

LAKES IN THE ANTHROPOCENE: REFLECTIONS ON TRACKING ECOSYSTEM CHANGE IN THE ARCTIC.

By JOHN P. SMOL. Luhe, Germany: International Ecology Institute, 2023. ISBN 978-3-946729-30-3. x + 438 p., maps, b&w and colour illus. €50.00. Also available as an ebook.

It was a generation ago, sometime in 2007, when I first came across the name of John P. Smol. I was about to start a PhD thesis about the paleolimnology of subarctic ponds in Nunavik (northern Québec). With a background in geology and geomorphology, I knew close to nothing about paleolimnology—that is, the history of aquatic ecosystems based on the study of lacustrine sediments. My about-to-be thesis co-supervisor (who, as I would later learn, was himself a former PhD student of Smol) gave me a couple of compact, high-density, medium-blue volumes from the *Developments in PaleoEnvironmental Research* (DPER) series (e.g., Last and Smol, 2001a; 2001b) and said something to the effect of: “Read this and come back in a few days.” So I quickly immersed myself in the broad and still expanding paleolimnological approach, its tools, the wealth of multi-proxy data collected, and the new kinds of questions I would be able to tackle. At that time, I had not yet gotten myself dirty in the field, collecting those precious sediment cores—that would come soon enough—but it was a good start. A first exploratory trip to the fascinating world of mud ...

Lakes in the Anthropocene is a different, special kind of book—not a typical textbook about paleolimnology (although a primer chapter introduces the basic concepts) nor a simple collection of research outputs (although several chapters present examples of paleolimnological studies conducted by the author and his colleagues through the years). Written in a personal tone, the 13 chapters provide a broad vision of where the field of Arctic paleolimnology comes from and what its major accomplishments are, focusing specifically on the many people who have done this work and the many types of data that have been collected and integrated. Or, as Smol explains it, from the very start of the book:

my main focus is on how and why we conducted our collaborative research programs, emphasizing the value of personal relationships and demonstrating the power of comparative paleolimnological approaches to address a diverse array of environmental issues. (p. 3)

The first chapters introduce us to the key importance of Arctic ecosystems—including, of course, ponds and lakes—as environmental sentinels in our Anthropocene world (Chapter 1); the pioneer and sometimes MacGyveresque studies focused on Arctic limnology in the 20th century (Chapter 2), and what could be labelled as Paleolimnology 101 for non-specialists (Chapter 3). We then dig in more detail into the emergence, during the early 1980s, of Arctic paleolimnology as a

multi- or interdisciplinary field of inquiry based on the strong controlling influence of lake ice cover dynamics on lake ecology—or, as the author puts it, “the power of ice” (Chapter 4). This is where we can fully grasp the context and the profound impact of a series of influential papers in the field, including a first report, based on fossil diatom analysis, of the unequivocal effects of climate change on Arctic lake ecology post-19th century (Douglas et al., 1994) and a seminal pan-Arctic synthesis of climate-driven regime shifts in ecological communities, which involved 26 co-authors (!) spread across three continents (Smol et al., 2005). We also learn about the fruitful collaborations that can be developed with polar archaeology, documenting pre-European migrations across the Arctic, specifically the limnological legacies of the Dorset and Thule peoples, centuries to millennia ago (Chapter 5). The following chapters present examples of informative paleolimnological reconstructions that provide insights into many aspects of Arctic environment dynamics, such as coastal storms (Chapter 6), permafrost thaw (Chapter 7), waste management in northern communities (Chapter 8), mining footprint (Chapter 9), long-range contaminant transport (Chapter 10), and Arctic fish and birds as biovectors of nutrients and contaminants (Chapters 11 and 12, respectively). Finally, the author brings us back to where it all started, in Cape Herschel, Ellesmere Island (Nunavut), where numerous ponds studied since the early 1980s were drying out in the early 21st century, abruptly crossing a “final ecological threshold” (Chapter 13). Interestingly, such a trend had also been observed elsewhere in the Arctic (e.g., Smith et al., 2005), and is still ongoing at a fast rate, specifically in the context of widespread permafrost thaw (Webb et al., 2022).

