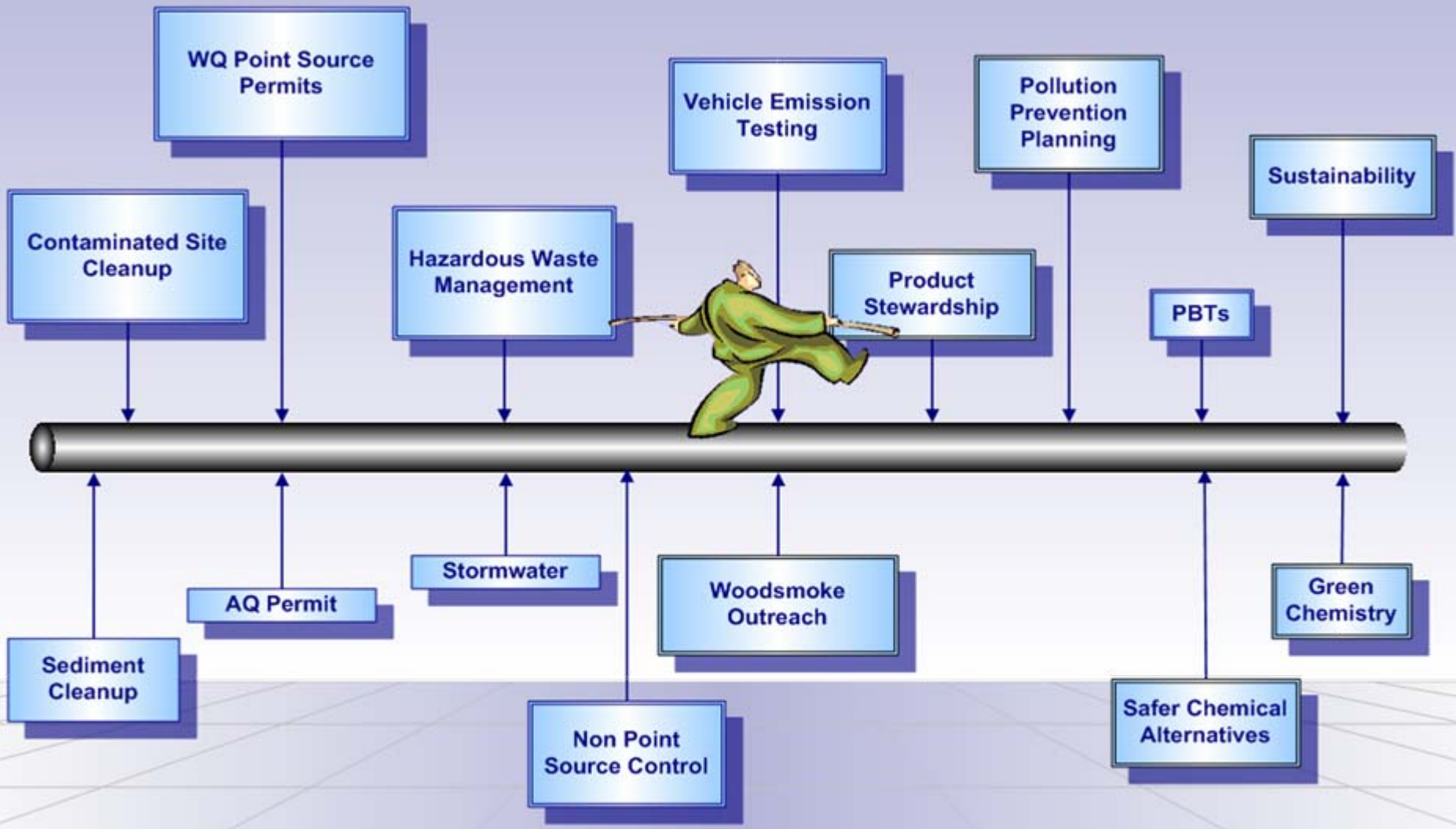
Reducing Toxic Threats Initiative
Management and Accountability

