

# ***Overview of Freshwater Fish Tissue Contaminant Monitoring in Washington***

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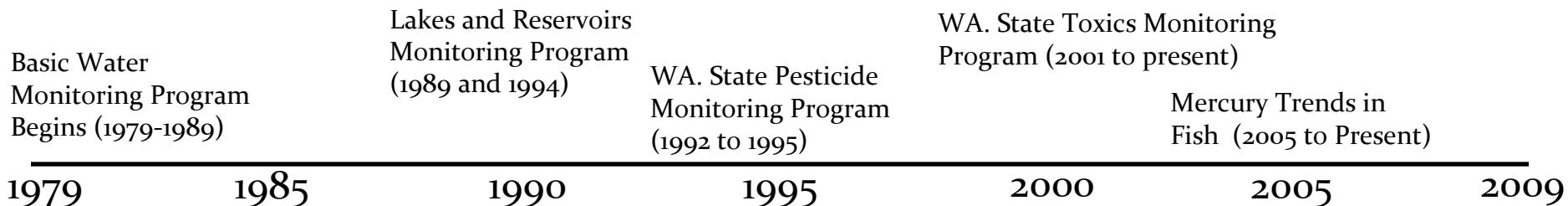


# Washington State Department of Ecology Environmental Assessment Program

- Ecology is 1 of 11 natural resource agencies in Washington
- 1500 employees in Ecology
- EAP is monitoring and assessment branch of Ecology
- 140 employees in EAP
- Staff dedicated to long-term FW fish monitoring= 6
- Annual budget for long-term FW fish monitoring= \$1,000,000

# 30 Years of Freshwater Fish Monitoring in Washington

Year	Activity
1979	<b>Basic Water Monitoring Program Begins</b>
1985	Yakima River Chlorinated Pesticide Study
1988	Lake Roosevelt Contaminant Studies
1989	<b>Lake and Reservoirs Water Quality Assessments</b>
1990	Spokane River PCBs in Fish Studies
1992	<b>Washington State Pesticide Monitoring Program</b>
1997	1st TMDL for Toxics, Yakima River Chlorinated Pesticides (Aquatic Life)
1998	Occurrence of PBDEs in WA Fish
1998	Lake Whatcom Mercury in Fish Study
2001	<b>Washington State Toxics Monitoring Program</b>
2002	National Lakes Sampling in WA
2003	Statewide Mercury in Fish Baseline Assessment
2005	<b>Mercury Trends Monitoring in Fish</b>
2005	Statewide PBDE in Fish Baseline Assessment
2006	Yakima River Chlorinated Pesticide and PCB Human Health TMDL
2008	National Rivers and Streams Sampling in WA
2008	Statewide PFC Baseline Assessment



# Current Monitoring

## Overall Approach

- Screen for Problems (exploratory)
- Conduct Focused Studies (source ID and need for advisories)
- Trend Monitoring (targeted and rotating)

## Washington State Toxics Monitoring Program (Long-Term)

- Exploratory Component: Fish Tissue
- Organic Trends: Semi-Permeable Membrane Devices
- Mercury Trends: Fish Tissue

## Focused Studies

- Typically 1-3 years in duration

# Permits

State Agencies	Lead Time	Renewal
Washington State Department of Fish and Wildlife	4-6 weeks	Annual
Washington State Parks and Recreation Commission	1 month	Annual

Federal Agencies	Lead Time	Renewal
US Fish and Wildlife Service	9 months	5 years/annual amendments
NOAA Fisheries	6-9 months	5 years/annual amendments
National Parks	1 month	Varied lifespan/annual
National Recreation Areas	1 month	Varied lifespan/annual

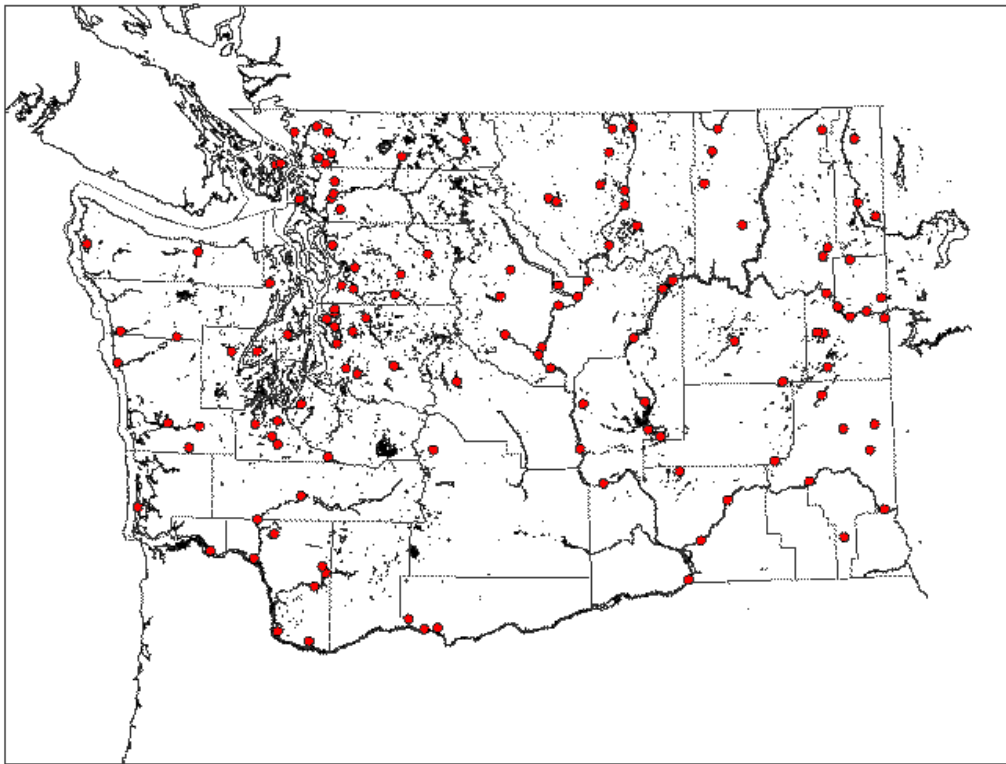
Other	Lead Time	Renewal
“Permissions”(tribes, cities, USFS, PUDs, and private landowners )	4-6 weeks	Annual

