Lower
Columbia
River Estuary
Partnership

TOXICS REDUCTION

June 4, 2008

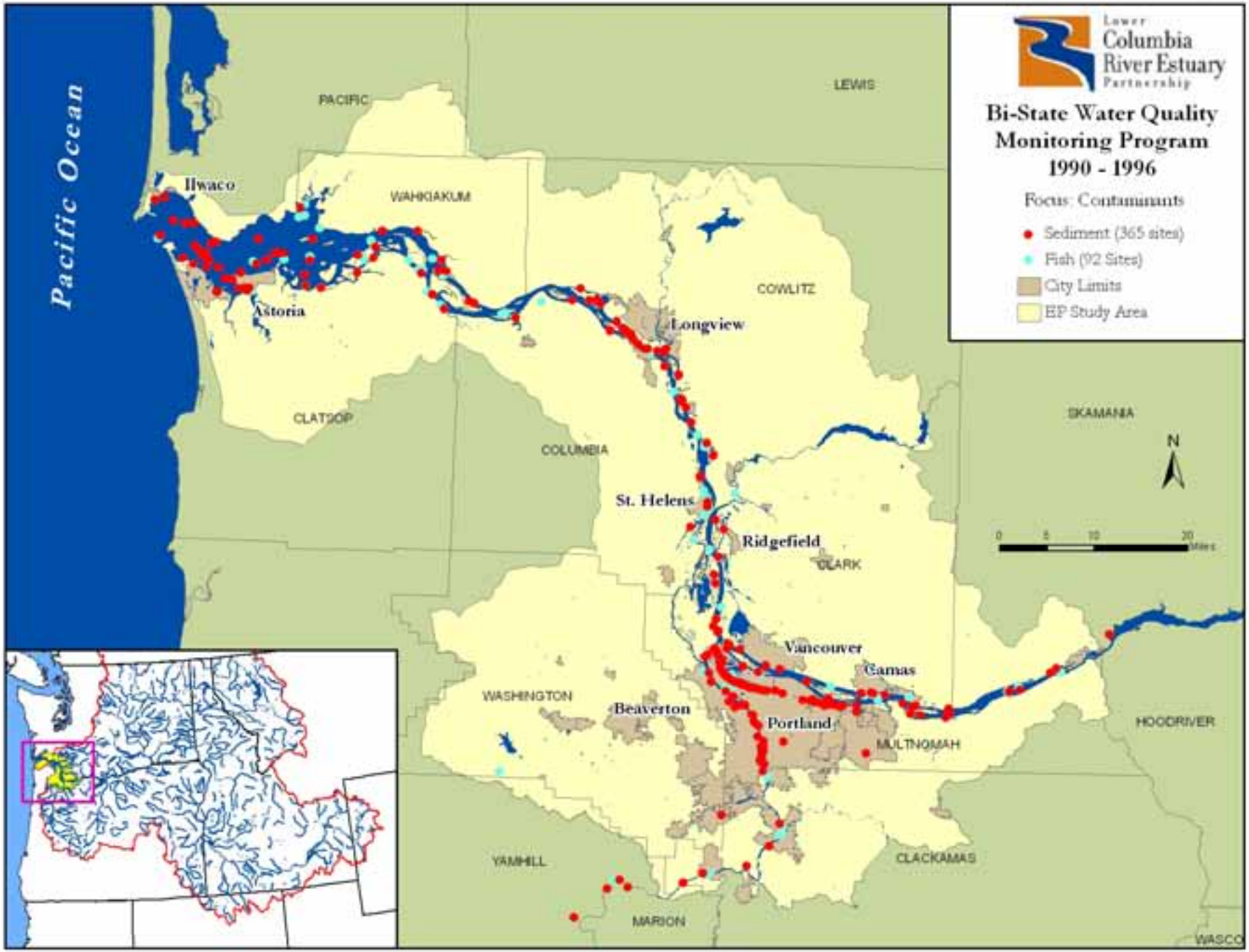
Lower Columbia River Monitoring Efforts to Date

- 1989 – 1996: Bi-State $6,000,000
- 1996- 2005: One time Snapshots
  - EMAP: $500,000
  - BEST: $3,000,000
  - Others

2004-2008

- BPA investment 2004-2007
  - Ecosystem Classification System, Habitat Monitoring, Water Quality Monitoring, Salmonid Sampling, Toxics Model Development
- BPA 2008-2011
  - Habitat
- States: Active (Expanding) Monitoring Programs w/in States
- EPA Columbia River Toxic Reduction Strategy

