

## [McNeill on Gornitz, 'Rising Seas: Past, Present, Future'](#)

Review published on Sunday, September 7, 2014

**Vivien Gornitz.** *Rising Seas: Past, Present, Future*. New York: Columbia University Press, 2013. Illustrations, tables, graphs. 360 pp. \$120.00 (cloth), ISBN 978-0-231-14738-5; \$40.00 (paper), ISBN 978-0-231-14739-2.

**Reviewed by** John R. McNeill **Published on** H-Environment (September, 2014) **Commissioned by** David T. Benac

### **Everything You Always Wanted to Know about Sea Level**

This is a textbook for people who know a little chemistry and physics but are novices in climatology and geoscience. It includes graphs and tables galore, but only a few formulae. Readers with only modest education in the natural sciences can follow it.

The book opens with a primer on ocean dynamics as they affect sea level and coasts, including winds and currents, the thermohaline circulation, tides, storms, El Niño/Southern Oscillation (ENSO), and the North Atlantic Oscillation (NAO). This section is mainly descriptive, although it usually explains why a particular phenomenon exists. Next, Vivien Gornitz turns to sea levels over the past 60 million years or so, but especially within the last 2.7 million, the present era of alternating glacial and interglacial periods. Here one learns why sea level changes, how sea level is measured, and how past sea levels are estimated. The detail and explanation grows thicker with time, so one learns more about the past 100 years than about the Cenozoic. The book continues with sections on the hazards to coastlines presented by rising sea level, and how humankind might respond to the challenges sea level rise presents. It ends with a plea for reducing greenhouse gas emissions and finding a way to a carbon-neutral energy regime. Along the way Gornitz provides a fair bit of information on earth history, climate history, climatology, and environmental science.

Gornitz does not try to hide the uncertainties in her subject. Some textbooks gloss over the controversies and unknowns of a certain field. No one knows just how high the sea level was at the depth of the last interglacial about 120,000 years ago, and Gornitz admits it and then presents the range of expert opinion. No one knows for sure how Lake Agassiz (a huge lake in north-central North America that formed at the end of the last glaciation) drained to the ocean, whether via the Mackenzie or the St. Lawrence or some other route. No one knows for sure whether when the sea level rose (after the last ice sheets retreated) a massive flood filled the Black Sea, inspiring flood myths that appear in the Bible and the Epic of Gilgamesh, as one of Gornitz's colleagues at Columbia University believes. (Gornitz generously notes the work of many of her Columbia colleagues in the book, giving the impression that half of the relevant science takes place at her university.)

The parts of the book of greatest interest to historians take up only a few pages. Gornitz gives a fine account of how the lower sea level during the last glaciation—120 or so meters lower at the lowest—eased the migration of humans around the world from about 100,000 to about 14,000 years ago, including the peopling of the Americas across the Beringia land bridge. Closer to the present, she explains how in the past few decades, the burning of fossil fuels and anthropogenic climate

change have become the driving force behind sea level rise. These stories will be familiar to most environmental historians, and perhaps of little interest to most other historians. But they are well told here.

For readers interested in the present and the future, the book offers insightful information. I found enlightening Gornitz's account of the challenges to coastal communities of current and expected sea level rise. This section of the book emphasizes U.S. cities, especially New York, but also includes useful summary treatments of the perils faced in the Chesapeake (where islands are disappearing); the Carolina Low Country; the Mississippi Delta; and the oceanic atolls, such as Kiribati, Tuvalu, and the Maldives. I also enjoyed her remarks on measures available to combat sea level rise. These measures range from "armoring"—mainly the building of sea walls—to surrender in the form of migration away from low-lying coasts.

The book has a few mildly annoying features, such as repetition and a liberal sprinkling of exclamation points. Whether it will serve its primary purpose well as a textbook for classes devoted to the subject of sea levels is not for me to judge. As an introduction to its subject for the community of scholars who subscribe to H-Net, it will serve admirably.

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**Citation:** John R. McNeill. Review of Gornitz, Vivien, *Rising Seas: Past, Present, Future*. H-Environment, H-Net Reviews. September, 2014. **URL:** <http://www.h-net.org/reviews/showrev.php?id=41493>

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