# Collection Methods

- Boat electro-fishing (larger rivers and streams)
- Backpack electro-fishing (small streams)
- Gill nets
- Beach Seine
- Fyke nets
- Set lines
- Hook and line



# Washington State Toxics Monitoring Program Exploratory Sampling (2001 to 2008)



WSTMP Sampling Sites (2001 to 2008)

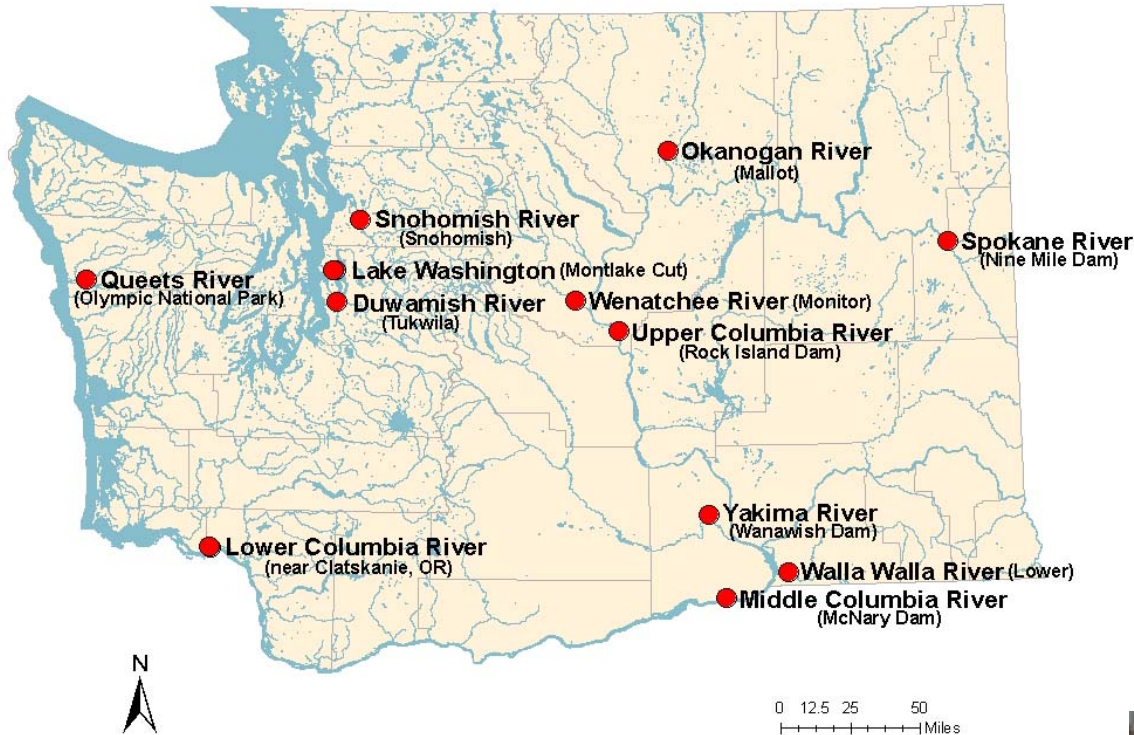
## Overview

- 15-20 sites per year
- 3-5 species per site
- Mercury, Chlorinated Pesticides, PCBs , PBDEs, and Dioxins/Furans
- Other data- age, length, weight, and sex

## Site Selection Factors

- Lack of historical data
- Importance for fishing
- Cooperation with other monitoring efforts

# Organic Trends (Initiated 2007)

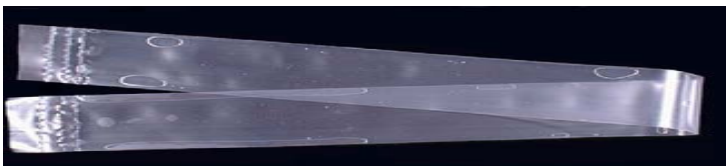


## Overview

- 12 sites per year
- Fall (low flow) and Spring (high flow)
- Passive samplers (SPMDs)
- Chlorinated Pesticides, PCBs, PBDEs, and PAHs

## Site Selection Factors

- Fixed stations (targeted)
- Range of land use types (background, urban, agricultural and mixed use)



# Mercury Trends

- Six sites per year for 5 years  
Repeat sampling at 5 year intervals
- Four years completed (2005 – 2008)  
Sampling for 5<sup>th</sup> year underway
- Ten individuals used for trends assessment  
Target species: LMB, SMB and WAL
- Three additional composites of 2 other species  
Evaluate alternative species with low contaminant levels for advisories



