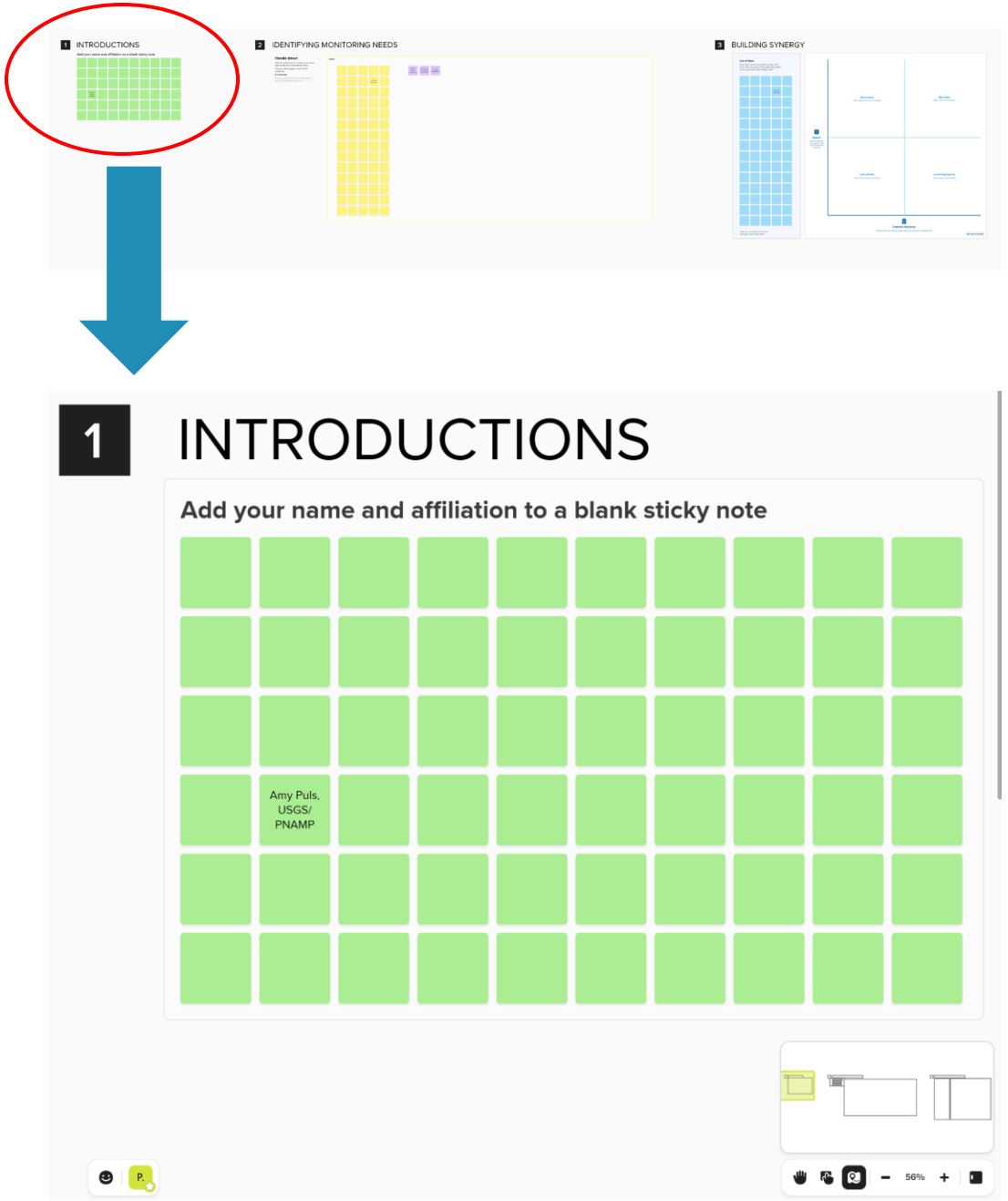
Please turn camera and mic off when not speaking.

AGENDA

10 min	WELCOME AND INTRODUCTIONS (Jen Bayer, USGS/PNAMP)
5 min	CRBRP OVERVIEW (Michelle Wilcox, EPA)
20 min	TOXICS MONITORING PROJECT INFORMATION SUMMARY (Patrick Moran, USGS)
30 min	CRB TOXICS MONITORING DASHBOARD (Katia Rar, EPA)
40 min	METHODS COMPARISON (Meghan Dunn, EPA)
15 min	BREAK
40 min	IDENTIFYING NEEDS AND BUILDING SYNERGY (All)
30 min	MONITORING PROJECT REPORTING (Lisa Kusnierz, EPA)
15 min	HELP SHAPE THE FUTURE OF TMS (Amy Puls, USGS/PNAMP)

INTRODUCTIONS

1. Open Mural using the link in the chat
2. Navigate to the “Introductions” section on the left side of the board
    1. Zoom using mouse wheel or use +/- on bar at bottom right of the window
    2. “Click and drag” to move to different sections of the board
3. Under “Introductions” click on an empty/unoccupied “sticky note”
4. Type your name and affiliation



EPA Columbia River Basin Restoration Program

Toxics Monitoring Subgroup
Workgroup Workshop
December 5, 2023

Michelle Wilcox
US EPA Region 10

PROJECT CATEGORIES AND FUNDING PRIORITIES

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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)