October 24, 2007

Today's Outline

- Discussion: Pervasive Population Pollutants
- Performance Measurements: Roll out of standard Reducing Toxic Threat Measures
- Follow-up: Issues from the March 07 GMAP

Ecology's Toxic Control and Reduction Continuum



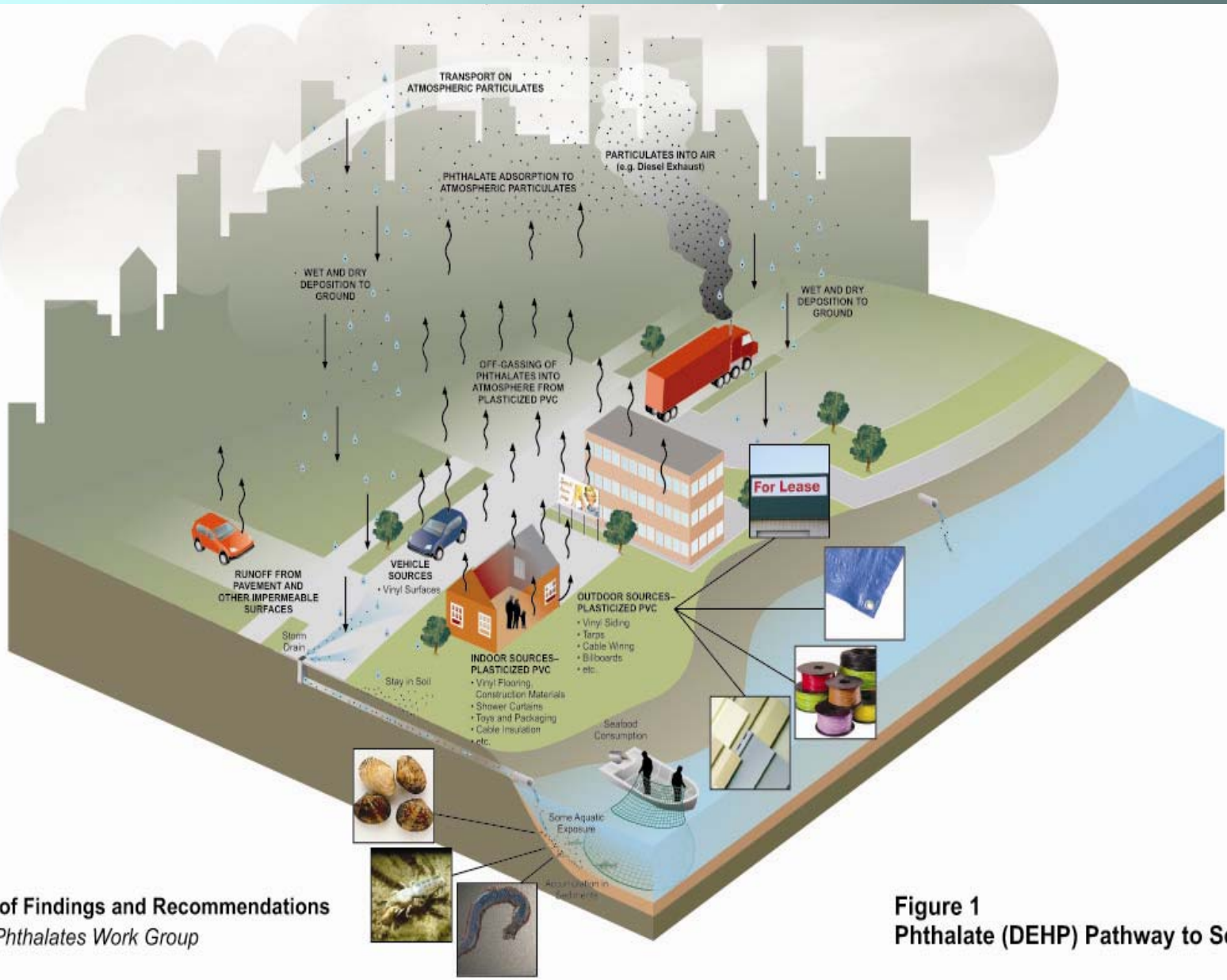
Pervasive Population Pollutants (P3's)

- Are released into the environment below regulatory levels but accumulate to levels of concern.
- Tend to come from products; more people = more P3s and at higher levels.
- Are characterized by diffuse sources – a million points of pollution (cars, buildings, landscaping, consumer products).
- Tend to fall through the "regulatory cracks."

