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W. Jeffrey Bolster, *The Mortal Sea: Fishing the Atlantic in the Age of Sail* (Belknap Press, 2012). 978-0674047655

Contents

Introduction by Jacob Darwin Hamblin, Oregon State University	2
Comments by Christine Keiner, Rochester Institute of Technology	5
Comments by Poul Holm, Trinity College, Dublin, Ireland	10
Comments by Vera Schwach, Nordic Institute for Studies in Innovation, Research, and Innovation (Norway)	14
Comments by Helen M. Rozwadowski, University of Connecticut, Avery Point	19
Author's Response by W. Jeffrey Bolster, University of New Hampshire	23
About the Contributors	29

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Introduction by Jacob Darwin Hamblin, Oregon State University

The ocean's history is profoundly difficult to assess, and reliable documentary evidence about its ecology is hard to come by. Even when we recognize the poisoned fruits of human labor—through chemical or radioactive pollution, acidification, and depleting the life forms within the sea with over-fishing—we might still bicker about what a sustainable relationship between humans and the sea would look like. Did such a relationship ever exist? Given the multiple fisheries collapses in the twentieth century, it is tempting to believe that a fundamental change in that era turned the ocean from an inexhaustible resource into a vulnerable pool of changing chemical composition and declining biological life.

In *The Mortal Sea: Fishing the Atlantic in the Age of Sail*, W. Jeffrey Bolster tackles head-on the problem of understanding how humans have changed the life of the oceans. How do we know whether declines in fish populations, observed over many centuries, represent genuine population decreases? How can we develop a reliable historical narrative about decisive moments in the history of humans, fish, and the sea? The book looks in particular at the area between Cape Cod and Newfoundland, an “Atlantic crossroads” where Europeans and Natives alike fished, from the preindustrial era to the twentieth century. Although the book takes us to the First World War, the subtitle suggests not only its focus but also its main theme, namely that “the origins of today’s unnatural ocean” can be found much earlier than the era of factory trawlers and sonar (5).

Bolster suggests instead that the uptick in human impact on the oceans in the twentieth century was a matter of scale rather than changing practices. Key patterns had been established during the Age of Sail: fishermen targeting a wider range of species, expanding their use of nets while also developing long-lining, requiring high quantities of bait and new gear, and finding markets in faraway places. Bolster sees patterns of intensification in structural changes, as when state governments replaced town-based decision-making, or when new federal subsidies and massive capital investment shaped the fishing industry. All of this occurred in the Age of Sail, not the era we typically associate with techno-powered overfishing.

What’s at stake here is not whether or not fish populations went into decline, but rather what caused it and whether humans were conscious of how they were shaping sea life. Bolster notes unambiguously that, despite conventional wisdom to the contrary, fishermen prior to the twentieth century did not all believe in the inexhaustibility of the sea. Many of them worried that their practices would have serious repercussions on fish populations, and such concerns spread to their communities.

I asked **Christine Keiner**, an associate professor of history at Rochester Institute of Technology, to comment on *The Mortal Sea*. Keiner has spent years researching the conservation dimensions of the ocean, specifically in the oyster industry. Like

Bolster, she wrestles with questions of regulation and cooperation. In her book *The Oyster Question*, for example, Keiner explores how scientific advice blended with the traditional ways of watermen in the Chesapeake region, creating a regulated commons that seemed sustainable for decades, before scientists broke ranks in favor of private interests. She challenges scholars to see the story not merely as a classic tragedy of the commons, but as part of existing struggles over agricultural reform, modernization efforts, and state politics.¹

Poul Holm, the Trinity Long Room Hub Professor of Humanities at Trinity College Dublin, has a wide-ranging interest in the history of fisheries from the medieval period to the twentieth century. Holm chairs the executive committee of the History of Marine Animal Populations project (HMAP), a global research effort to understand past ocean life, using historical and scientific evidence. One of the clearest uses of HMAP, he contends, will be in helping to establish historical baselines for crucial fishing regions. Based on evidence from HMAP, Holm has stated that it is now possible “to begin to piece together a picture of human interaction with marine life in the North Sea in the past 1,000 years,” by adapting marine science methodology to historical data.²

