

US EPA ARCHIVE DOCUMENT

Survey of New Findings in Scientific Literature Related to Atmospheric Deposition to the Great Waters

Fact Sheet

Action:

- The U.S. Environmental Protection Agency (EPA) has issued two reports that compile recent scientific information related to emission sources, deposition trends and concentrations in aquatic environments of special concern known as the Great Waters. These reports, titled “Survey of New Findings in Scientific Literature Related to Atmospheric Deposition to the Great Waters” focus on two pollutants of concern: polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCB). The reports are available at: <http://www.epa.gov/oar/oaqps/gr8water>.
- Atmospheric deposition of pollutants has been recognized as a significant contributor in many locations to water quality problems, including toxic contamination of fish and accumulation of those toxins in the wildlife and humans that consume them. The Clean Air Act directs the EPA to consider the contribution of atmospheric deposition to pollution in the “Great Waters.”
- The Great Waters comprise the Great Lakes, Lake Champlain, Chesapeake Bay, and coastal waters that are National Estuarine Research Reserves under the National Oceanic and Atmospheric Administration (NOAA) or National Estuary Programs under EPA. Under the Great Waters Program, EPA was required to prepare biennial Reports to Congress on Deposition of Air Pollutants to the Great Waters.

Key Findings:

- The reports include results from studies of deposition of PAH and PCB at several more Great Waters than reported in the previous reports to Congress, including Galveston Bay, Corpus Christi Bay, San Francisco Bay, Tampa Bay, and sites throughout New Jersey. In addition, new research related to the Great Lakes is reported.
- For both pollutants, concentrations are higher in urban and industrial areas than in rural areas. These findings are consistent across several studies in different geographic areas where concentrations were measured. In general, the reports’ findings are consistent with conclusions described in the last Great Waters Report to Congress, published in 2000.

PAH:

- In the Great Lakes region, long-term monitoring of PAH concentrations related to deposition generally shows no trends (i.e., there is neither an increasing or decreasing trend). In Chicago, however, concentrations in precipitation and air decreased between 1997 and 2003.

- In coastal areas, NOAA Mussel Watch provides long-term information about PAH and other toxic pollutants in the environment by measuring concentrations in mussels at over 200 sites, including sites in Great Waters. The median PAH concentration across all sites showed a decreasing trend between 1986 and 2002. However, at most individual Mussel Watch sites, there are no trends in PAH concentrations.
- Various statistical modeling analyses were used to examine the types of emissions sources responsible for the deposition, and their geographic areas relative to the Great Waters.
- Emissions primarily result from combustion of fossil fuels, including wood combustion, mobile sources, and coke ovens. There is regional variation among which types of sources are the most significant contributors. For instance, in the Galveston Bay/Corpus Christi Bay region the major sources are combustion and petroleum vaporization and in the Chesapeake Bay/Baltimore region the major sources are combustion of coal, oil and wood, and gasoline and diesel vehicles.

PCB:

- In the Great Lakes and southern New Jersey, PCB concentrations in fish and fish-eating birds are declining since the 1970s, and populations of these birds are increasing. Nevertheless, levels in fish in the Great Lakes continue to be high enough to be of concern for wildlife.
- State and tribal advisories for human consumption of fish were in effect in 2004 for all the Great Lakes, Lake Champlain, coastal waters of the northeastern states, Chesapeake Bay and its tributaries, San Francisco Bay and Puget Sound. The Mussel Watch data show a decrease in the median PCB concentration in mollusks nationally. However, most individual sites show no trend.
- Although PCB compounds are no longer manufactured, they are still being emitted into the air due to historical sources. PCB were used widely in electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; and in pigments, dyes and other products. The EPA's National Emission Inventory cites open burning of household waste as the largest contributor nationally. A modeling study specific to Chicago identified as PCB sources a large transformer storage yard, municipal sludge drying beds, and a landfill, among others.
- In many of the Great Waters, PCB in the water from historical contamination is volatilizing at a higher rate than PCB are being deposited to the water.

Additional Information:

- For additional information about these reports, please contact Gail Lacy at 919-541-5261 or lacy.gail@epa.gov.