Lower Columbia River Estuary Partnership


Lower Columbia River Estuary Partnership
Bi-State Water Quality Monitoring Program 1990 - 1996
Focus: Contaminants
Sediment (365 sites)
Fish (92 Sites)
City Limits
EP Study Area
Pacific Ocean
PACIFIC
LEWIS
WAHKIAKUM
COWLITZ
CLATSOP
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SKAMANIA
CLARK
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YAMHILL
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CLACKAMAS
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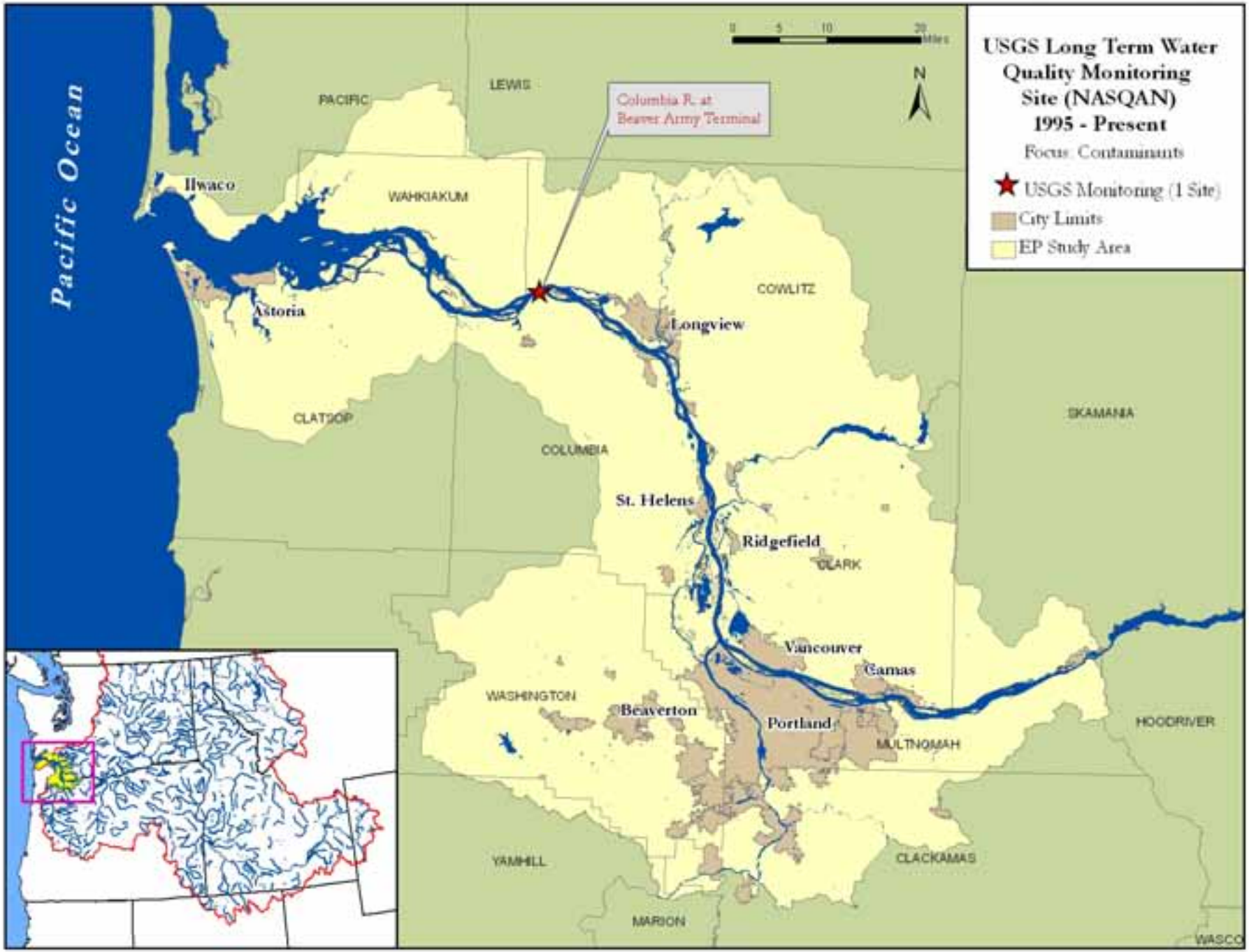
0 5 10 20
Miles