Few countries are more closely associated with the fishing industry, and with international efforts to conserve fish populations, than Norway. That is one reason I invited Norwegian fisheries historian **Vera Schwach** to comment on Bolster’s book. Schwach’s existing work points out that a country’s economic system, political system, and culture make an enormous difference in its approaches to conservation. In Norway, for example, the practice of science was a critical aspect of human relations with the oceans from the eighteenth century onward, and yet economic priorities often prevailed. For centuries, fish not only were crucial as food, they formed the backbone of the national economy. She points out that the scientific community in Norway was predisposed toward an economic point of view, despite the apparatus existing to implement more rigorous regulations.³

Our final commentator is **Helen M. Rozwadowski**, an associate professor of history at University of Connecticut, Avery Point. She is the author of the award-winning book *Fathoming the Ocean*, a cultural history of exploration of the deep sea during the nineteenth century. She also is the author of *The Sea Knows No Boundaries*, an authoritative history of the most significant international body designed to assess

¹ Christine Keiner, *The Oyster Question: Scientists, Watermen, and the Maryland Chesapeake Bay since 1880* (University of Georgia Press, 2010).

² Poul Holm, “Fishing Down the North Sea,” in Bernd Herrmann, ed., *Beiträge zum Göttinger Umwelthistorischen Kolloquium 2007-2009* (Göttingen: Universitätsverlag Göttingen, 2010), 1-12. For an overview of HMAP and a response to commentary on it, see Poul Holm, Marta Coll, Alison MacDiarmid, and Henn Ojaveer, “HMAP Response to the Marine Forum,” *Environmental History* 18:1 (2013), 121-126.

³ Vera Schwach, “The Sea Around Norway: Science, Resource Management, and Environmental Concerns, 1860-1970,” *Environmental History* 18:1 (2013), 101-110.

fish populations in the North Atlantic, the International Council for the Exploration of the Sea. Rozwadowski has argued in favor of widening scholars' attention to the history of the oceans. "The history and legacy of who controls ocean space and ocean resources," she writes, "promises to add profoundly international and spatial dimensions to existing histories that focus on nation-states."⁴

Before turning to the first set of comments, I would like to pause here and thank all the roundtable participants for taking part. In addition, I would like to remind readers that as an open-access forum, *H-Environment Roundtable Reviews* is available to scholars and non-scholars alike, around the world, free of charge. Please circulate.

⁴ Helen M. Rozwadowski, *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea* (Belknap, 2005); Helen M. Rozwadowski, *The Sea Knows No Boundaries: A Century of Marine Science under ICES* (Seattle: University of Washington Press, 2002). Quote is from Helen M. Rozwadowski, "The Promise of Ocean History for Environmental History," *Journal of American History* 100:1 (2013), 136-139.

Comments by Christine Keiner, Rochester Institute of Technology

Eight years ago, W. Jeffrey Bolster published a thought-provoking essay promoting the ocean as “the next frontier for environmental historians.” Citing recent news stories about scientific struggles to understand drastic declines in fish stocks and marine health, he argued, “It is increasingly clear that people have been using the oceans and leaving their marks for centuries, even though the marks long appeared invisible. Isn’t it time to recognize the oceans as part of history?” Bolster’s template for a new subfield drew on his experiences as a professional seafarer and historian of early America by combining elements of maritime history, historical ecology, and environmentalist concern. Negotiating “the quandary of disciplinary boundaries” would not be easy, he warned, noting the difficulties experienced by historians participating with scientists in the pioneering History of Marine Animals Population (HMAP) project, an international decade-long initiative designed to provide the historical baselines needed to improve contemporary marine management, among other goals. Nevertheless, the intellectual and applied benefits of enriching the marine environmental history canon could far outweigh the professional risks inherent in innovative interdisciplinary endeavors.⁵

The HMAP project of 2000-2010, while highlighting conflicting aspects of science- and history-oriented worldviews, did indeed promote productive collaboration, including Bolster’s self-identified “refashioning as an environmental historian.”⁶ Thanks to HMAP’s funding of historical marine studies, and to the prior foundation of research conducted by such innovative scholars as Arthur McEvoy, Joseph E. Taylor III, and Helen Rozwadowski, the field of marine environmental history is experiencing rapid and exciting growth. The January 2013 issue of *Environmental History* features a marine forum of ten essays which collectively make the case that after two decades, “the field now stands ready to take its place on more equal terms alongside environmental history that devotes its energy to topics concerning the use of terrestrial resources.”⁷ And now, with the publication of Bolster’s book *The Mortal Sea: Fishing the Atlantic in the Age of Sail*, would-be marine environmental historians have a magisterial model for chronicling the ocean’s common destiny with humans as ecological actors.

