Puget Sound and the Duwamish River

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Seattle Post-Intelligencer

Key findings:

- Pollution is historic and ongoing
- Loss of variety of critters, now mostly ratfish
- Everyone is contributing to Sound's woes

Effects of pollution:

- Critters and people can be harmed

Some effects are lethal…

…. some are not

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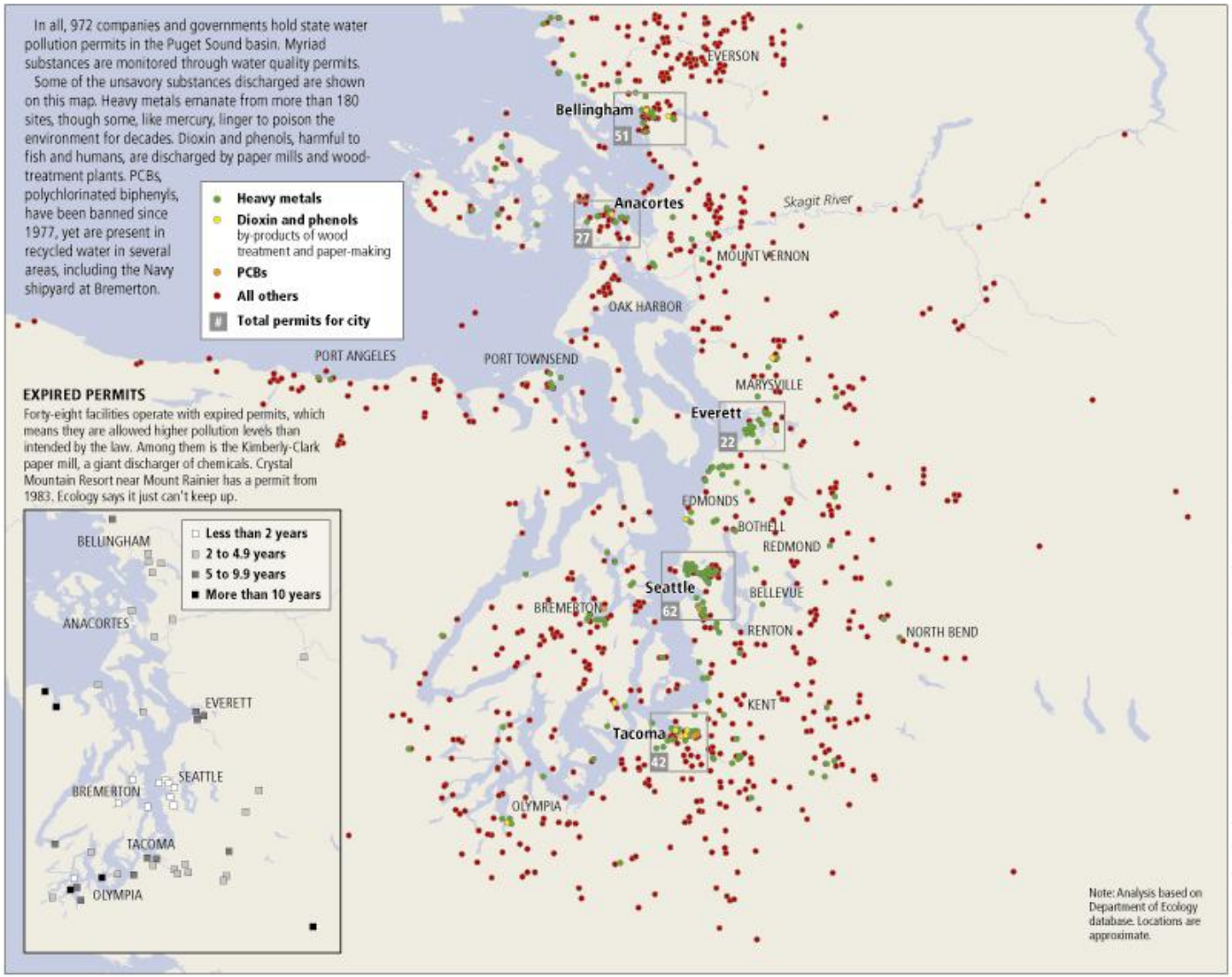
PERMITTED TO POLLUTE

In all, 972 companies and governments hold state water pollution permits in the Puget Sound basin. Myriad substances are monitored through water quality permits.