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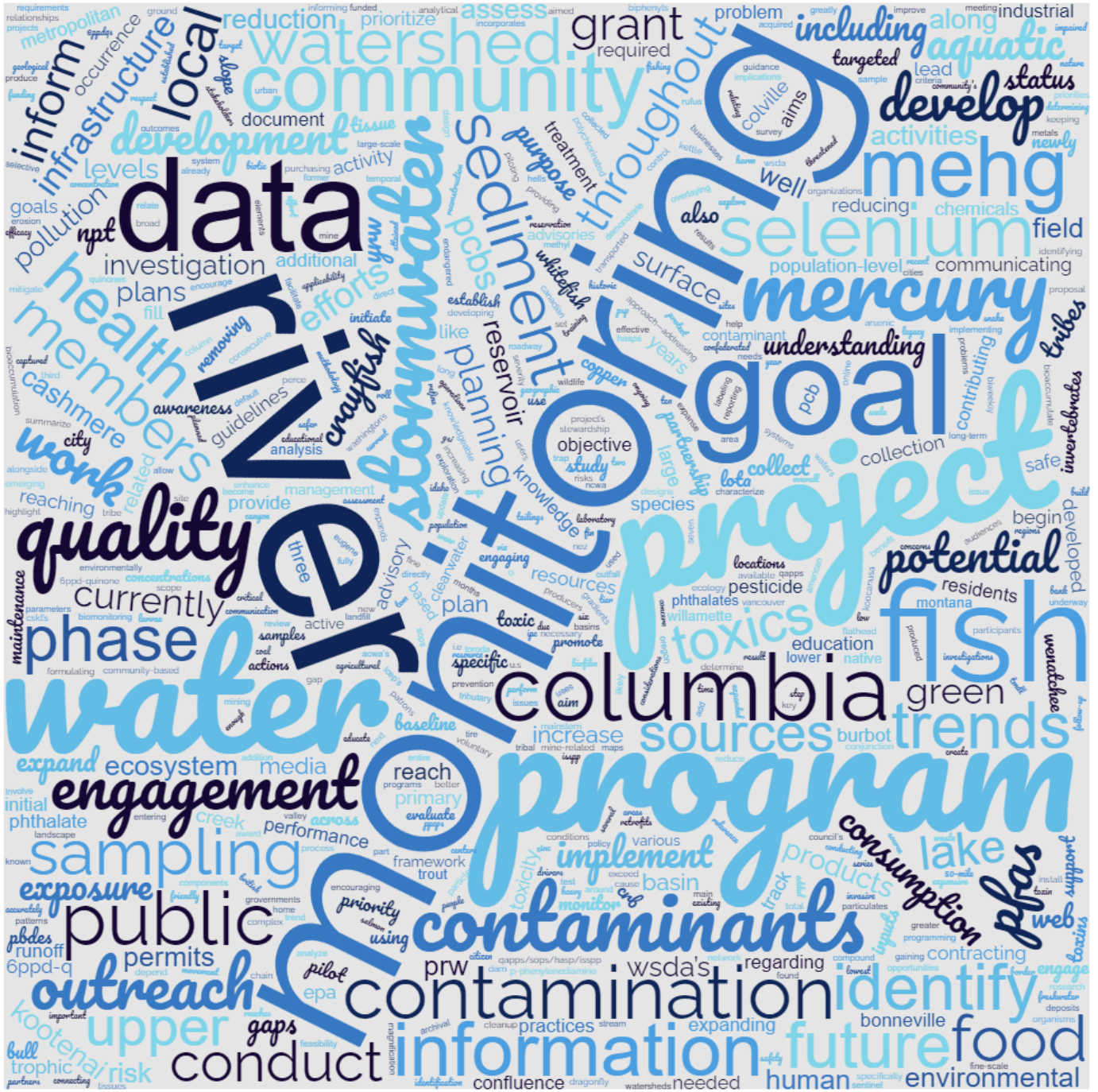
Purpose: A community of practice to share information on monitoring and leverage activities within and outside of EPA funded grants.

Toxics Monitoring Project Information Summary

Or… how did we get here, what are we doing now, and what might we be missing?

Patrick Moran, USGS



What has the CRBRP Grant Program Recently Funded?

(Should read- 'What work is currently going on?' Not there yet.)

"Matrix" of current grant-funded projects

https://www.epa.gov/columbiariver/columbia-river-basin-toxics-monitoring-project-tracking-matrix

54+ projects tracked by EPA with a Unique Identifier

How to summarize? We created these categories:

1. Novel Pollutants of Concern needing more info (ie. 6PPDQ, PFAS, PBDEs), n= 10
2. Human Health Risk(s), predominantly, = 13
3. Aquatic Health Risk (ESA), predominantly = 5
4. BMP Development = 8
5. Novel Lab or Field Methods = 7
6. Primarily or Significantly Outreach = 11

Recent RFAs

- 2020 = $2M
- 2022 = $72M w/ BIL Funding
- 2023/24 = new awards pending, not included

Other Ways to Summarize Types of Projects

- Spatial coverage across basin
  - See Katia's presentation (map and filter)
  - County designations in matrix
- Which entities are conducting the work
- Particular pollutants
- Sources (cities, agriculture, roads, wastewater treatment plants, industries)
- Key receptors (Humans, children, Tribal members, ESA species)

1) Novel Pollutants of Concern

current projects in this category

Note: details are from grantees' work plans

Project Title	Parameters	Lead Entity	Entity conducting monitoring	Location
Urban Waters Partners	urb. stormwater pollutants	Cascade Pacific RC&D	Long Tom Watershed Council, (EWEB and SUB)	Eugene
Columbia Mainstem Framework	Plan toxics monitoring	Yakama Nation	USGS	Columbia Main- **plan only**
Monitor Contaminants Kootenai River	Hg, Se, Se spec, N,S, other	Kootenai Tribe of Idaho	Kootenai Tribe ID	Kootenai
TLC: Tracking Toxics in the Lower Columbia (Phase I)	PAHs, (DDTs), PCBs, PBDEs, PFAS, WWTP & cyanotoxins	Lower Columbia Estuary Partnership	USGS	Lower Columbia Main
Clearwater River Toxics Assessment and Monitoring	T-Hg, M-Hg, PPCPs, PBDEs, and PFAS/PFOS	Nez Perce Tribe	Nez Perce Tribe & Idaho Fish and Game	Clearwater
Clearwater Watershed Baseline	DDT, THg, MeHg, metals, nutrients, microplastics; PCBs, PBDEs, OC pests	Nez Perce Tribe	Nez Perce Tribe - Water Resources Division, US FWS, angler volunteers	Clearwater
River TALC: Toxics Assessment of the Lower Columbia	6PPDQs and certain other roadway runoff specific chemicals	North Coast Watershed Association	The North Coast Watershed Association (NCWA)	Lower Columbia Main
Reducing PFAS and Phthalates within the Columbia Basin, Oregon	PFAS, Adsorbable Organic Fluorine (AOF)	Oregon Ass. Clean Water Agencies	ACWA members; WWTP	Middle and Lower Columbia Main
Crayfish as indicators of 6PPD-q	6PPD-quinone, tire particulates	Univ of Idaho	Salish School of Spokane; Clark Fork Coalition; U of I; MT FWP	Spokane and Boise Rivers
Evaluating and Prioritizing CECs Lower Columbia	non-target Hi-Res Mass Spectrometry	UW-Tacoma Urban Waters	UW-Tacoma Urban Waters	Lower Columbia Main