⁵ W. Jeffrey Bolster, “Opportunities in Marine History,” *Environmental History* 11 (2006): 567-597, quotes on pp. 569 and 588, respectively.

⁶ Poul Holm, Marta Coll, Alison MacDiarmid, Henn Ojaveer, and Bo Poulsen, “HMAP Response to the Marine Forum,” *Environmental History* 18 (2013): 121-126; W. Jeffrey Bolster, *The Mortal Sea: Fishing the Atlantic in the Age of Sail* (Cambridge: Harvard University Press, 2012), quote on p. 358.

⁷ Michael Chiarappa and Matthew McKenzie, “New Directions in Marine Environmental History: An Introduction,” *Environmental History* 18 (2013): 3-11, p. 3.

A key way in which Bolster historicizes the ocean is by applying the concept of shifting baselines to the history of human relationships with marine environments. Popularized by biologist Daniel Pauly in an influential 1995 article, the shifting baselines syndrome refers to the idea that fisheries researchers consider ecosystem health in the context of the conditions they witness at the beginning of their careers; over time the baseline of what constitutes normality thus undergoes extreme changes.⁸ Employing such a framework enables Bolster to problematize historiographical assumptions about the roles of natural abundance and providentialism in the British North American extractive economy. For example, the intriguing second chapter demonstrates how seventeenth-century emigrants and their descendants viewed the Atlantic's bounty through the lens of the early modern European experience of overfishing, a perspective forged over the course of hundreds of years of intensive use of Old World coastlines. As a result, he argues based on records of colonial sea and river fishery regulations, they tried to "balance short-term needs against long-term costs, even as they harvested marine resources with the fervor of men on the make and squabbled over rights of access" (p. 58). Moreover, whereas historians have often looked askance at exuberant colonial accounts of the American continent's marine abundance, Bolster's integration of modern marine biology into his analysis of colonial primary sources suggests that we must not dismiss such accounts as propaganda or lies. In addition to reinterpreting familiar sources, such an ecological perspective helps him decipher underutilized archival materials such as fishery logbooks, leading him to conclude that the shifting baselines syndrome was well under way in the northwest Atlantic by 1800, thereby producing profound ecological and cultural changes, even as technological innovations and market forces masked the cumulative loss of ecosystem resilience.

My favorite themes of the book deal with the nineteenth-century clashes between fishermen and university-trained natural history experts over who had the right to interpret marine ecosystem dynamics. I have long harbored an affinity for Thomas Henry Huxley, the British naturalist most often remembered as "Darwin's bulldog," the fearless popularizer of *On the Origin of Species by Means of Natural Selection* (1859), and as the promoter of the less enduring idea that "the cod fishery, the herring fishery, the pilchard fishery, the mackerel fishery, and probably all the great sea fisheries, are inexhaustible."⁹ I used to justify the latter remark, delivered at the 1883 International Fisheries Exhibition, by emphasizing Huxley's qualifier, that humans could not deplete ocean resources *with the technologies of the day*, which mainly consisted of muscle- and sail-powered gear. But I can no longer defend this idea thanks to *The Mortal Sea*, which shows how preindustrial (that is, pre-twentieth century) modes of harvesting the North Atlantic had devastating ecological impacts when multiplied over the course of a "400-year fishing spree" (p.

⁸ Daniel Pauly, "Anecdotes and the Shifting Baselines Syndrome of Fisheries," *Trends in Ecology and Evolution* 10 (1995): 430.

⁹ T. H. Huxley, Inaugural Address, Fisheries Exhibition, London (1883), <http://aleph0.clarku.edu/huxley/SM5/fish.html>, accessed 18 March 2013.

233)—effects which fishermen began to perceive and seek to remedy long before Huxley's era. Marine scientists have often overlooked the value of harvesters' ecological observations and of long-term historical frameworks.

