# The National Monitoring Network
for
# U.S. Coastal Waters and their Tributaries

# Puget Sound Demonstration Area

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**Update with Donna Myers and Mike Yurewicz**
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# Overall Project Objectives

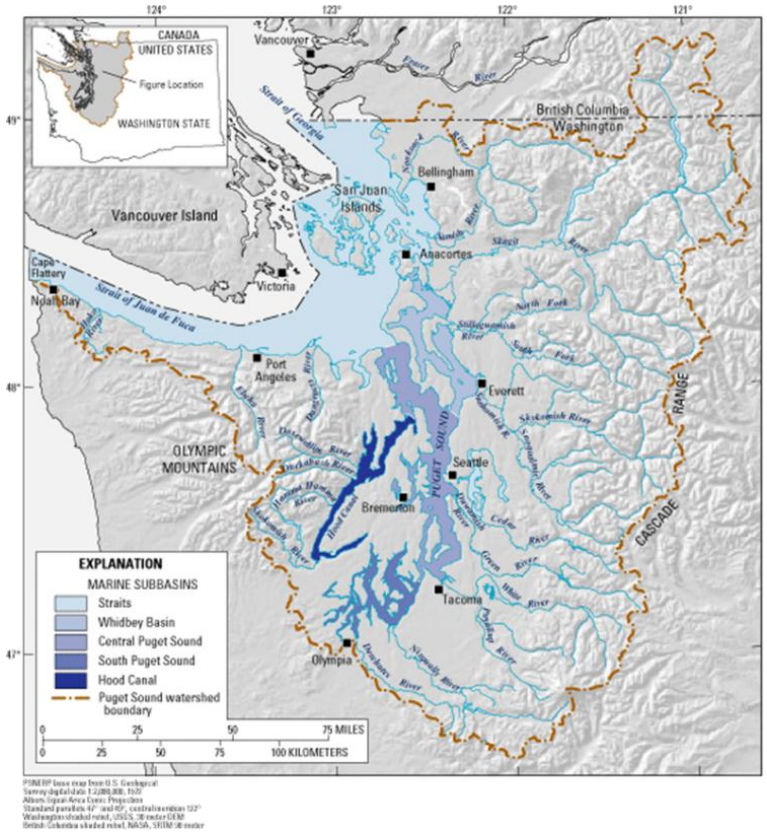
- Objective 1: Conduct data inventory and gap analysis of monitoring activities in Puget Sound
- Objective 2: New monitoring to fill a recognized data gap: sediment loads and associated chemical loads from large rivers to Puget Sound

# Objective 1

- Puget Sound Ecosystem Monitoring Program (https://sites.google.com/a/psemp.org/psemp/)
  - Part of Puget Sound Partnership, funding from National Estuary Program
  - Steering Committee (Rick)
  - Number of workgroups
    - Freshwater working group
    - Marine Waters working group (Kathy)
  - 2012 "State of the Sound" (http://www.psp.wa.gov/sos.php)
  - Data inventory and gaps analysis being completed by working groups this year
  - We will relate these inventories to the NMN design

