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Columbia River Basin:
State of the River Report for Toxics
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www.epa.gov/region10/columbia

Which Contaminants are Found in People?

Two studies recently investigated the amount and type of toxic contaminants found in people. In 2005, ten Washington residents volunteered to have their hair, blood, and urine tested for the presence of toxics as part of the "Pollution in People" investigative study by the Toxic-Free Legacy Coalition. [2] Each person tested positive for at least 26, and as many as 39, of the 66 toxics tested for, including common pesticides; plasticizers and fragrances found in vinyl, toys, and personal care products; flame retardants found in electronics, mattresses, and furniture; lead, mercury, and arsenic; and both DDT and PCBs.

In 2007, ten Oregon residents representing a diverse group of people from rural and urban areas throughout the state volunteered to have their bodies tested in a study of chemicals in people conducted by the Oregon Environmental Council and the Oregon Collaborative for Health and the Environment. [3] Each person had at least 9, and as many as 16, of the 29 toxics tested for in their bodies. Similar to the Washington study, these toxics included pesticides, mercury, plasticizers, and PCBs. Every participant had mercury, PCBs, and plasticizers in their blood.

While some of these toxics found in people may come from consuming fish or wildlife in the Columbia River Basin, the majority of the toxics found in people come from everyday activities and products such as food, cosmetics, home electronics, plastic products, and furniture. A greater effort to reduce toxics in the products we produce and consume will be needed to limit human exposure and intake of toxics and to reduce the amount of toxics that we put into the ecosystem.

What about Hanford and radionuclides?

For more than 40 years, the U.S. government produced plutonium for nuclear weapons at the Hanford Site along the Columbia River. Production began in 1944 as part of the Manhattan Project, the World War II effort to build an atomic bomb. Plutonium production ended and cleanup began at Hanford in 1989. Over 600 waste sites have been identified in the immediate vicinity of the nuclear reactors. These waste sites have contaminated the groundwater with radionuclides (nuclear waste) and toxic chemicals, above drinking water standards. In certain areas, the contaminated groundwater has reached the Columbia River.

The waste sites and facilities near the River are undergoing an intensive investigation and cleanup effort. One part of that investigation will evaluate the risk to humans and other organisms in the Columbia River ecosystem from Hanford contaminants, including radionuclides, heavy metals, and some organic chemicals. The risk assessment results will be available in 2011. [5] Because of the ongoing investigation and cleanup efforts, this *State of the River Report for Toxics* does not focus on effects on the river from Hanford.

VISIT THE WEB For more information on the "Pollution in People" studies, visit the Toxic-Free Legacy Coalition: http://www.toxicfreelegacy.org/index.html and the Oregon Environmental Council: http://www.oeconline.org/pollutioninpeople.

VISIT THE WEB For more information about the Hanford cleanup, go to: http://yosemite.epa.gov/R10/CLEANUP.NSF/sites/Hanford and www.hanford.gov.

What are Emerging Contaminants of Concern?

A growing number of substances that we use every day, including pharmaceuticals, cosmetics, and personal care products, are turning up in our lakes and rivers, including the Columbia River. [4] These "emerging chemical contaminants" often occur at very low levels. With improved detection technologies, we are becoming more aware of their widespread distribution in the environment, and concerns are increasing about their potential impacts on fish and shellfish, wildlife, and human health. Hormones, antibiotics, and other drugs, which are commonly found in animal and human waste sources, are examples of emerging contaminants. Current-use pesticides and perfluorinated compounds—chemicals used in consumer products to make them stain- and stick-resistant—are other examples of emerging contaminants.

Emerging chemical contaminants include pharmaceuticals and other products that are not properly disposed. These contaminants are increasingly accumulating in waterways, including the Columbia River.

Although several of these emerging contaminants have been detected in water and sediment in the Lower Columbia River, information from locations elsewhere in the Basin is extremely limited. In response to these newly recognized contaminants, the U.S. Geological Survey (USGS) is sponsoring a four-year study in the Lower Columbia River addressing the movement of emerging contaminants from water to sediment, and through the food web to fish-eating birds, to evaluate the threat to the environment and human health.

Dioxins: A success story in toxics reductions

A 1987 EPA study showed unsafe levels of dioxin in fish from the Columbia River [6] Dioxins are persistent bioaccumulative toxins that can cause developmental and reproductive problems and potentially increase the risk of cancer. Dioxins are a byproduct of combustion and manufacturing processes, including bleaching paper pulp with chlorine.

In response to the study, in 1991 EPA collaborated with Oregon and Washington to require reductions in the amount of dioxin discharged by 13 paper mills to the Columbia, Snake, and Willamette Rivers. These pulp and paper mills subsequently changed their bleaching process, which reduced releases of dioxins into the Columbia River Basin.

Since 1991, dioxin concentrations in resident fish in the Columbia have decreased dramatically (Figure 3.3). [7,8,9,10,11,12] The dioxin content of osprey eggs has also shown a significant reduction in the lower part of the river. [13] However, dioxin is extremely persistent, and fish consumption advisories are still in place for some locations in the Basin.

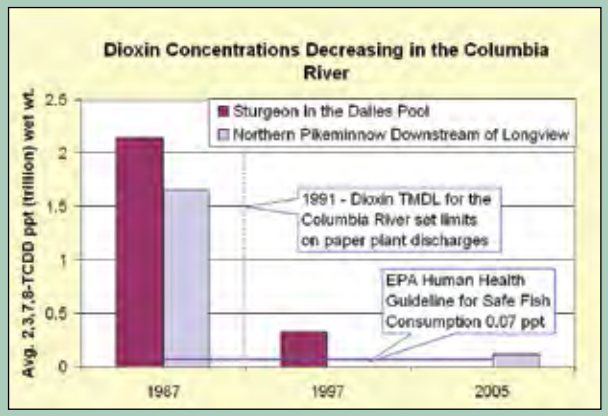

Figure 3.3: Dioxin levels in Columbia River fish have decreased significantly since pulp and paper mills changed their bleaching process, which reduced dioxin discharges in the early 1990s.

VISIT THE WEB For more information about dioxins in the Columbia River Basin, go to: www.deq.state.or.us/wq/TMDLs/columbia.htm and www.ecy.wa.gov/biblio/97342.html.