Bolster goes so far as to say that had the fisheries investigators of the generation following Huxley "been trained historians they might have generalized more thoroughly from their data, for some of the patterns they revealed concerning changes in the sea had very deep roots" (p. 259). This strikes me as somewhat unfair and presentist, since, after all, systematic efforts by marine ecologists and fisheries biologists to historicize the ocean date only to the 1990s. Even so, Bolster's insistence that we not take for granted the immutability of the seas (and their relative imperviousness to preindustrial fishing techniques) led me to an important insight regarding my home discipline of the history of biology: that Huxley's aforementioned quote exemplifies a stunning irony with respect to the rise of evolutionary thinking in the late nineteenth century. Whereas "Darwin's bulldog" was one of the first to grasp a key principle underpinning natural selection—that the earth and its products are the result of long-term, *historical* changes—Huxley and his fellow specializing biologists of the late Victorian era failed to apply such insights to their studies of the North Atlantic fisheries. When it came to viewing the ocean and its inhabitants, Huxley and his esteemed colleagues held the same kinds of *ahistorical* views as the young-earth creationists for whom they reserved the deepest pool of contempt. The persistence in western culture of "invocations of the sea's timelessness" is fascinating indeed (p. 295).

Bolster's "what-if" scenario is perhaps deliberately presentist, since the epilogue makes a strong case for applying the painful lessons of "1,000 years of fishing history" to current marine management (p. 280). "At every step of the way recounted here, from the arrival in Iceland about 874 A.D. of Viking settlers, who confronted vast herds of walrus, to the American controversy over otter trawling from about 1912 to 1915, the precautionary approach could have made a difference...Modest stewardship would have perpetuated renewable resources for the future...Stewardship pays dividends" (p. 279). The appropriateness of asserting such normative values is of course a contested one among historians, but as an environmentalist and scholar who seeks to inform (however modestly) contemporary environmental policymaking, I fully endorse Bolster's call for applying the precautionary principle to new fishing technologies, and for this and other reasons hope the publisher will market the book to lay readers. Along these lines, the epilogue reminds me of Richard C. Hoffmann's statement in the 2008 *American Historical Review* Conversation on Environmental Historians and Environmental Crisis that "Environmental history, perhaps more than other kinds of history, is a valuable source of comparative exempla for attentive citizens and their leaders, informing about things that worked and things that did not in human

relations with the natural world.”¹⁰ Might marine environmental history possess a greater capacity than terrestrial environmental history to inform present-day public discourse?

The other question I would like to ask Bolster relates to the crucial task of giving not only the ocean a voice, but also preindustrial fishermen. The middle chapters of *The Mortal Sea* complement recent works by such historians as Matthew McKenzie and Brian Payne (building on the terrestrial-based scholarship of Richard Judd) which personify resource users as ecological actors via thoughtful analyses of legislative petitions and other obscure archival sources, often drawing attention to the complex class dynamics operating within tidewater/rural communities. Bolster’s analysis of marine conservation laws enacted by New England towns since the colonial era challenges perceptions of fishermen as greedy, one-dimensional agents of destruction, revealing a long history of organized efforts by small-scale fishers to resist market forces and overcapitalization, and to harness the power of the state to stem the declines they perceived as a result of their close contact with the forces of nature. Such regulations often aimed to conserve limited resources by privileging locals: “Blaming outsiders for depleting resources had a long history, and was a tactic that would extend well into the future” (p. 114). This theme, and the broader concept of “local commons regimes,” has informed other environmental histories by way of anthropology, and thus I was surprised that *The Mortal Sea* does not explicitly place its analysis of the “tragedy of the commons” within the context of the maritime anthropology literature. Perhaps this is because, as Bolster rightly claims, “the notion of ‘traditional fisheries,’ often shorthand for preindustrial activity, obscures historical changes in marine ecosystems” (p. 87). Still, I would like to learn more about his views on the applicability of cultural anthropology to scientifically-informed marine environmental history. Given the recent rise of marine historical ecology, are the proxy forms of historical evidence provided by maritime anthropological studies now obsolete?

My final quibble is with Bolster’s use of the word “clean” regarding data derived from a specific set of mid-nineteenth-century logbooks (p. 151). I understand his point that the records in question are more trustworthy than catch statistics which relied on indirect, tax-based accounting systems, yet such an adjective seems a bit dodgy considering the many uncertainties pervading the reconstruction of ecological baselines. But otherwise *The Mortal Sea* does a fantastic job of explicating the dynamic relationships between human resource users and marine ecosystems, thereby helping us understand the dire state of our oceans today. No one who reads this book will ever again be able to use the sea as a metaphor for the eternal and unchanging.¹¹ By integrating “a perspective simultaneously historic and ecological”

¹⁰ Richard C. Hoffman, Nancy Langston, James C. McCann, Peter C. Perdue, and Lise Sedrez, “AHR Conversation: Environmental Historians and Environmental Crisis,” *American Historical Review* 113 (2008): 1431-1465, p. 1457.

