Persistent Organic Pollutants - The Stockholm Convention

POPs are passed from mother to child mainly through breast milk. Levels of PCBs in the blood of some Inuit women are higher than Health Canada guidelines, and levels of certain POPs in breast milk have been found up to nine times higher than those in women who live in southern Canada.

Persistent organic pollutants persist! Therein lies the problem. Years after they have been banned, they can still be found in the environment - intact.

PCBs, DDT, toxaphene and dioxins are some of the pollutants in question. They do not break down easily and they accumulate in the fatty tissue of fish and animals. They also biomagnify, so that their concentration increases with each step in the food chain.

Most of the persistent organic pollutants (POPs) in the Canadian environment are a legacy of past uses within Canada and the northern United States.

They also continue to be transported in the atmosphere from distant sources in the southern United States, Mexico, Central America, Eastern Europe and Asia.

POPs tend to be found at high concentrations in top predators in Canada's North, though high levels are also found in fish and wildlife in the Great Lakes and St. Lawrence basin.

The geographic location and socio-economic activities of Aboriginal people in the North make them particularly susceptible because they eat traditional foods contaminated by these pollutants.

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NWRI and Persistent Organic Pollutants

In the Canadian and circumpolar Arctic, NWRI scientists continue long-term research on the extent of persistent organic pollutants in the environment and their biological effects, for example:

- they are currently studying POPs in landlocked char fish in Resolute and Char lakes in the central Canadian archipelago, and collecting annual samples to follow changes over time;
- along a north-south transect in the Canadian Arctic, they use lake sediment cores to gain a better idea about the sources, long-range transport and impacts of new and old organic pollutants;
- to learn more about the behaviour of contaminants in high Arctic lakes, they developed a model and applied it to Amituk and Char lakes. Their results suggest that some Arctic lakes act as conduits, not sinks, for chemicals, with much of the annual contaminant loading from snowmelt exported from the lake in runoff water;
- NWRI scientists regularly visit small communities in the North to share the results of their research on POPs in fish and marine mammals with local residents;
- working with other experts in the international Arctic Monitoring and Assessment Programme, NWRI researchers contributed significantly to the scientific assessment of POPs in the circumpolar Arctic. The assessment report brought together all data available on organic pollutants in Arctic air, seawater, sediments, and terrestrial, freshwater and marine biota and gave governments of the eight Arctic countries a clearer picture of the state of the Arctic environment; and
- NWRI scientists also led the Canadian Arctic Assessment Report on POPs and mercury in fish and wildlife.

Photo credit: Derek Muir

Impacts of NWRI Research on Decision Making

NWRI research helped prompt national and international recognition of the need for global action on POPs. Canada became the first country to sign and ratify the United Nations POPs Convention in 2001 - more commonly known as the Stockholm Convention (which entered into force on 17 May 2004).

This global agreement will reduce or eliminate emissions of twelve toxic substances known as the "dirty dozen," a group that includes PCBs, DDT, dioxins and furans.

Canada was the first country to commit specific funding to aid developing countries and those with economies in transition to build their capacity to deal with POPs. The Canadian Government provided $20 million to the Canada POPs Fund in March 2000.

Canada is also a signatory to the United Nations Economic Commission for Europe's POPs protocol that lists 16 chemicals (the Stockholm Convention 12 and 4 more) for a phase-out by countries of western Europe including Russia, and Canada and the United States.

Interestingly, much of NWRI's research expertise on the transport of POPs started with identifying the extent of contamination in the Great Lakes in the 1970s. This research became a significant contribution to Canada's Toxics Substances Management Policy, which preceded the Stockholm Convention by some 10 years. It was also instrumental in forging Annex 15 (on Airborne Toxic Substances) of the Great Lakes Water Quality Agreement, which calls for pollution control measures to reduce atmospheric deposition of toxic substances.

Benefits to Canadians

With its vast northern landscape, Canada is particularly vulnerable to the threats to human health and environmental security posed by persistent organic pollutants. A sustainable and prosperous northern economy ultimately depends on a safe and sustainable environment.

NWRI research directly benefited Canadians by playing an essential role in shaping the Stockholm Convention, a first step in protecting human health and the environment by dramatically reducing or eliminating emissions of some of the world's most hazardous chemicals. This international agreement has become a powerful tool in helping all countries maintain their domestic effort on POPs: fostering global action on a truly global problem.

NWRI research continues to benefit Canadians by producing vital scientific information on new POPs and their risk to the environment, information that will support further international, national and regional agreements and initiatives to protect the Canadian and global environment from the dangers of toxic chemicals.

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