2) Human Health Risk(s)

current projects in this category

Project Title	Parameters	Lead Entity	Entity conducting monitoring	Location
Lower Wenatchee PCBs	PCB congeners	Chelan County Natural Resource	CCNRD, WA Ecology	Wenatchee
Columbia River Mainstem Pilot, A&B	Hg, DDXs, PCBs, PBDEs,	Yakama Nation	USGS	Bonneville Pool- Mainstem
Upp. Col. Toxics Monitoring	MeHg, THg, As, Cu, Pb, PCBs cong, DDXs	Colville Tribe	Colville Tribe	Upper Columbia Main
Quantifying Toxins in Fish Upper Columbia	Hg, dioxins and furans, and PCBs	Montana Trout Unlimited	Montana FWP; Trout Unlimited; Clark Fork Coalition	Clark Fork
Clearwater River Toxics Assessment and Monitoring	T-Hg, M-Hg, PPCPs, PBDEs, and PFAS/PFOS	Nez Perce Tribe	Nez Perce Tribe & Idaho Fish and Game	Clearwater
Clearwate Watershed Baseline	DDT, THg, MeHg, metals, nutrients, microplastics; PCBs, PBDEs, OC pests	Nez Perce Tribe	Nez Perce Tribe - Water Resources Division, US FWS, angler volunteers	Clearwater
Nez Perce Methylmercury	THg, MeHg	Nez Perce Tribe	Nez Perce Tribe, USGS, Idaho Power	Salmon, Snake
The Crayfish Mercury Project 2023-2024	mercury	U of I	citizen scientists	Spokane, Boise
Crowdsourced crayfish	THg	U of I	U of I, citizens, others	Spokane, Boise
Upper Columbia Basin Contaminants	metals, MeHg, THg, PCBs Aro&Cong, cations, carbons	Spokane Tribe	Spokane Tribe's Limnology Program, contractor	Upper Columbia Main
Fish consumption and advisory awareness Flathead Lake	MeHg	Univ Montana	Flathead Bio Station, Salish and Kootenai Tribes (CSKT)	Flathead Lake

3) Aquatic Health

current projects in this category

Project Title	Parameters	Lead Entity	Entity conducting monitoring	Location
Columbia River Mainstem Pilot, A&B	Hg, DDXs, PCBs, PBDEs,	Yakama Nation	USGS	Columbia Main
Monitor Contaminants Kootenai River	Hg, Se, Se spec, N,S, other	Kootenai Tribe of Idaho	Kootenai Tribe ID	Kootenai
*The Crayfish Mercury Project 2023-2024	mercury	U of I	citizen scientists	Spokane, Boise
Evaluating and Prioritizing CECs Lower Columbia	non-target Hi-Res Mass Spec	UW-Tacoma Urban Waters	UW-Tacoma Urban Waters	Lower Columbia Main

4) BMP Development

current projects in this category

Project Title	Parameters	Lead Entity	Entity conducting monitoring	Location
City of Vancouver Columbia Slope	SVOCs, PAHs, phthalates, chlorinated, OC pests	City of Vancouver	Herrera Consultants	Vancouver
City of Vancouver Columbia Slope Phase 2	SVOCs, PAHs, phthalates, chlorinated, OC pests	City of Vancouver	Herrera Consultants	Vancouver
TLC: Tracking Toxics in the Lower Columbia (Phase I)	PAHs, (DDTs), PCBs, PBDEs, PFAS, WWTP & cyanotoxins	Lower Columbia Estuary Partnership	USGS	Lower Columbia
Eliminating Erosion Bodie Mine, Kettle Creek, WA	As, Cd, Pb, THg, Se, Cu, Zn`	Trout Unlimited	Trout Unlimited; Herrera	Middle Columbia
Monit, Reduc, Collect Ag Pesticides	OC Pests, Current Pests	Washington Dept Ag	WSDA, Palouse Conservation District (PCD)	Yakima, Palouse
Next steps in pesticide stewardship partnerships	ag pesticides	Washington Dept Ag	WSDA, Palouse Conservation District (PCD)	Yakima, Palouse

5) Novel Lab and Field Methods

current projects in this category

Project Title	Parameters	Lead Entity	Entity conducting monitoring	Location
Lower Wenatchee PCBs	PCB congeners	Chelan County Natural Resource	CCNRD, WA Ecology	Wenatchee
Communities Monitor Mercury, dragonflies	THg, MeHg	Oregon State University	Oregon State University (OSU), USGS, citizen scientists	Willamette
Crayfish indicate 6PPD-q	6PPD-quinone, tire particulates	U of I	Salish School of Spokane; Clark Fork Coalition; U of I, MFWP	Spokane, Clark Fork, Boise R.
The Crayfish Mercury Project 2023-2024	Hg	U of I	citizen scientists	Spokane, Clark Fork, Boise R.
Reconstructing 40 years Se otoliths	Se	Univ Connecticut	Univ Connecticut	Kootenai
Columbia Mainstem Framework	Plan toxics monitoring	Yakama Nation	USGS	Columbia Main

Observations

- Spatial distribution
- Land uses
- Sources
- Human health studies;
  diet surveys would be helpful
- Statistical designs

Alignment with the goals identified in 123 Amendment???

2010 CRB Toxics Reduction Plan - 5 goals

- Increase public understanding and political commitment to toxics reduction in the Basin
- Increase toxic reduction actions
- Conduct monitoring to identify sources and then work to reduce toxic contamination
- Develop a regional, multi-agency research program
- Develop a data management system that will allow us to share information on toxics in the Basin

2011 CR Estuary Plan (originally 1999) - 7 priority issues

- Biological integrity
- Habitat loss and modification
- Impacts from human activity
- Conventional pollutants
- Toxic contaminants
- Institutional constraints
- Public awareness and stewardship

CRB TOXICS MONITORING DASHBOARD

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Audience: TMS and other entities working to assess, reduce, and/or clean up toxics in the CRB.

