Analysis

POPs

The politics of uncertainty

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The data create a chantilly lace-like pattern, where the pattern emerges as much from the gaps as from the information in hand.
—Pete Myers, co-author *Our Stolen Future*

"We don't have enough data," is a familiar refrain heard in many political circles brought together to address a range of issues. Lack of data, uncertainty, and ignorance regularly derail many political processes ranging from fishery management to evaluating the impact of chemicals on human health. Government agencies are often paralyzed in the face of uncertainty.

Often, the politics of uncertainty is used to preserve the status quo and to avoid taking the necessary steps to prevent harm. Sometimes uncertainty about the full potential impact of certain activities or substances allows their introduction into commerce before their effect is fully realized, often leading to not-so-pleasant surprises.

The best-documented cases of political uncertainty are seen in the history of pollutants and their impact on human health and the environment. It is evident this uncertainty has wreaked havoc across species and ecosystem lines. In its 2002 report *Late Lessons from Early Warnings*, the European Environmental Agency (EEA) tracked the history of action and inaction in response to early warnings through 14 case studies.

"The key point in each case concerns the length of the gap between the specific problem being identified and effective action being taken. The answer for many case studies was that the gap was long, certainly many years or decades, and, in some cases, of the order of a century," said David Gee of the EEA, one of the co-authors of the report speaking at a conference at the University of Massachusetts' Center for Sustainable Production in Lowell, Massachusetts. "The case studies also provide many examples where 'early warnings,' and even 'loud and late' warnings, were clearly ignored; where the scope of hazard appraisal was too narrow; and where regulatory actions were taken without sufficient consideration of alternatives, or of the conditions necessary for their successful implementation in the real world."

One of the case studies in the European report involves polychlorinated biphenyls or PCBs. Recent reports identifying high levels of PCBs in farmed salmon in some cases, up to 16 times higher than levels in wild salmon have been the subject of news stories globally.

The studies suggest that PCBs are found in the salmon feed, which includes small pelagic fish. To mitigate this problem, many of the studies have recommended that salmon farmers get their feed from areas where the fish are found to have lower levels of PCBs.

The Salmon of the Americas (SOA), a salmon aquaculture industry-marketing consortium representing salmon farms in North America, Chile and Canada, is trying to respond to the reports. "We know this is a problem and we're talking with the suppliers, telling them that they need to reduce their PCBs," says Alex Trent of SOA. "But wild salmon are also contaminated the same way as the farmed because they're eating the same fish."

Food chain

In fact, high levels of PCBs and other pollutants have been detected in wild animals, particularly those on top of the marine food chain such as whales,

porpoises, sea lions, sea birds and larger fish.

According to the EEA report, the impact of PCBs on marine and other wildlife was documented as early as 1966 when Soren Jensen discovered an unknown molecule in the muscle of white-tailed sea eagles in higher levels that in the fish the eagles were eating. By the time he published his findings in 1969, he had presented information showing "remarkably high PCB concentrations in a large proportion of the Baltic Sea fauna."

At the same time, infertility was leading to a reduction in the population of three seal species in the Baltic Sea. Some studies suggested that all three species had high levels of PCBs and dicholorodiphenyl-trichloroethane (DDT). A 1998 report by the Swedish Environmental Protection Agency cites studies that link high PCB levels in seals to reproductive disorders, skin and claw damage, and damage to the intestines, kidneys, adrenal glands and skeleton.

No other well-known chemical might better exemplify the persistent nature of some pollutants than PCBs. PCBs were first developed in a lab in 1881. By 1899, chloracne, a pathological condition resulting in painful and disfiguring skin disease, was identified in people working in the chlorinated organic industry. Yet production continued.

Monsanto began mass-producing and marketing PCBs in 1929, primarily for use in electrical equipment and as ingredients in polyvinyl chloride (PVC plastics, paints, carbonless copy paper, lubricants and adhesives.

By the mid-1960s, evidence showed that PCBs were not staying in the products but instead in the environment, food chain and people. Despite the early evidence and a string of worker-related illnesses spanning three decades, PCBs were not banned in the US until 1976, when the Toxics Substances Control Act was enacted. Production in the US finally ceased in 1979. In other parts of the world, particularly in eastern European countries, production continued until the mid-1980s.

Today, we know that PCBs belong to a class of chemicals commonly referred to as Persistent Organic Pollutants (POPs). POPs are highly toxic, fat soluble, synthetic chemicals found in common, everyday products or as by-products of some industries. Once released into the environment, POPs can travel vast distances across air and sea currents. POPs accumulate in fatty issue and are passed up the food chain as one animal eats another organism.

"The PCBs found in farmed salmon further speaks of the persistent nature of these chemicals. Thirty years after it was banned, PCBs are out in the environment from historic uses and disposal circulating around and showing up in the food chain," said Mike Belliveau, Executive Director of the Environmental Health Strategy Center in Bangor, Maine, a non-profit organization that advocates for safer alternatives and cleaner industry through building partnerships.

Belliveau's organization is part of national and international networks working to eliminate certain known POPs and advocating for the development and use of safer alternatives.

"Despite what we know about PCBs and similar substances, today there are many chemicals in commerce that are similarly persistent, and should have not been allowed to be marketed and distributed," says Belliveau. "Now they are showing up in the food chain and they are showing up in fish and other marine animals. Once they are in the food chain, they become part of our diet."

Indeed, the presence of PCBs in farmed salmon shows that persistent pollutants are in the marine food chain. Many commercially valuable fish such as wild salmon, cod, tuna and haddock undergoing rebuilding plans feed on the same small pelagic fish that constitute portions of the farmed salmon feed. Yet, the impact of persistent pollutants on the reproductive and immune systems of marine animals is not thoroughly studied nor taken into account when devising management plans for the marine environment.

"The traditional fishery biologists are ignorant of the plausible effects of endocrine disruptors on fish," says Pete Myers, CEO of the Environmental Health Sciences (EHS) and co-author of *Our Stolen Future*, a 1996 book exploring the world of endocrine disruptors. EHS is engaged in advancing public understanding of environmental links to health. According to www.ourstolenfuture.org, "The investigation begins with wildlife, as it was in animals that the first hints of widespread endocrine disruption appeared."

Although *Our Stolen Future* moves from animals to people to make its case, it does examine "a series of experiments examining endocrine disruption of animals in the laboratory that show conclusively that fetal exposure to endocrine disrupting chemicals can wreak life-long damage."

Safer alternatives

Pointing to studies such as those outlined in the book, efforts are on the way at State, regional and international levels to act on early warnings, advocate the use of safer

alternatives to toxic materials when available, and to eliminate certain known toxicants from the production processes.

Through the United Nations Environmental Program (UNEP) the international community has agreed to eliminate POPs from the environment through the ratification of the Stockholm Treaty. They have prioritized a list of 12 particularly potent POPs referred to as the "dirty dozen" as needing urgent action.

Alex Trent of SOA believes such actions as the Stockholm Treaty are needed to address the issue of PCBs. "We live in a world where we've put a lot of stuff that shouldn't be there. We will absolutely support the international efforts to ban the dirty dozen," said Trent.

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