Lower Columbia River Summit

Toxic Contaminant Reduction Action Agenda

Partners Call for More Investment in the Lower Columbia River

Over 100 community leaders from the private, non-profit and public sectors met January 4, 2008 to discuss next steps for toxic reduction and monitoring of the lower Columbia River and estuary. The Estuary Partnership and U.S. Geological Survey (USGS) sponsored the Columbia River Summit on Toxic Contaminant Reduction to spur a regional collaboration to define an action plan for reducing the level of toxic contaminants in the Columbia River system.

Oregon State Representative Jackie Dingfelder and Washington State Representative Deb Wallace

Oregon State Representative Jackie Dingfelder and Washington State Representative Deb Wallace hosted this cross-river discussion to reinforce that the river is a shared resource, requiring a coordinated effort to manage and protect.

U.S. Environmental Protection Agency (EPA) Region 10 Administrator, Elin Miller welcomed participants reaffirming that the Columbia River is a high priority of the agency beginning with the designation of the Columbia basin as one of the nation's Great Water Bodies and EPA's toxics reduction strategy.

The session was a follow-up to the May 2007 meeting which brought many of the same parties together to focus on emerging issues in the lower river. At that time, policy leaders and scientists said there had been inadequate funding for both data analysis and reduction actions.

EPA Region 10 Administrator, Elin Miller

Since May, the Estuary Partnership Board developed potential actions and brought folks back to help refine and prioritize them. The Board sought input from Summit participants on appropriate activities for the Estuary Partnership that would build on existing efforts and fill gaps.

USGS and the Estuary Partnership began the day with an overview of what is currently known about the lower river.

The Estuary Partnership Board of Directors presented its proposed set of actions. Participants assessed those and provided input to help direct the Board.

In the end, parties agreed on three next steps:

1. More money is needed. Investment in the Columbia is inadequate at many levels. There needs to be sustained monitoring for toxics.
2. On-the-ground reduction actions need to be initiated.
3. Consumers need information to understand how their activities affect the Columbia and what they can do.

Summit Participants: Sustained Monitoring is Key to Education, and Reduction Actions

Working in small groups participants discussed four potential actions for the Estuary Partnership that would help reduce toxics:

- Expand and sustain monitoring of toxics in the lower river, including their impact on salmon, humans and other species, to determine trends over time.
- Host toxic reduction take-back programs targeting pesticides and pharmaceuticals.
- Institute consumer choice campaigns identifying contaminants to avoid in purchasing personal and home care products, including flame retardants.
- Clean up small pockets of contaminants in sediment and/or at river shoreline sites.

The highest priority was expanded monitoring focused on learning more about the impacts of toxic contaminants on salmon, humans, and other species. Monitoring will allow us to identify contaminants, their levels and movement over time and evaluate the effectiveness of reduction efforts.

But …What became clear was that the four potential actions are integrated. Monitoring, education, take-backs, and clean-ups are all interdependent. Sustained monitoring helps us "connect the dots."

- Data and information give us what we need to provide the public and specific users with credible information.
- Data and information should drive reduction efforts.
- Credible data and information inform policy makers about water quality issues and associated health and environmental risks.
- Monitoring is essential to evaluate the effectiveness of toxic reduction efforts.

Key themes for toxics reduction in the lower Columbia River and estuary.

- Money is a big issue, many participants noted: there needs to be more of it. The Columbia Basin is the only Great Water Body to not receive any appropriations in FY07 or FY08. Other Great Water Bodies are receiving between $5,000,000 (Long Island Sound) to $20,000,000 (Puget Sound) to $31,000,000 (Chesapeake Bay). Drawing attention to the national significance of the river will be important.
- Monitoring identifies contaminants; telling us how to focus education, inform policy decisions, and develop reduction projects.
- The cumulative effect of multiple contaminants on humans, fish, wildlife and the environment need to be assessed.
- Informing citizens is key. Getting citizens to take ownership is important.
- Education should start at the grassroots level. It should communicate that the river has a toxics problem. It should provide the public with specific actions they can implement in the home or workplace.
- Education efforts by agencies, industries and policymakers should be coordinated to maximize effectiveness. For example, Oregon Environmental Council has consumer education programs and the Oregon Association of Clean Water Agencies is spearheading pharmaceutical take-back efforts in Oregon. Don't duplicate; build on.
- The Estuary Partnership has a history forming partnerships, developing regional solutions, garnering funds for restoration, monitoring, and delivering quality education programs.
- Given the expanse of the river, the diversity of environmental issues, the responsibilities of various governments, and the region's overall economic needs, no single entity is ideally suited to tackle all these issues. The Estuary Partnership is the right entity to bring together these groups to increase toxic monitoring and reduction efforts.
- The Estuary Partnership plays an important role in toxic reduction efforts as both an implementer and coordinator.
- The larger watershed context is important. The Estuary Partnership may be able to help with upstream (above Bonneville Dam) efforts by providing an example of our work in the lower river.
- The lower river needs to stay in the forefront of thinking. Estuary results are critical to basin-wide efforts.

