Nancy Langston. *Sustaining Lake Superior: An Extraordinary Lake in a Changing World.* New Haven: Yale University Press, 2017. Illustrations. 312 pp. $35.00, cloth, ISBN 978-0-300-21298-3.

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For those who have spent time on Lake Superior, it is a hauntingly beautiful place. Loons make their distinctive calls as waves whip icy water onto rocky shorelines where jack pine and paper birch tremble. Nancy Langston's *Sustaining Lake Superior* captures Superior's beauty through eloquent prose and vivid photographs, but her excellent book is hardly just a biography of the world's largest lake by surface area: Langston excels at documenting the toxic legacies of industrial development, especially the ways that contaminants manifested themselves across time and space in unexpected ways.

Focusing on the nineteenth and twentieth centuries, Langston demonstrates that Lake Superior is haunted by past decisions. She contends that early industrialists lived by the mantra that "the solution to pollution is dilution," the belief that the lake's large size would dilute pollution and mitigate most harm. Langston claims that a second idea, assimilative capacity, or the ability of a healthy ecosystem to absorb and breakdown pollutants, also minimized concerns about contamination. These ideas, she claims, initially worked well because the lake was able to heal much of the damage from human activities.

As industrialization intensified at the beginning of the twentieth century, dilution and assimilative capacity were less successful, but beliefs about Lake Superior's natural resiliency continued to hold. After World War II, new synthetic chemicals, some from far-off places, accumulated in Lake Superior and challenged ideas about pollutants. Dilution was not a solution when contaminants could biomagnify in organisms. Processes like deforestation and the extirpation of beavers had also diminished the assimilative capacity of the Lake Superior ecosystem, since trees and beavers broke down or hid away pollution.

Langston illustrates these changing understandings of pollution's mobility and toxicity by focusing on two industries: pulp and paper and iron mining. The first of two chapters on pulp and paper seeks to understand how an industry that proclaimed itself as the conservation-minded solution to lumbering's environmental problems became the region's greatest source of water pollution between the 1870s and 1930s. By way of an answer, Langston suggests that sanitary engineers believed that the assimilative capacity of Lake Superior would naturally ameliorate pollution, meaning that there was no reason to stop industrial development to satisfy those concerned about recreation. In the second chapter on pulp and paper, Langston argues that the postwar pollution boom altered these long-standing beliefs as pollutants built up in human and non-human bodies and did not break down in the water. Those who

tried to solve the problem by adopting the popular "better living through chemistry" mantra were able to make the water smell and look clean by spraying ever-more toxic chemicals into the water. The public was largely satisfied by what they perceived as clean water and did not object to industry's continued release of contaminants. Eventually, new understandings of bioaccumulation and mobility shattered both the dilution and assimilative capacity models, and old solutions were seen as doing more harm than good. Today, the historic legacies of the pulp and paper industry preoccupy communities, which face toxic burdens and the economic burden of cleanup.

The three chapters that follow on iron mining make similar arguments about early ideas of pollution and postwar challenges to these assumptions while also engaging with the effects on fish and the unequal burden faced by Native peoples. Humans and non-humans have agency in this story, coproducing the toxic legacies that continue to plague a lake thought to be pristine: complex nearshore habitats, limnological conditions, rocky shore bottoms, poorly understood currents, and fish that transcended human boundaries all challenge management proposals. These challenges speak to uncertainties inherent in management, which Langston shows industry exploited in order to pollute. Making pollution visible thus becomes a central theme in Langston's work, as various chapters raise questions about whose expertise should be privileged, what evidence counts and why, and how to deal with stakeholders and issues that span multiple scales.

Although Langston suggests that toxic legacies persist, she is hopeful about the place she clearly loves. Lake Superior is resilient, and there have been instances in the past where local, national, and international efforts have helped address contamination across disciplinary and species boundaries. Despite her optimism, she also warns, in a final chapter on climate change, that existing recovery plans may have to change. Enduring contaminants make many species more susceptible to climate stressors and pollutants mobilize differently with warming. Yet the history of conservation recoveries that she details so clearly throughout the book can provide guidance for the new challenges that result from persistent pollutants mobilizing in new ways with climate change.

Overall, *Sustaining Lake Superior* makes contaminants visible, accessibly showing readers the social and ecological processes by which pollutants have entered the environment and the enduring effects of those contaminants. The text would speak to undergraduates in environmental history or policy, especially since either the section on pulp and paper or the one on mining could be assigned to students as a case study on industrial development and resiliency. Because Langston has produced a model of accessible academic writing, her work should also be of interest to general readers—Canadians and Americans alike—concerned about the Great Lakes. Langston ends by contending that there is reason to be optimistic about Lake Superior's future, but there is also reason to be optimistic about scholarship in environmental history with contributions like *Sustaining Lake Superior.*

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