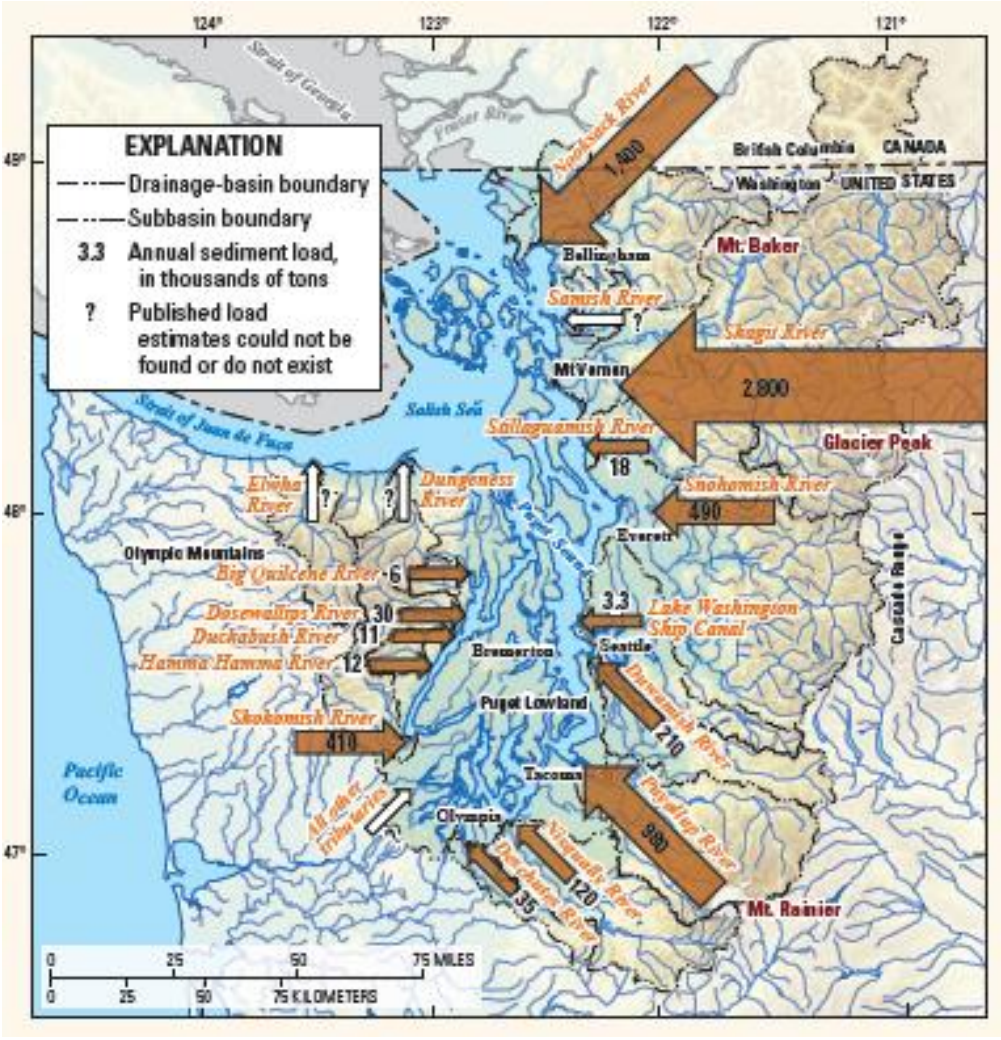
# Objective 2

- New monitoring to fill a recognized data gap
  - Sediment and associated chemical loads from large rivers
  - Sources for data gap ID: Ecology's Puget Sound Toxics Loading Analysis, USGS NAQWA and CHIPS programs



# Why sediment loads?

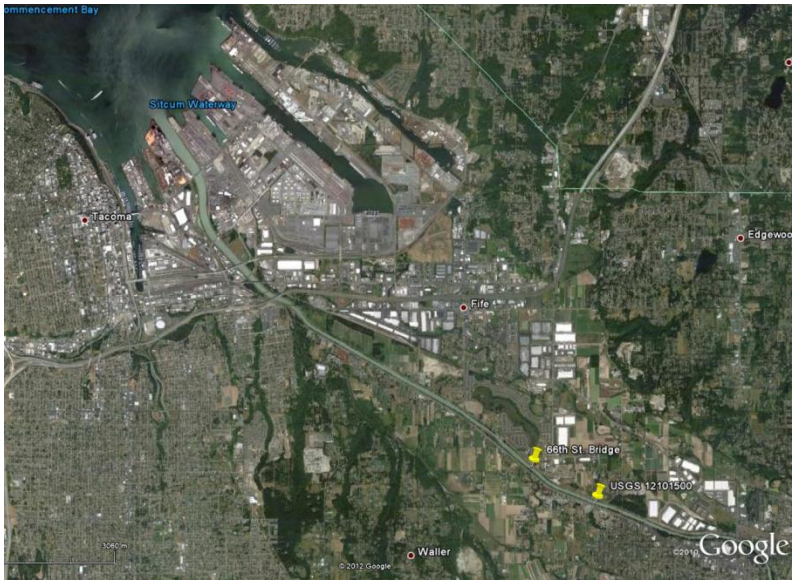
- Expected high sediment transport in Puget Sound rivers
- Magnitude of sediment load to Puget Sound poorly quantified
- Chemical load associated with sediments poorly quantified
  - Seasonal/within storm variation not known

