



# Port Angeles Harbor Sediments Investigation

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# Ecology Staff

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- Meg Bommarito – Public Involvement
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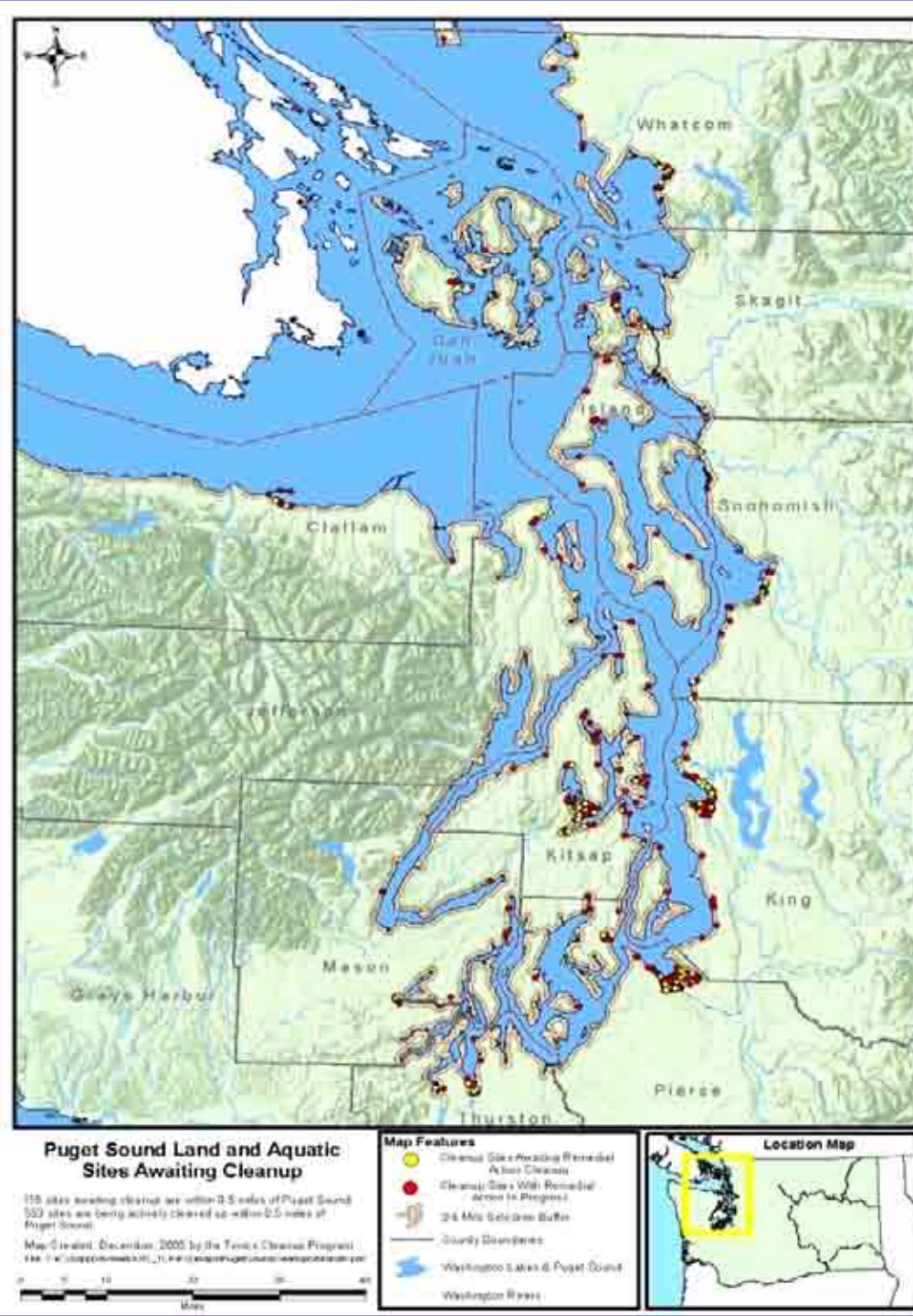


# The Big Picture

- Puget Sound Initiative (PSI) = Governor's initiative to restore the health of Puget Sound by 2020
- Priorities for 2007-2009 include:
  - Cleaning up contaminated sites and sediments.
  - Preventing toxic contamination.
  - Protecting and restoring marine and freshwater habitats.