What Has Happened Since January 4, 2008?

Armed with input from the Summit, the Estuary Partnership submitted a $3.2 million request to Congress to establish a credible sustained monitoring program, to target reduction projects, and monitor toxic contaminants in water, sediment, fish and wildlife on the lower 146 miles of the river, from Bonneville Dam to the Pacific Ocean. **This project will fill the gaps and fund on-the-ground reduction actions.** It would be an initial investment in what EPA's Ms. Miller encouraged us to do: "think about the basin as a whole," starting with the lower river and estuary and determining how this can support EPA's focus on the entire basin. Over twenty entities have written letters of support to Congress.

In their concluding remarks at the Summit, after a robust discussion, both Representatives Wallace and Dingfelder called for increased state and federal investment in toxics reduction in the lower Columbia River.

Representative Dingfelder made perhaps the most dramatic statement when she said "Oregon has not done enough for the Columbia River." She stressed that it's time to step up and put more resources into monitoring and toxics reduction, as Washington and other states have done.

Representative Wallace said, while Washington has taken some bold steps, such as banning PBDEs, clearly our work is not over and she pledged to maintain this two-state collaboration in identifying areas where Oregon and Washington can work together for greater success.

What Do We Know?

The Coordination: Who is Doing What?

During the Summit, the Estuary Partnership and USGS presented a summary of monitoring and reduction actions undertaken by the states of Oregon and Washington, EPA, USGS, NOAA, the Estuary Partnership and other key partners since 1989. The Estuary Partnership coordinates with a wide range of public agencies and many of them provided detailed information about their monitoring and reduction efforts. This sharing helps ensure that the Estuary Partnership is adding to what is being done, not duplicating or competing with other's efforts.

We know that the lower Columbia River is in trouble. Previous studies found toxics (DDT, PCBs, PAHs) in water, sediment and fish tissue causing reproductive problems in mink, river otters and eagles and impairing fishing, shellfishing, and other human contact activities. More recent studies show levels that are affecting the mortality, disease susceptibility, and growth in salmon. Other toxic contaminants are affecting salmon too, including their ability to reproduce and avoid predators, inhibiting recovery of these ESA-listed species.

The Estuary Partnership mapped out what monitoring has been done and offered its assessment of what is needed to establish a credible monitoring program that would provide enough data over time to tell us what toxics are in the system, where they are moving, identify sources, assess trends, and direct reduction efforts.

Of most significance is that the Bi-State Water Quality Program has been the only large scale, comprehensive monitoring done. This program examined the entire ecosystem, including water, fish, wildlife, and sediment and focused on toxics and conventional pollutants, including dioxins/furans, PCBs, PAHs, and DDT. More specifically, it collected sediment at 365 sites, fish at 92 sites and monitored water quality monthly at 10 sites. Overall, the Bi-State Water Quality Program established the baseline for trend assessments in the Columbia River mainstem and remains the most comprehensive work in the lower river to date.

Only one site has been monitored regularly by USGS since the Bi-State Water Quality Program ended. Toxics monitoring at this site, however, has been reduced in frequency due to changes in funding levels.

The various monitoring efforts by USGS, NOAA, the States, EPA and others have given us good information, but they have been isolated studies, not coordinated among agencies. They give us snapshots in time, but we cannot integrate these snapshots and assess changes to the system over time. To be scientifically valid, we need protocols and we need to repeat events. Knowing both positive and negative trends is important if we want to invest money to reduce contaminants, improve the system, and get creditable feed back on our collective management actions.

The lower Columbia River is in trouble.

The Gap: What Do We Need to Know?

From these one time studies, we just do not have the whole story.

- We cannot identify areas where toxics are accumulating geographically or in the food chain.
- We cannot identify sources.
- We cannot track changes over time in types or levels of contaminants.
- We cannot evaluate the effectiveness of toxics reduction actions over time.
- We cannot target reduction actions where they will be most effective.

We need more information.

Trend data and source identification are critical. Toxic levels change, toxics move, new contaminants enter the system. To illustrate: in 1994 studies, Osprey eggshells showed high levels of DDE; in 2004, DDE levels were down, but flame retardants (PBDEs) were increasing. To make informed decisions about investing money in clean up and toxic reduction, data needs to be collected consistently and tracked over time.

What if We do Nothing?

Contaminants in the Columbia affect local economies and the health of the environment and citizens, including and beyond the impacts on salmon.