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]

CRB TOXICS MONITORING DASHBOARD

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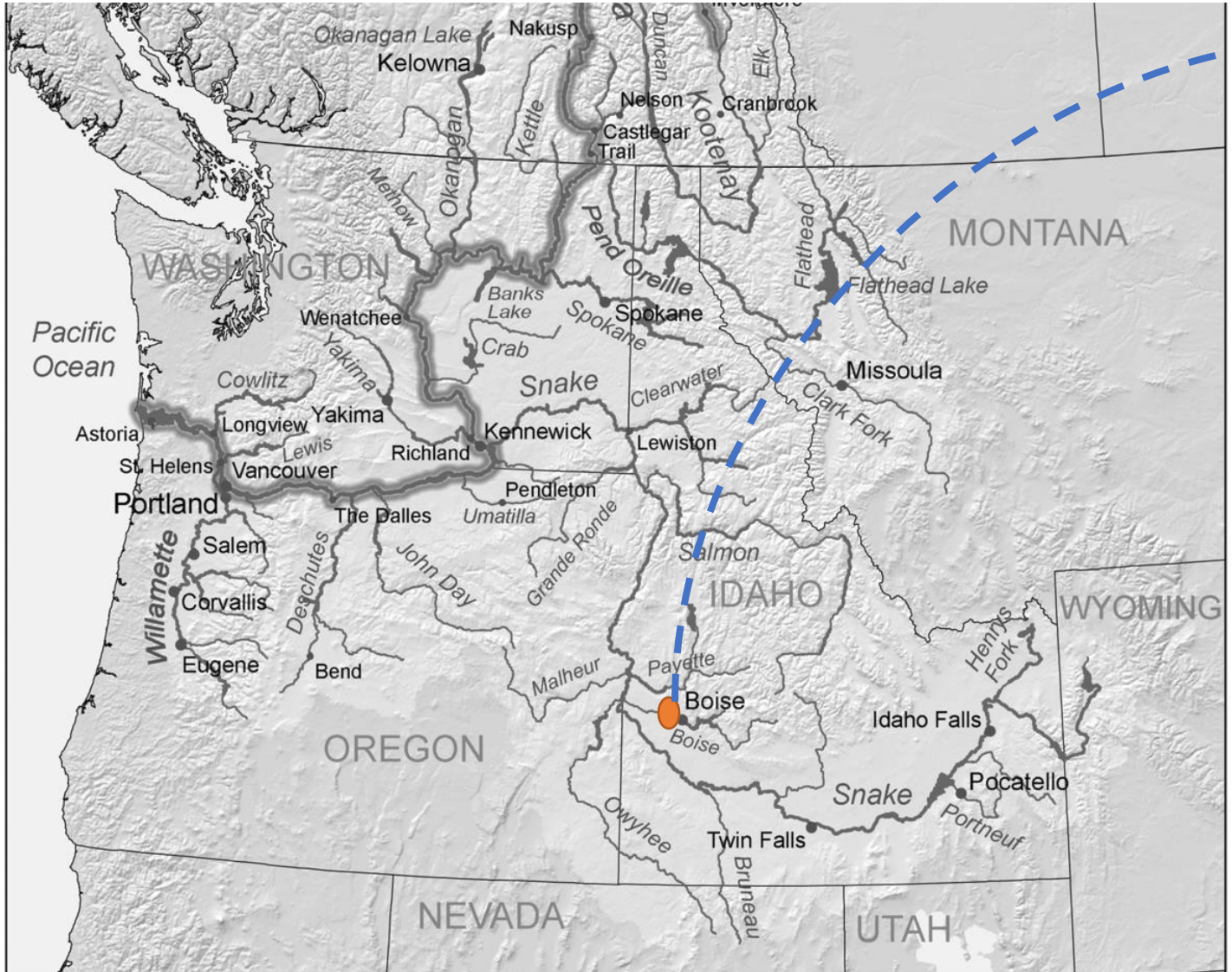
Monitoring Project Dashboard Prototype Demonstration

Katia Rar
US EPA Region 10

EPA

FILTERS AND FUNCTIONALITY OF DRAFT MONITORING PROJECT DASHBOARD TO VISUALIZE MATRIX DATA

COLUMBIA RIVER BASIN RESTORATION PROGRAM



- **Monitoring location** (polygons created by monitoring project leads)
- **Parameters monitored** (ex. Hg – metal – tier 1 EPA prioritization – not a persistent organic pollutant)
- **Media sampled** (ex. surface water, sediment, crayfish, fish tissue, etc.)
- **Primary source pathway** being investigated
- **Methodology** (ex. Standard, Clean Water Act (CWA) approved, or novel analytical method)

MONITORING PROJECT DASHBOARD

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Follow along using the link in the chat
or the QR code

What other filters would be useful to you?

007

- Cost estimates per sample type
- Apologies if I missed it, but is general land use category (urban, ag, forestry, mixed use) - or level of urbanization- a category that can be filtered (or is it on the priority list for the future)?
- Link to project results
- Laboratories conducting the smalyses
- This is a great start and looks adaptable going forward.
- A grouping of typical EJ filters that could be turned on/off could be very informative..
- Pacific lamprey conservation initiative RMUs
- species
- fish species

Do you have any other feedback regarding the prototype geospatial tool?

005

- Link to living document of Laboratories conducting the analyses and estimates of cost per sample for varying types of samples
- a light shading of the Columbia River Basin as a whole- Across 4 states and BC
- Color coded polygons for land use and types of toxins sampled
- Underlying regulatory ne Janis a
- QAPP links are not working
- sources of contamination , industry type, etc?
- watersheds highlights vs. reaches sampled
- Identify known point sources?

Methods Comparison

Columbia River Basin Toxics Monitoring Projects

Meghan Dunn
US EPA, Region 10
QA Chemist
Laboratory Services and Applied Science Division
December 5, 2023

LABORATORY ACCREDITATION

Searching for an Accredited Laboratory – if needed

Multiple options and accreditation bodies, here are a few

TNI = The NELAC Institute
https://nelac-institute.org/

Oregon, ORELAP
https://www.oregon.gov/oha/ph/laboratoryservices/environmentallaboratoryaccreditation/pages/index.aspx

Washington
https://apps.ecology.wa.gov/laboratorysearch/

FINDING SAMPLING SOPs

USGS, Surface Water
- https://water.usgs.gov/owq/Fieldprocedures.html
- https://www.usgs.gov/mission-areas/water-resources/science/national-field-manual-collection-water-quality-data-nfm

EPA, Region 4, Sediment
- https://www.epa.gov/foia/sediment-sampling-operating-procedure
- https://response.epa.gov/sites/2107/files/2016-r10.pdf

EPA ERT (Emergency Response Team), Surface Water
- https://response.epa.gov/sites/2107/files/2013-r10.pdf

EPA ERT, Fish Handling and Processing
- https://response.epa.gov/sites/2107/files/2039-r10.pdf

EPA ERT, Benthic Invertebrates
- https://response.epa.gov/sites/2107/files/2054-r10.pdf

MERCURY

Project Summary for Mercury Analysis

Biota	Sediment/Soil	Water
8 Grants	**3 Grants**	**4 Grants**
- 2 TBD method	- 2 TBD methods	- 1 TBD
- 3 EPA 1631E	- 2 EPA 1631E	- 3 EPA 1631E
- 2 EPA 6020B		- 1 EPA 6020B
- 1 EPA 7473		

Considerations: Low level vs routine mercury analysis
Purpose of data use (6020B vs 1631 or 7473)

METHYL MERCURY

Project Summary for Methyl Mercury Analysis

Biota	Sediment/Soil	Water
4 Grants	**2 Grants**	**2 Grants**
- 1 TBD method	- 1 TBD (ICP-MS)	- 2 EPA 6020B
- 2 EPA 1630	- 1 EPA 1630	
- 1 EPA 7473		

Tip: method modifications may be needed to analyze tissue (fish, other). It is a good idea to choose a lab with tissue experience.