Pacific Ocean
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Columbia R. at Beaver Army Terminal
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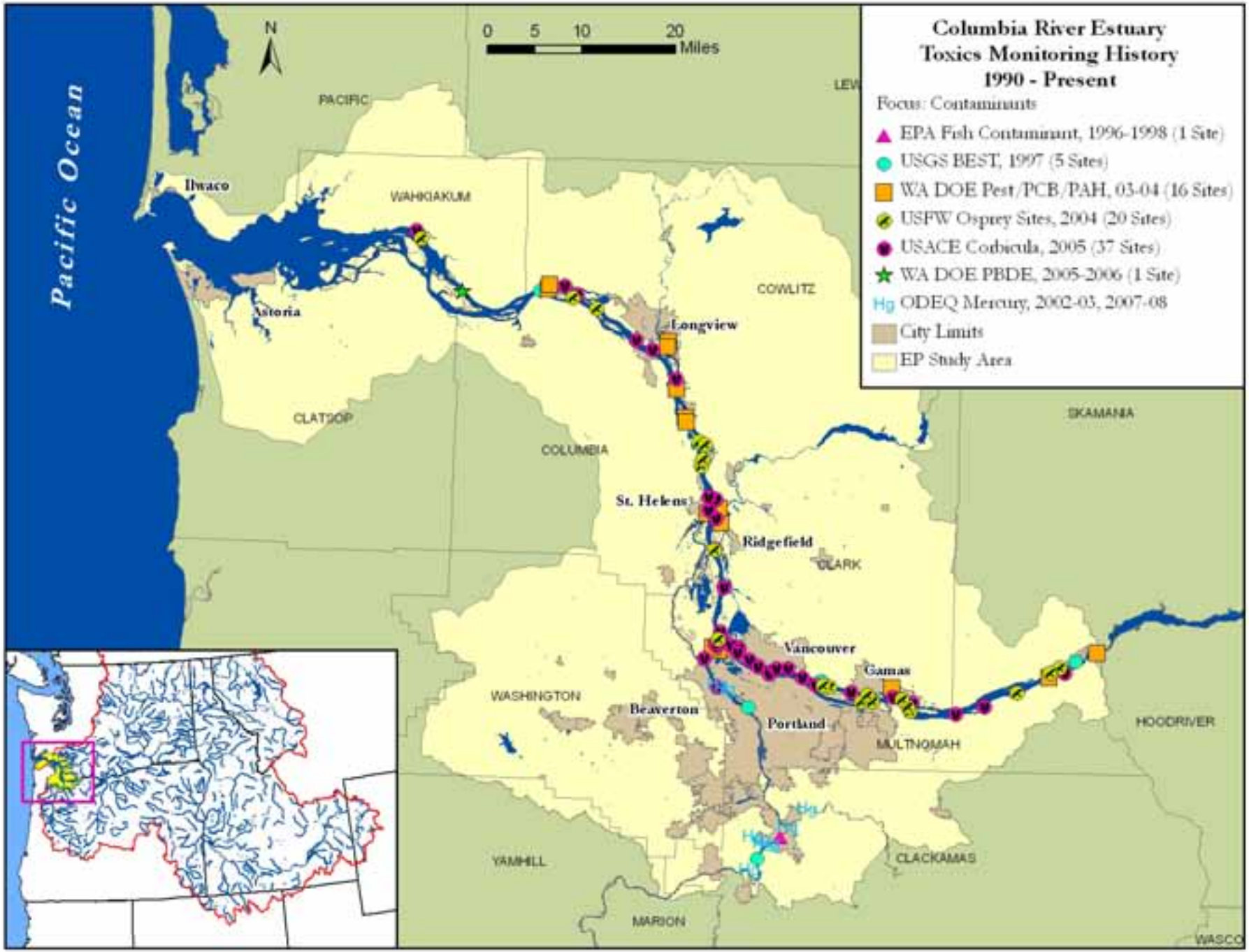
0 5 10 20 Miles
USGS Long Term Water Quality Monitoring Site (NASQAN) 1995 - Present
Focus Contaminants
USGS Monitoring (1 Site)
City Limits
EP Study Area


