Lower Columbia Estuary Partnership

Toxic Contaminants in the Columbia River

2014 Science to Policy Summit Report

The Lower Columbia Estuary Partnership hosted our eighth annual Science to Policy Summit on toxics reduction Friday, June 13, 2014 at the Vancouver, Washington Hilton. One hundred scientists, community leaders, and natural resource practitioners joined the discussion. A panel of scientists presented emerging data on toxics in the lower river, their sources, and impacts on the ecosystem and humans. A second panel presented successes in reducing contaminants, including pesticide stewardship partnerships, child product safety legislation, and green purchasing. Representative Brad Witt (OR) and Representative Sharon Wylie (WA) co-hosted the event. Summit participants reviewed factors that made successes possible and identified opportunities to build upon them. ***One theme emerged: we need to expand funding for toxics reduction and elimination.***

The Issue: Toxics are Ubiquitous

Toxic contaminants are threatening the vitality of the Columbia River and our community. Toxics impact human health, plants and animals, and our economy. In 2013, Oregon and Washington health officials advised that eating certain resident fish from the Columbia River could have negative health effects on people. Fish that live their entire life near Bonneville Dam had elevated levels of mercury and PCBs.

What toxics do:

- PCBs harm our immune systems and increase cancer risks.
- Mercury affects the developing brains of children and alters behavior and learning.
- Contaminants in flame-retardants, pharmaceuticals, and other chemicals cause male fish to morph to females during their life cycle.
- Thirteen types of salmon that use the lower Columbia are listed as threatened or endangered under the Endangered Species Act.

Charge for the Day: Take Action

Debrah Marriott, Estuary Partnership Executive Director, opened the day with a charge to take action. We have known for many years that toxics are in our system. In 2007, we hosted our first summit on toxics, providing data from our recently completed monitoring. We followed in 2008 with a concerted discussion about what we need to do. Since then, we have worked with members of Congress to secure legislation to authorize funding for toxics reduction and clean up. The bill is close to being reintroduced.

The more we learn about toxics, the worse the news. Impacts of "new" contaminants of emerging concern, including chemicals in personal care products, pharmaceuticals, and flame retardants, have been added to previously known contaminants. Rates are increasing for some forms of cancer; hormone balances are disrupted; brain function is impacted. This contamination is the collective result of many activities over many years, is extensive, and requires comprehensive solutions. There is good news. Many industries, businesses, municipalities, states, growers, farmers, ports, and others are voluntarily reducing contaminants.

Debrah urged us to heed the call of Native Americans and consider the impact of our choices on the seventh generation of our children's children, to be able to look our children in the eye and know we did everything we could to make this world good for them.

Update: US Senator Merkley (OR) and Congressman Blumenauer (OR) reintroduced the Columbia River Restoration Act on July 28, 2014.

The Challenge

Representatives of Washington and Oregon Governors and Estuary Partnership Board Members Rob Duff and Gabriela Goldfarb set a challenge.

Robert Duff, Office of Washington Governor Inslee
The State of Washington has taken steps to reduce toxics in numerous ways. It established green purchasing standards with Oregon and adopted child product safety legislation. It is wrestling now with fish consumption rates. Admitting past mistakes and acknowledging that some of these contaminants are here to stay is key. Some, like organochlorines, were designed to be persistent in order to do things they were intended to do – control pests. Thinking about the contaminants we use today and the impacts of their continual release will help shift our outcome. We need to look forward, including examining federal statutes – some of which still allow the use of these contaminants.

Rob challenged us to shift our paradigm. Many problems we face today start with the products we use and the choices we make. He encouraged us to go further to look at sources and assess the synergy of toxics; we can't look at contaminants in isolation. There are successes that have led to better choices and less toxics and green chemistry can provide the focus for better product design.

Rob encouraged us to be bold in our approach – sometimes the best choice is to just not use the toxics. That option has no harmful impact to human health, and no cost to clean up or treat. Change is imperative for our children. One in thirteen now have learning disorders linked to persistent exposure to PCBs, lead, mercury, and other toxics. What are the next chemicals we uncover as harmful? Using them until we learn the ramifications is not an appropriate course.

Gabriela Goldfarb, Office of Oregon Governor Kitzhaber
The State of Oregon is actively reducing toxics in the environment. Governor John Kitzhaber's green chemistry executive order created systems and incentives to companies who provide less toxic janitorial products used in state government buildings. Companies are responsive, in part because it offers an opportunity to differentiate themselves from others. The state's procurement staff are also responsive in pursuing cleaner, less toxic products, giving their work a broader mission.