Examples include –

phthalates, zinc, copper, PAHs, fecal coliform, pesticides and herbicides, personal care products

Many sources of Pervasive Population Pollutants



Summary of Findings and Recommendations
Sediment Phthalates Work Group

Figure 1
Phthalate (DEHP) Pathway to Sediments

Sources are Common Products

For Example, P3's from cars include:

Engine Leaks:
- Oil, brake & Transmission fluid
- Antifreeze
- Gas
- Battery acid

Tires & Brakes:
- Zinc
- Copper
- Phthalates

Tail Pipe:
- Carbon dioxide
- Carbon monoxide
- Sulfur

Interior:
- Phthalates (from plastics)

Standard Regulatory Programs Won't Work for P3s

- Most regulatory programs focus on controlling relatively few point sources.
- For pollutants that are regulated at the source, most are released at or below regulatory levels.
- Current programs are not designed to address diffuse, pervasive pollutants.
  - The initial release is at or below regulatory levels.
  - Accumulation occurs, generally in sediments, that exceed regulatory levels.
  - Early findings from the Toxics Loading Study indicate that even if we could eliminate all the regulated sources, we would still have significant levels of these pollutants.

As an example, 350,000 to 450,000 pounds – that's 159 to 205 metric TONS -- of zinc released into the environment in Washington each year due to tire wear alone!

Existing Problem; New Approaches

- P3's are not a new problem but several things make them more evident:
  - Successes in dealing with point sources
  - Successes in contaminated site cleanup
  - More and more people
  - More and more products with toxins
  - More and more developed land
- Different and new approaches are being tried to deal with these pollutants.

Toxics Loading Study: Phase 1

Why we are assessing toxics loadings:

- We don't know all the sources of toxics in Puget Sound, even from point sources
- Need to understand them and to prioritize strategies for reducing them.
- You can't manage what you don't measure.

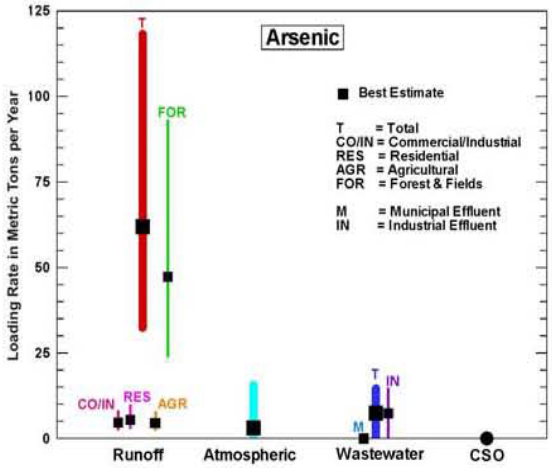
The Phase 1 Study was a "Broad Screening" of available data. It had limitations:

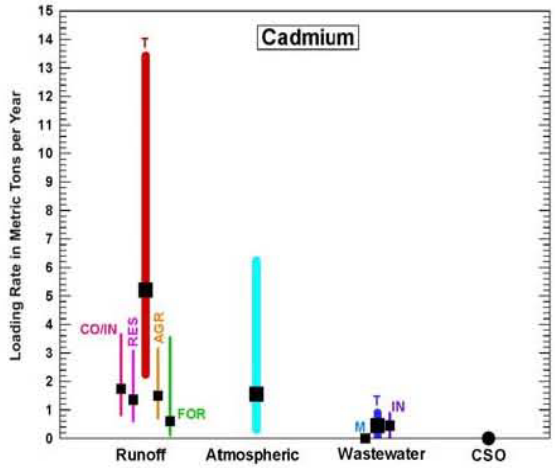
- Available funding was low ($135,000).
- Evaluated only 5 of 9 pathways.
- Limited number of chemicals were included in the research.
- The geographic area covered was large (Puget Sound was grouped into 6 large basins).