Some of the unsavory substances discharged are shown on this map. Heavy metals emanate from more than 180 sites, though some, like mercury, linger to poison the environment for decades. Dioxin and phenols, harmful to fish and humans, are discharged by paper mills and wood-treatment plants. PCBs, polychlorinated biphenyls, have been banned since 1977, yet are present in recycled water in several areas, including the Navy shipyard at Bremerton.

- **Heavy metals**
- **Dioxin and phenols** by-products of wood treatment and paper-making
- **PCBs**
- **All others**
- **#** **Total permits for city**



EXPIRED PERMITS

Forty-eight facilities operate with expired permits, which means they are allowed higher pollution levels than intended by the law. Among them is the Kimberly-Clark paper mill, a giant discharger of chemicals. Crystal Mountain Resort near Mount Rainier has a permit from 1983. Ecology says it just can't keep up.

Note: Analysis based on Department of Ecology database. Locations are approximate.

A MILLION POUNDS OF CHEMICALS

Only 20 of about 700 industrial users in the Puget Sound basin are required by the EPA to calculate how many pounds of waste they discharge into the water. Based on that limited data, more than 1 million pounds of chemicals were dumped into the Sound in 2000. Here were the top dischargers, based on Toxic Release Inventory (TRI) data:

Kimberly-Clark Corp., Everett	534,266 pounds
Georgia-Pacific West Co., Bellingham*	317,832
Simpson Tacoma Kraft Co., Tacoma	142,242
Daishowa America Co., Port Angeles	96,505
Port Townsend Paper Corp., Port Townsend	39,330
Tosco Refining Co., Ferndale	37,841
BP Cherry Point Refining Co., Ferndale	35,933
Puget Sound Naval Shipyard, Bremerton	4,805
Equilon Puget Sound Refining, Anacortes	4,231

*Shut down its pulp mill, eliminated most discharge.

MOST COMMON TYPES OF PERMITTED FACILITIES:

Sand and gravel pits	302
Sewage treatment plants	119
Boat repair/shipyard	116
Dairies/commercial farms	64

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Findings were surprising:

- More than 900 pollution permits in the Sound
- PCBs still released
- High number of expired permits
- State parks and small towns among worst violators

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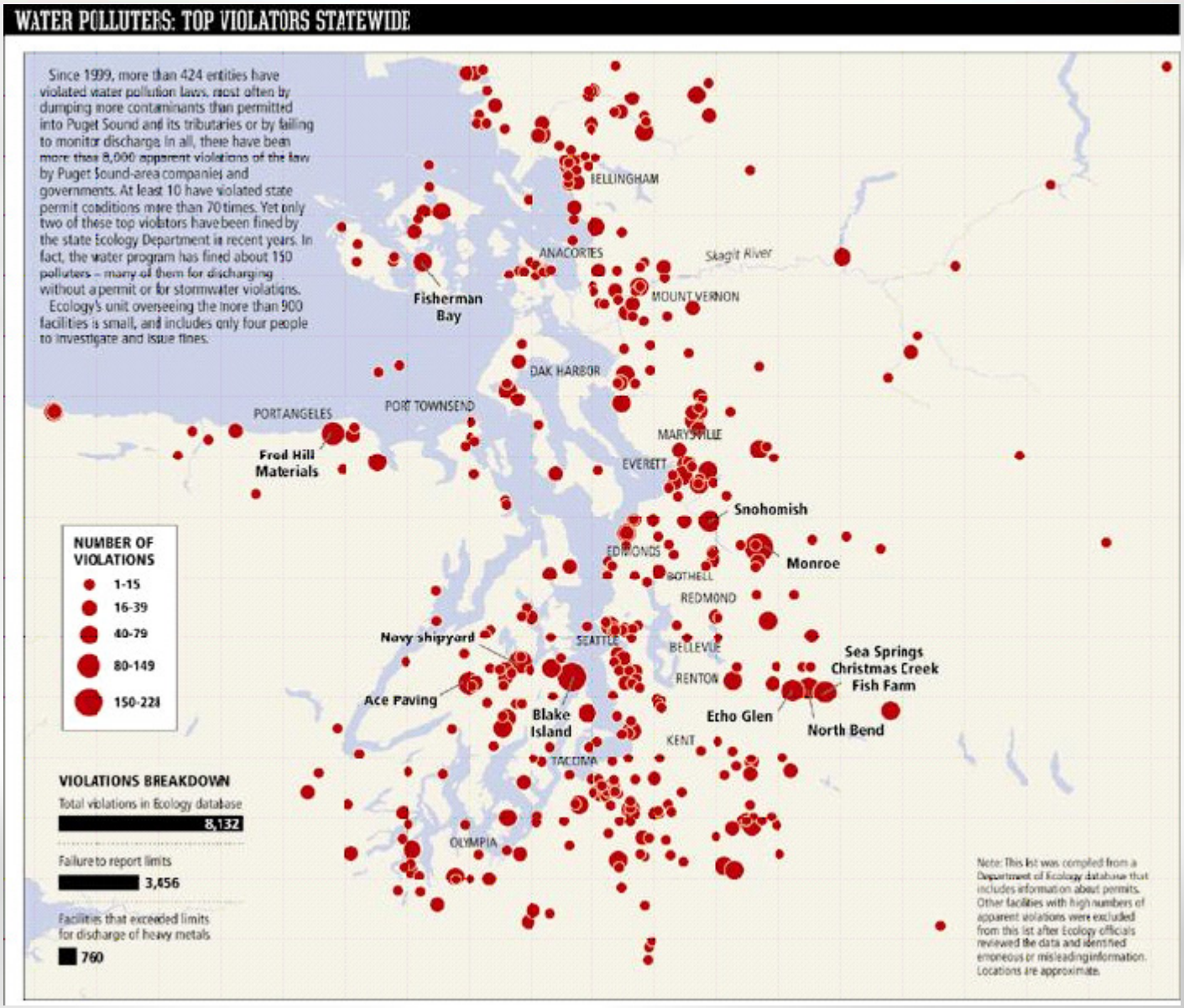
WATER POLLUTERS: TOP VIOLATORS STATEWIDE