Columbia River Estuary
Toxics Monitoring History
1990 - Present
Focus: Contaminants
EPA Fish Contaminant, 1996-1998 (1 Site)
USGS BEST, 1997 (5 Sites)
WA DOE Pest/PCB/PAH, 03-04 (16 Sites)
USFW Osprey Sites, 2004 (20 Sites)
USACE Corbicula, 2005 (37 Sites)
WA DOE PBDE, 2005-2006 (1 Site)
Hg ODEQ Mercury, 2002-03, 2007-08
City Limits
EP Study Area
N
0 5 10 20 Miles
Pacific Ocean
PACIFIC
WAHKIAKUM
Ilwaco
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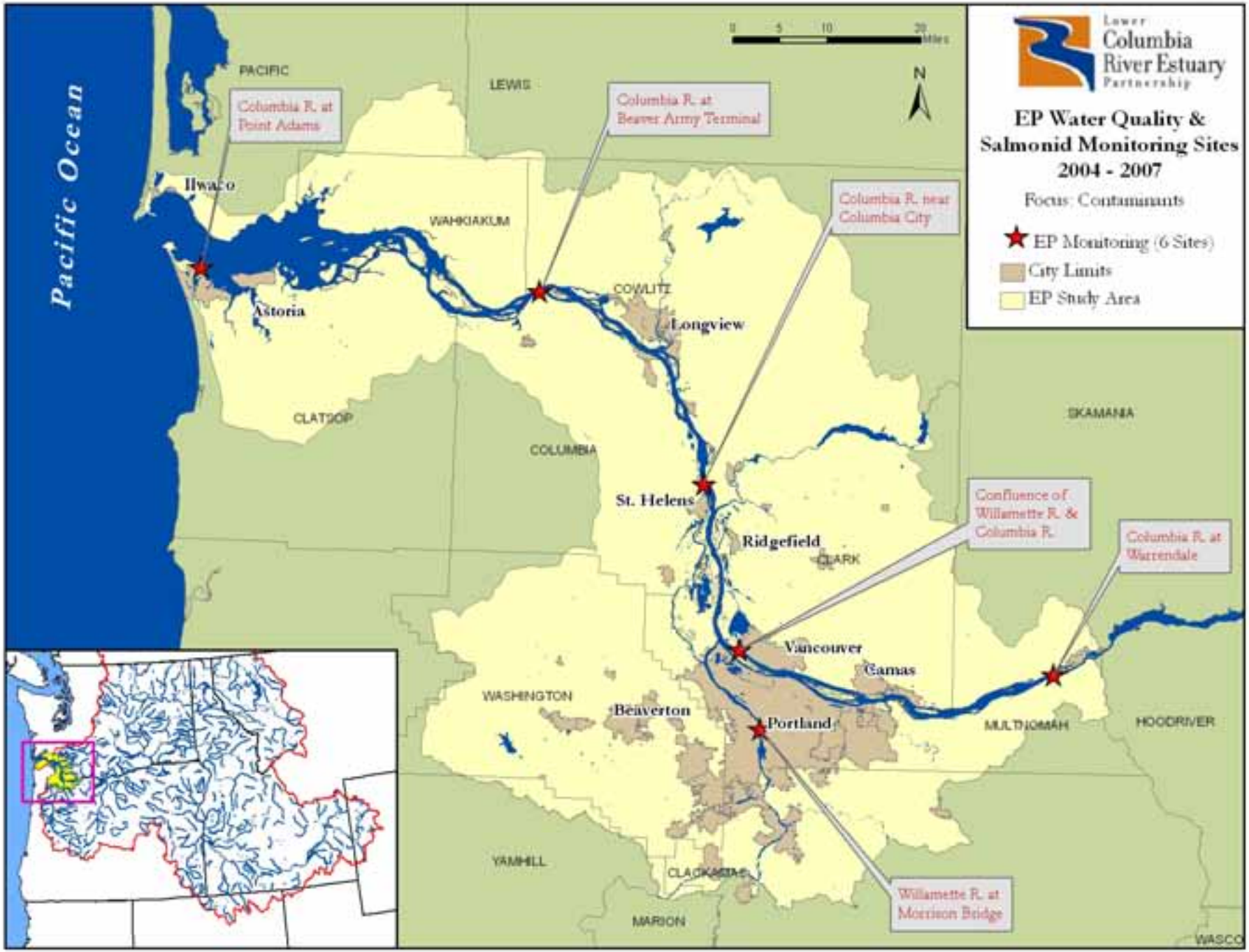
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Camas
Beaverton
Portland
Columbia R. at Point Adams
Columbia R. at Beaver Army Terminal
Columbia R. near Columbia City
Confluence of Willamette R. & Columbia R.
Columbia R. at Warrendale
Willamette R. at Morrison Bridge
N
Lower Columbia River Estuary Partnership
EP Water Quality & Salmonid Monitoring Sites 2004 - 2007
Focus: Contaminants
EP Monitoring (6 Sites)
City Limits
EP Study Area