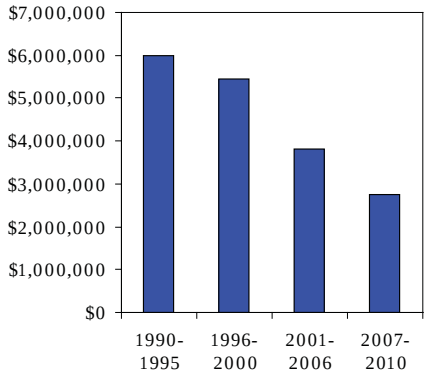
- The viability and competitiveness of local port economies are hindered by issues related to dredging and contaminated sediments, putting these communities at an economic disadvantage often for problems they inherited.
- Recent monitoring found PCB concentrations in fish 7 to 70 times higher than the recommended levels for safe consumption, causing health advisories to be issued.
- Columbia River Basin tribal members eat an average 9 times the estimated national rate of fish per day, giving them a much higher exposure to contaminants.

Are We Ready to Move Forward?

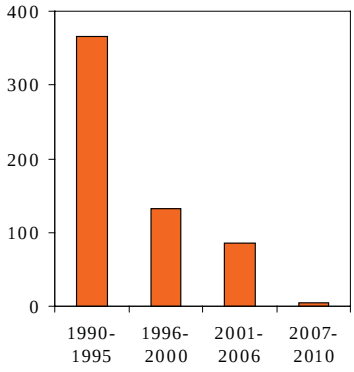
There is a regional strategic monitoring strategy. In 1999, the Estuary Partnership with 30 partners, defined data needs that would assess trends impacting public and ecosystem health, identify where toxics accumulate, assess sources, and direct and evaluate toxics reduction projects. The strategy builds on what has been done and is being done in the states. It identifies what is not being done. We need to secure funds to implement lower river monitoring – to fill the gaps in what has been done.

There is coordination. The Estuary Partnership regularly convenes a large group representing interests working on the river. We now need to integrate efforts more to improve efficiencies – get more results. **We know who has done and is doing what.**

The investment is going in the wrong direction: the problems identified support more investment not less.



Monitoring Dollars 1990-2010



Number of Sites Monitored 1990-2010

We need to bring the Columbia in line with the six other Great Water Bodies in terms of federal funding and support. **The Columbia Basin is the only Great Water Body to not receive any appropriations in FY07 or FY08 and to not be included in the President's FY09 budget.**

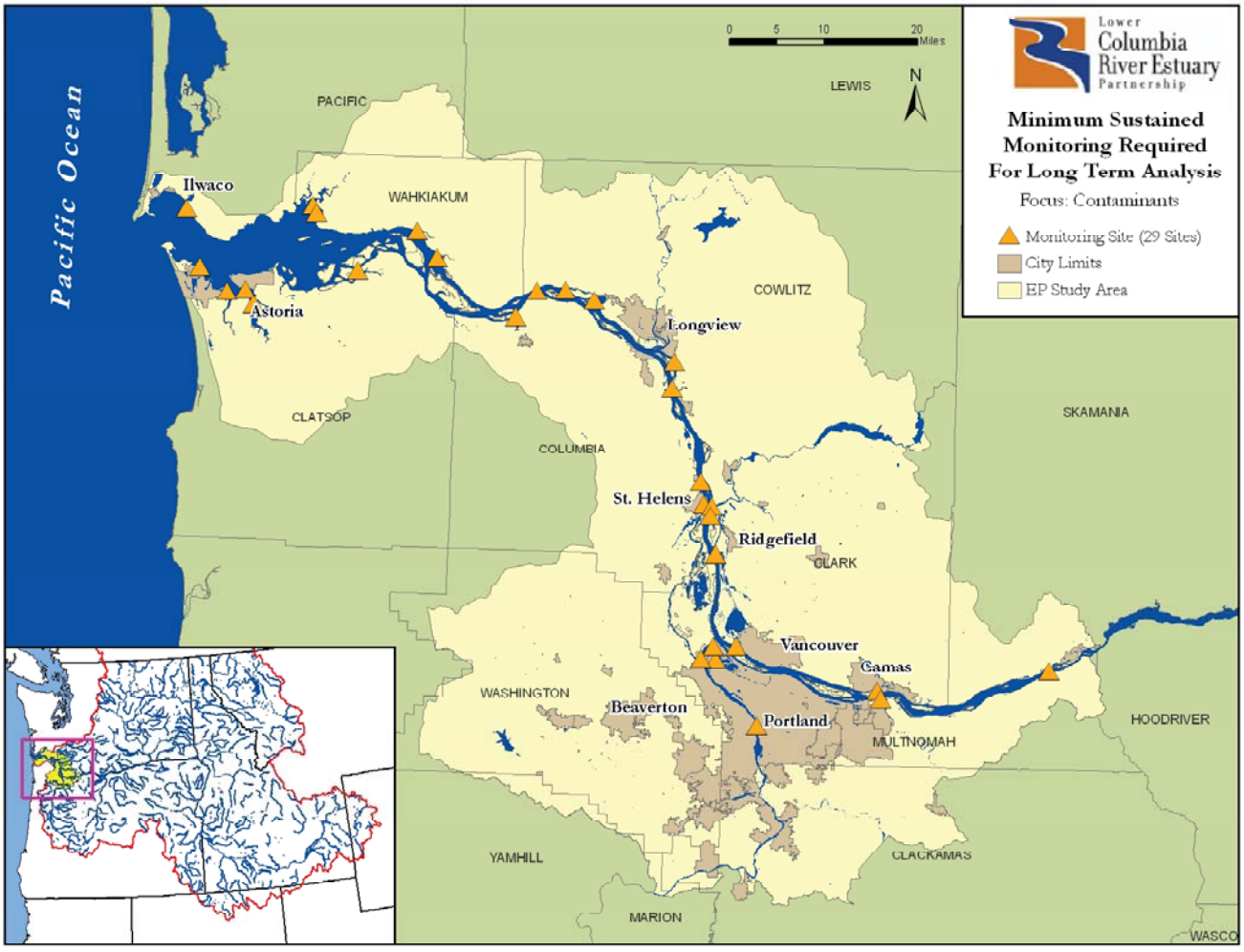
We need cooperation and integration. We need to fill data gaps.
We need to reduce contaminants. We need sustained monitoring.