METALS (excluding Mercury)

Project Summary for Metals Analysis

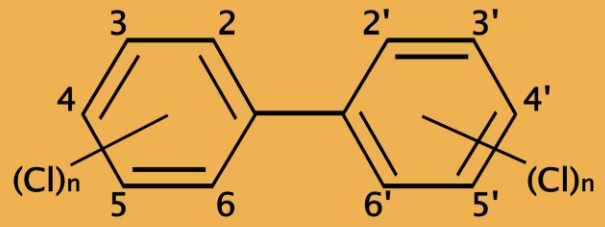
Biota	Sediment/ Soil	Water
4 Grants	**3 Grants**	**3 Grants**
- 2 TBD	- 2 TBD	- 1 TBD
- 2 EPA 6020	- 1 EPA 6020	- 1 EPA 6020
		- 1 EPA 200.8

Metals chosen for Analysis per Project

As	Cd	Cu	Pb	Se	Zn	All 22
X		X	X			
		X	X		X	
X	X	X	X	X	X	
				X		
						X

Both EPA 6020 and EPA 200.8 are ICP-MS methods (same instrument).

ICP-AES and ICP-MS have some differences in reporting limits, differences in behavior per element. Either is ok as long as it suits your project. ICP-MS methods are a good choice for Pb testing.



PCB AROCLORS AND CONGENERS

Project Summary for PCB

Biota	Sediment	Water
4 Grants	**2 Grants**	**3 Grants**
- 1 TBD method	- 1 TBD	- 2 TBD
- 2 EPA 1668	- 1 EPA 1668	- 1 EPA 8082
- 1 EPA 8082		

Note: Aroclors and Congeners are tested by different instruments and methods and provide different information.

- **Congener testing (Method 1668) is quite sensitive**
- **Aroclor testing (Method 8082) is more cost effective and less sensitive**

- 209 Congeners
- 7 Aroclors

ORGANOCHLORINE PESTICIDES

Project Summary for Pesticides

This Pho
under

Biota	Sediment	Water
3 Grants	**4 Grants**	**5 Grants**
- 1 TBD method	- 1 TBD	- 2 TBD
- 1 EPA 1699	- 2 EPA 1699	- 1 EPA 8081
- 1 EPA 8270	- 2 EPA 8270	- 2 EPA 8270
		- 2 EPA 8321

- 6 DDx grants
- 5 Organochlorine Pesticide grants

- Current use (WA Dept Ag)
- Historic use most projects
- High resolution vs lower resolution

Observations: Current grantees mostly target organochlorine pesticides, or the subset of DDx organochlorine congeners which are breakdown products of DDT. A few projects are scanning more broadly for organic compounds via LC-MS/MS

ORGANICS: PBDE, PAH, PHTHALATES, etc.

Project Summary for Other Organics

Methods:
EPA 1613 for dioxin/furans
EPA 1614 for PBDE
EPA 8270 for semivolatiles/PAHs
EPA 1694 for PPCP

Biota	Sediment	Water
3 Grants	**1 Grant**	**6 Grants**
- 2 PBDE	- 1 PBDE	- 3 PBDE
- 1 dioxin/furan		- 1 dioxins/furans
		- 2 semivolatiles
		- 1 PPCP
		- 2 broad range of trace organics

PBDE = polybrominated diphenyl ethers (flame retardants)
PPCP = personal care products and pharmaceuticals

EMERGING CONTAMINANTS: 6PPD-Q, PFAS, ALGAL TOXINS

Project Summary for Emerging Contaminants

Biota	Sediment	Water
2 Grants	**0 Grants**	**4 Grants**
- 1 PFAS (biosolids)		- 3 PFAS
- 1 6PPDq (biota)		- 1 6PPDq
		- 1 Cyanotoxin

GENERAL CHEMISTRY
Nutrients, TSS, Anions, and more

6 grants total

Variety of Laboratory Analytes
Nitrogen, many options for analysis: • Total Kjeldahl N (NH_3 + NH_4^+) • nitrite as N • nitrate as N • nitrite + nitrate as N • ammonia as N
Phosphorus Ortho-phosphate
Anions Total/Dissolved Organic Carbon Total Suspended Solids
Grain size

CRBTM Matrix Collaboration

- Search for projects seeking similar analytes or matrices
  - Compare/share method choices
  - Compare/share sampling techniques
  - Compare/share lab options
- Search for alternative methods

Thank you! Let's Discuss

Meghan Dunn
Quality Assurance Chemist
EPA Region 10
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Below is a list of potential challenges that practitioners face when planning monitoring projects. Rank the list from most to least challenging, with the most challenging being first.

(1/2)

0 1 2

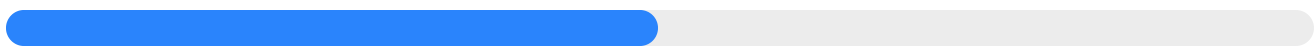
1. Lab availability — 3.50
2. Underbudgeting / budget constraints — 3.08
3. Choosing labs to process samples — 2.92
4. Choosing analytical methods — 2.50

Below is a list of potential challenges that practitioners face when planning monitoring projects. Rank the list from most to least challenging, with the most challenging being first.

0 1 2

(2/2)

5. Finding SOPs for collection methods



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What other significant challenges do you face when planning your monitoring project?