¹¹ In addition to the many literary references Bolster cites in this regard, I cannot help but add an illustrative line from Andrew Lloyd Weber’s 1986 musical *Phantom*

(p. 53) into a compelling set of stories about people struggling to subsist on—or profit from—nature’s oft-unpredictable bounty, Bolster has created the watery equivalent of William Cronon’s classic work of environmental history, *Changes in the Land* (1983).

of the Opera: “We never said our love was evergreen/Or as unchanging as the sea/But if you can still remember/Stop and think of me.”

Comments by Poul Holm, Trinity College, Dublin

Some ten years ago when I first met Jeff Bolster, he had just published *Black Jacks* to wide scholarly and popular acclaim. I tried to convince him that it was time to not only write the history of humans at sea but of human actions in the sea. Not only would this be a new approach but we also had the promise of funding from the A.P. Sloan Foundation to support the project. Jeff was skeptical of the idea at first, arguing as I recall that even if lip service might be paid to history, in his experience the scientists of the project were likely to run away with most of the money. He did give it a try, though, and in the next few years he and his colleagues, notably historians Karen Alexander and William Leavenworth, and ecologist Andy Rosenberg, published papers which not only showed that collaboration across the humanities and natural sciences is perfectly possible but also demonstrated the potential of historical analysis to question assumptions of fisheries management.¹² Jeff Bolster alerted the entire historical profession of the potential of marine environmental history in a seminal article,¹³ and with his new book he takes on the task of reaching out to a wide educated readership.

The Mortal Sea is deceptively simply planned as an expose of the fishing down of the rich waters of the Gulf of Maine in the course of three centuries. Bolster argues that by the seventeenth century the waters of the Old World had been fished down and that New Englanders were right to rave about the richness of the waters of the New World. Here they found an abundance of fish and specimens of a size that they had never seen before. In the next couple of hundred years they enjoyed reaping the bounty of the sea, introducing wasteful practices such as damming the rivers and fishing out nursery seabeds, thus slowly depleting life in the sea. By the early nineteenth century degradation in the near shore caused fishermen to go ever farther to the sea and introduce new much more effective fishing gear. The introduction of long-lining or trolling as it was called had immediate and destructive effects on cod stocks. While local observers noted with alarm even in the early years the effects of unbridled human action, scientists, capitalists and most politicians insisted on the abundance of the sea and pushed on. "The history of the Gloucester fishery has been written in tears", commented one reporter in 1876 who is cited by Bolster. The loss of lives in the latter nineteenth century as the sailing vessels were

¹² Rosenberg, A. A., W. J. Bolster, K. E. Alexander, W. B. Leavenworth, A. B. Cooper, and M. G. McKenzie. 2005. The history of ocean resources: modeling cod biomass using historical records. *Frontiers Ecol. Environ.* 3:84-90. W. Jeffrey Bolster, Karen E. Alexander, and William B. Leavenworth, *The Historical Abundance of Cod on the Nova Scotian Shelf*. In Jackson, Jeremy B.C.; Alexander, Karen E.; Sala, Enric (Eds.) *Shifting Baselines. The Past and the Future of Ocean Fisheries* (Island Press, 2011).

¹³ "Putting the Ocean in Atlantic History: Maritime Communities and Marine Ecology in the Northwest Atlantic, 1500-1800," *American Historical Review* 113 (Feb., 2008).

pushed to the extreme was staggering. Technological innovation in terms of the introduction of steam and trawling in the early twentieth century saved human lives but also led to an avalanche of cheap fish as the fish was chased everywhere. Haddock stocks finally crashed in 1930 but trawlers carried on targeting scrod, juvenile haddock, which fitted nicely on the dinner plate. Bolster gives short shrift to the late twentieth century but ends on an optimistic note that the history of depletion may lead to a precautionary approach in the future.

Bolster succeeds admirably in describing how each and every generation of fishermen, advisors and decision makers was trapped in their minds by generational memory loss – the changing baseline syndrome – that did not provide insight into the cumulative effect of bad decisions and let us forget how much had already been lost. No one can read the book and not come away with a sense of Bolster's empathy for the tragedy of fishing. Each one of his characters "felt deeply that people were meant to fish". His concluding words are memorable: "were they to return now to the fishing ports and banks where they spent their days, they would be devastated by the catastrophic changes in the sea they knew. Had their generations steered a precautionary cause, circumstances would be better. Now it is up to us" (p262).