What Do We Need to Address the Problem?

The Estuary Partnership estimates that a minimum of $3.2 million each year for the next six years is needed to **fill gaps in data and fund on-the-ground reduction actions**. This will institute critical aspects of previous one-time work to provide information on the extent and distribution of toxics including pesticides, metals, PCBs, PAHs, PBDEs, dioxins/furans, estrogenic compounds, pharmaceuticals and personal care products. It will give data over time to assess trends impacting public health and ecosystem health, it will identify areas where toxics are accumulating, identify sources of contaminants, and evaluate effectiveness of toxics reduction projects over time. The $3.2 million is in addition to investments being made by others: Bonneville Power is continuing to fund monitoring focused on juvenile salmon habitat and USGS is assessing how contaminants accumulate up the food chain.

Funds will be used to:

- Collect and analyze data. Funds will support monitoring at 29 sites, collecting samples from water, sediment, salmon, river mammals, and birds to get a comprehensive picture of contaminant sources and patterns. Over 130 emerging contaminants (such as estrogen compounds and personal care products); approximately 50 commonly used insecticides, herbicides and fungicides; over 130 moderately used pesticides; nearly 20 trace elements (including mercury, copper, and lead); and PCBs, PAHs, and flame retardants will be measured. This includes contaminants that cause growth, behavior, and reproductive abnormalities in salmon, river mammals, ospreys, and potentially humans.
- Host the pesticide take-back projects in lower river communities. One recent pesticide take-back site at The Dalles collected over 17,000 pounds of DDT.
- Provide consumers with information. Certain ingredients in personal care products cause hormone disruption in fish; providing consumers with information can help keep some of these contaminants out of the system.
- Complete a regional sediment management plan to aid disposal of contaminated sediment.



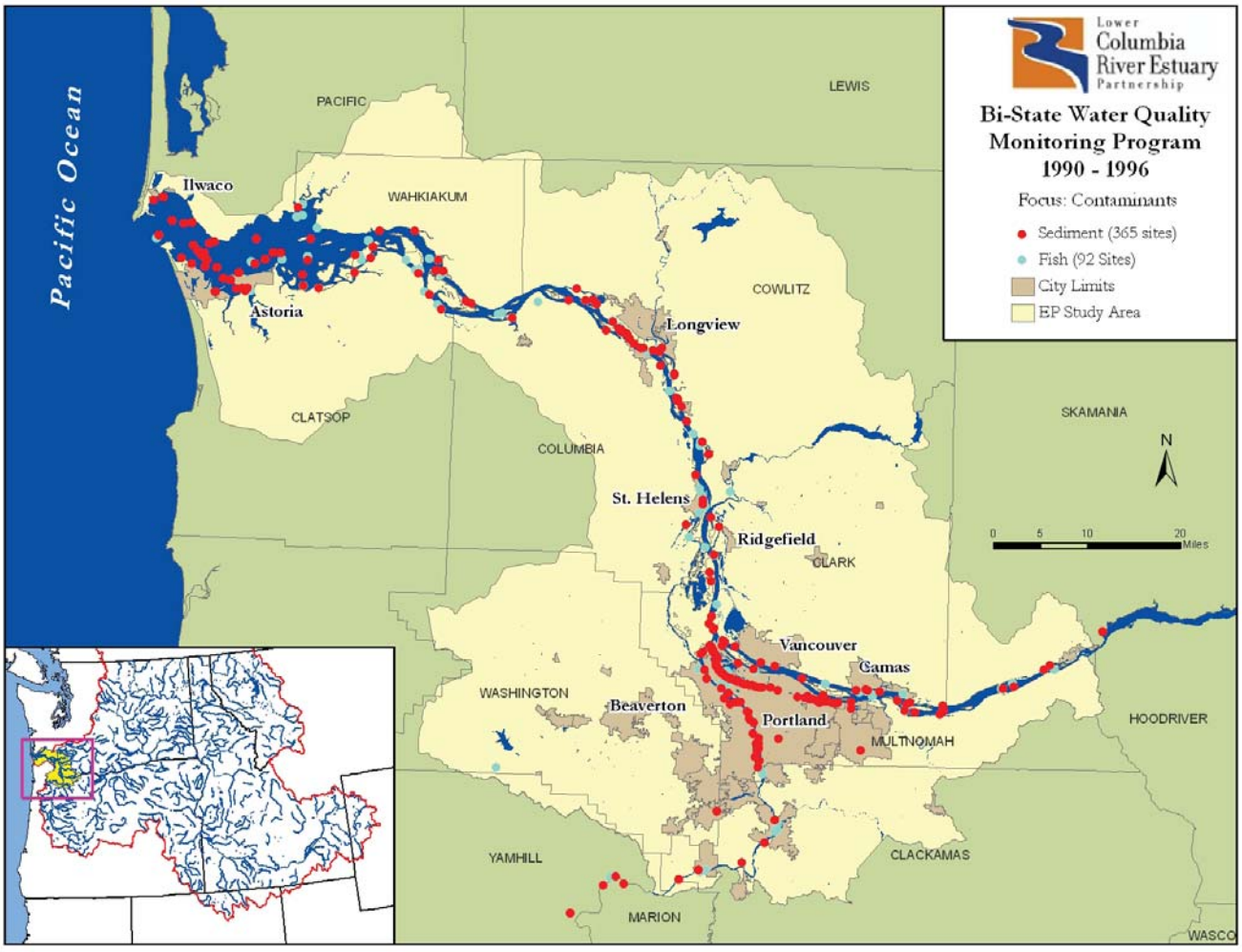
Minimum Monitoring Sites Proposed by Estuary Partnership to Provide Long Term Trend Analysis