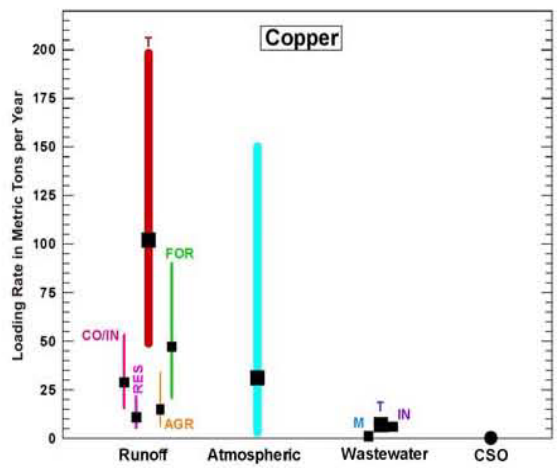
Our early learning from Phase 1 Study

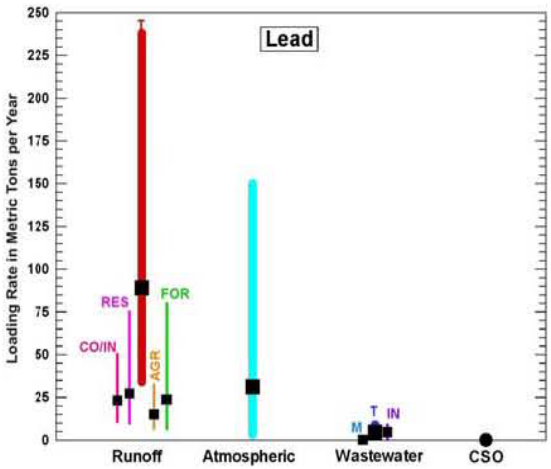
- Surface runoff was most common pathway for most chemicals; mostly from developed land.
- Air deposition loadings are comparable to surface runoff for PAHs & PBDE.
- Municipal and industrial wastewater data is incomplete.
- Combined Sewer Overflows represents less than 1% of total loading:
  - However, they do have localized effects, for example, the Lower Duwamish.
- Direct oil spills were a very small source (4% of total).

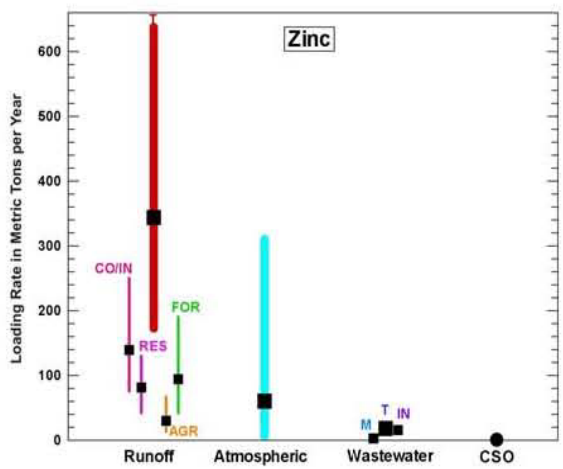
Pathways of Toxic Loadings: Select Pollutants