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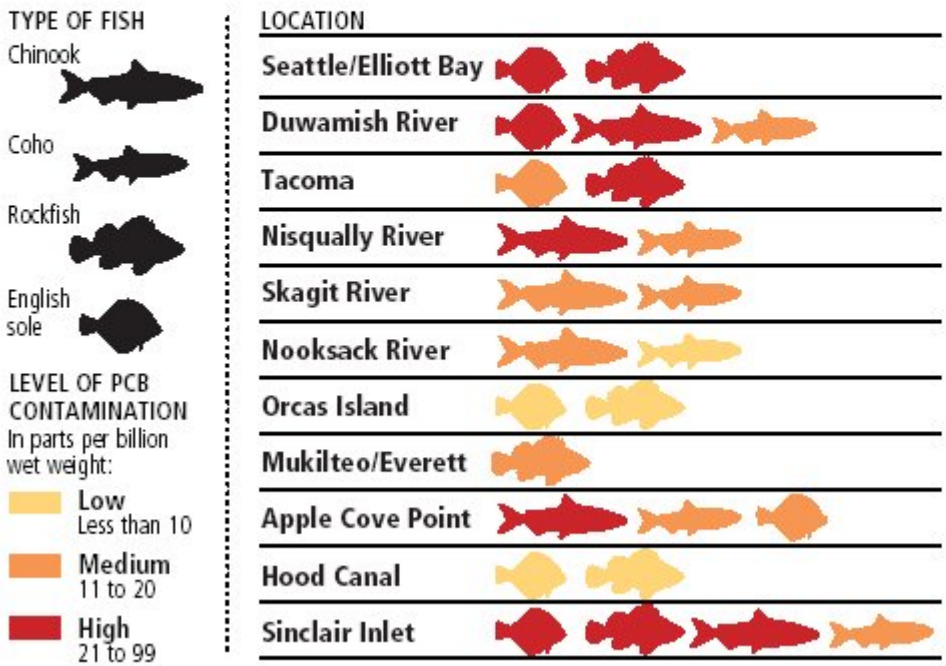
Lingering threat: PCBs

PCB CONTAMINATION IN PUGET SOUND FISH

Banned for 23 years, polychlorinated biphenyls (PCBs) continue to circulate in the ecosystem, moving from air and mud into shellfish and small creatures, then into fish and mammals. While the state has collected 10 years' worth of data on PCB contamination in four types of fish, it has not set a standard for what is unsafe to eat.