0 0 8

- Collection permits in general
- Getting Fish collection permits
- Funding
- picking a lab
- Short hold times and difficulty shipping in time
- expertise around analytical lab details when QAPP writing
- 1) Experience with developing QAPPs and 2) internal project team members having enough time and expertise to dive into the QAPP and provide substantive review comments.
- Shipping. We have had numerous overnight coolers fail to arrive.
- Lab timing, long delays. Funding/budget processes.
- Getting to sites to monitor. Labor is expensive.
- Timing and budgets
- Lab turnaround time

Do you have tips or lessons learned that you want to share with the group?

0 0 4

- Establish external contracts asap
- Contact the contract lab early in the project
- sub-contracting takes more time (months) and project hours than budgeted
- Collaboration is key
- If you think you should get a boat for your sampling campaign, do it. Get the boat.

TAKE A BREAK

be back at 11:00 am Pacific

Image: Katie Doherty

IDENTIFYING NEEDS AND BUILDING SYNERGY

1. Open Mural using the link in the chat
2. We will start with “Identifying Monitoring Needs” located in the middle of the board
3. Jen will provide instructions before we begin

Final Grant Reporting:

Monitoring Focused Projects

Lisa Kusnierz, EPA Region 10
Regional Monitoring Coordinator

December 5, 2023

Overview

- Reporting Requirements
- Recommended Outline
- Suggestions and Discussion

Questions for You

- Are there any elements that you feel are missing from this outline?
- Are there any suggestions that you feel are so valuable they should be more explicitly identified in the reporting requirements within the terms and conditions?

Reporting Requirements

(2) Semi-Annual Reporting – Shall cover, at a minimum:
A comparison of actual accomplishments to the outputs/outcomes established in the work plan for the performance period...

(3) Final Technical Reports – In accordance with EPA regulations (Title 2 CFR, Parts 200 and 1500), the recipient agrees to submit to the EPA Project Officer within one hundred and twenty (120) days after the expiration or termination of the approved project period a final report in at least one reproducible format suitable for printing. The final report shall document project activities over the entire project period and shall include comprehensive information on each of the areas listed above under **Reporting**, as well as:

A description of monitoring results (including miles of river monitored, location of monitoring sites, types of parameters monitored); description of implemented agricultural, stormwater, and pollution prevention best practices (including # of farmers, acreage, types of crops, location and type of stormwater best practice, type of pollution prevention best practices and tools, etc, (including numbers of individuals/entities reached and how they were reached, and communication tools developed) and/or lessons learned over the project performance period.

Outline Objectives

- Meet reporting requirements*
- Present information about your monitoring project in a way that will give others a snapshot of your project's objectives, methods, and results
- Highlight information that could be most useful to others collecting and evaluating data in the basin
- Help indicate progress towards the broader goals of the Columbia River Basin Restoration Program:
  - Track trends in water quality; conduct monitoring to identify sources
  - Pollution prevention, improving water quality, cleaning up contaminated sites, & increasing public engagement and knowledge

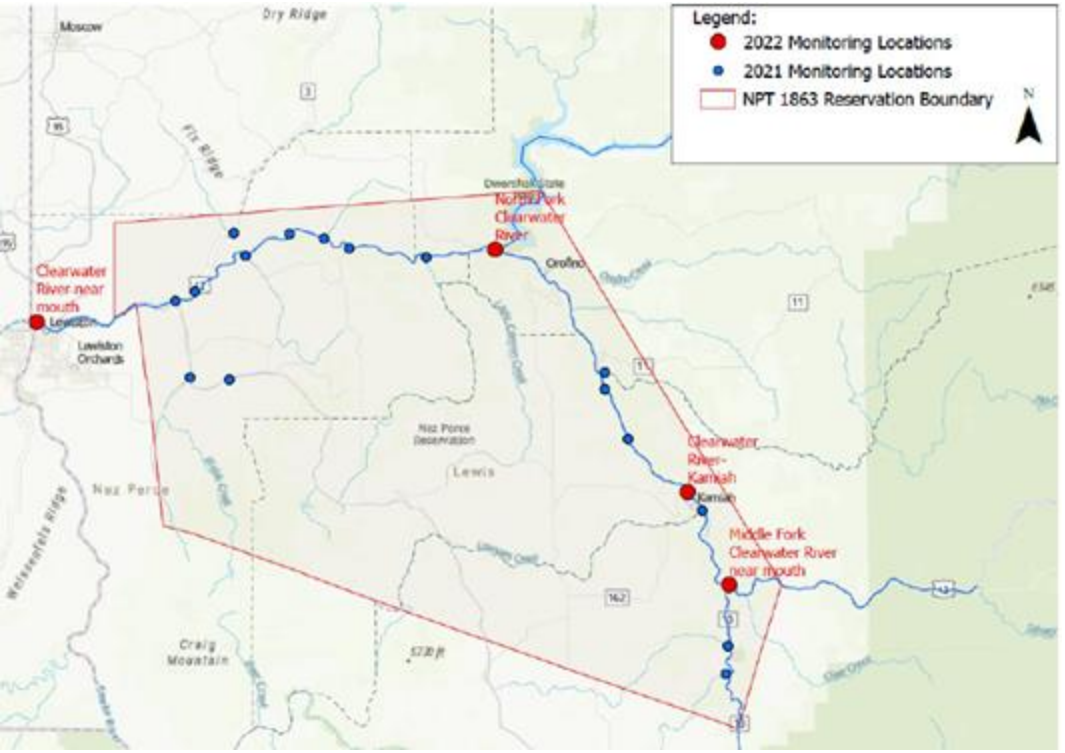
Outline Overview

- Executive Summary
- Introduction
- Methods and Data Availability
- Monitoring Results*
- Outreach (if applicable)*
- Environmental Results Achieved (if applicable)*
- Lessons Learned*
- Conclusions and Next Steps
- Administrative (budget, personnel, etc)

Executive Summary

- Brief overview of project with start and finish dates, funding info, and a summary of accomplishments/major findings.*
- Summary of linkages to the Columbia River Basin Restoration Program: do the results indicate any of the CRB priority pollutants are/are not a concern based on monitoring results? Were any source areas or pathways (i.e., agriculture, forestry, mining, urban, WWTP, industrial) identified for pollutants of concern?

Introduction



- Summary of project goals describing the project needs and objectives (from work plan)*
- Description of project area and waterbodies or watershed, miles monitored, and monitoring locations (with a map).* Identify the rationale for the site locations (e.g., probabilistic, bracketing sources/different pathways, capturing different contributing areas, etc).
- Identify if you're aware of similar historical data and if this project is associated with another ongoing or planned monitoring effort or project to reduce toxicants. Also, identify if you're aware if any Columbia River Basin priority pollutants and/or sources of them have previously been identified in your project area.
- Comparison of outputs/outcomes relative to work plan.* This could include a table of milestones.