Deceptively simple as the story is in all its rich detail, his explanatory model does raise a few questions. Bolster is extremely good at explaining the basics of oceanography and marine ecology but he does stretch the evidence a bit too far when he describes the difference between seventeenth-century Old and New World marine life. He explains primary productivity in the ocean – the abundance of phytoplankton – as the main source of upper trophic life and therefore of fish stocks, and states that measurements of primary productivity, milligrams of carbon per square metre – are remarkably similar along the Northern European and North American coastlines. In fact, the European case is the Wadden Sea, a three thousand sq. mile coastal stretch of the North Sea, while the comparable area of the southern Gulf of St. Lawrence is at least ten times larger. While the North Sea itself is quite productive, it is far less so than much larger areas of the Gulf of Maine and the Newfoundland Banks.¹⁴ It may therefore be less of a surprise that the NW Atlantic would have compared favourably in the seventeenth century in terms of upper trophic abundance as indeed it does today.

Bolster argues that when explorers remarked on the abundance of marine life in America relative to home, this indicates that the European waters had already been severely depleted. He cites medieval evidence for the decline of right whales and gray whales in the Bay of Biscay and the English Channel, decline of gray seals and eider ducks in the North Sea, and the fishing out of sturgeon and salmon from European rivers and estuaries. He goes on that while "it is impossible to state with any certainty whether or not most European sea fish stocks were being affected, it is

¹⁴ Continuous Plankton Records: Plankton Atlas of the North Atlantic Ocean (1958–1999). II. Biogeographical charts. *Mar Ecol Prog Ser* 2004, Suppl: 11-75.

clear that the system as a whole had been significantly degraded by 1500" (p34). This is a bold statement that would require a complete rethinking of European fisheries history if it were the case. In fact, the case evidence is proof in neither direction. Certainly, there is medieval and early modern evidence for species decline and even the extinction – for unknown reasons – of the gray whale on both sides of the Atlantic by the seventeenth century. We might add the disappearance of the flamingo from the North Sea 2,000 years ago. In this case, however, Europe is little different from North America: the 'pristine myth' of an unimpacted North America has been debunked.¹⁵ Human pressure certainly took its toll on coastal life on both sides of pre-Columbian Atlantic but what about marine impacts in the early modern period, which is Bolster's concern?

We do have quantitative evidence to gauge the fishing pressure in European waters and it does not support a claim of depletion. The largest and best-documented fishery of all is the Dutch North Sea herring fishery which in 1602 extracted an exceptional 79,000 metric tonnes.¹⁶ This was without a doubt the single best-managed and technologically most advanced capitalist fishery of the world at the time. Yet, the catch was far below today's Total Allowable Catch of about 200-300,000 tonnes. The TAC is a measure to secure that fishing pressure does not exceed the reproductive capacity of the stock. Indeed, 1602 was an exceptional year, and annual catches in the seventeenth century were mostly in the range of 20,000-50,000 tonnes, or by any standards at most 25% of today's recommended sustainable catch.

The point is not that European catches were insignificant – certainly by the standards of the day the Dutch fishery was magnificent – but that it is highly unlikely that their sustained fishery was able to cause a fishing down effect of North Sea herring. The reason for European admiration of conditions in the NW Atlantic was simply that these waters were so much more productive than anything they had seen at home. The combined efforts of French and British fishermen were enough to extract a staggering 180,000 metric tonnes from Newfoundland waters in 1664. Bolster's claim that Old World waters had been fished down is unsubstantiated and it is also unnecessary in order to argue the case that New World waters were extremely attractive.

Bolster largely tells his story of the fishing down of NW Atlantic waters by means of anecdote – the persuasive power of story after story of contemporary accounts of excessive catches and failure of the run of fish the following year. Contemporary quantitative evidence is of course often lacking, and all we have are people's stories, which deserve to be heard. Occasionally, Bolster makes clear that contemporary claims are likely to have been alarmist such as when New Englanders believed that

¹⁵ William M. Denevan, The "Pristine Myth" Revisited. *The Geographical Review* 101 (4): 576-591.

¹⁶ Bo Poulsen, *Dutch Herring: An Environmental History, c. 1600-1860* (Amsterdam University Press, 2008).

their few and small boats had an impact on the staggering but unpredictable abundance of mackerel in the seventeenth century. However, such is the flow of his narrative and the many stories we are told that it is difficult to fully assess the ecological impact of early modern fisheries.