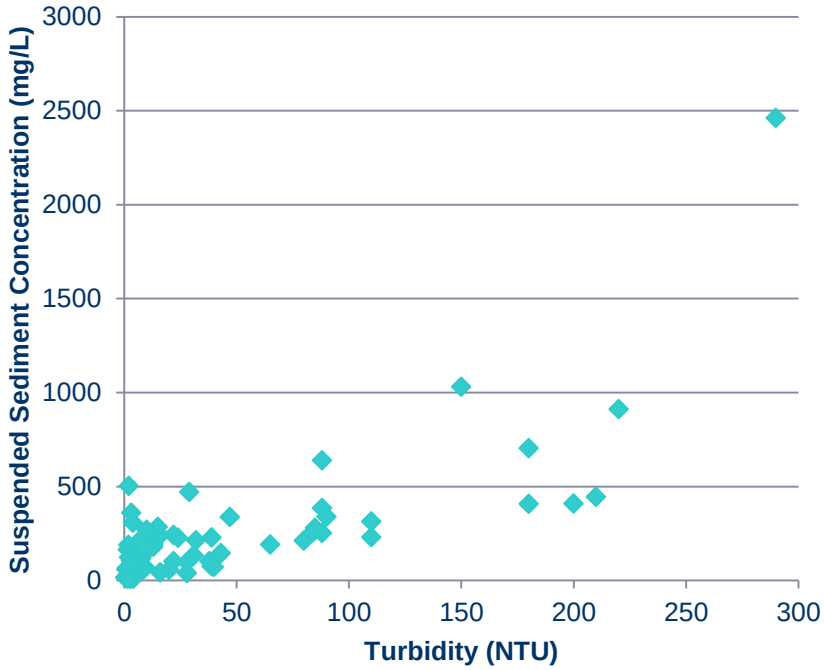



Annual sediment load from large rivers to Puget Sound (*from USGS Fact Sheet 2011-3083)*

# Why sediment loads?

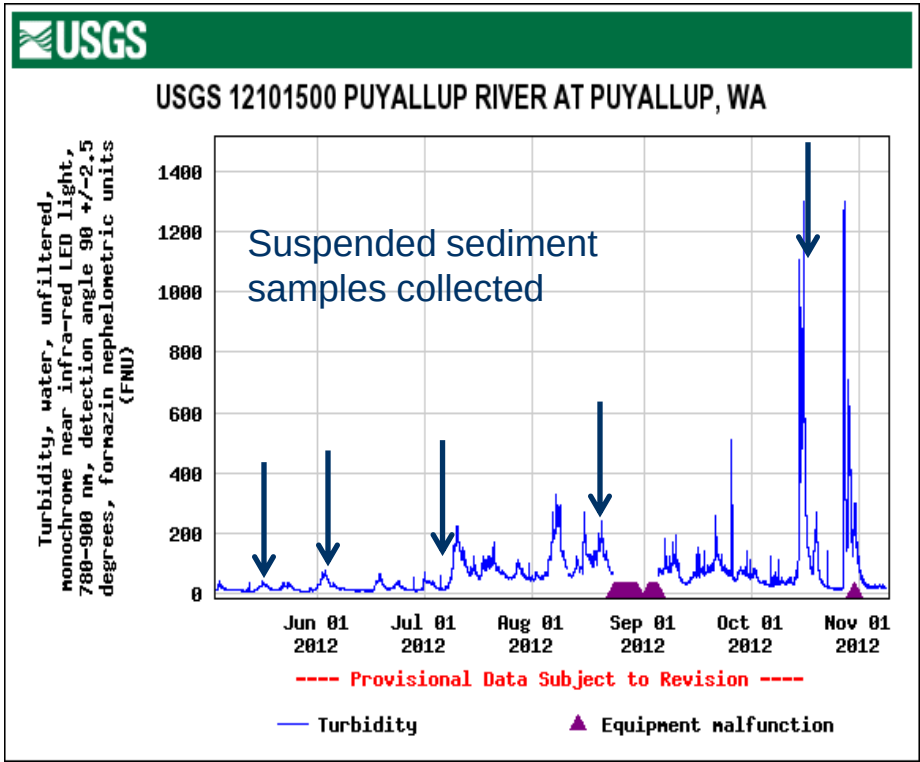
- Example: Puyallup River (USGS 12101500)
  - Period of record: 1914 – present
  - Sparse water quality data during high sediment events
  - Ecology detected suite of organic contaminants on sediment during single low-flow sampling