The State of Oregon is developing a janitorial supplies pilot with the State of Washington. Next, Oregon plans to take a similar approach with office supplies, which has the potential for broad impact, especially if other states and local governments adopt and apply Oregon's guidelines. Because of the volume of the state's purchasing, these efforts increase the demand for less toxic products and increase their availability for other consumers.

Oregon is working to further reduce flame retardants (the state banned products with more than 0.1% of three different flame retardants in 2011). Oregon also adopted the most protective criteria for human fish consumption in the nation – a criteria that had a long history of development and took a great deal of leadership. It was not an easy decision or process, but it was the right thing to do.

Gabriela concluded that Oregon's efforts along with the work of the people attending the summit would make a real difference to the Columbia River and the region's children. We each share in creating that legacy.

"We stand now where two roads diverge. But unlike the road in Robert Frost's familiar poem, they are not equally fair. The road we have long been traveling is deceptively easy, a smooth superhighway on which we progress with great speed, but at its end lies disaster. The other fork of the road – the one less traveled by – offers our last, our only chance to reach a destination that assures the preservation of the earth." - Rachel Carson

The Science: Emerging Data About Toxics in the Columbia River

Jennifer Morace, Hydrologist, United States Geological Survey, *The Pathways and Effects of Toxics in the Columbia River and the Unknowns*

USGS reported on recently completed work with the Estuary Partnership and others, which included several studies. These studies found contaminants in water, sediment, fish, birds, and the aquatic food web with higher concentrations of most toxic contaminants in the urban corridor of Portland to Longview.

Specifically, the Estuary Partnership Ecosystem Monitoring Program documented contaminants in lower river juvenile salmon and their food. The "Characterization of Contaminants in Wastewater Treatment Plant Effluent and Stormwater Runoff" assessed contaminants at nine cities along the lower Columbia River. Tests found 112 compounds in wastewater. Current wastewater treatment facilities can not test for or treat these compounds. The study also found 114 compounds in stormwater. Trace elements and PAHs, which are related to automobiles and impervious surfaces, were the most widespread compounds detected.

The "Columbia River Contaminants and Habitat Characterization" study tested water column, sediments, invertebrates, resident fish, and ospreys. It documented exposure to contaminants; bioaccumulation and magnification of contaminants within the aquatic food web; and indicated genetic and reproductive effects to organisms.

Many of the compounds studied could be characterized as "pseudo-persistent" chemicals because they are constantly being introduced in the environment through human use, causing frequent exposure for aquatic organisms.

Paul Lumley, Executive Director, Columbia River Inter-Tribal Fish Commission, *PBDEs, PCBs and Mercury Presence in the Columbia Basin*

Columbia River tribes eat 6 to 11% more salmon than the general public, and we know the river is contaminated with toxics that impair fish and human health. The recent fish advisory on the Columbia River is very disturbing for tribes because fish are central to their culture. In 2011 and 2012, Future of Our Salmon conference presentations called for short and long term policy needs. Short term needs are: make existing policies stronger, develop incentives to affect people's choices, and increase the supply and demand for safer alternatives. Long term needs are: continue to support the Columbia River Restoration Act (CRRA), reform the Toxic Substances Control Act, ask companies to make products safe, and support better toxics research. Paul noted that the Columbia was designated a "Large Aquatic Ecosystem" in 2006 by EPA, but it is the only one not funded.

Important studies in the basin include the 2002 EPA/ CRITFC Fish Contaminant Study and the 2009 State of the River Report for Toxics. NOAA research on PCBs and PBDEs reveal concentrations in juvenile fall Chinook salmon from the lower river high enough to change thyroid function; reduce disease resistance; impair growth and metabolism; and impact reproduction.

In addition, mercury is found in the Columbia Basin and toxic contaminents are bioaccumulating in endangered juvenile salmon, Pacific lamprey, white sturgeon and in the food chain. CRITFC studied contaminants in lamprey with USGS and found high concentrations in the larval stage. Based on these studies, the EPA approved Oregon's surface water quality standards using a fish consumption rate of 175 grams/day. Other states' standards use consumption rates that are too low, especially given the consumption rates of several cultures.

CRITFC currently is supporting two resolutions. The first will require EPA change laws that still allow up to 50 ppm of PCBs to be used or discharged, and a second will amend the outdated Insecticide, Fungicide, and Rodenticide Act. The resolutions will protect the subsistence rights of indigenous people, and protect their health and the health of salmon.