The Background: Monitoring Since 1989

1989-1995: Bi-State Water Quality Program
The States of Oregon and Washington, along with the ports and paper industry, provided the initial monitoring investment of $6,000,000 for the Bi-State Water Quality Program. This data collection, research and analysis effort was the first comprehensive, ecosystem-focused assessment in the lower Columbia River and estuary.

Results of Bi-State Water Quality Program:
- Dioxins/furans, metals, PCBs, PAHs, and pesticides impair the water, sediment, fish, and wildlife.
- Arsenic, a human carcinogen, exceeded both the EPA ambient water-quality criteria for the protection of human health and the EPA human health advisories for drinking water.
- Sediment contamination was highest near urban and industrial areas, with contamination in excess of reference levels for DDE, PCBs, dioxins/furans, and PAHs.
- Reproductive abnormalities were observed in river otter and some river otter contained concentrations of PCBs that exceeded threshold levels for tissue and scat.
- Nesting eagles show evidence of accumulation of DDE and PCBs that impair reproduction.
- Riparian habitat and tidal swamps and marshes have decreased by as much as 75% from historical levels.
- Beneficial uses are impaired (fishing, shellfishing, wildlife and water sports).

1995: Lower Columbia River Designated an "Estuary of National Significance." This designation was supported by the level of degradation of the estuary that was revealed by the Bi-State Water Quality Program.



Sites Sampled by the Bi-State Water Quality Program, One-Time Event

1996-1999: Estuary Partnership developed Comprehensive Conservation and Management Plan including Aquatic Ecosystem Monitoring Strategy for the Lower Columbia River.

The Aquatic Ecosystem Monitoring Strategy for the Lower Columbia River (Monitoring Strategy) calls for sustained monitoring to follow-up on previous one-time work and better provide information on the extent and distribution of toxics including pesticides, metals, PCBs, PAHs, PBDEs, dioxins/furans, estrogenic compounds, pharmaceuticals and personal care products in water, sediment, fish, and wildlife. The sustained monitoring would provide data to assess trends impacting public and ecosystem health, expand understanding of current conditions, fill existing data gaps, identify areas where toxics may be accumulating, assess the sources of these contaminants, evaluate effectiveness of toxics reduction projects over time, and direct reduction projects. It also calls for immediate on-the ground toxics reduction and pollution prevention projects, implemented with our partners. It was developed by over 40 scientists from the public and private sectors working with USGS and the Estuary Partnership. It assessed who was doing what, who had responsibility for what, and defined gaps. The gaps in what others do are defined in the Estuary Partnership monitoring strategy.

The *Monitoring Strategy* is one of 43 actions which make up the *Comprehensive Conservation and Management Plan (Management Plan)*. The *Management Plan* guides all Estuary Partnership activities and investments. The 43 actions address problems in the river and are categorized in three broad program areas: **habitat loss and modification, toxic and conventional pollution and information.**

The *Management Plan* was developed by a very large steering committee representing the diverse interests in the river and using an innovative and extensive process and tools to include the broadest input from citizens.

2000-2003: Estuary Partnership Secures Funding for Restoration and Monitoring.

2004-2007: Northwest Power and Conservation Council / Bonneville Power Administration Funds Estuary Partnership Ecosystem Health Assessment.