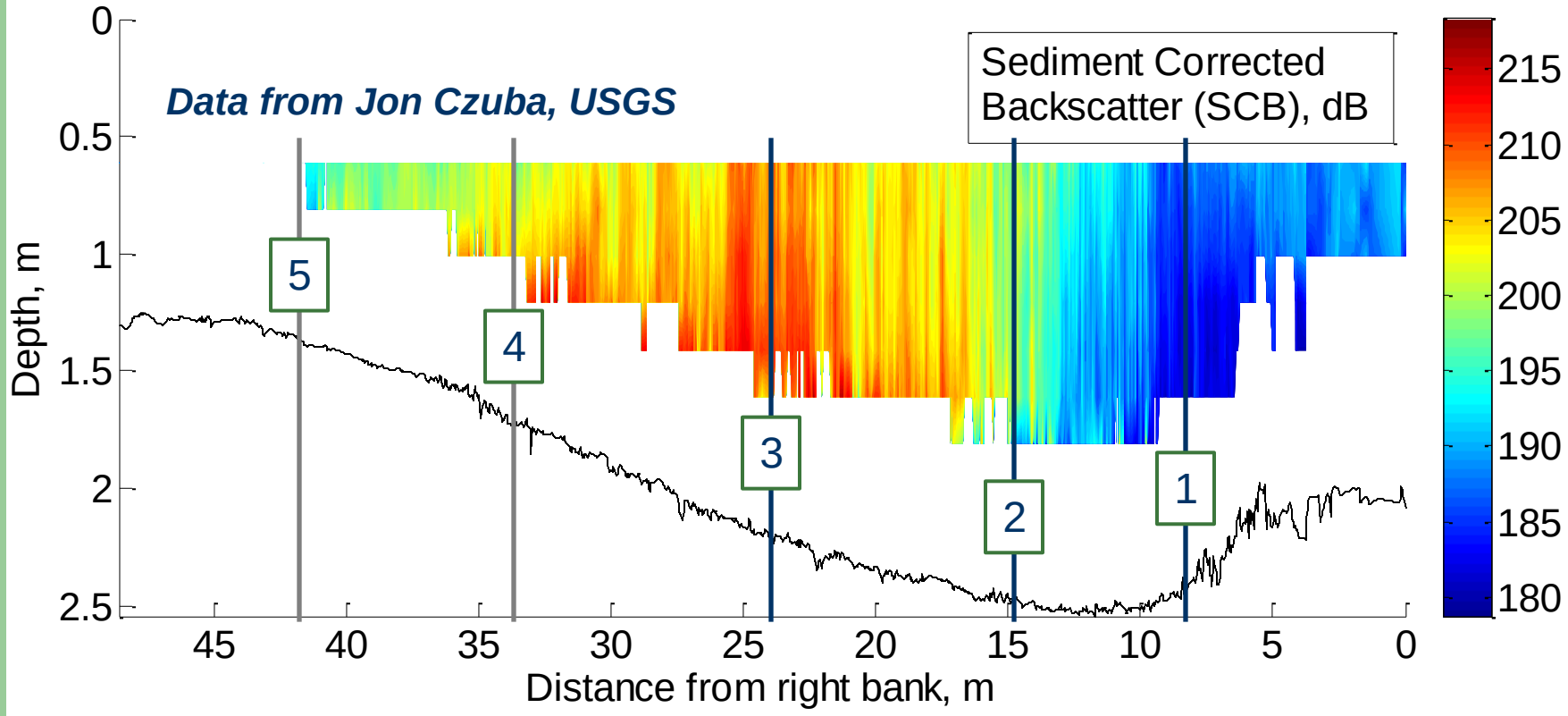
# Monitoring approach

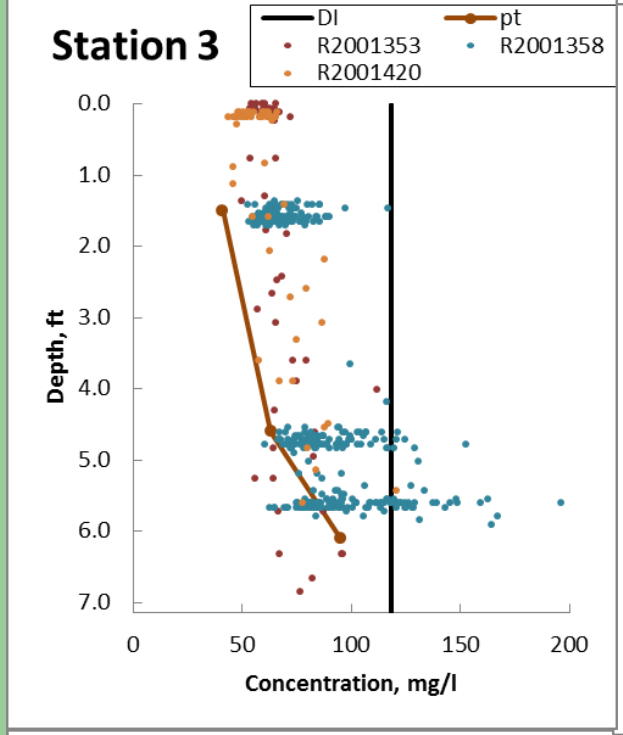
- Develop annual sediment load and associated chemical load from large (then medium) rivers to Puget Sound
- Focus on high-flow and high-sediment events
- Utilize modern technologies
  - In-stream continuous turbidity monitoring (online real-time)