Nat Scholz, Ecotoxicology Program Manager, NOAA Fisheries, *EcoToxicology: Impacts of Toxics in Stormwater on Salmon & the Effectiveness of Green Stormwater Infrastructure*

Stormwater runoff introduces toxic pollutants into freshwater and estuarine habitats that are potentially lethal to salmon and other aquatic species. In partnership with Washington State University and USFWS, the EcoToxicology Program studied the effects of urban runoff as it relates to the survival of adult coho salmon for over a decade. The study first looked at habitat restoration work in west Seattle that enhanced and opened up habitat on Longfellow Creek.

Intensive evaluation of the project found that adult coho mortality was occurring, with 60% to 90% of the returns dying prior to spawning. Surveys expanded to other urban watersheds and found pre-spawning mortality to be a recurrent problem.

Analysis found that the amount of impervious surface and road density within a drainage closely corresponded with the rate of pre-spawn death by adult coho.

Additional experiments collected highway stormwater runoff after rainstorms. Coho adults were placed in tanks with urban runoff in one and clean water in the other. After three and a half hours, fish in the stormwater tanks became lethargic and severely stressed, with 100% mortality occurring after four hours of exposure. All fish in the clean tanks free of stormwater runoff survived.

Over 200 different chemicals combinations were identified in the runoff, including heavy metals and hydrocarbons. Experiments captured urban runoff and filtered it through multiple cleaning systems to identify the effectiveness of cleansing the water. Mortality rates remained consistent with the previous analysis.

The results of these experiments show that stormwater runoff has deleterious health effects on aquatic biota and humans, and treating stormwater is costly and does not eliminate exposure to the contaminants. Using salmon as an indicator species, we can assess the effectiveness of pollution reduction strategies and work to improve water quality.

Coho salmon unexposed to stormwater (3.5 hrs)

Coho salmon exposed to stormwater (3.5 hrs). 100% mortality occurring after four hours of exposure.

Toxics Reduction Activities

Kevin Masterson, Toxics Coordinator, Oregon Department of Environmental Quality, *Pesticide Partnerships and Reduction*

Oregon has gained significant reduction in pesticides entering waterbodies. Using localized, watershed-based partnerships, Oregon's Pesticide Stewardship Partnerships (PSPs) work with state agencies, natural resource groups, tribal governments, landowners, and growers to reduce toxic pesticides in our waterways. PSPs monitor pesticides in waterways with stakeholders to voluntarily adjust practices that have heavy pesticide-use, and monitor results. The first PSP pilot program began in Hood River in 2000, and has grown to eight PSPs in seven watersheds. PSP actions include training growers how to reduce spray drift, assisting in integrated pest management, implementing buffer strips and reducing spraying near streams, and encouraging the use of less toxic pesticides.

Kevin highlighted several successes from Hood River, Wasco, and Walla Walla in reducing various pesticides in local creeks. In one instance in the Wasco watershed, mathalion concentrations were reduced from eight times over the water quality level to below the accepted level in just two years. In the Yamhill watershed, spraying techniques have been improved to reduce pesticide use by 35% and drift by 99%. PSPs received a boost in 2013 when the Oregon legislature allocated stable funding to continue the program, expand it to two additional watersheds, refine monitoring efforts, host seven pesticide collection events over two years, and provide technical assistance to current PSPs.

Josh Grice, Research Analyst, Washington Department of Ecology, *Child Safety Products Legislation*

Washington State's Children's Safe Product Act (CSPA) was passed in 2008 banning various toxics, including lead, cadmium, and phthalates, in products designed for children, such as children's toys, jewelry, clothing, cosmetics, and car seats. The CSPA requires reporting to the Department of Ecology (Ecology) on Chemicals of High Concern to Children (CHCC) present in children's products. These chemicals are linked to cancer, reproductive disruption, and endocrine disruption.

Data gathered by Ecology so far shows that many chemicals thought to be successfully banned are still in products – over half of phthalates reported are permanently banned under federal law. An alarming finding: 63% of contaminants listed in products have no reported function. Ecology has an online database of CHCC in children's products searchable by chemical, product type, and company.

Alice Brawley-Chesworth, Regulatory and Policy Analyst, City of Portland, Bureau of Environmental Services, *Wastewater Management & Treatment: What it can do and what it can't*

Wastewater plants are highly successful in removing solids, pathogenic bacteria, and bulk nutrients. They are not designed to remove all toxic chemicals. Alice explained that existing treatment options, such as micro filtration or reverse osmosis, are not sufficient to remove many toxics. Adding technologies to reduce toxics in wastewater bring important impacts to consider: increased treatment costs of 70%; increased land consumption needed for treatment plants; increased energy use and greenhouse gas emissions; increased chemical demand; and disposal of additional solid and contaminated liquid waste. Further complicating efforts, 500 to 1000 new chemicals are found in waterways each year.