The Estuary Partnership's targeted monitoring efforts assessed the impacts of toxics on salmonid species. Samples were collected monthly for water quality and juvenile salmonids and analyzed for toxic and conventional pollutants, including PAHs, PCBs, emerging contaminants (estrogen compounds and flame retardants), current use pesticides, nutrients, trace elements, chlorophyll *a*, bacteria, and suspended sediment. Key partners include USGS and NOAA Fisheries.

Results of the Estuary Partnership Ecosystem Health Assessment:

- Contaminants banned in the 1970s are still detected in sediments and juvenile salmon; these "legacy" contaminants include pesticides (dichlorodiphenyl-trichloroethane; DDT) and compounds used as industrial coolants and lubricants (polychlorinated biphenyls; PCBs).
- PCBs in salmon tissue and PAHs in salmon prey exceed estimated thresholds for delayed mortality, increased disease susceptibility, and reduced growth in salmonids.
- Coincident to their detection in fish, almost half of the types of PCBs were found on suspended sediment. *These contaminants break down slowly, remaining in the environment a very long time and accumulate up the food chain. Exposures to PAHs, PCBs, and PBDEs render salmon more susceptible to disease-induced mortality.*
- Exposure to flame retardants (PBDEs) is on the rise throughout the Pacific Northwest, and salmon in the vicinity of Portland have levels within the top 10% of those reported for resident fish in the region. Flame

retardants were also found on the suspended sediment with concentrations of two of the most toxic forms, penta-BDE and deca-BDE being the highest.

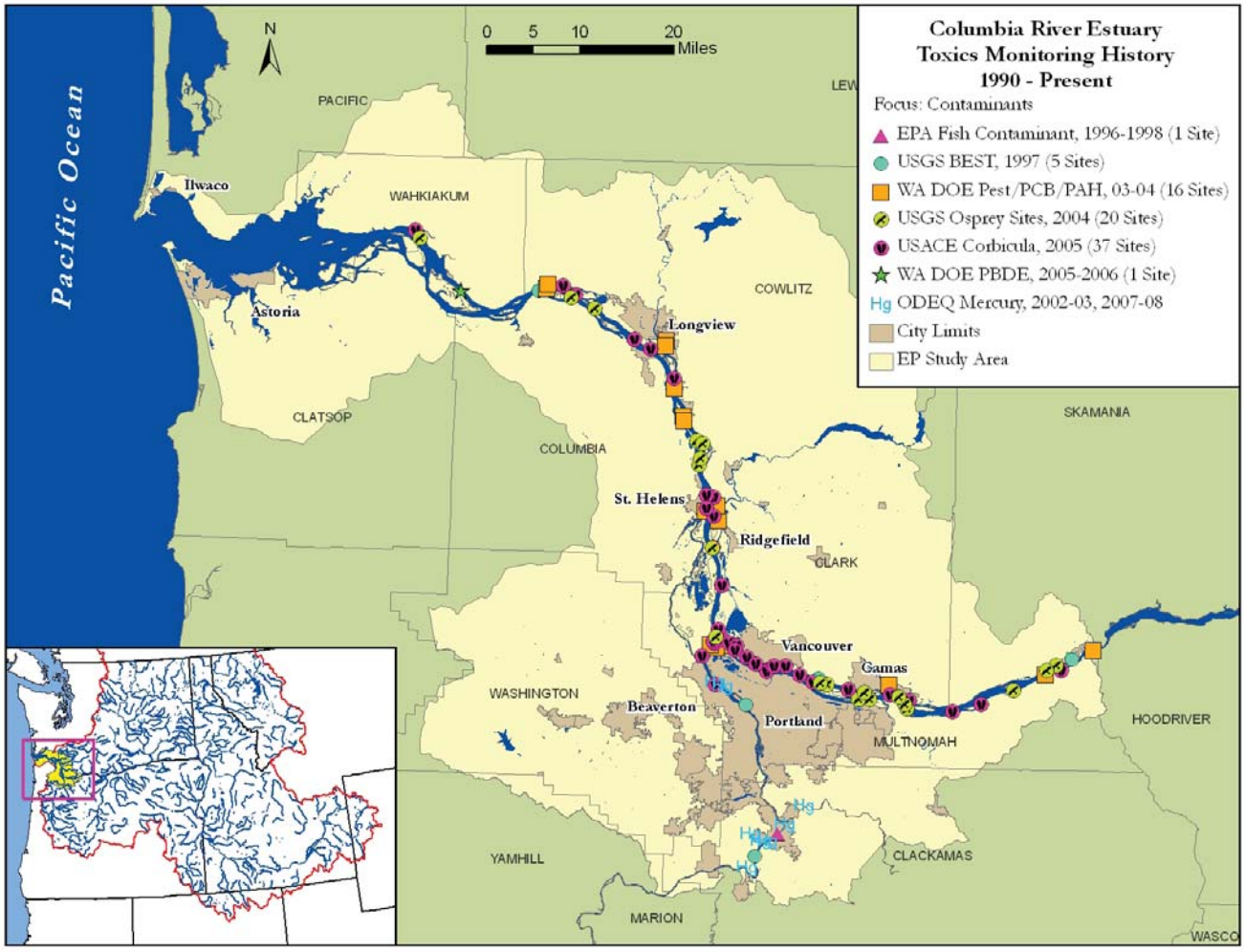
- Copper was detected in the water at concentrations known to interfere with the normal function of key sensory systems in fish, such as imprinting, homing, schooling, shoaling, predator detection, predator avoidance, and spawning behaviors in salmon.
- Juvenile Chinook salmon collected from the Portland area have abnormal levels of an estrogen-regulated yolk protein. Water samples from the same area contained a known endocrine disruptor. This is an indication that pharmaceuticals and wastewater products may be interfering with the endocrine system of salmon. *Some known contaminants as well as some emerging contaminants do not accumulate in fish tissue but can impact the growth, reproduction and immune systems of aquatic organisms.*

