



## SPOKANE RIVER REGIONAL TOXICS TASK FORCE



# The Challenge of PCBs in the Spokane River

### What are PCBs?

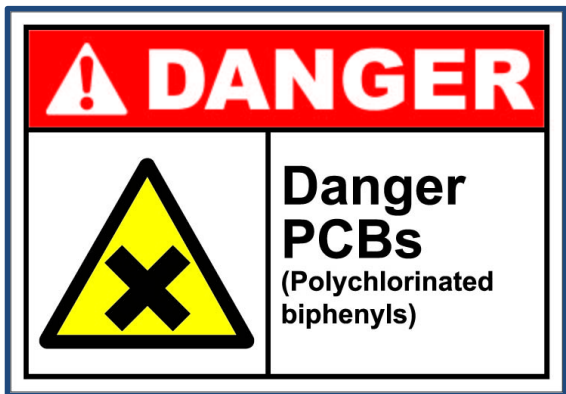
Polychlorinated biphenyls (PCBs) comprise a family of toxic human-made compounds that persist in the environment and accumulate in animal tissue. There are 209 different PCB molecules, with differing toxicity. PCB mixtures vary, from thin and light-colored liquids to yellow or even black waxy solids.

### Background on PCBs

PCBs, first produced in 1927, became commercially manufactured in 1935 for their insulating and fire-resistant properties. They were used in many products, including: oil-based paints, hydraulic fluids, electrical equipment (transformers, capacitors, light ballasts, switches, and electromagnets) as well as adhesives and tapes, cable insulation, building caulking, and floor finish.

When it was found that PCBs build up in the environment and result in serious health effects in animals and humans:

- Commercial production of PCBs was curtailed in 1977.
- The uncontained use of PCBs was banned in the United States in 1979, via the Toxics Substances Control Act (TSCA).
- There were no regulatory controls on PCB disposal before 1979, therefore legacy PCBs can still be found throughout the environment.
- In 1979, the estimated global inventory of PCBs was 1.5 million tons.



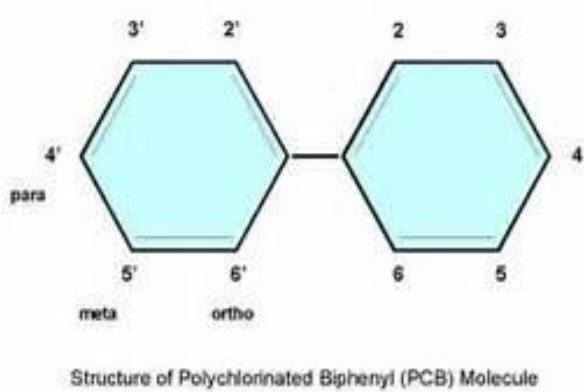
For more information about PCBs, their health effects, and federal regulatory measures on PCBs go to  
\*<https://www.epa.gov/pcbs>



### PCB Reduction Challenge

PCBs are more than a legacy pollutant. US EPA regulations, under the Toxics Substances Control Act (TSCA), still allow for the production of inadvertent PCBs as byproducts of chemical manufacturing. PCBs can also be found in some imported products. This Federal allowance of 50 parts per million (ppm) is much larger than the Washington water quality standard for PCBs of 0.000000007 ppm, and the Spokane Tribal water quality standard of 0.000000013 ppm. Recent testing by the Department of Ecology (Ecology) found PCBs in commonly-used consumer products. 49 of 68 products tested contained PCBs (Ecology, 2014). Ecology tested 133 more products in 2015 and found that 72% of the samples contained PCBs above 1 part per billion (Ecology, 2016). Outdated regulations regarding PCB cleanup standards, the mobility of PCBs in the environment, and possibly ongoing inadvertent production make comprehensive action plans and achieving water quality standards more challenging.