Alice concluded that efforts to prevent toxics from entering wastewater are preferable. It is more cost effective than developing and implementing new technologies at all wastewater facilities, and it removes exposure to contaminants.

Kevin Scribner, Salmon-Safe, *Growers: Voluntary Reduction in Pesticides*

Salmon-Safe has been certifying farms, vineyards, university and corporate campuses, parks, residential developments, and large-scale construction from northern California to British Columbia for over 17 years. Salmon-Safe focuses on pesticide reduction and water quality protection, and provides a voluntary, incentivized third-party certification to landowners who want improve water quality. The Salmon-Safe certification tells consumers that they are supporting farms, businesses, and developments that use ecologically sustainable agricultural practices that protect water quality and native salmon. There are more than 350 Salmon-Safe landowner success stories in the Columbia Basin.

Kevin profiled five specific farms and businesses. In 2013, Roy Farms of Yakima became the first Salmon-Safe certified hops grower in Washington, with 150 organic acres certified. Roy Farms subsequently partnered with Portland's Hopworks Urban Brewery to create a Salmon Safe IPX using their Salmon-Safe grown hops.

Over the past decade, Salmon-Safe has expanded into the urban landscape in order to acknowledge the need for equity between rural and urban landowners to protect water quality. The 175-acre Nike World Headquarters campus was certified as Salmon-Safe in 2005, and was the first corporate campus to receive the Salmon-Safe label. In 2013, the City of Portland began a challenge for all city bureaus to evaluate their impact on habitat and water quality, and to become Salmon-Safe within two years.

Roger McFadden, Senior Scientist, VP, Staples, Inc., *Corporate Changes: Transitioning to Safer Chemicals, Materials and Products*

Staples has expanded its corporate ethic and action to be more environmentally sustainable, and has adopted an aggressive approach to decreasing their use of toxic chemicals. Among their changes, they now stock and use fewer products containing toxic chemicals. They focus on the chain of the product from development to disposal. Roger discussed key factors that can affect a business' decision to increase their environmental sustainability: scientific findings on health and environmental hazards, customer demand for transparency and safe products, and maintaining a positive brand identity.

A strong brand identity and good brand reputation with consumers are major factors in business decisions. In the age of social media, consumers are able to share experiences with businesses instantly, either helping or harming brand image for a company. Often, individuals trust what other consumers say about a company more than what the company says about itself. This can be a strong motivator for businesses to be transparent and increase their "green" reputation.

Roger reminded us that chemicals are key to retailers and the public, with new chemicals often increasing productivity, quality, and convenience in our lives. To manage the use of toxic chemicals, Staples employs the Chemical Footprint Project, which allows a company to assess their current chemical use and progress, choose suppliers that are leaders in using less toxics, and share information about chemicals. Staples challenges suppliers to improve their products by handling chemicals of concern as contaminants, and considering potential exposure to vulnerable populations, life cycle impacts and cost, and green chemistry options.

Using safer chemicals in products not only protects consumers, the environment, and future generations, it also safeguards corporate brands, and creates shared value for consumers, the company, and the community. Roger concluded by saying that what drives him is to know he has done his best to leave to his grandchildren a place that is healthy for them.

Participant Discussion

Attendees convened in small groups to discuss what factors contributed to success stories, how to expand successes to become mainstream, and what role the Estuary Partnership can play. Several specifics emerged:

1) Have credible, on-going science and data to build successful strategies.

2) Communicate data and information clearly in terms that matter to the public. Be clear about the implications.

- Messaging needs to be simple to understand, and tailored to focus on what matters to people as individuals. Make it personal.
- Don't hide the facts or the impact. People want to know how contaminants can affect them.
- Share success stories to motivate change.

3) Give choices and specific steps that individuals and businesses can take to decrease their use of toxics and make a difference.

4) Link positive environmental outcomes and economic drivers to make change attractive to businesses.

5) Create a market for safe products. Follow the states' lead with janitorial supplies and child products safety. Getting large corporations and government agencies on board can create a greater impact, as it can drive supply and demand changes.

- Develop a toxics-free brand, similar to Salmon-Safe. This 'stamp of approval' could be a way to provide choices in a simple and comprehensible way.
- Find economically-viable alternatives to toxic chemicals, as many toxic chemicals play a valuable role in industry and society. Funding should be allocated for research into "green" chemicals.