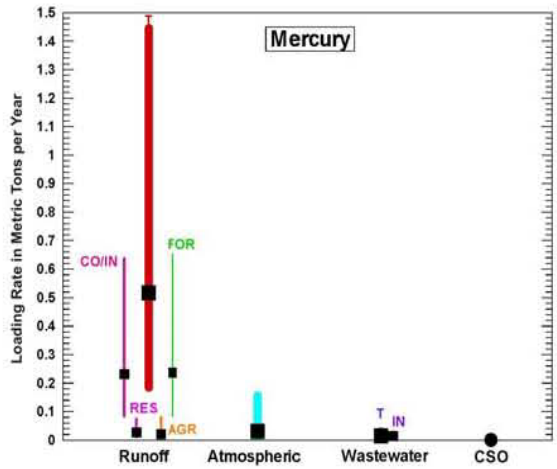












Red Line = Surface Runoff

Blue Line = Air Deposition

Toxics Loading Study: Phases 2 & 3

Goals of Phase 2 ($600,000):

- Loading estimates will be improved using existing literature and data to:
  - Quantify road runoff and loading from Publicly Owned Treatment Work and industries.
  - Evaluate the movement of contaminants between media.
  - Improve the model to predict the effects of loading in Puget Sound water and biota.

Goals of Phase 3 (Will be proposed for the 09-11 budget - $1.6 million):

- Collect environmental sampling data to analyze and verify our estimates:
  - Quantify toxics from roadways and combined sewer overflows.
- Model air deposition of diesel fuel soot emissions from mobile sources.
- Refine the Puget Sound toxics model and evaluate pollution reduction scenarios.

How We Will Use the Results

- At the end, our goal is to have sufficient information to prioritize control strategies that will reduce loadings most effectively.

At a cost of $2.2 million, estimated 4.5 FTEs of staff time and 2.5 years

Case Study: Phthalates in Sediments

- Within two years of cleaning up The Thea Foss Waterway from historical contaminants, phthalate levels exceeded sediment standards.

- Working with EPA, Pierce County, the City of Tacoma, and King County for over 14 months, we learned:
  - Primary source of phthalates is PVC products.
  - Pathway is off-gassing leading to airborne deposition to land and water.
  - Phthalates then concentrate in sediments.
  - Concentrations over sediment standards were localized – around the end of storm and sewer pipes.
  - Relative human health and environmental risks are low.

Phthalates in Sediment

- What can we do to prevent recontamination?
  - Implement focused O&M plans with action triggers to manage buildup.
  - Improve coordination with local air agencies.
  - Provide stakeholder outreach and education.
- **Identify pervasive population pollutants of similar nature with more risk to develop a comprehensive, integrated regulatory approach to address the air to stormwater to sediment pathway.**
- Continue sediment cleanup even while recognizing that cleanup is equally damaging to the biota the phthalates harm.
- Study Costs
  - 14 months (8/10/06 to 10/2/07); $185,000

Boatyard Pilot Project for Zinc and Copper

Ecology and the Northwest Marine Trade Association will test alternative approaches for reducing the runoff of zinc, copper and other metals into Puget Sound.

- Efforts to sweep-up, clean-up and or vacuum-up the particles have not been effective.

The Pilot Projects

- The Port of Edmonds boatyard will install a system using passive filtration.
- CSR West in Ballard will utilize technology called electro-coagulation – a process by which electromagnetic energy separates metals from water.
- Canal Boatyard in Ballard will process contaminants using ionic exchange.