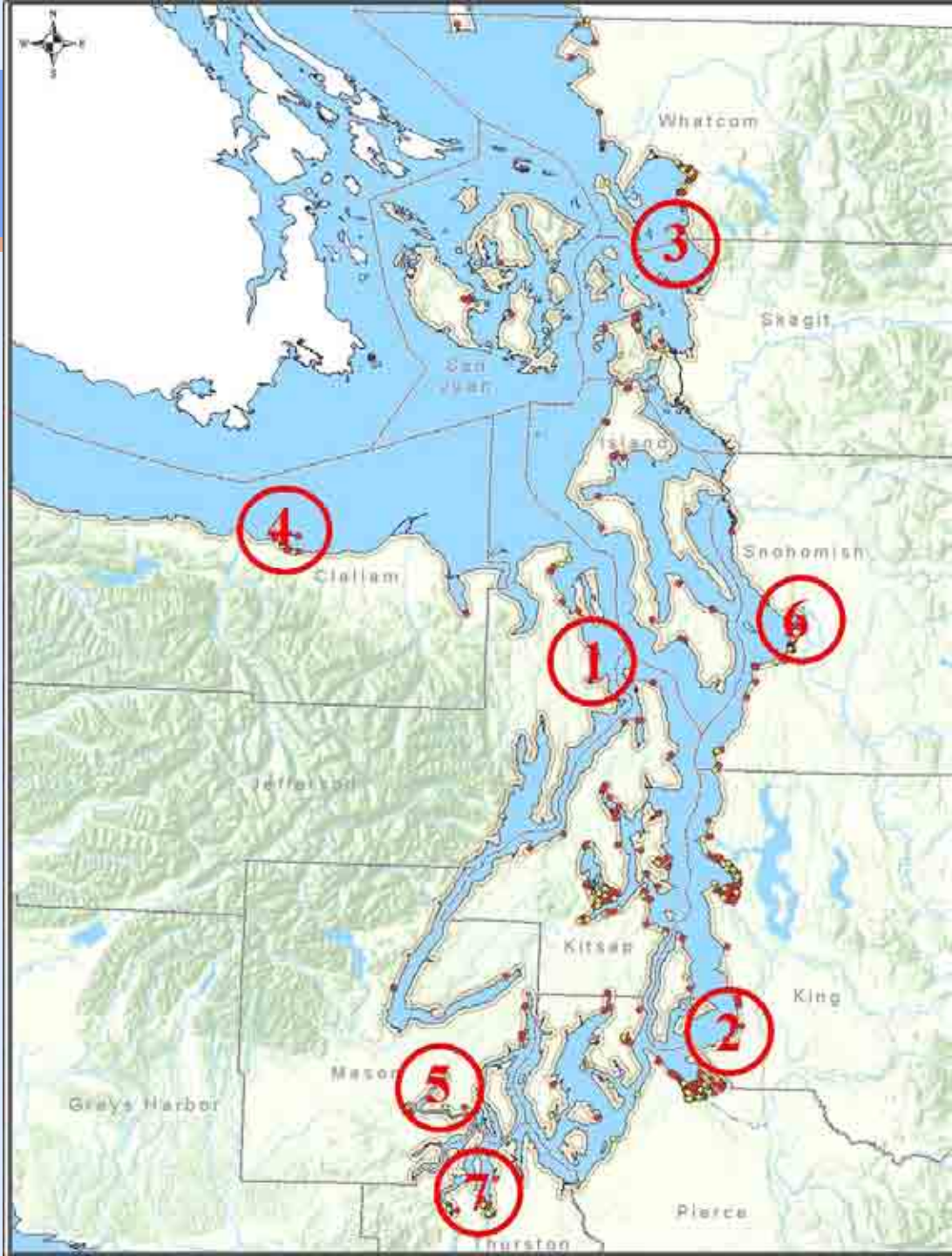
# Toxics Cleanup Program Focus

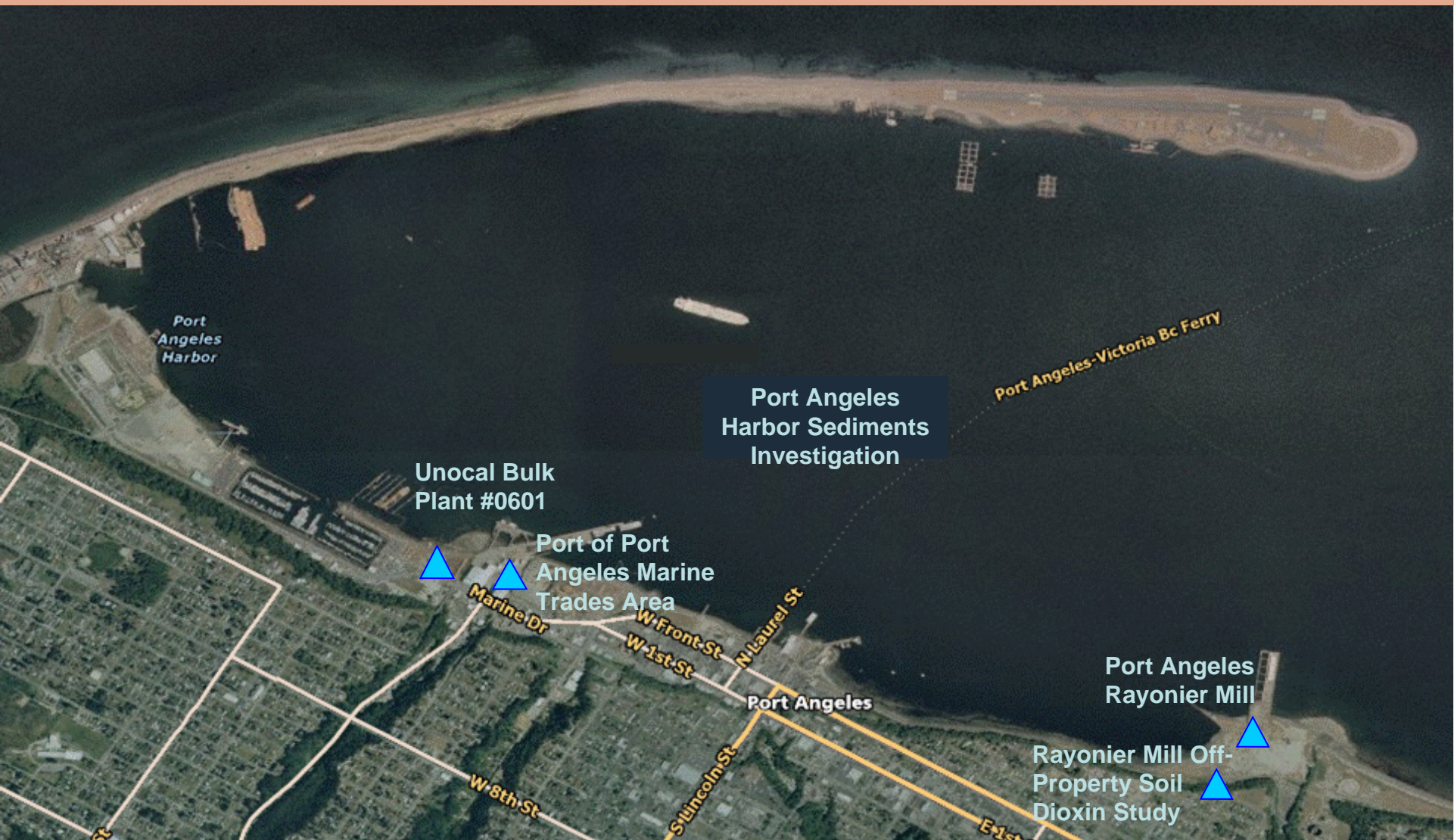
- Accelerate cleanups for sites within 1/2 mile of the shoreline and in water



# Priority Areas

1. Port Gamble
2. Dumas Bay
3. Padilla/Fidalgo Bay
4. Port Angeles
5. Oakland Bay
6. Port Gardner/Port of Everett
7. Budd Inlet