Lakes in the Anthropocene synthesizes, or rather distills, a great deal of scientific work conducted over four decades—the bibliography is a chunky 60-plus pages!—while emphasizing the important contribution of traditional environmental knowledge gained over many generations by local Indigenous communities, a potential synergy that could and should be more recognized in future Arctic studies. As a big-picture geographer, I would have enjoyed more examples from elsewhere across the Arctic, fully embodying the subtitle (*Reflections on Tracking Ecosystem Change in the Arctic*), although the author acknowledges that the North American Arctic is the main focus here, keeping the book to a reasonable length. Luckily, for the reader’s enjoyment, *Lakes in the Anthropocene* heavily relies on direct field impressions, descriptions, illustrations, anecdotes, and recollections, with abundant pictures from the author. Smol does a great job of building on 35-plus years of experience in travelling across the Arctic to depict how these remote and very lake-rich landscapes—or should we say waterscapes or limnoscapescapes?—are currently experiencing unprecedented changes in response to climate change. This couldn’t possibly be further from a comfortable and monotonous armchair science perspective. Reading the book, one is tempted to escape from the office

and immediately go north to help or be involved in this Arctic paleolimnology community effort.

So, what kind of printed work is this, finally? A textbook? Not really. A memoir? Not only. A fascinating journey—both spatially and temporally—into a truly interdisciplinary field of research, told by one of its founders? Certainly. I would highly recommend it to any graduate student starting a project in any field of physical geography, biology, ecology, archeology, or anything involving freshwater ecosystem dynamics at different spatial and temporal scales. More generally, the book is quite relevant for Arctic researchers wishing to know more about paleolimnology and for paleolimnologists interested in Arctic fieldwork and the challenges specific to high-latitude environments. I would add that it can also be of great interest to science historians studying the development of novel ideas (see the many examples of transdisciplinary coffee discussions in the book) and the patient and time-consuming lab analyses (and controversies—you need those, too). This is a book I wish I had read twentyish years ago, at the start of my tortuous scientific career.

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LAKE LADOGA: THE COASTAL HISTORY OF THE GREATEST LAKE IN EUROPE. Edited by MARIA LÄHTEENMÄKI and ISAAC LAND. Helsinki: The Finnish Literary Society, *Studia Fennica Historica*. 2023. ISBN 978-951-858-628-2. 233 p., maps, b&w illus., bib. Softbound. US\$47.90. Also available in ebook and pdf format.

Lake Ladoga: The Coastal History of the Greatest Lake in Europe offers an overarching, multidisciplinary take on coast history through the examination of the greatest lake in Europe. The northern Ladoga region and its drainage basin serve as a scene for the representation of natural and cultural changes. These changes have historically occurred in a transnational context in which Russian, Scandinavian, and other Indigenous interests have competed. The edited volume is divided into four sections, each exploring a separate theme, and a postscript.

The first part focuses on coastal history. In the first chapter, “Transnational History of Ladoga,” Maria Lähteenmäki begins with an overall picture of Lake Ladoga and its impact on the transnational history of the area. The chapter connects the unique characteristics of the northern Lake Ladoga area to the wider context of the global family of great lakes.

In the chapter, “Taking Lakes Seriously,” Isaac Land refers to “sea blindness” and the pervasive inability to recognize the influence of bodies of water on human activity (p.28). Lakes and their shorelines have had, and continue to have, an infinite influence on human existence, not only as providers of resources, but as features of culture.

In the third chapter, “Coastal Environmental History: Aims and Perspectives,” Tuomas Räsänen demonstrates why the coastal environmental history is an integral but distinct branch of environmental history. Coastal areas play an important role in economic prosperity, such as in providing routes for the transportation of goods, but the resulting impacts of these human endeavours are rarely beneficial to shoreline environments. For example, oil drilling, trade, and transportation create enormous economic benefits, but the risk of oil spills can be disastrous for coastlines. Given this, it was surprising that Räsänen concentrates on the negative aspects of the fishing industry and overfishing, while oil drilling and spills were only briefly mentioned at the end of the chapter (p. 46).

Part II considers the settlement and population history of the Ladoga region. Thomas Rosén’s article, “Scandinavian Eastern Viking Routes and Settlements,” provides an intriguing glimpse into the controversy surrounding the Scandinavian presence around Lake Ladoga from the ninth century onward. It is also an important example of how history is interpreted and sometimes manufactured to serve ideological interests. Rosén points out that contemporary written sources and chronicles are scarce, contested, and open to interpretation. Language is naturally malleable, and it evolves through time; readers of this chapter with