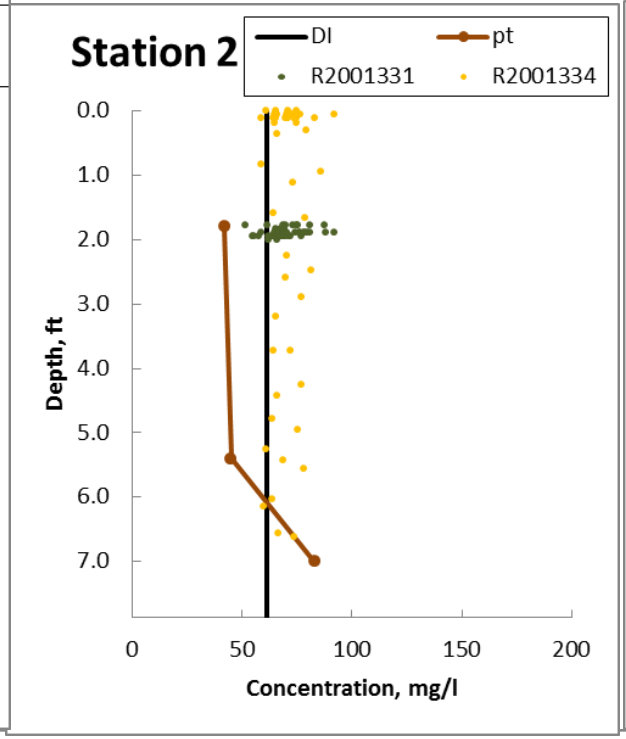


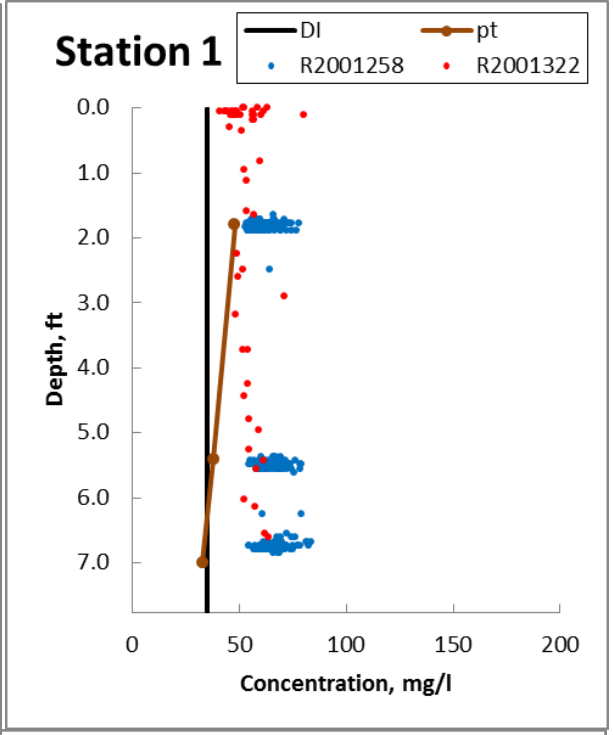
# Monitoring approach

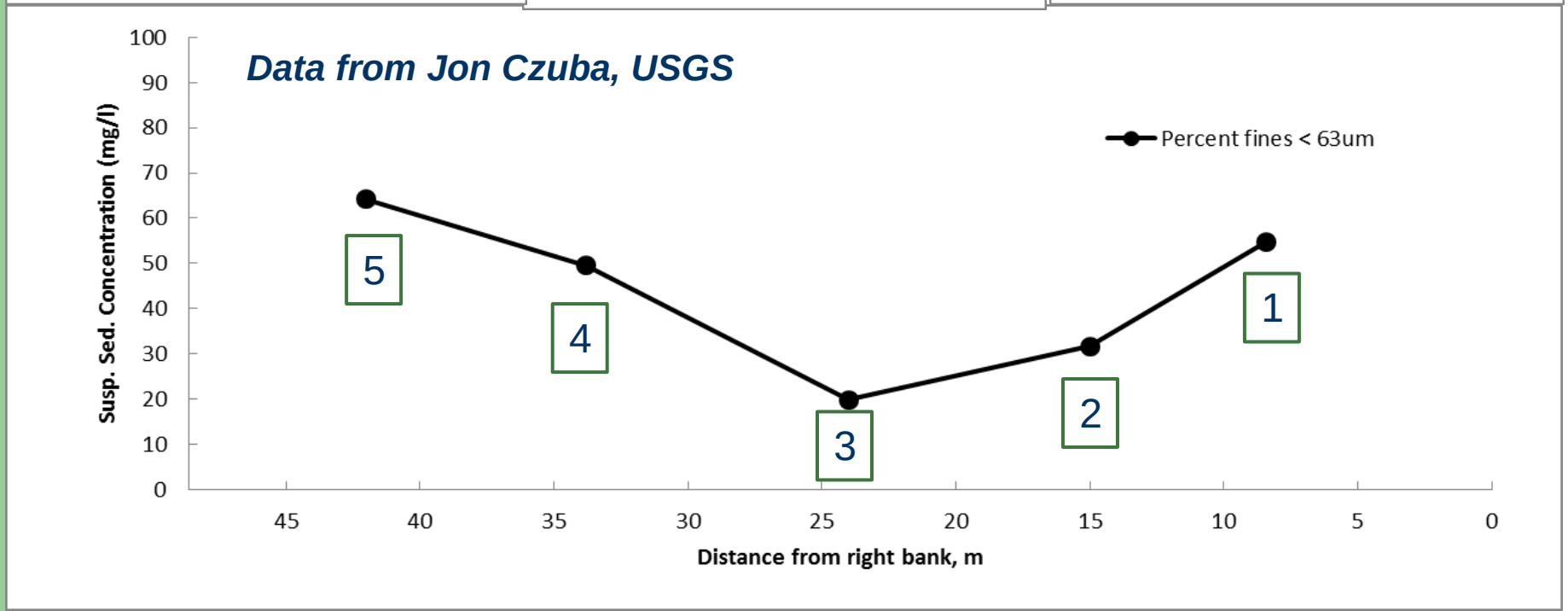
- Utilize modern technologies (cont.)
  - Particle size-dependent sediment flux using LISST (Laser In-Situ Scattering and Transmissometer)
  - Water velocities using ADCP (acoustic doppler current profiler)




Station 3
DI
pt
R2001353
R2001358
R2001420
Depth, ft
Concentration, mg/l

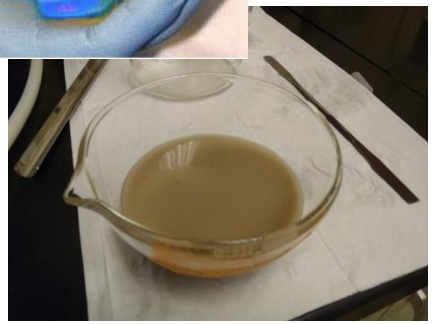

Station 2
DI
pt
R2001331
R2001334
Depth, ft
Concentration, mg/l


Station 1
DI
pt
R2001258
R2001322
Depth, ft
Concentration, mg/l


Data from Jon Czuba, USGS
Percent fines < 63um
Susp. Sed. Concentration (mg/l)
Distance from right bank, m
5
4
3
2
1