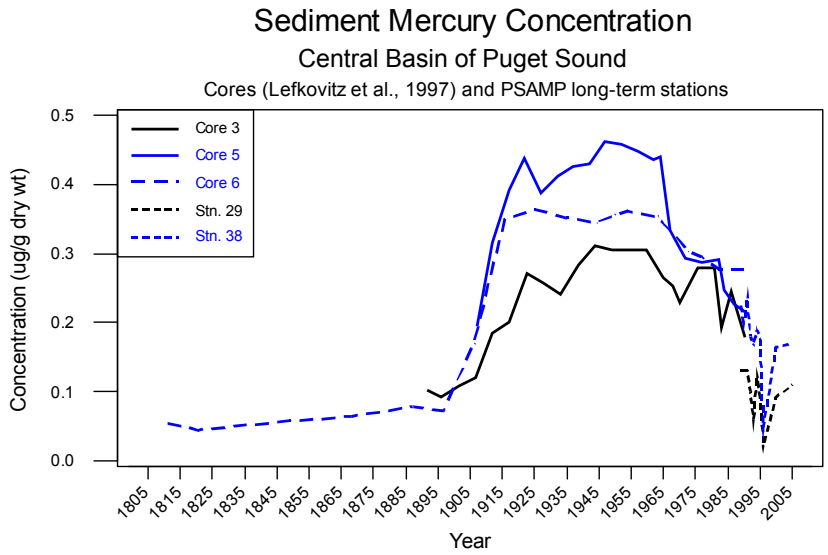
The Study

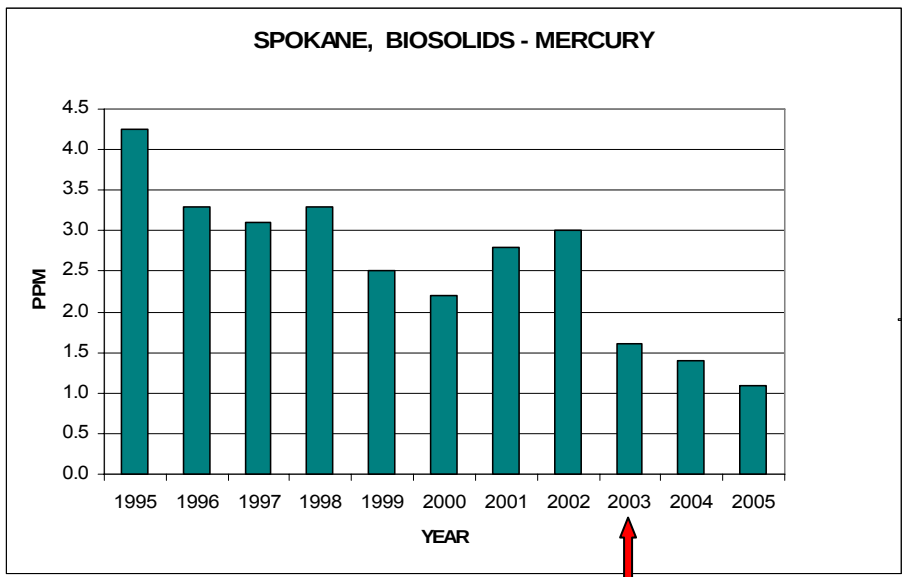
- Water quality will be measured before and after it goes through each of the treatment systems to determine which is the most effective at cleaning the stormwater.
- Each will be evaluated for cost effectiveness.
- All the equipment was in place in October and the testing will run through the end of the year. The results will be published in early in 2008.
- This should provide a road map for all 86 permitted boatyards in the State to install the appropriate technology for their yard so they can meet water quality standards.

What can we learn from other efforts?

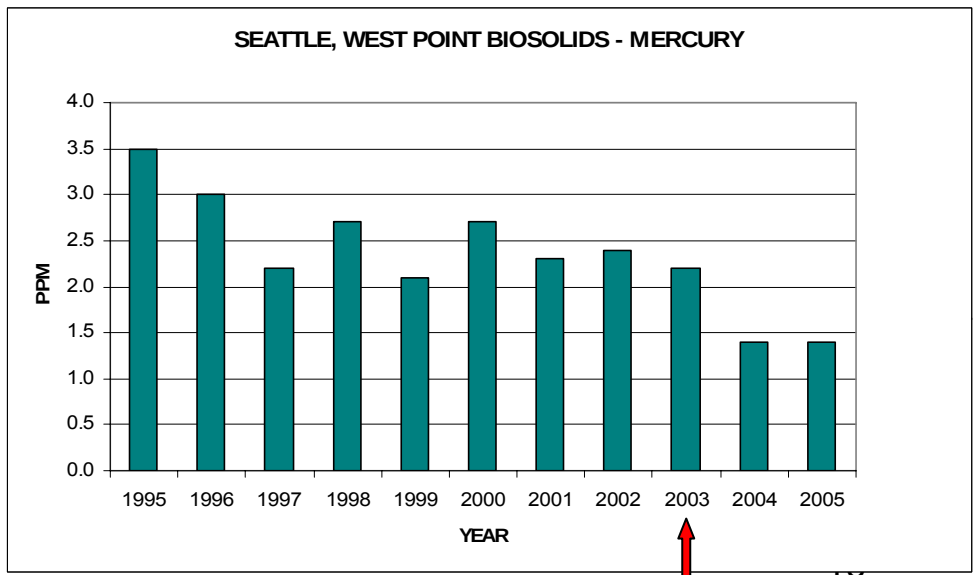
Through our Mercury Chemical Action Plan, we worked with dentists to reduce the discharge of mercury from dental amalgam.