Methods and Data Availability

Phase II (Year 2): Monitor surface water, sediment, and biotic tissue in the Clearwater River for pesticides, metals, PCBs, PBDEs, and nutrients.					
Surface Water		Sediment		Biotic Tissue: *Fish, Mussel, Lamprey Ammocoete*	
Parameter	Method	Parameter	Method	Parameter	Method
		Total solids	160.3M	Total solids	160.3M
				Lipids	NOAA lipid
Nutrients (NO3+NO2, TKN, NH3, OP, and total phosphorus)	353.2 ASTM D1426-08B 350.1 365.3 365.3	Nutrients (NO3+NO2, NH3, & Orthophosphorus)	352.3M 350.3 365.3		
Total Hg	1631	Total Hg	1631 app.	Total Hg	1631 app.
Methyl Hg	1630 mod.	Methyl Hg	1630 mod.	Methyl Hg	1630 mod.
Metals (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mo, Ni, Se, Ag, Tl, V, Zn)	EPA 200.8	Metals (As, Cd, Cr, Cu, Pb, Ni, Se, Zn)	6020A	Metals (As, Cd, Cr, Cu, Pb, Ni, Se, Zn)	6020A
		PCBs	1668C - HRCG/HRMS	PCBs	1668C - HRCG/HRMS
		PBDEs	1614	PBDEs	1614
		Organochlorine Pesticides	1699 - HRCG/HRMS	Organochlorine Pesticides	1699 -HRCG/HRMS

- Summarize field methods and identify the parameters and associated media monitored along with the analytical method.
- Reference the QAPP and briefly describe how the monitoring was consistent with it. Did data meet data quality objectives identified in project QAPP, and were modifications made for any data not meeting objectives?
- Summary of data uploaded to WQX/Water Quality Portal or other publicly available database and if pre-processing (sample averaging or aggregation) was done

Monitoring Results* –Screening Values

Pollutant	EPA Aquatic Life Criteria[1] Freshwater Acute (ug/L)	EPA Aquatic Life Criteria[1] Freshwater Chronic (ug/L)	Human Health Criteria[2] Consumption of Water & Organism (ug/L)	Human Health Criteria[2] Consumption of Organism only (ug/L)
DDT DDD DDE	1.1	0.001	0.000030 0.00012 0.000018	0.000030 0.00012 0.000018
Total Mercury	1.4	0.77		
Methyl Mercury				0.3 mg/kg (Methyl Hg)
Antimony (Sb)			5.6	640
Arsenic (As)	340	150	0.018	0.014
Barium (Ba)			1,000	--
Beryllium (Be)			--	--
Cadmium (Cd)	1.8	0.72	--	--
Chromium (Cr)	570	74	--	--
Cobalt (Co)				
Copper (Cu)*	--	--	1,300	--
Lead (Pb)	65	2.5		

- Standard practice to identify evaluation criteria or screening values in QAPPs for data to be used for regulatory purposes
- QAPP and linkage to CRB Data Quality Objectives: identifying or evaluating pollutants of concern

Monitoring Results* – ID Screening Values

Screening values from EPA 2017 Mid Columbia Fish Toxics Assessment

Table 5. Human health SVs used to evaluate MCR fillet fish tissue results. SVs for two effects levels with two fish consumption rates. Units are all ng/g (ppb) fillet wet weight.

Analyte[1]	Cancer SV (ng/g ww)		Non-cancer SV (ng/g ww)	
	General population	High consumer	General population	High consumer
Mercury	--	--	120	40
4,4-DDD	4.886	1.667	--	--
4,4-DDE	3.449	1.177	--	--
4,4-DDT	3.449	1.177	--	--
DDT total	3.449	1.177	502.513	171.429
Aldrin	0.069	0.024	35.176	12.000
Chlordane total	3.350	1.143	586.265	200.000
Dieldrin	0.073	0.025	58.627	20.000
Heptachlor	0.261	0.089	586.265	200.000
Heptachlor Epoxide	0.129	0.044	15.243	5.200
Hexachlorobenzene	0.733	0.250	938.024	320.000
Endosulfan I	--	--	7035.176	2400.000
Endosulfan II	--	--	7035.176	2400.000
Endosulfan sulfate	--	--	7035.176	2400.000
Endrin	--	--	351.759	120.000
alpha-BHC	0.186	0.064	--	--
beta-BHC	0.651	0.222	--	--
Lindane (gamma-BHC)	--	--	351.759	120.000
Methoxychlor	--	--	5862.647	2000.000
Mirex	--	--	234.506	80.000
PCB total	0.586	0.200	--	--
PCB total-immun. effects	--	--	23.451	8.000
PCB total-develop. effects	--	--	30.151	10.286

Table 6. Ecological endpoint SVs used to evaluate MCR whole body fish tissue results. Units are all ng/g (ppb) whole body wet weight (Source: Lazorchak et al. 2003, Dyer et al. 2000 as updated by B. Shephard).

Analyte	General aquatic	Kingfisher	Mink	Otter	General wildlife
Arsenic	227	--	--	--	--
Cadmium	113	--	--	--	--
Chromium	4800	--	--	--	--
Copper	173	--	--	--	--
Lead	189	--	--	--	--
Mercury	60	30	70	100	--
Nickel	390	--	--	--	--
Selenium	560	--	--	--	--
Zinc	5688	--	--	--	--
2,4 DDD	--	20	--	--	--
2,4 DDE	--	20	--	--	--
2,4 DDT	--	20	--	--	--
4,4 DDD	54	20	--	--	--
4,4 DDT	54	20	--	--	--
4,4 DDE	54	20	--	--	--
DDTs total	54	20	360	490	--
Chlordane total	56	5	830	1140	--
Dieldrin	9	360	20	30	--
Hexachlorobenzene	31979	--	--	--	330
PCB total	440	440	130	180	--
PBDE total	--	13(kestrel)[1]	32	--	--

Monitoring Results*

- Present summary statistics for each parameter (i.e., minimum, maximum, mean) and identify how those compare to the benchmark, if one has been identified. For projects with large analyte lists, focus the statistical summary in the main document on parameters exceeding benchmarks, or those with a longer period of record or that you intend to continue evaluating for longer term monitoring. Include the rest of the statistical summary info by matrix/media in a report appendix. However, a narrative or tabular summary should be included in the main document for parameter groups or Columbia River Basin priority pollutants that were analyzed and do not appear to be of concern for your project area (i.e., high percentage of non-detects or all below benchmark values), as well as those that were prevalent but have no benchmark.
- When the same analytes are analyzed across multiple media (i.e., water, sediment, tissue), group them by parameter group when presenting the data

Do you agree it would be most helpful to see results for projects sampling multiple media (e.g., water, tissue, sediment) presented by parameter group?