# Focused Study Examples

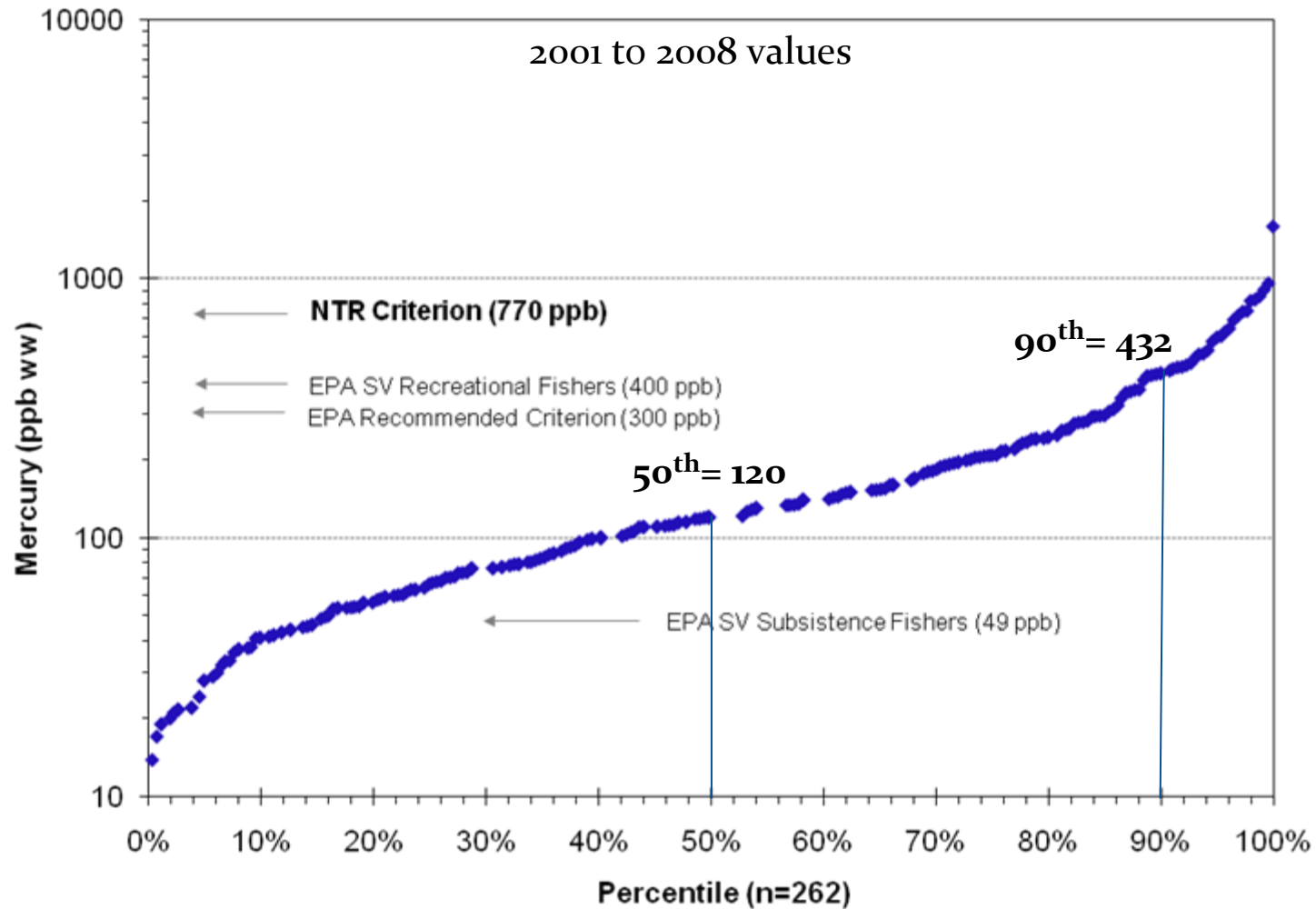
## ➤ Statewide

- Mercury Baseline
- PBDE Baseline
- Perfluorinated Compounds Baseline
- Background Levels of PCBs and Dioxins in Fish
- Hatchery Fish and Feed