1996-2006: Eleven One-Time Studies by Different Federal and State Partners

Between 1996 and 2006, different federal and state partners conducted eleven studies that were one-time efforts. Key studies and their results include:

- **EPA Columbia Basin Fish Contaminant Survey, 1996-1998.** EPA focused on toxics in resident and anadramous fish and examined pesticides and PCBs at four sites in the lower river and estuary. Findings showed that all species of fish had some levels of toxic chemicals in their tissue and Chinook and coho salmon and steelhead had toxics in their eggs. Pesticide concentrations were higher in resident species, especially mountain whitefish, white sturgeon, large-scale sucker, and walleye. Also, PCBs were higher in Pacific lamprey than anadramous fish species.

- **USGS Biomonitoring of Environmental Status and Trends, 1997.** This study focused on DDT, dioxin, PCBs, and mercury in fish at six sites in the lower River. USGS found mercury, DDT, PCBs, dioxins, and other contaminants exceed criteria in fish and that several male bass in the lower river had ovotestes, indicating exposure to estrogen compounds.



Sites Sampled by State and Federal Partners – One Time Event

- **USGS (with funding from Estuary Partnership) Distribution of Organochlorine and PAHs in the lower Columbia River, 1997-1998.** USGS studied the distributions of dioxins/furans, PCBs, PAHs, and organochlorines at 9 sites in the lower river. They found that dioxins/furans, DDT, and PCBs were prevalent in the system and that concentrations of organochlorine compounds and PAHs were elevated at tributary mouths.

- **EPA, Washington Department of Ecology, and Oregon Department of Environmental Quality, Coastal Environmental Monitoring and Assessment Program, 1999-2000.** This study examined mercury, zinc, and DDT in fish and sediment at 117 sites and found fish exceeded toxic screening criteria for mercury, zinc, and DDT.

- **EPA and Oregon Department of Environmental Quality Willamette Basin Mercury Monitoring, 2002-2003.** Mercury and methyl mercury concentrations in water, sediment, and fish were examined at 3 sites in the lower river. Results showed that restoring the beneficial use of fish consumption in the Willamette Basin requires an interim water quality criteria of 0.92 ng/L of mercury (vs. the 12 ng/L mercury standard elsewhere in the state).

- **EPA and Washington Department of Ecology; Concentrations of 303(d) Listed Pesticides, PCBs, and PAHs Measured with Passive Samplers, 2003-2004.** Dieldrin, DDT, PCBs, PAHs, metals, and pesticides were assessed in river water at 16 sites. Concentrations of dieldrin, DDT, and PCBs exceeded human health criteria. Also, the Multnomah Channel, Columbia Slough, Willamette River, and Lake River are the most contaminated contributing water bodies, discharging DDT, dieldrin, and PCBs into the Columbia River.

- **USGS, Toxics in Osprey Eggs, 2004.** USGS examined PBDEs, mercury, PCBs, and pesticide concentrations in osprey eggs collected from nests along the Columbia River. Results showed that levels of DDT, PCBs, and dioxins were decreasing in osprey eggs. However, levels of mercury and PBDEs were increasing in the eggs.

- **EPA, Washington Department of Ecology, and Oregon Department of Environmental Quality, Coastal Environmental Monitoring and Assessment Program, 2005.** Results from this study are pending.

- **US Army Corps of Engineers, Contaminants in Corbicula, 2005.** This study targeted concentrations of PBDEs, PAHs, PCBs, chlorinated pesticides, metals, and organotin in Corbicula at 37 sites in the lower river. Findings revealed that Corbicula was widespread and that all Corbicula had detectable levels of bioaccumulative toxins.