Results of Estuary Partnership's Water Quality and Salmonid Monitoring 2004-2007

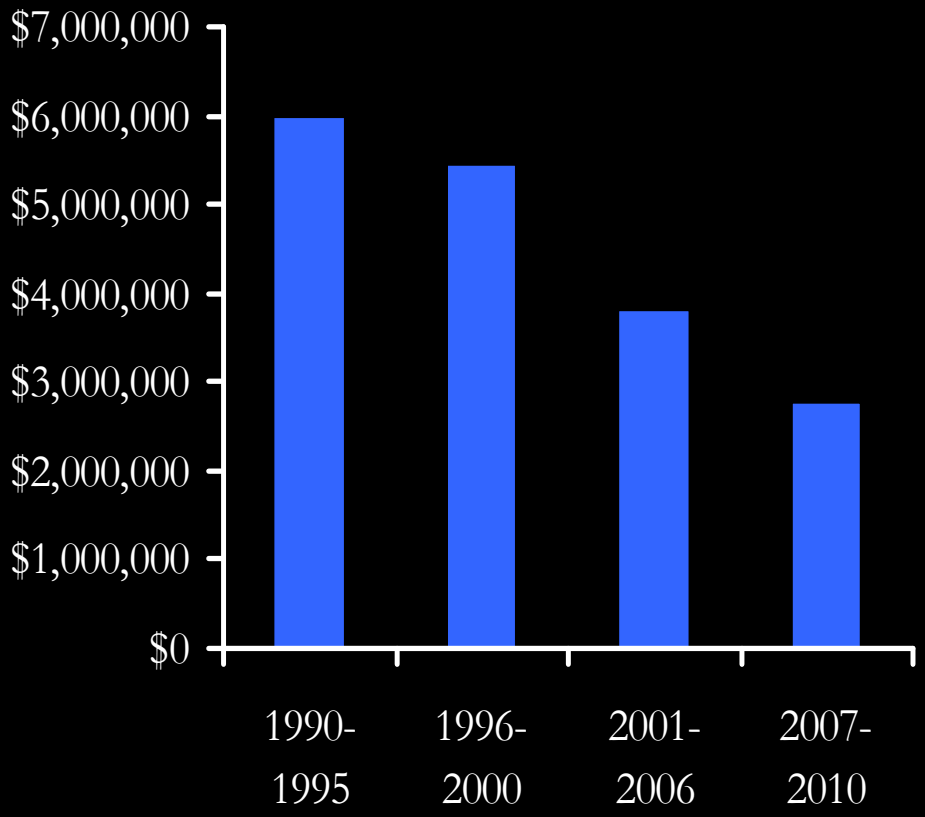
- Emerging contaminants such as flame retardants and signs of estrogen exposure found in juvenile Chinook salmon.
- PAHs, PCBs, and PBDEs found throughout the lower River in water, sediment, and juvenile Chinook salmon.
- PCBs in salmon tissue and PAHs in salmon prey exceed estimated thresholds for delayed mortality, increased disease susceptibility, and reduced growth.
- DDT and PCBs are still detected in juvenile Chinook salmon and are accumulating up the food chain.