# Ecology work in Port Angeles



# Rayonier-Related Work

- Rayonier Mill
- Rayonier Mill Off-Property Soil Dioxin Study
- City of Port Angeles stakeholder work
- Port Angeles Harbor Sediments Investigation



# Investigating Sediment Contamination



WASHINGTON STATE  
DEPARTMENT OF  
E C O L O G Y





# Sediments Investigation

- Purpose of the Investigation
- History of Contamination
- Sampling & Analysis Plan (SAP)
- Next Steps
- Public Involvement



# Purpose of the Investigation

- To determine the **nature and extent** of sediment contamination.
- To study how sediment contamination and wood waste **move through the harbor**.
- To investigate **current and historic sources** of sediment contamination in Port Angeles Harbor.
- To further characterize and potentially identify new **areas of concern**.
- To assess **human health and ecological risks**.



# History of Contamination

- Historic and current sources:
  - Saw mills and plywood
  - Pulp and paper mills
  - Marine shipping, transport
  - Boat building
  - Petroleum bulk facilities
  - Commercial fishing
  - Combined sewer outfalls
  - Runoff, residential and industrial, stormwater





# History of Contamination

- Harbor contaminants:
  - Wood debris, creosote, related contaminants
  - Dioxins and furans
  - Polycyclic aromatic hydrocarbons (PAHs)
  - Polychlorinated biphenyls (PCBs)
  - Heavy metals
  - Chlorinated pesticides



# Wood Waste in Port Angeles Harbor





# Sampling Design

- Sampling Locations
  - Port Angeles Harbor areas of concern
    - Western harbor
    - Ediz Hook
    - Eastern intertidal
    - Outer harbor
  - Rayonier Mill areas of concern
  - Reference samples – Dungeness Bay

# Harborwide Proposed Sample Locations (Figure 4-2)



# Harborwide Tissue Sample Locations (Figure 4-8)







# Sampling Design

- Rayonier Mill Study Area
  - Sampling 7 areas of concern.
  - Adds to information collected by Rayonier for the Study Area Marine Remedial Investigation.
  - Needed for risk assessments.

# Former Rayonier Mill Study Area and Proposed Sample Locations (Figure 2-4)



**Legend**

- Proposed Rayonier Investigation Sample Location
- Former Rayonier Mill Study Area
- Outfall Location
- Former Rayonier Mill