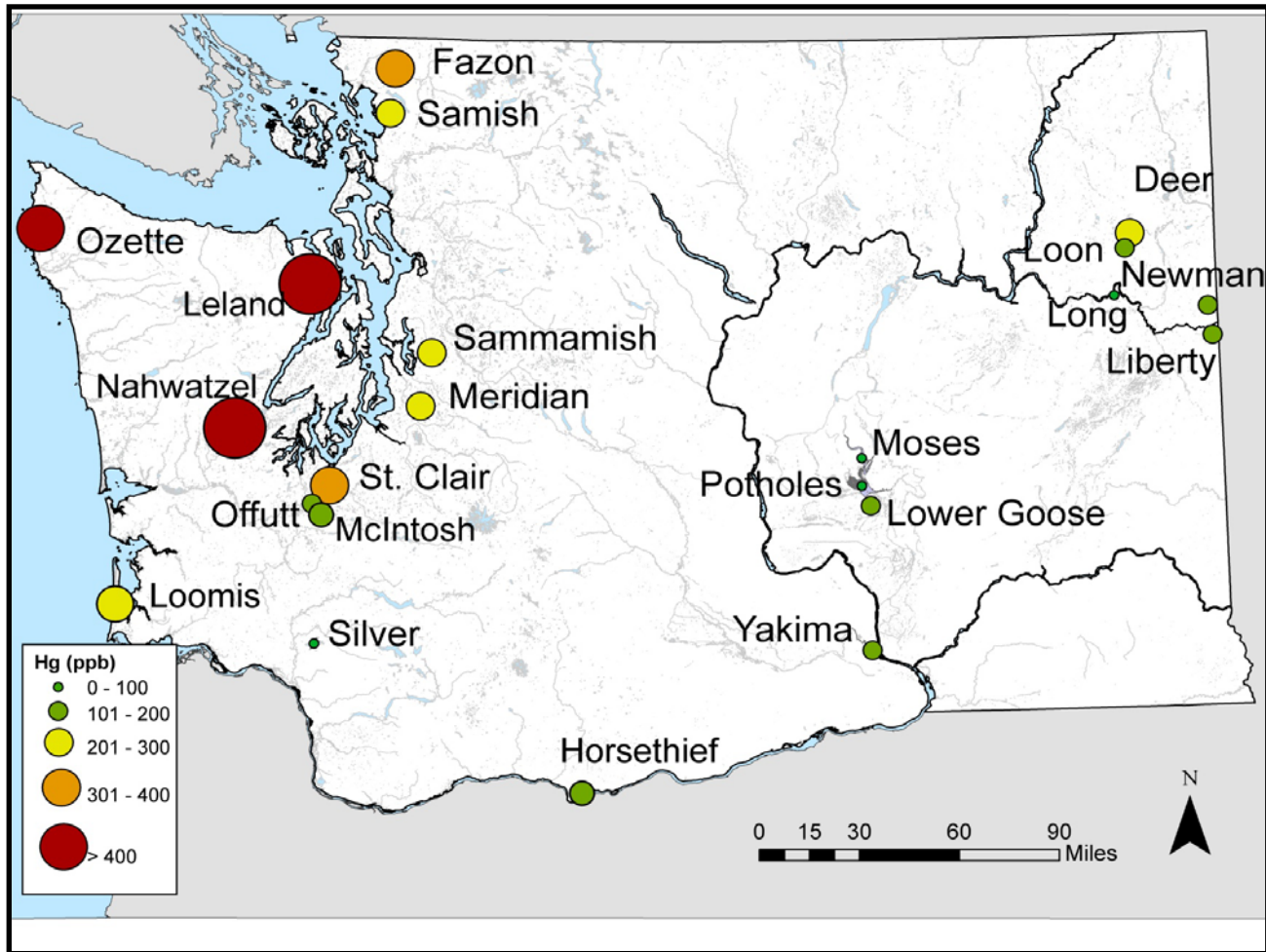
## ➤ Other

- Potholes Reservoir (Dieldrin)
- Spokane River Osprey and Fish (PBDEs)
- Cyanobacteria Toxins in Fish
- TMDLs (Chlorinated Pesticides and PCBs)
- TMDL Effectiveness
- Mercury and Small Scale Mining
- Arsenic Speciation in Similkameen River Fish
- Lake Ozette Mercury Loading

