

## Research in Green Bay Preceding Superfund

During the Twentieth Century, PCBs in the Lower Fox River and the Bay of Green Bay become the focus of many academic researchers from a wide variety of backgrounds and origins. Academics from the U. of Wisconsin and other universities, as well as the research arms of the U.S. Fish and Wildlife, the U.S. Geological Survey, the U.S Environmental Protection Agency, the Wisconsin Department of Natural Resources, and the Canadian Wildlife Service all studied PCBs in the Fox River and Green Bay system from the 1960s through the 1990s. Some of them studied how PCBs moved through the Fox River and into Green Bay. Others discovered PCBs in birds of outer Green Bay and tried to determine the sources. Still others studied the effects of PCBs on biota and people, both in terms of health and economics. Many prominent researchers laid essential groundwork that long preceded cleanup and restoration discussions under the Superfund law.

For example, in 1936, the Patuxent Wildlife Research Center in Maryland became the first wildlife experiment station in the U.S., and it later became part of the U.S. Fish and Wildlife Service when the agency was established in 1940. In the 1960s, Patuxent started the Fish and Wildlife “Contaminants Program,” based on earlier investigations of pesticides, especially DDT. Rachel Carson’s seminal book, *Silent Spring*, was largely based on DDT research conducted at Patuxent. In 1975, Patuxent moved its wildlife health research to the new National Wildlife Health Laboratory in Madison, Wisconsin and consolidated the Contaminants Program into the Patuxent Center. The 1970s is also when Patuxent began focusing on organochlorine chemicals, which included pesticides like DDT, chlordane, and lindane, as well as other chemicals like dioxins, furans, and PCBs. A nationwide study of organochlorines in wildlife discovered unexpectedly high levels in herring gull eggs on Sister Island in outer Green Bay. The discovery of organochlorines in Green Bay herring gull eggs led to many decades of subsequent research, which determined that PCBs were the class of chemicals in the eggs, that PCBs were also in many other species, and that the PCBs sometimes caused adverse effects.

In addition, the U. of Wisconsin at Green Bay was founded in 1965, and classes began there in 1968. The university emphasized environmental sustainability at a time of growing environmentalism in the years running up to the first Earth Day in 1970, an event founded by Wisconsin Sen. Gaylord Nelson. Soon called, “Eco U,” the campus evoked park settings, with many natural areas preserved. Classes overlooked the bay to the northwest, and the campus was nestled below a wooded ridge on the Niagara Escarpment.

The school pioneered environmental programs soon after similar efforts at Middlebury College in Vermont and Syracuse University in New York, and they attracted professors and students interested in studying the natural world along with mankind’s impacts on it. The university also housed the Richter Museum of Natural History, with displays of gulls, terns, herons, egrets, cormorants, and pelicans, based on the earlier collections of birds and eggs by ornithologist Carl Richter of Oconto, Wisconsin, and later curated by Tom Erdman. Collections in the museum were directly involved in many of the critical studies that first discovered organochlorines in Green Bay birds, as well as the subsequent exploration of PCBs and their effects on wildlife.

A number of the university’s professors pursued research that would become directly relevant to later Superfund discussions about cleanup and restoration, and many also joined the ongoing technical discussions that directly preceded involvement of Superfund authorities. Many professors also joined or presented to the technical committees of the “Green Bay Remedial Action Plan,” particularly the “Science and Technical Advisory Committee.”

Yet another example of early foundational research for Green Bay emanated from the 1909 Boundary Waters Treaty between the U.S. and Canada. The treaty covered all water bodies bordering both nations, including the Great Lakes. The Great Lakes Water Quality Agreement of 1972 followed from the treaty and defined geographic “Areas of Concern” throughout the Great Lakes. In the 1987 update to the agreement, the Green Bay Area of Concern was established, with PCBs identified as the primary issue. This led to the original Green Bay “Remedial Action Plan” in 1988. The original plan also established the precursor to the Science and Technical Advisory Committee, which was originally called the “Toxic Substances Technical Advisory Committee.” The Green Bay Area of Concern also led the Great Lakes National Program Office of U.S. EPA to spearhead the Green Bay Mass Balance Study, which led to some of the largest PCB data collections in history, along with sophisticated modeling of PCB fate and transport.

In 1992, as the U.S Fish and Wildlife Service began preparations for a Green Bay damage assessment, agencies, universities, paper mills, and environmental groups continued to provide most of the Science and Technical Advisory Committee’s expertise, and they continued to focus on what should be done about PCBs in Fox River sediments. Throughout the rest of the 1990s, the committee remained relevant as a local source of great expertise. However, it lacked institutional standing within the regulatory constructs of both the state and federal governments. Instead, its role was purely advisory, and it was all too easy for agencies to forget any of its inconvenient advice. Consequently, it was often neglected, particularly by the Fox River Coalition, the Fox River Group of paper companies, and the Wisconsin Department of Natural Resources as they vied with U.S. EPA and U.S. FWS for influence and control over cleanup and restoration decisions. Still, by 1992, the remedial action plan authors and the committee had framed much of the technical debate regarding PCB contamination of Fox River sediments.