# Monitoring approach

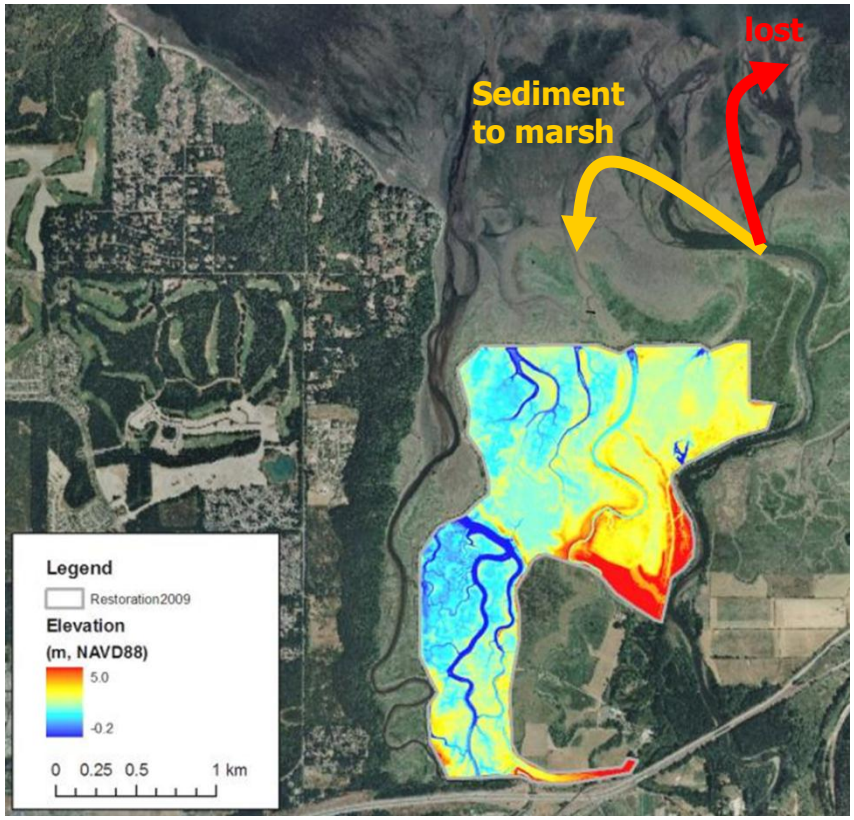
- Utilize modern technologies (cont.)
  - Analyze suspended and bed sediment for nutrients, PAHs, PCBs, TPCN using large-volume centrifuge and passive samplers
  - Preliminary centrifuge methods testing results:
    - 90% sediment recovery at 600 mL/min, 97% recovery at 300 mL/min
    - Collect approximately 1 g suspended sediment / 15 L

# Expected outcomes

- Guidelines/protocols for effective monitoring of sediment and associated chemical loads from a range of Puget Sound river sizes and characteristics
- Data to assess sediment delivery to marshes, beaches, and other nearshore habitats
  - Is there enough to compensate for sea-level rise?
  - Is the sediment quality affecting ecology and habitat (i.e. forage fish, and marine sediment)?

Nisqually River delta
(E. Grossman, USGS)



# Linkages

- Urban CHIPS (Coastal Habitats in Puget Sound)
  - Sediment quality affects on forage fish food web and sediment habitat
- WA State Department of Ecology
  - New study on Green River to address potential recontamination of downstream remediated Superfund site sediment
- Puyallup Watershed Stakeholder Meeting
  - Connections to ongoing USGS work: groundwater and sediment loading modeling work

**Major Partners:**

- Puget Sound Partnership
- Puget Sound Ecosystem Monitoring Program (PSEMP)
- Northwest Association of Networked Ocean Observing Systems (NANOOS)
- Washington State Department of Ecology
- U.S. Environmental Protection Agency (EPA) Region 10
- National Oceanic and Atmospheric Administration (NOAA) Fisheries Service
- USGS Coastal Habitats in Puget Sound (CHIPS) Program
- USGS National Water-Quality Assessment (NAWQA) Program
- USGS Northwest Area Office Puget Sound Leadership Team

# Thank you

**Web access:**
http://wa.water.usgs.gov/projects/riverloads/

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Mount Rainier beyond the Puyallup River