# Mercury Statewide

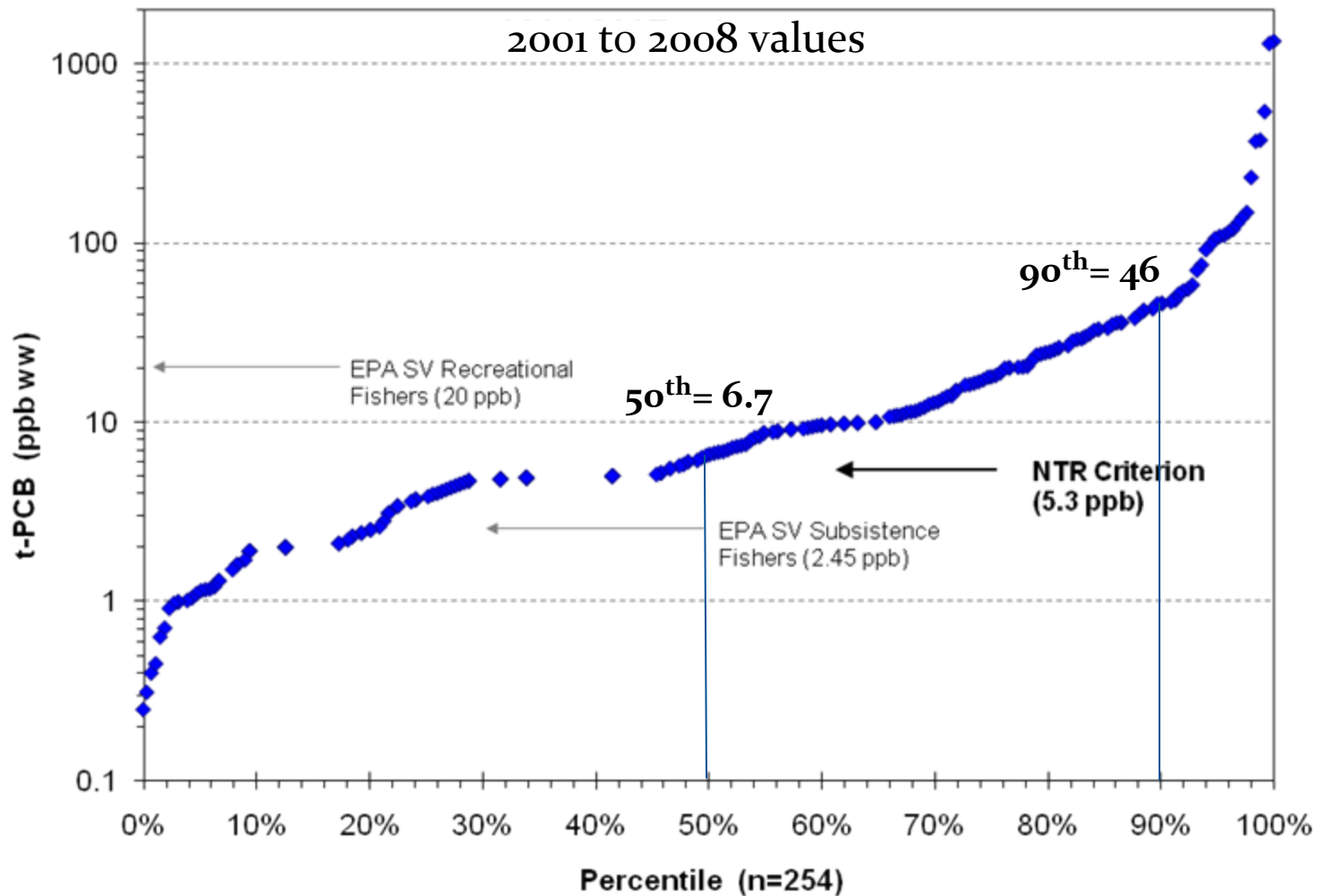


# Mercury Distribution (2005 to 2008)



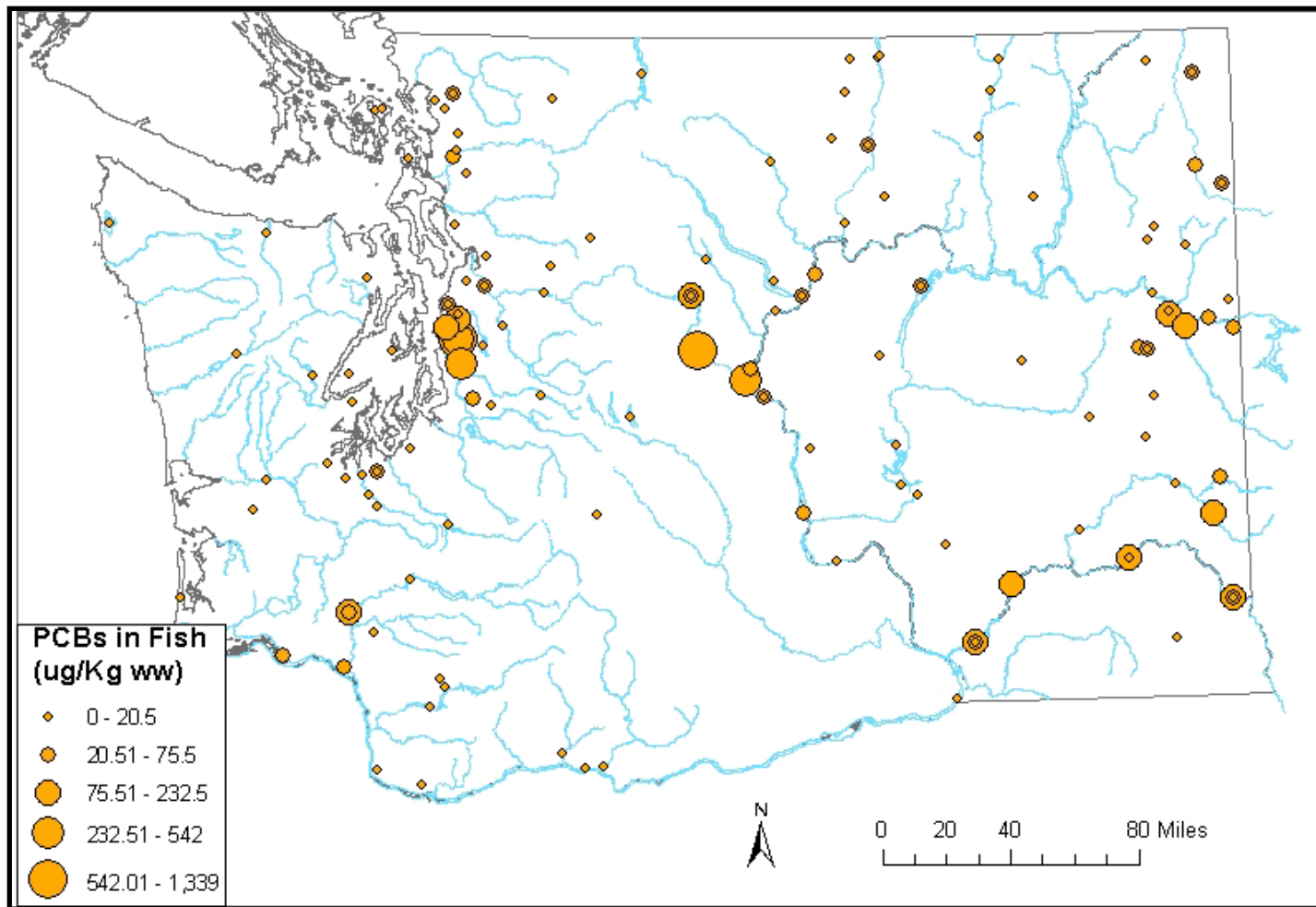
Concentrations normalized to “standard sized” 356 mm bass. Calculated using linear regression from 10 individuals from a water body.