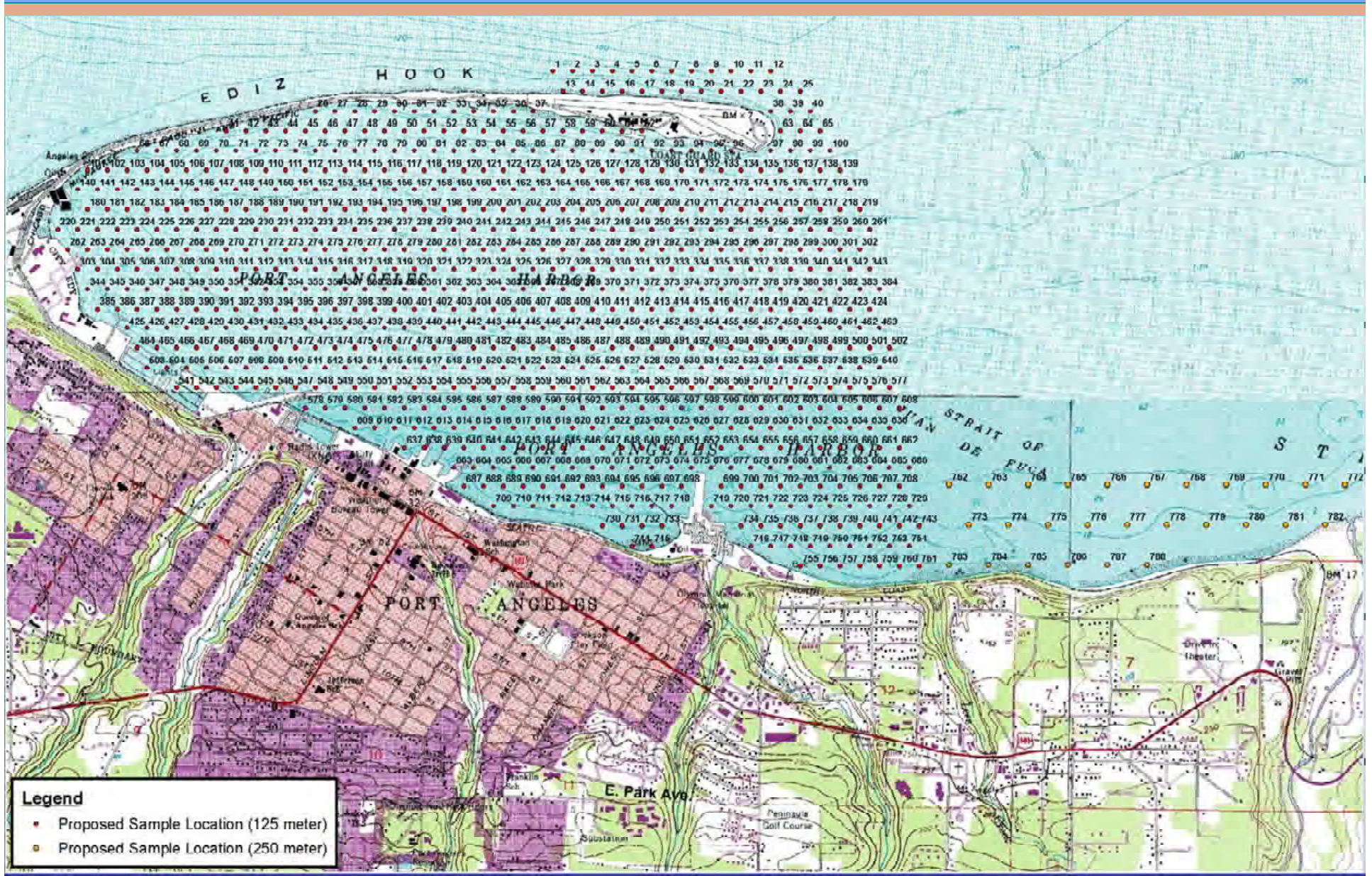


# Current Monitoring & Sediment Transport

## Purpose:

1. Most available data is for *surface* currents
  2. To help determine sources of contamination
- Where sediments are picked up and deposited
  - How sediments are transported
  - Bottom current direction and speed

# Sediment Trend Analysis Sample Locations





# “Fingerprinting” Analysis

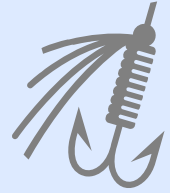
- Define *types* of sources of dioxins, furans, and PAHs (petroleum products)
  - For dioxins – define a wood waste treatment source vs. an air emissions source.
  - For PAHs – tell the difference between creosote from wood pilings, a bulk fuel spill, or a gasoline or diesel tank leak.
- Cannot always use it for specific source identification



# Risk Assessment Design

## Human health risk assessment

- Populations at potential risk of exposure:
  - Subsistence and recreational fishers
  - Residential users
  - Recreational users
- Assessment calculates risk based on:
  - Potential intake of contaminants through **ingestion** and **dermal** (skin) contact
  - Chemical toxicity (cancer or non-cancer health effects)





# Risk Assessment Design

## Ecological risk assessment

- Looks at types of wildlife that might be exposed to harbor contaminants:
  - Brant
  - Cormorant
  - Greater scaup
  - Harbor seal
  - Raccoon
  - Bald Eagle
- Looks at the potential risks to those species through food or sediment ingestion.





# Next Steps

June 2008

Final Sampling & Analysis Plan

Summer 2008

Sediment sampling

Fall 2008

Laboratory analysis & data  
validation

Early 2009

Draft Sediment Investigation

Report and risk assessments –  
*available for public review*





# Public Involvement

- Public Participation Plan
- Public comment period until May 29 – *submit comments here!*
  - Information about Port Angeles Harbor history
  - Information about pollution in the harbor
  - Input about the Sampling and Analysis Plan
- Responsiveness summary
- Public review of the draft investigation report and risk assessments



Questions?