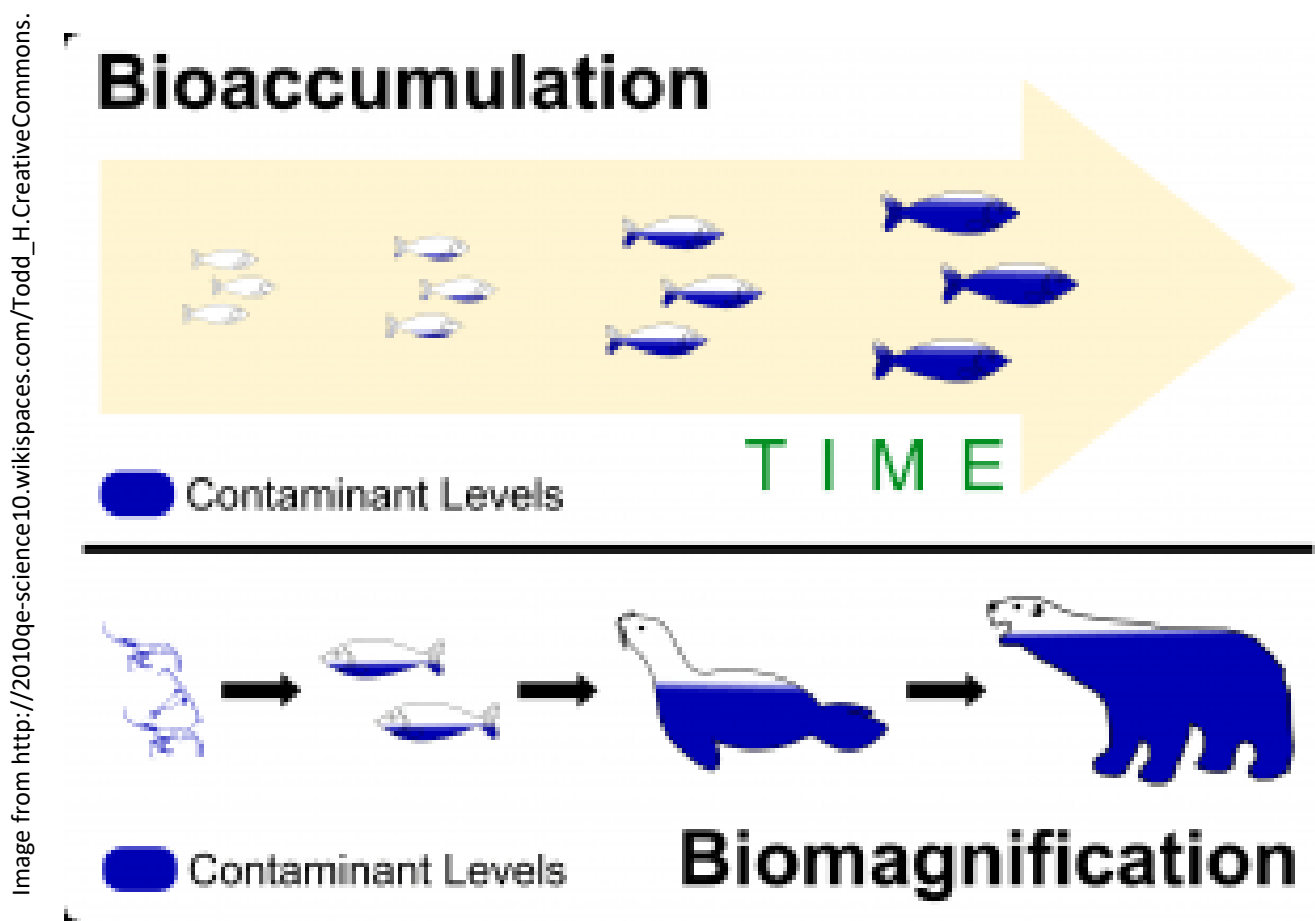
### Polychlorinated biphenyls (PCBs)



Structure of Polychlorinated Biphenyl (PCB) Molecule

### Health Effects of PCBs

PCBs end up in our environment, including our lakes and rivers. They persist and travel up through the food chain, in some cases having ongoing impacts to humans and the environment. Low concentrations in the river build up (bioaccumulate) to higher concentrations in fish. This is a serious issue, particularly for people that consume fish from the Spokane River. Exposure to PCBs can result in skin ailments and liver damage, and they are a probable carcinogen. PCBs also have negative health effects on immune, reproductive, nervous, and endocrine systems. Contributions of PCBs from major pathways such as stormwater runoff, WWTPs, groundwaters, and aerial deposition are all highly variable which makes precisely calculating their relative contributions difficult.(EPA\*)



**Bioaccumulation occurs when an organism accumulates a toxic faster than it can be excreted and thus concentrations increase over time as they get older.**

**Biomagnification occurs as toxics build up in concentration up the food chain.**

### PCB Cleanup and Source Reduction

In the past 20 years, cleanup, regulatory actions, and some natural attenuation have significantly decreased PCBs in the Spokane River:

- Remediation has directly removed significant sources of PCBs.
- Natural reductions in the magnitude of PCBs have occurred due to environmental attenuation such as deep sediment burial.
- As existing products containing high levels of PCBs such as transformers, light ballasts, and caulks have reached the end of their useful lives and been removed from service, the pool of PCB sources to the environment has declined.