# PCBs Statewide

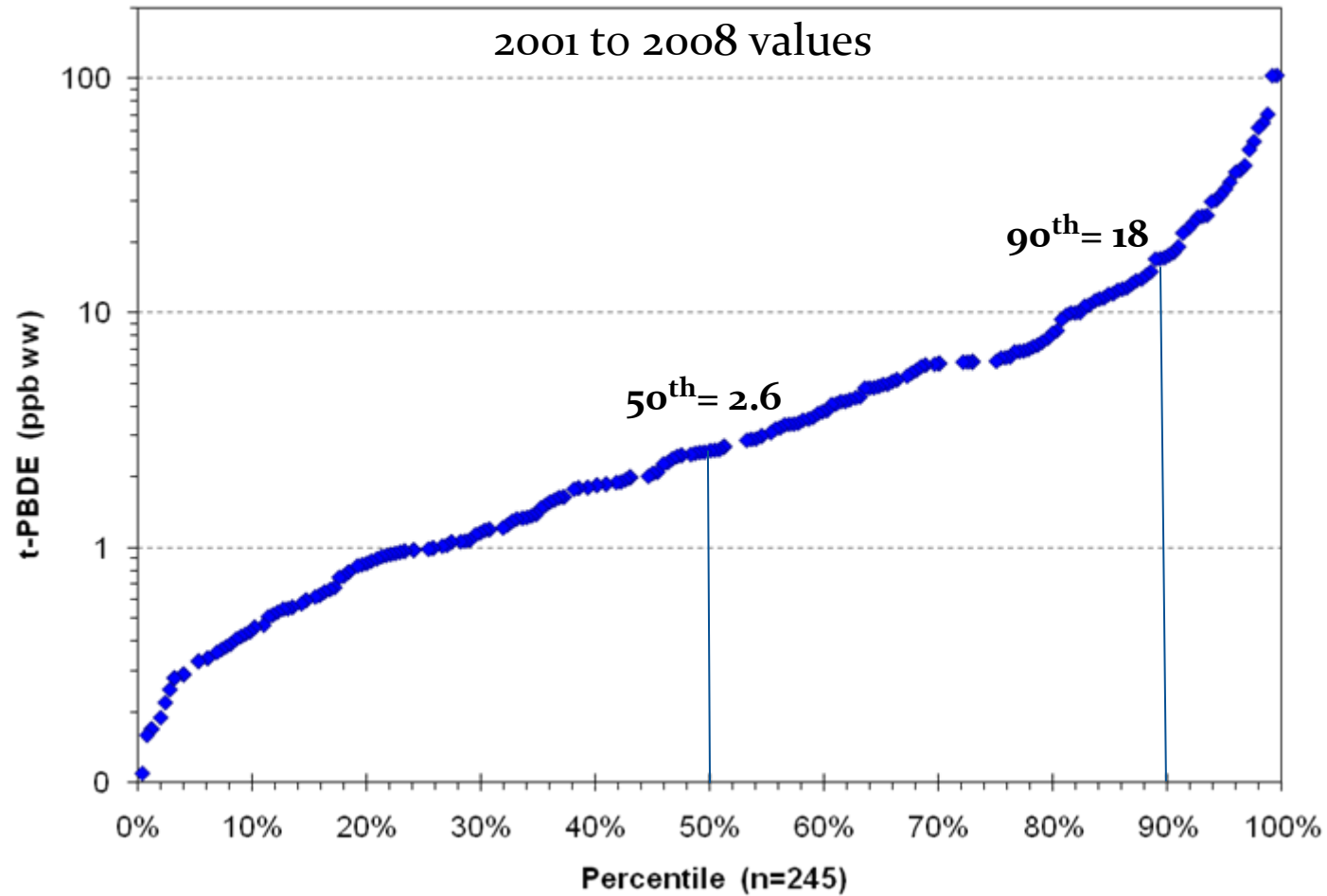


# PCB Distribution

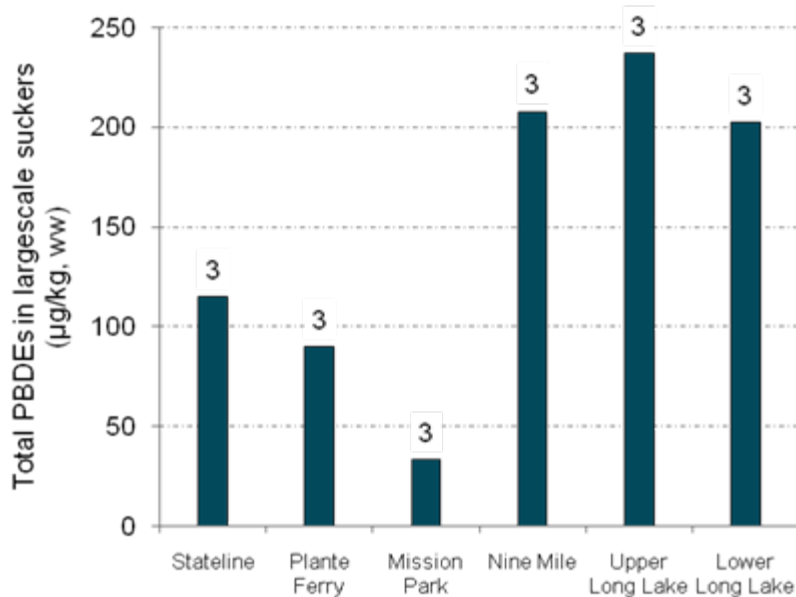
(2001 to 2008)