Results *continued*

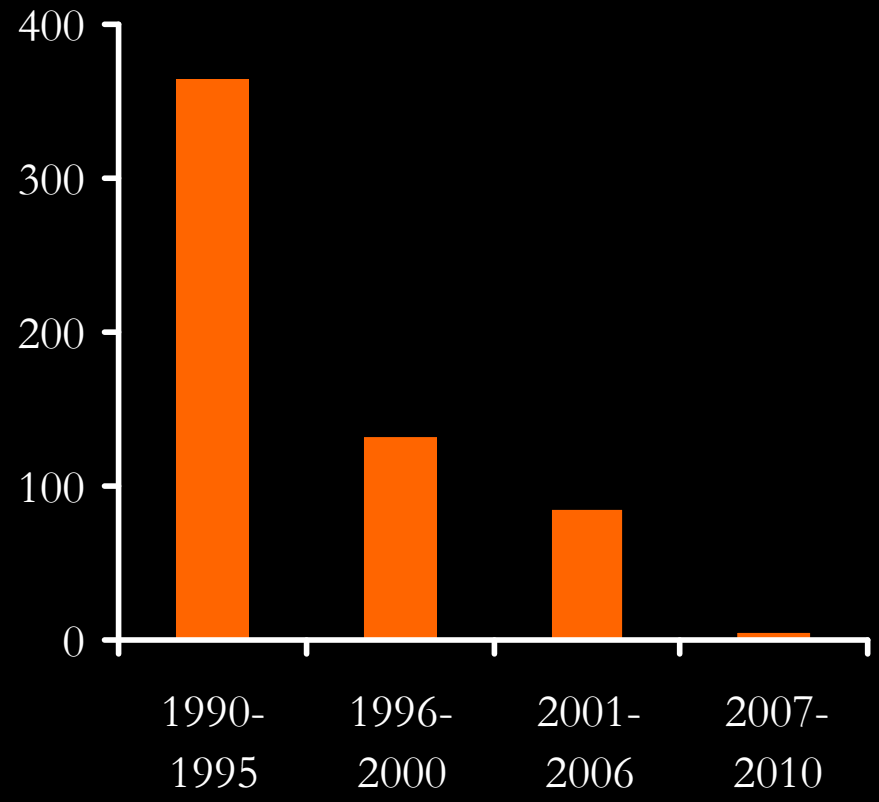
- Several current use pesticides were detected in the lower river. Most frequently detected pesticides were atrazine and simazine, which can affect salmon behavior or act as hormone disruptors.
- Copper was detected in river water at concentrations known to interfere with salmon sensory systems and thus impair behaviors like homing, schooling, prey capture, predator avoidance, and spawning.
- Mercury was detected in sediment and juvenile salmon and is accumulating up the food chain.
- Urban, industrial areas contribute significantly to toxics in juvenile salmon (Highest PCBs, PAHs, and PBDs in prey and fish from Portland to Beaver Army Terminal)