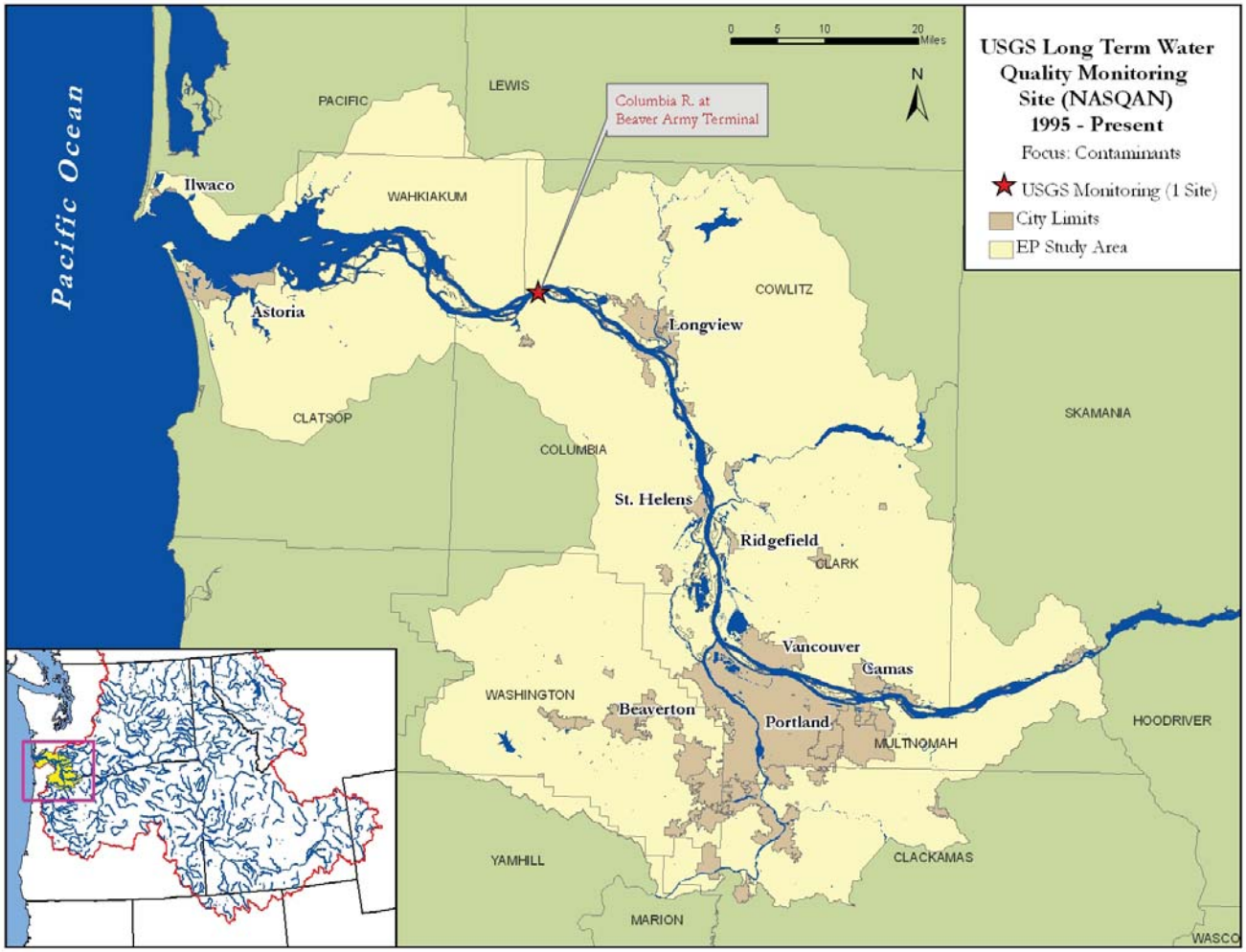
- **Washington Department of Ecology, PBDEs in Washington Rivers and Lakes, 2005-2006.** PBDE concentrations in fish and water were studied at 1 site in the lower river. Results found that the mainstem Columbia river had the 4th highest PBDE concentrations out of 20 sites sampled statewide.

1996-2006: One Long-term Monitoring Site in the Lower Columbia River and Estuary

While the above eleven studies have examined toxics in the lower river, only one long-term monitoring site has been maintained between 1996 and 2006. USGS maintains this one site as part of its National Stream Quality Accounting Network (NASQAN). USGS measures water samples for toxics, including pesticides and metals. Over time, it has found copper, chromium, nickel, and zinc at concentrations high enough to cause health effects. In addition, monitoring results show that pesticide concentrations in the mainstem are low, but contributions from tributaries during storm events are measurable.

2008-2010: Northwest Power and Conservation Council / Bonneville Power Administration Funds Estuary Partnership Habitat and Salmon Monitoring.

Current monitoring by the Estuary Partnership is assessing habitat conditions for salmonids in the lower Columbia River and estuary. Data will be collected on vegetation patterns, conventional water quality parameters (such as temperature, dissolved oxygen, and salinity), and juvenile salmon. However, this monitoring will not investigate toxic contaminants in salmon or in the habitats supporting them.



The One Long-Term Monitoring Site (Operated by USGS)

Lower Columbia River Estuary Partnership

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The stewardship we build lasts a lifetime.