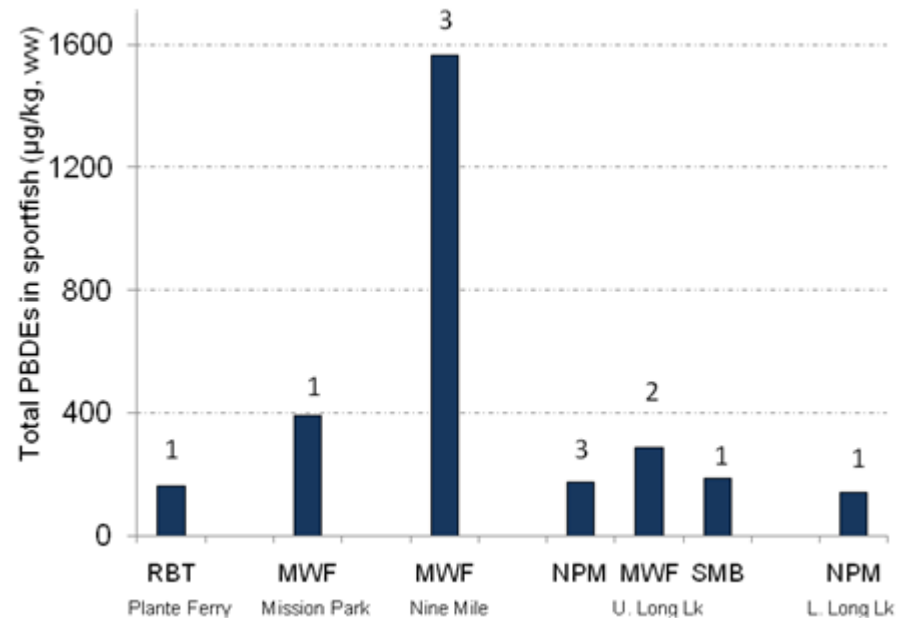
# PBDEs Statewide



# Spokane River PBDEs



Whole suckers

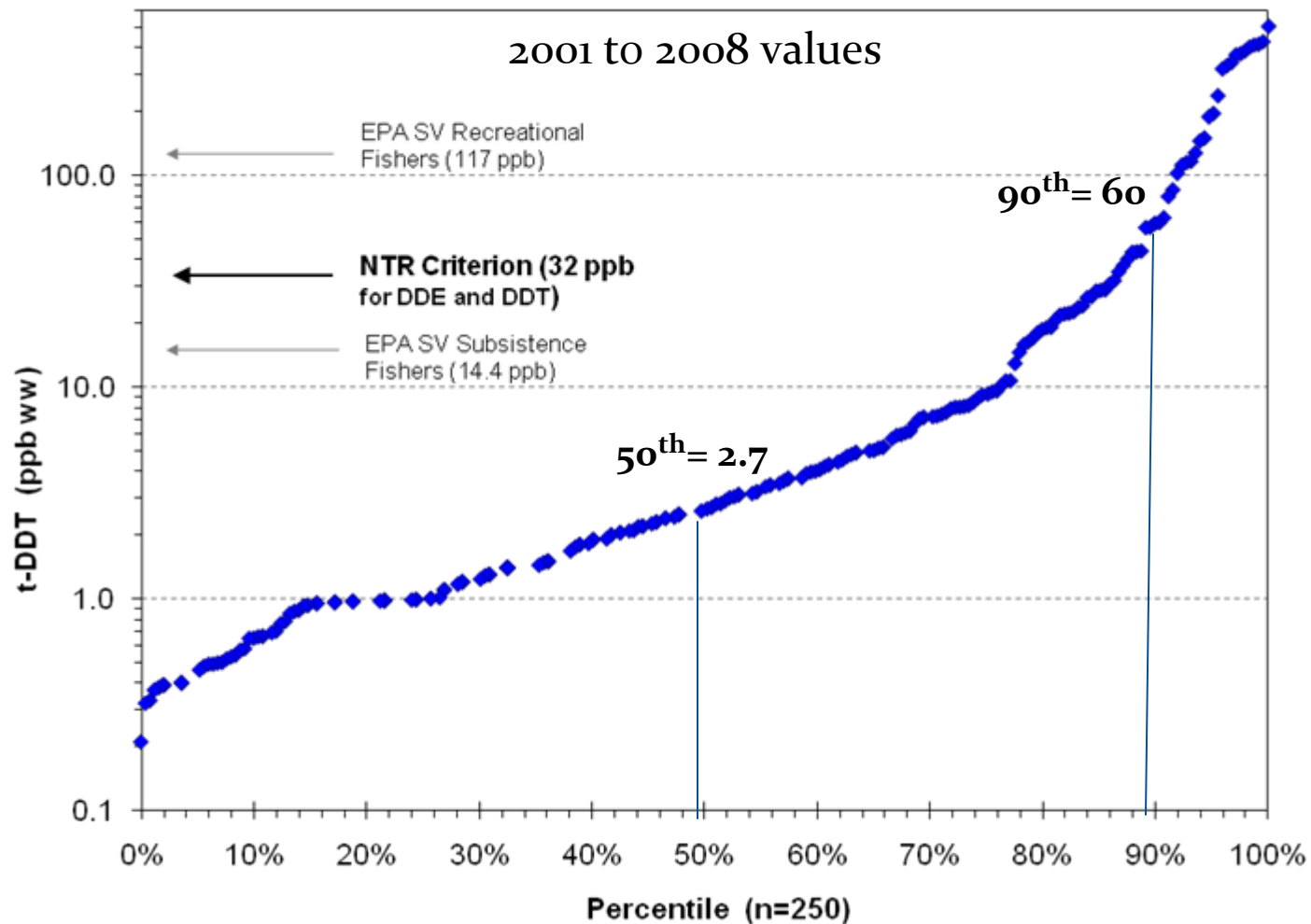


Sport fish fillets

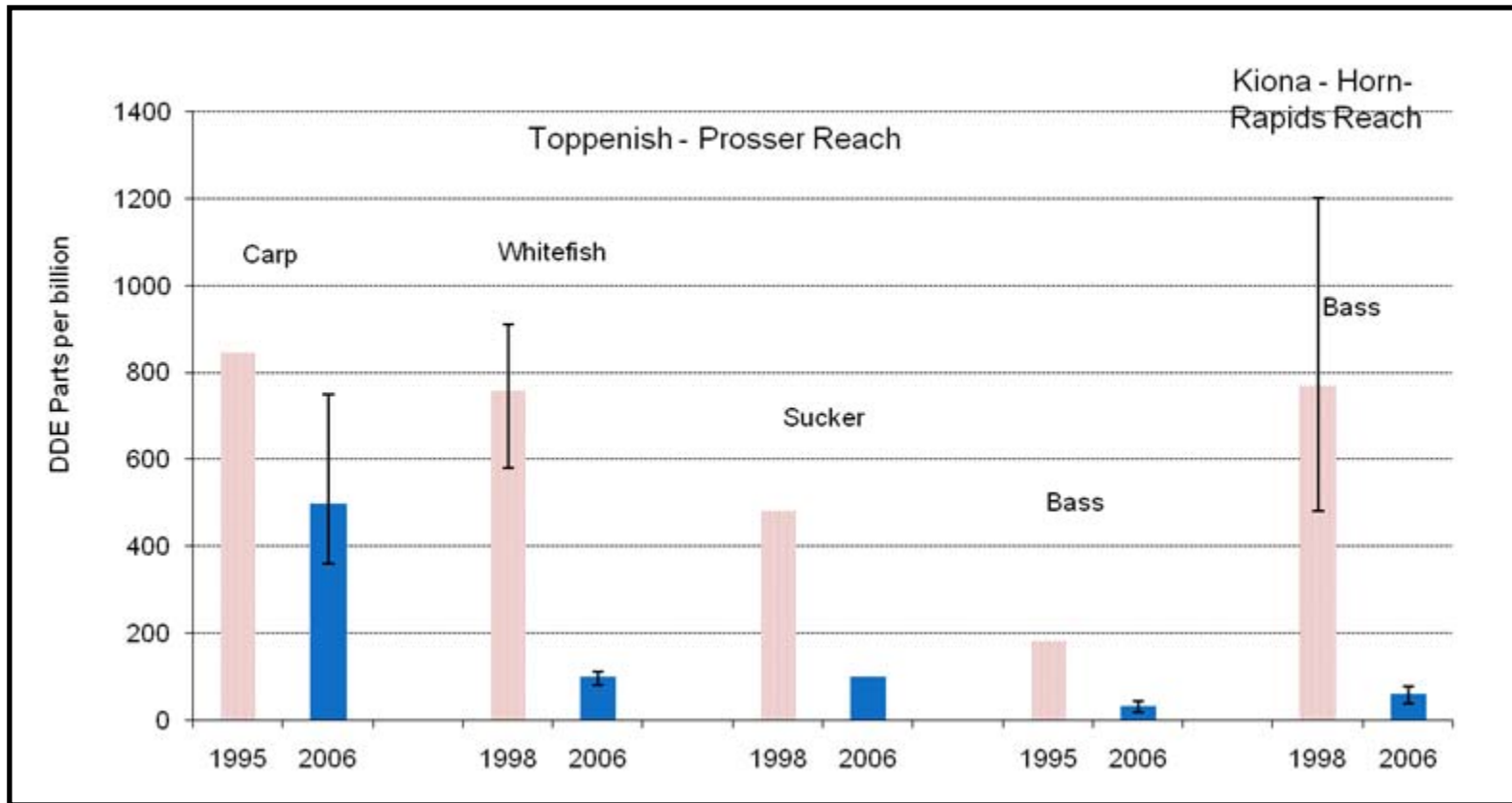
Mean concentrations- Number of composites shown above bar

RBT= Rainbow Trout, MFW= Mountain Whitefish, NPM= Northern Pikeminnow, and SMB= Smallmouth bass

# Total DDT Statewide



# Yakima River DDE Levels in Fish 1998 and 2006



- Consumption advisory placed on Yakima River in 1993
- Advisory lifted in 2009 due to drop in DDT levels

# Future Activities

- Revise monitoring plan for exploratory fish component (implement summer 2010)
- Update organic trends monitoring program (implement spring 2010)
- Revisit mercury sites (5 year rotation) to evaluate trends (summer 2010)
- Final report for perfluorinated compounds baseline study

# Contact and Resources Information



- Washington State Toxics Monitoring Program  
Keith Seiders: [keith.seiders@ecy.wa.gov](mailto:keith.seiders@ecy.wa.gov)
- Mercury Trends  
Chad Furl: [chad.furl@ecy.wa.gov](mailto:chad.furl@ecy.wa.gov)
- Environmental Information Management System  
<http://www.ecy.wa.gov/eim/>
- Department of Ecology Publications  
<http://www.ecy.wa.gov/pubs.shtm>
- Environmental Toxics Monitoring by Ecology  
Webpage  
<http://www.ecy.wa.gov/programs/eap/toxics.html>