Lower Columbia River Estuary Partnership

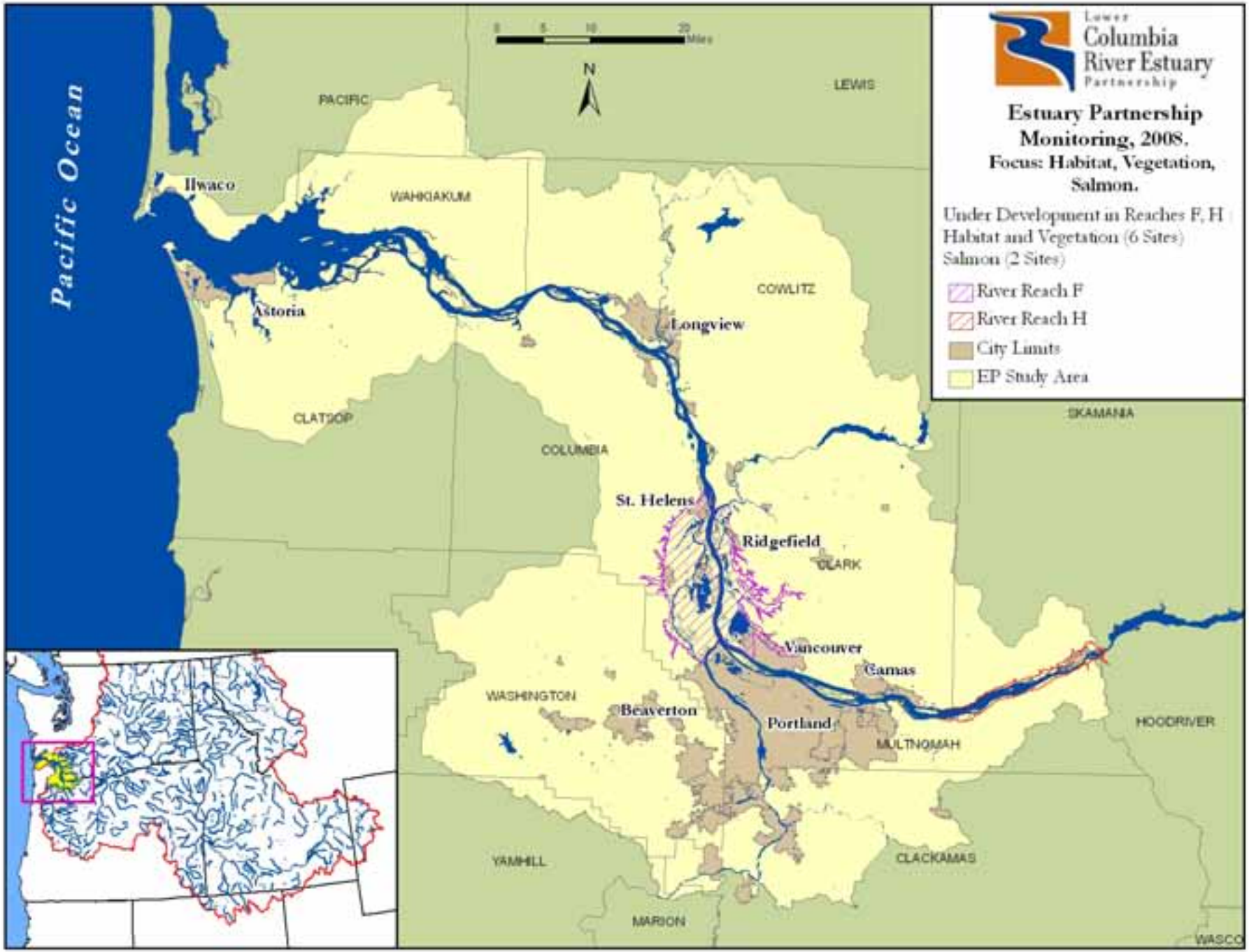
Monitoring Investment



Number of Monitoring Sites



Lower Columbia River Estuary Partnership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Lower Columbia River Estuary Partnership
Estuary Partnership Monitoring, 2008.
Focus: Habitat, Vegetation, Salmon.
Under Development in Reaches F, H
Habitat and Vegetation (6 Sites)
Salmon (2 Sites)
River Reach F
River Reach H
City Limits
EP Study Area


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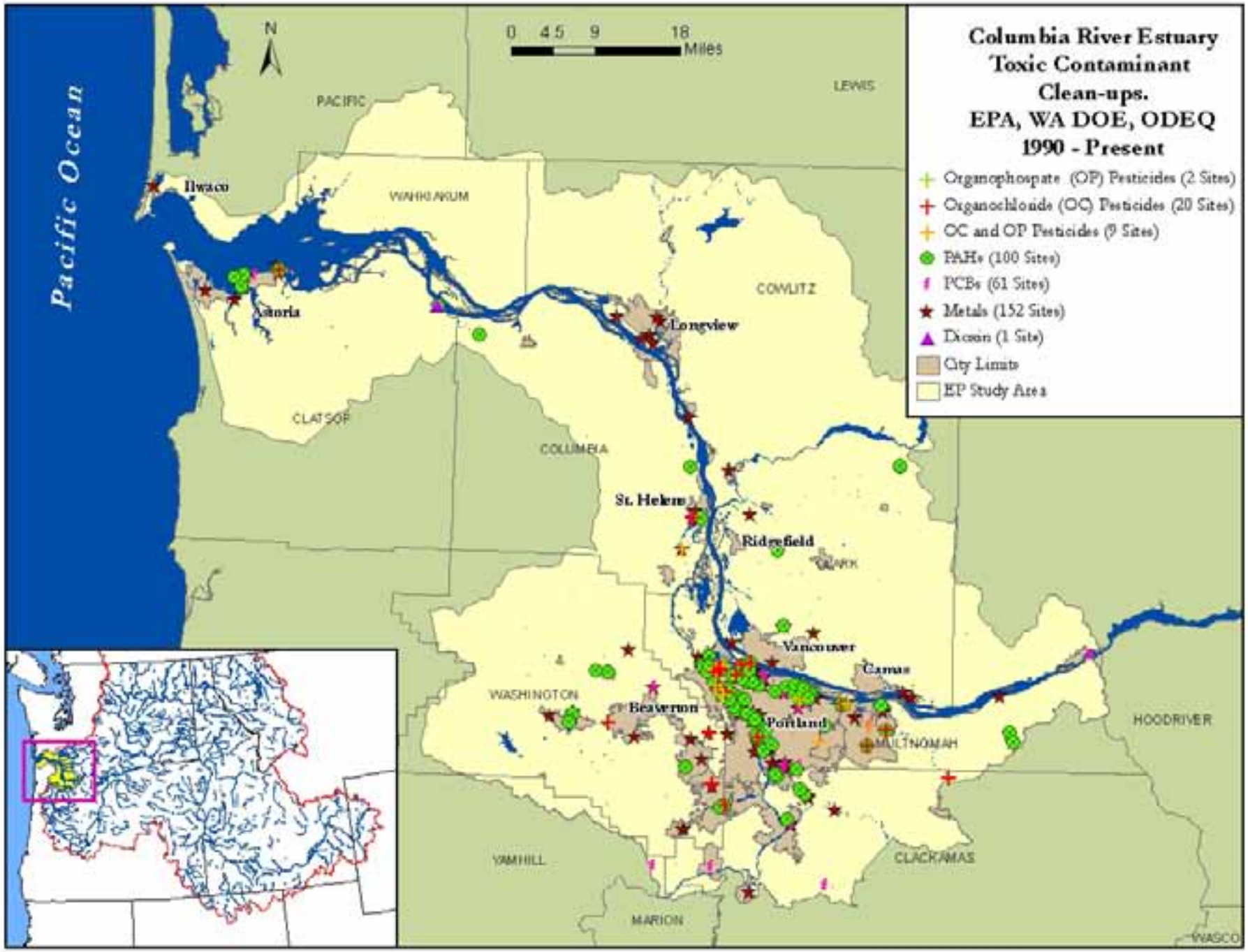
Lower Columbia River Estuary Partnership
Minimum Sustained Monitoring Required For Long Term Analysis
Focus: Contaminants
Monitoring Site (29 Sites)
City Limits
EP Study Area