6) Engage and educate the next generation so they can be environmental stewards and make informed decisions. In doing so, they influence their families and peers.

7) Use a mix of tools.

- Non-regulatory approaches are effective and need to be expanded.
- Peer-to-peer exchanges are most effective.
- Regulations are a part of the mix, like the CFC ban imposed in 1978 and the children's safe product laws Washington recently passed. We can do it again.
- Regulatory processes need to recognize activities that are reducing toxics and put those on a different path than actions that would cause harm or use toxics.

8) Find Leaders. Strong and dedicated leadership is absent right now.

- We need to think longer than two, four, or six year election cycles.
- Decisions should reflect the right thing to do, even if not popular.
- Individual and institutions need to be pushed forward and motivated.

9) Pass the Columbia River Restoration Act – get funding to clean up and reduce and remove toxics. We have great successes; we need far more of them.

10) Find our common ground. We have more in common than sometimes we make evident. Promote collaborations and include as many different stakeholders as possible. Build trust between stakeholders. Remove our labels and business titles, and focus on what matters in our hearts…and to the seventh generation of our children's children.

Message from the Co-Host

The Honorable Brad Witt, Oregon House of Representatives, and Honorary Member of the Estuary Partnership Board of Directors, offered a strong reminder that we need to make sustainable choices. We need to make sure the paths we take forward support the people who live and work in the lower Columbia communities.

Closing

Dan Opalski, US EPA Region 10 Director, Office of Water and Watersheds

Dan closed the summit with a moving call to action. He discussed EPA's commitment to the Columbia River and talked about their efforts here. But he noted that there is more to what brings us together than that.

The choices we make today will affect the world our children have tomorrow. Regulations and monitoring are important, but protecting our waterways and eliminating toxics will take good choices – choices that likely will not all be easy.

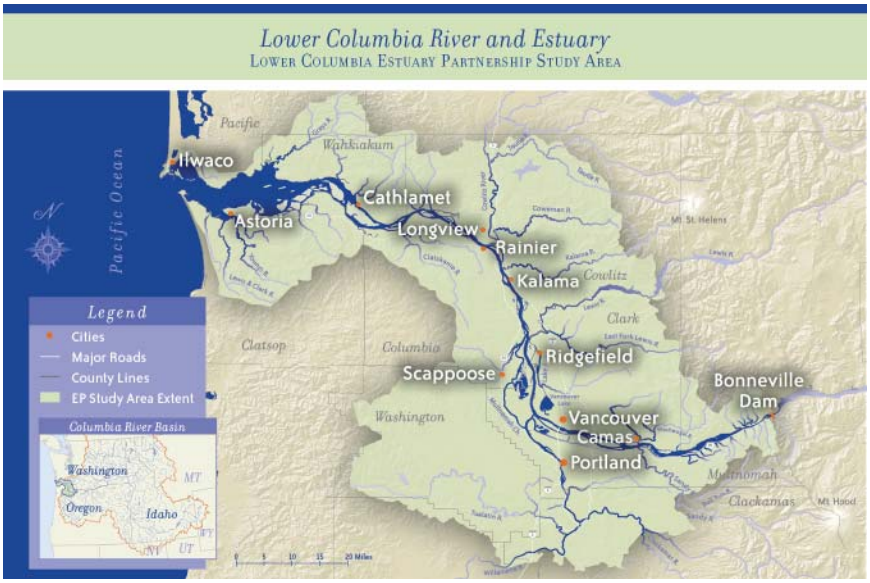
They will require we work together, work from what matters, perhaps even remove our business viewpoints and think about what is paramount. And that is pretty simple.

Our job is to make our children safe.

The Estuary Partnership

The Lower Columbia Estuary Partnership was created in 1995 by the governors of Washington and Oregon and the US Environmental Protection Agency when the lower Columbia River was designated 'an estuary of national significance,' making it one of 28 National Estuary Programs. To address the more than 50% habitat loss and contaminated water, sediment and fish tissue, they wanted an entity to provide regional collaboration, unify efforts, and fill gaps to advance on-the-ground improvements.

We develop and manage habitat restoration projects, working with hundreds of partners to restore over 20,419 acres of habitat since 2000. We developed a scientific framework to assure our investments in restoration are strategic and cost effective. We monitored toxics in the lower river and focus on reducing toxics. We provided 58,398 students with over 285,000 hours of instruction in outdoor education programs; helping over 2,405 teachers meet science benchmark requirements. Over 11,132 volunteers and students have planted over 69,925 native trees and shrubs to help protect riparian corridors and restore habitat.



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