

*Lake Erie Rehabilitated: Controlling Cultural Eutrophication, 1960s–1990s.* By William McGucken. (Akron: University of Akron Press, 2000. xvi, 318 pp. Cloth, \$49.95, ISBN 1-884836-57-7. Paper, \$29.95, ISBN 1-884836-58-5.)

In this meticulous, yet often dry and ponderous work, historian William McGucken traces the efforts by the United States and Canada to control cultural eutrophication in Lake Erie. Cultural eutrophication is when “a lake’s nutrients are being excessively increased by some human activity – as, for example, the disposing of sewage in the lake...” (2). The sign of this process in Lake Erie was algae growth that covered much of the surface, washed ashore, and whose decomposition led to depleted oxygen levels and the loss of desirable fish such as walleye and blue pike. Lake Erie was not the only lake undergoing this process in the years after WWII, but it was the most publicized one in North America. While McGucken considers the various “ecological, engineering, health, industrial, international, political, and scientific issues” (6) involved in this story, his concentration on the scientific is both the strength and the weakness of the book.

McGucken, who died in 2000, was chair of the history department at the University of Southern Indiana. He published three other books: *Nineteenth-century Spectroscopy: Development of the Understanding of Spectra, 1802-1897* (1969), *Scientists, Society, and State: The Social Relations of Science Movement in Great Britain, 1931-1947* (1984), and *Biodegradable: Detergents and the Environment* (1991). *Lake Erie Rehabilitated* is part of University of Akron Press’s series on technology and the environment (indeed, McGucken was one of the founding co-editors). Given the author’s background in the history of science, it fits that this work stresses the scientific over the political and social.

Although the focus of the book is Lake Erie, McGucken begins by examining the emergence of cultural eutrophication as an international problem to be corrected. Here, the author highlights the work of Richard A. Vollenweider of the Italian Institute of Hyrdobiology. In 1968 he prepared a widely circulated report on the problem of eutrophication worldwide, sponsored by the Organization for Economic Co-operation and Development (OECD). Meanwhile, sanitary engineers in the United States had also begun investigating the problem, and by the late 1960s, scientists had also issued reports at symposia sponsored by the U.S. National Academy of Sciences – National Research Council. These men noted the connection between phosphorus and algae blooms, and highlighted the increased use of synthetic detergents in automatic dishwashers, clothes washers (both commercial and in homes), and in other applications as the leading cause of excessive nutrient loading into lakes and rivers. They also noted the contributions of agricultural fertilizers. These reports recommended reducing or eliminating phosphates in detergents as well as through sewage treatment and for changes in agricultural practices.

McGucken then explores how state governments in the Lake Erie basin sought to respond as well as the efforts of the Canadian and Ontario governments. McGucken tracks the tension between scientists, business interests, and political leaders as both Canada and the United States, as well as local and state leaders, eventually adopted measures to control eutrophication in Lake Erie. The disputes and delays were centered on the recalcitrance of detergent manufacturers to accept data from scientific studies, then about whether to control phosphates through greater sewage treatment or eliminating them from detergents, and over levels of phosphorus and timetables for reduction or elimination. McGucken is at his best in explaining the science to the lay audience. The story is complex, and while McGucken often provides detail on various reports and agreements, he leaves some key issues unexamined and the book's organization makes following the events difficult.

The Canadians acted first and more forcefully than did the Americans, an interesting point that McGucken leaves unexplored. Canada enacted the Canada Water Bill in 1970, which mandated reduced phosphorus levels in detergents, and authorized the use of NTA (the sodium salt of nitrilotriacetic acid) as a substitute. Canada also embarked on an aggressive effort to update sewage treatment facilities to reduce further phosphate loading into Lake Erie and other bodies of water.