- As a result of the Dental Memorandum of Understanding, we have seen a decrease of mercury in biosolids from Spokane and Seattle
- The cost was approximately 2 FTE over 4 years ≈ $ 400,000



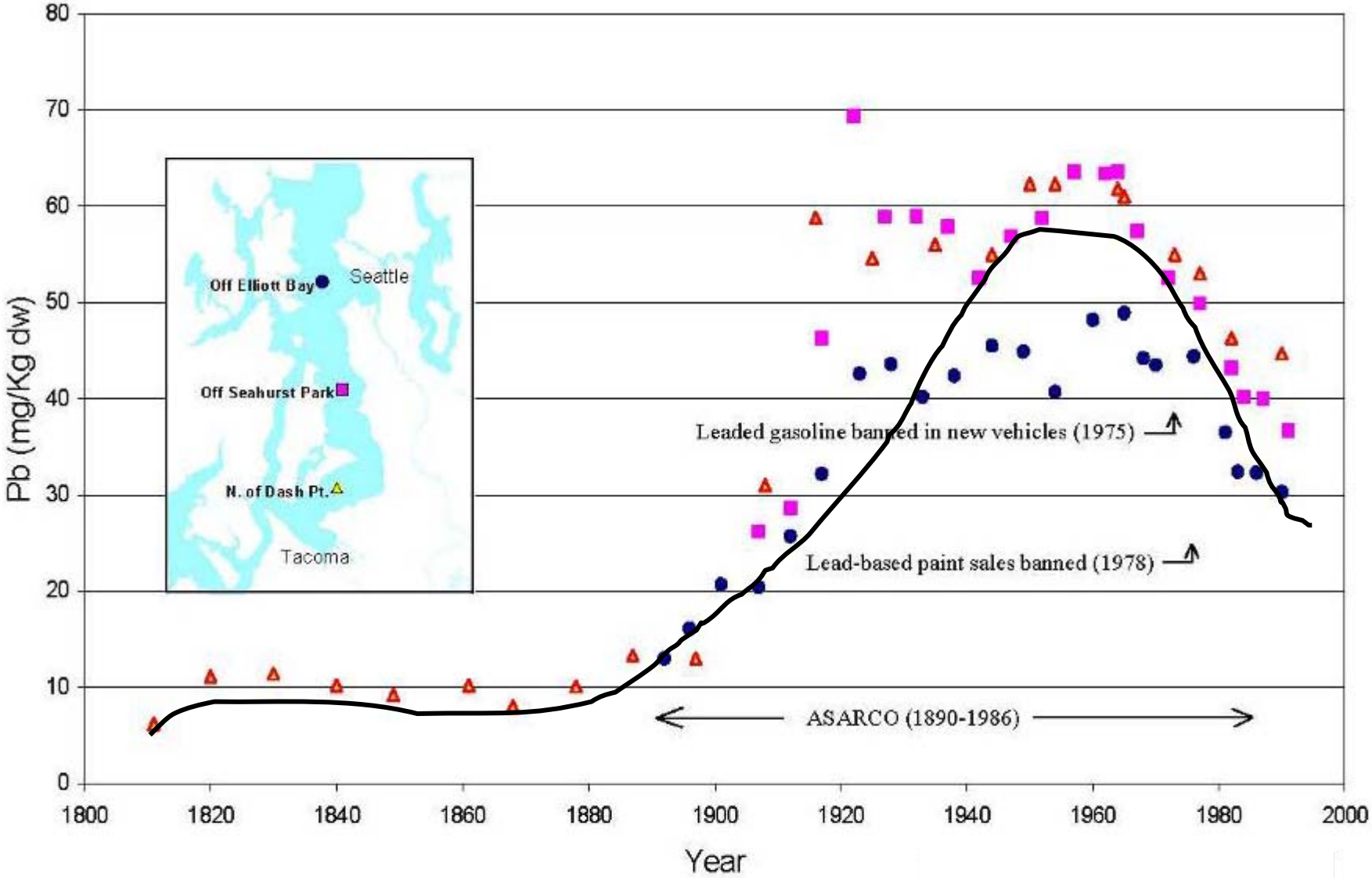


Dental MOU



Dental MOU

Lead Concentration Trends in Puget Sound



Graphic by Bill Yake (2001) Cores (Lefkovitz et al. 1997)

Discussion: Where do we go from here?

Should Ecology develop a strategy to try to deal with these pollutants?
Maybe just a subset, such as just copper and zinc?

From what we've seen so far, these pollutants are very expensive to control
Is it cheaper, better, more sensible to commit ourselves to repeat cleanups?

Was what we will or have learned from the Toxic Loading Study and Phthalates work worth it?
Are those approaches worth continuing, speeding up, or replicating?

Where does product stewardship factor in?
Should the environmental costs be incorporated into the cost of the products that contain these P3"s?

Any strategy may reinforce the need to remove toxics from some products or far upstream so they are not able to get into the environment
The data indicates this is a successful but very long term approach

If these toxins are simply replaced with others, we may not get the result we want
Does that suggest we should focus on repeat cleanups when they becomes necessary? Is there a way to get a better handle on alternatives?

If we acknowledge the need for a more comprehensive strategy, how to we reconcile current permit limits, especially in stormwater?
Would we be sending a mixed message? Is there a way to manage that?

Do we have the capacity and the will to take on a potentially very long term project that may not show results for a number of years?
Would a pilot project be a better approach?

Follow-up to March 20, 2007 GMAP

Follow-up to March 07 GMAP:
Proposed Public Celebration Event on Mercury Reduction Successes

Milestone: *10,000 pounds of mercury have been collected or captured between 2001 to 2006 that would have otherwise been released to the environment (2001 baseline).*

2008 Earth Day Recognition Event (proposed): Public recognition event to celebrate local governments, trade associations, schools, and civic organizations that have implemented mercury reduction programs.

Media Announcement (Proposed): Expand Take-it-Back Network for "curly bulbs." Announce the launch of Mercury Product Stewardship initiative to increase statewide fluorescent lamp and mercury switch recycling efforts in Washington State.

Use stakeholder process to develop potential amendments to the Mercury Education and Recovery Act (MERA) to accelerate mercury reduction.

Follow-up to March 20, 2007 GMAP

Mercury: Status of a National Permanent Repository

- EPA conducted three "stakeholder" meetings to determine needs, potential options, concerns and consequences of a national repository.

- The Environmental Council of the States (ECOS) Quicksilver Caucus (QSC) staff and leadership are representing all states' interests.

- All military mercury at the Defense National Stockpile Center (DNSC) in Hawthorne, Nevada.

- EPA did not set another meeting, but one may occur in November.

- As of September, EPA entered into a "discussion" phase, where no notes are published. The following is the verbal report from QSC:
  - Department of Defense (DoD) won't discuss total capacity of facility.
  - Congressional action needed to allow non-military disposal at DoD.
  - Recyclers concerned revenues will drop and want "compensation."
  - States with existing chlor-alkali units want disposal priority. No interest in removing already landfilled units.
  - An export ban is not supported unless there's a permanent national repository.