0 1 3

Yes, I agree

92 %

No, I would prefer to see results separated out for each media type

8 %

Graphics

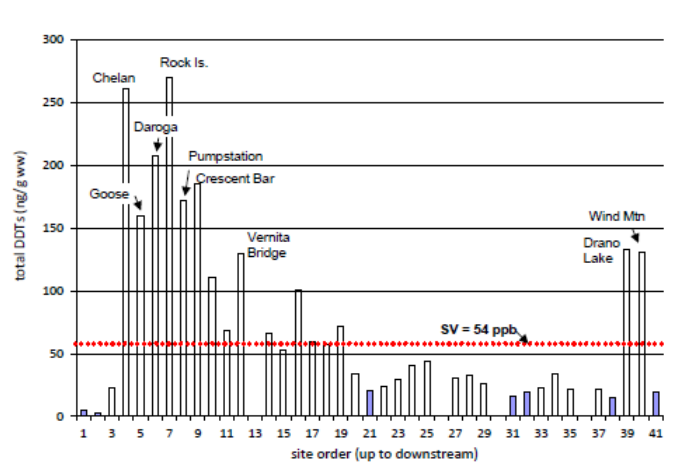


Figure 18. Total DDTs concentrations in Eco-fish composite samples at each sample site, MCR.

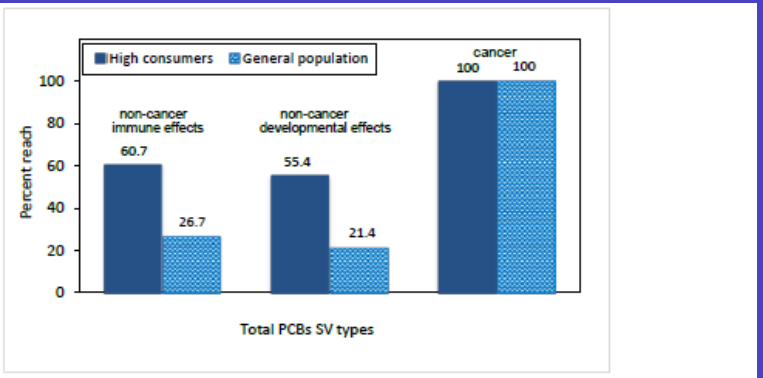
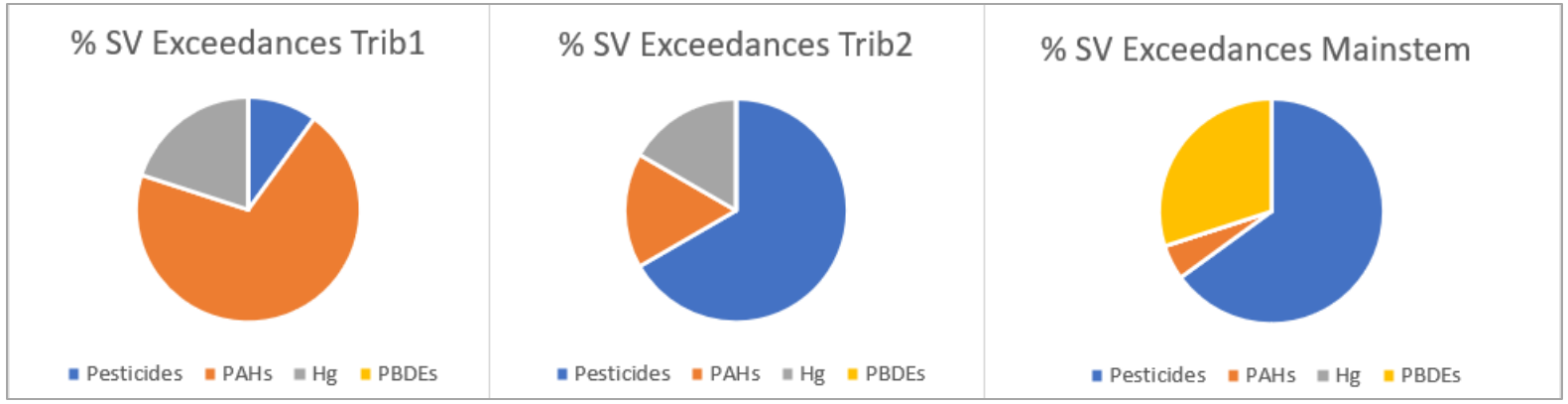


Figure 7. Percent of MCR reach exceeding the total PCBs cancer and non-cancer SVs in fillet tissue (N=718 rkm).

- Include some graphs for parameters with interesting spatial or temporal changes. This would likely be a line or bar graph. If there is a benchmark for a particular parameter, it is also helpful to plot or draw that value as a line across the plot so exceedances can easily be seen.
- Percent exceedances of benchmarks: Plot percent benchmark exceedances by location for each parameter group or parameter of interest. A bar graph or pie graph could be useful for this type of plot. This will help show pollutants of concern for your study area and if there are any hot spots.



Are there other plot types or way of presenting the data that you would find helpful to see as a recommendation?

0 0 2

- Box and whisker plots.
- Provide results in a geographic context

Lessons Learned* & Conclusions/Next Steps

- Describe aspects that did not go as planned.* This could include missed milestones, planning/access issues, unexpected costs, sampling complications, etc.
- What are your primary conclusions for pollutants of concern for your project area and source areas or pathways identified?
- Is associated work planned? Is this work intended to be used for trend analysis?
- Recommendations for the future based on lessons learned and/or recommendations based on findings or identified data gaps

Are there any elements or additional recommendations that you feel are missing from this outline? Are there any suggestions you feel are so valuable they should be more explicitly identified in the reporting requirements within the terms and conditions?

0 0 3

- No.
- Appreciate the additional recommendations for the report.
- No

HELP SHAPE THE FUTURE OF TMS

Provide feedback using survey link in chat

THANKS FOR JOINING US!

Questions or feedback?

Reach out to us anytime!

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Image: Anthony Quintano