Columbia River Estuary
Toxic Contaminant
Clean-ups.
EPA, WA DOE, ODEQ
1990 - Present
Organophospate (OP) Pesticides (2 Sites)
Organochloride (OC) Pesticides (20 Sites)
OC and OP Pesticides (9 Sites)
PAHs (100 Sites)
PCBs (61 Sites)
Metals (152 Sites)
Dioxin (1 Site)
City Limits
EP Study Area
Pacific Ocean
N
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Miles
PACIFIC
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WAHKIAKUM
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Next Steps: Monitoring

- Sustained monitoring on the mainstem
  - Evaluate the effectiveness of toxics reduction management actions over time
  - Assess where toxics are moving
  - Identify changes in contaminants and contaminant levels
- Better define aquatic life threshold limits for toxics, such as PAHs, PCBs PBDEs, estrogenic compounds, and pharmaceuticals and personal care products.
- Evaluate toxics sources and establish source reduction programs
- Funding
  - Strategy is in place; baseline established

Lower Columbia River Estuary Partnership

Data – over Time - Needed

- Developed plan to monitor 29 sites – tributary mouths, historic sampling locations.
- Sample water, sediment, salmon, river mammals, and birds to examine contaminant sources and trends over time.
- Monitor emerging contaminants (such as estrogen compounds and personal care products), legacy and current use pesticides, metals, PCBs, PAHs, and flame retardants.
- Monitoring will provide information on contaminant presence and potential effects on salmon growth, reproduction and immune system dysfunction and as well as abnormalities in river mammals, ospreys, and potentially humans.

Lower Columbia River Estuary Partnership

Potential Toxic Reduction Actions

Estuary Partnership *with partners*

- Expand sustained monitoring of toxics and their impact on salmon, humans, and other species who depend on the river in order to assess trends and changes over time.
- Increase toxic reduction actions in the lower river (pesticide take back programs, pharmaceutical take back programs).
- Consumer education campaign to identify harmful ingredients in personal care products and flame retardants and suggest alternative choices.
- Clean up small contaminated sites.
- Ingredient Ban.

Regulatory Actions

- Clean ups (EPA, ODEQ, WA DOE)
- Waste water treatment plants
- Storm water efforts
- Total Maximum Daily Loads (TMDLs)
- Dredge clean up at ports
- Ingredient Ban

Lower Columbia River Estuary Partnership

Toxics Reduction Needs

- Do what we can now with what we know from past and current work
- Institute sustained long term monitoring
  - Tells you how to focus reduction actions
  - Gives trend data to evaluate effectiveness of reduction efforts
  - Know the health of the system: what things are where, how they change, where they are coming from: the good, the bad, the in-between