More work is needed, however, if we are to have a clean river and healthy aquatic life. To achieve the water quality goals for the River, we need to significantly reduce levels of PCBs. This will take a coordinated approach where everyone works together – locally, across the state, and at the national level – to achieve this goal. While wastewater treatment plants receive PCB-containing water from the communities they serve and are effective in removing significant amounts of PCBs, they are unable, with current technology, to reach the low levels of the water quality standards. Reducing and/or eliminating PCBs entering the river is the key goal. This will require cleanup of legacy contamination on land, eliminating PCBs that are currently in use, controlling PCBs in wastewater, and preventing PCBs from being created and introduced into products we use.

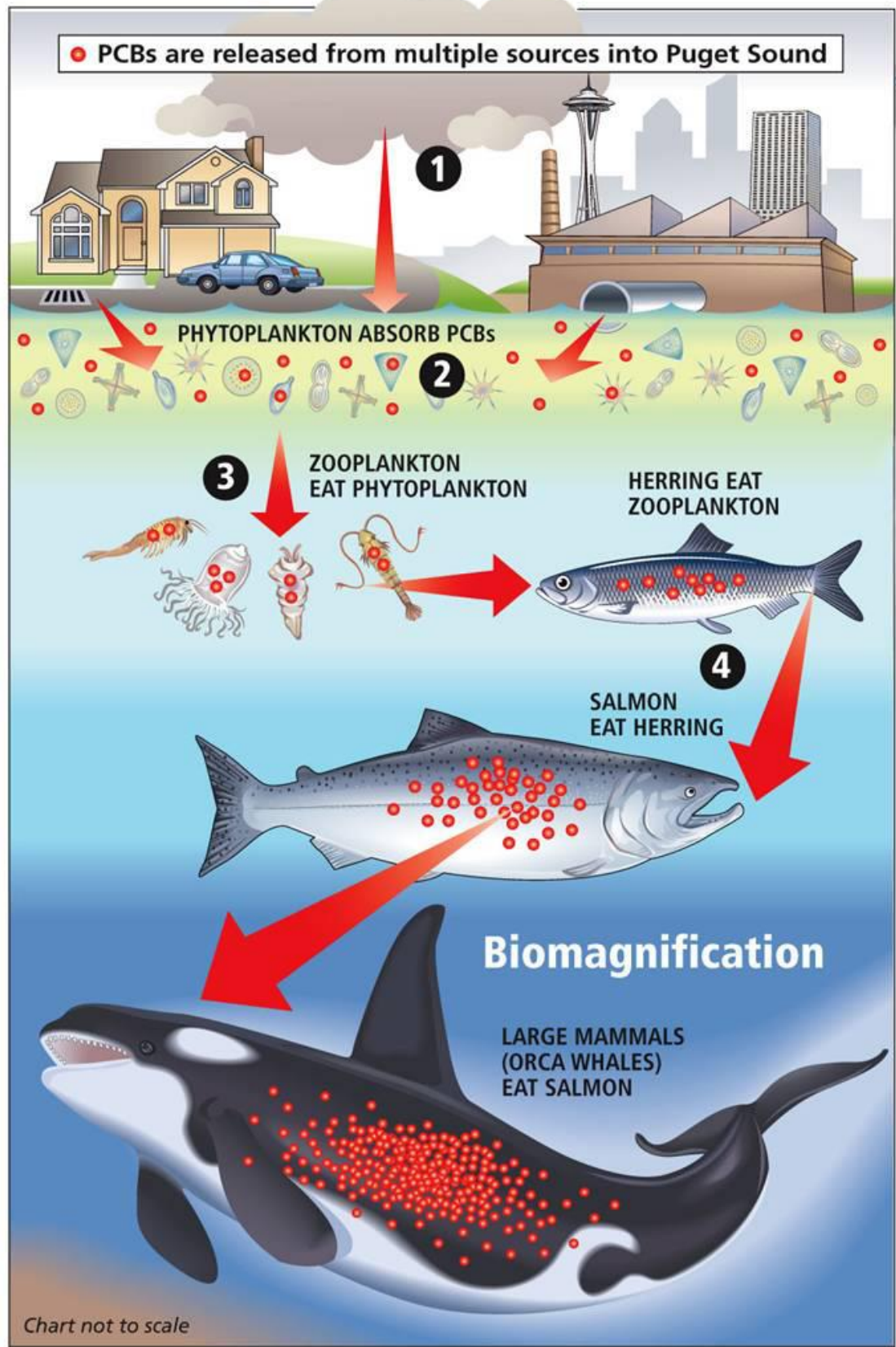


Image from [http://www.ecy.wa.gov/programs/hwt/RTT/pbt/images/pl\\_PCB.jpg](http://www.ecy.wa.gov/programs/hwt/RTT/pbt/images/pl_PCB.jpg)