Sources: The Puget Sound Ambient Monitoring Program and San Francisco Estuary Institute

Greatest threat: stormwater

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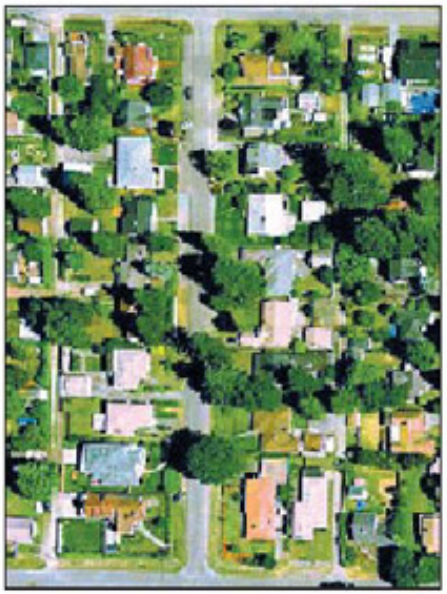
BEFORE



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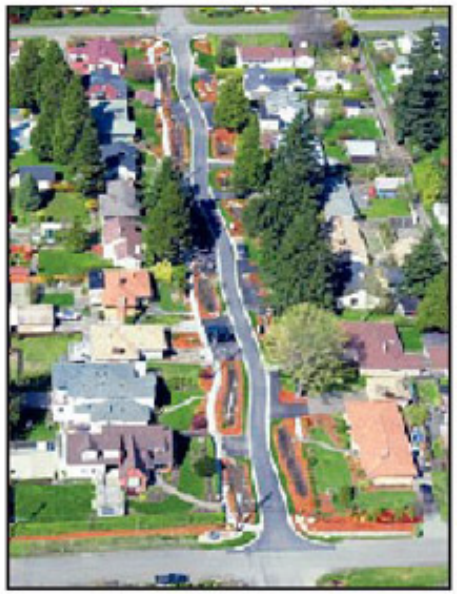
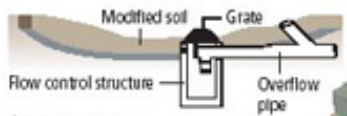


SWALES: STEERING STORMWATER

A major feature of the project involved creating carefully graded and landscaped swales along the street to collect most of the runoff. Three types of swales were used on this project. All swales are filled with modified soils to speed absorption and vegetation to slow runoff but they serve different purposes during larger storms.

Flow control swale

Regulates flow of stormwater for all swales

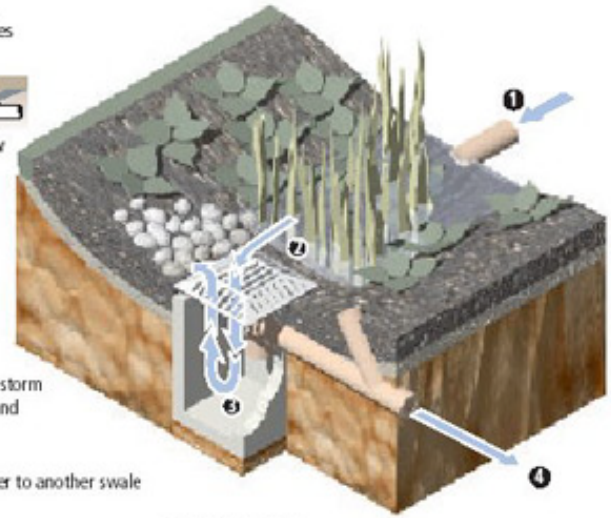


1 Flow direction
Water from other swales flows downstream through underground overflow pipes into flow control swale

2 Absorption
Modified soil absorbs water until it begins to pool

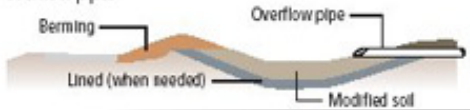
3 Ponding
During heavy rains the catch basin backs storm water up through the grate, creating a pond in the swale

4 Overflow port
Another overflow pipe carries excess water to another swale



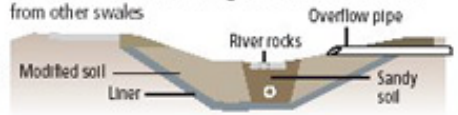
Conveyance swale

Drains excess water to other swales through connecting overflow pipes



Holding swale

Absorbs the most water into ground and receives water from other swales



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Vanishing fish and other critters

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The Duwamish

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Superfund site

- Public meeting scheduled

Nov. 29, 2007

- Last opportunity for public comment for more than 1 year
- More than 300 people attended EPA's meeting

Communicating the science

- Concepts very complicated
- But otter penises are easy to understand

Information sources

- Read the reports
- Read what agencies are saying to one another

Giving people a voice

- People are eager to talk
- Government doesn’t always listen

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Will anything change?

- Some cleanup will happen
- Will the river ever be clean enough for people to fish for their dinner?

Questions?

Ask away