The pathway to reduction of phosphates in the United States was much more tangled. Likewise, McGucken's narrative is often difficult to follow, moving between dates, groups, and agencies without enough signposts to aid the reader. In general, detergent companies put up stiff resistance to regulations and unlike those in Canada, U.S. federal agencies resisted mandating reductions of phosphorus in detergents. Instead, the EPA continued to emphasize reduction through waste treatment. In addition, the federal government also delayed authorizing NTA as a substitute, arguing that its environmental effects had not been adequately researched and that it was a carcinogen. (Subsequent research in Canada and elsewhere had not substantiated U.S. research). This led to the EPA reversing course in 1971, recommending use of phosphate detergents, a position not altered until several years later. Meanwhile, local and state governments began efforts to regulate detergent use, with Michigan the first state to mandate sale of reduced phosphate detergents in 1971 and again, with lower phosphate levels, in 1977. In contrast, Ohio and Pennsylvania would not pass similar legislation until 1988. More attention to the reasons behind these events, especially the actions of the EPA and the development of trends at the local and state levels, would have deepened McGucken's analysis.

While local, state, and federal governments acted independently, the heart of the story centers on the cooperative efforts between Canada and the U.S. that ultimately led to the rehabilitation of Lake Erie. The International Joint Commission (IJC) created in 1912, led the way with its studies and recommendations in the 1960s on eliminating phosphorus from detergents and building improved sewage treatment facilities. Out of the activities centered on the IJC came further talks between the two countries. Then, in 1972, Canada and the U.S. signed the Great Lakes Water Quality Agreement, which created a board to monitor and recommend policies to reduce pollution. Regarding eutrophication, the GLWQA

recommended, but did not require, reduction of phosphorus in detergents. It did establish a timetable for upgrading sewage treatment facilities. The countries amended the agreement in 1978 to include increased monitoring and research on non-point sources as well goals to reduce algae growths and restore aerobic conditions year-round to the central basin of Lake Erie. By the 1990s, McGucken notes that these goals had been met, but that eutrophication remains a serious problem in 18 near shore areas in all the Great Lakes, four of which are in Lake Erie: the mouth of the River Rouge in Michigan, and the mouths of the Black, Cuyahoga, and Maumee Rivers in Ohio. In addition, the clarity of Lake Erie reported in the media of late is because of the introduction of zebra mussels, more so than the reduction of phosphorus.

In addition to the complicated narrative, and the limited analysis of political developments, the major weaknesses of the book are that few individuals stand out amidst the descriptions of reports, meetings, and scientific data, that it is centered on elites, and that the writing and story lack emotion. McGucken attempts to deflect criticism along these lines. In the book's Introduction, he writes, "this is a story with a cast of thousands, the vast majority of whom remain anonymous members of subcommittees, committees, boards, and institutions" (13). The success in bringing eutrophication under control came from a "cooperative effort on the part of U.S. and Canadian federal, state/provincial, and local governments; the IJC and its boards and committees; the communities of limnologists, sanitary engineers, and agricultural scientists; and an often recalcitrant and always self-interested detergent industry" (13). He does attempt to bring the story to life by noting the contributions of a few individuals, including scientist Richard Vollenweider, engineer Daniel Okun, political leaders Joseph Greene, Canadian minister of Energy, Mines, and Resources, and William Ruckelshaus, head of the Environmental Protection Agency. Still, the majority of the narrative discusses decisions made by boards, committees, and governments, leaving out individual actions and creating a dry, almost emotionless story. Furthermore, the focus on elites provides only part of the story; occasionally McGucken alludes to others at the local level. For example, in discussing the growing opposition to phosphates in the United States, he notes the involvement of Buffalo's Housewives to End Pollution in organizing meetings with detergent manufacturers and posting signs in stores concerning phosphorus in detergents. But such stories of public involvement and action from below are few, as the narrative quickly returns to the author's areas of strength, organizations, reports and data. A greater balance between elites and grassroots involvement would have made for a more exciting read; but to be fair, it would have also meant a different book.

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