Bolster notes that the NW Atlantic ecosystem did seem able to sustain catches of 150,000 to 250,000 tonnes per year from the seventeenth to the middle of the nineteenth century, and that fluctuations may largely be explained by weather and other natural factors (65). He quickly asserts, however, that localized depletions did occur, and indeed these are what make up the bulk of the book. Bolster concedes that other factors than overfishing may explain declines in the second half of the nineteenth century (216). Indeed, the mysterious return of menhaden in 1890 seems one such factor that calls for more review of natural variability. I would have liked to see much more discussion of the forcing factors of fish abundance. Bolster may of course argue that there is a lack of quantitative evidence to inform such discussion, but as his seven tables, largely covering the period 1840-1920, show, Bolster and his colleagues have themselves produced abundant numerical evidence. There is indeed further evidence in the writings of Turgeon, Pope, and others, and I would have liked to see it used to test the ecological theories that Bolster knows so well.

As it is, the book left me wanting more, which is no bad thing. Jeff Bolster has cleared the ground and set the bar high for marine environmental history.

**Comments by Vera Schwach, Nordic Institute for Studies in Innovation,
Education and Research**

“Nothing is so boundless as the sea, nothing so patient.”¹⁷ With these words the Norwegian novelist Alexander L. Kielland initiated his now classic novel *Garman and Worse* from 1880. Later on the same page a sentence goes: “But what the sea is for those who live along its strand none can ever know, for they say nothing. They live all their life with face turned to the ocean; the sea is their companion, their adviser, their friend and their enemy, their inheritance¹⁸ and their churchyard.” Kielland’s words came to my mind as I opened W. Jeffrey Bolster’s *The Mortal Sea* and learned about his longstanding interest in people who had their faces turned to the sea, and read the history of how the populations on the seashores made use of the ocean and the fishes. Bolster’s overall aim is to provide historical insight on the human impact and (im)balances on fishing resources. He focuses on changing technologies and patterns of catch and sustainability in the age of sails. The text stretches from the medieval age to the early twentieth century, it concentrates on the Northwest Atlantic and includes many different species of sea fish. The title *The Mortal Sea* suggests that Bolster tells a history of decline and unsustainable fisheries, an assumption that turns out to be correct. One senses an undertone of a political commitment towards conservation, though this is no hindrance to compose a balanced and well-informed history. His history shows the potential of marine environmental history to gain profound understanding and stimulate reflections on the historical relationship between humans and nature. Bolster was in fact one of the first environmental historians who drew scholars’ attention to the importance of the ocean.¹⁹

I enjoyed greatly reading the ambitious and comprehensive book. I have been invited to comment on *The Mortal Sea* as a non-American historian, having worked on marine science and the fishing industry. My first remark is directed towards Bolster’s choice of methodology, and the second on some underlying values and theories in the construction of an environmental history for the ocean.

Bolster’s history is clearly influenced by Daniel Pauly’s “shifting baseline” concept, especially through its implementation in the HMAP-project (History of Marine Animal Populations), in which Bolster co-directed working on the Gulf of Maine and

¹⁷ Alexander L. Kielland, *Garman og Worse*, first edition published in 1880; for an English translation, please see: <http://www.hotfreebooks.com/book/Garman-and-Worse-A-Norwegian-Novel-Alexander-Lange-Kielland--5.html>.

¹⁸ Inheritance is an incorrect translation of the original word “ervert”, which translates into English: occupation (and income). The Norwegian word for inheritance is “arv”.

¹⁹ “Opportunities in Marine Environmental History”, *Environmental history*, vol. 11, (no. 3, 2006): 567–597.

Nova Scotian Shelf.²⁰ The backdrop for the HMAP-project was an article written by Pauly in 1995, in which he criticized the fisheries biologist for routinely using the state of the fishery at the start of their careers as a baseline for the estimation of the abundance of the fish species. Pauly argued that this baseline should be shifted: a crucial question is how plentiful the species were before human exploitation began.²¹ Since then Pauly's notion of the importance of knowing the fishing resources in an untouched state has been debated and refined by fisheries scientists and marine ecologists. The involvement of professional historians and the HMAP project grew out of the fisheries scientists' need for long time temporal reference. The "shifting baseline" concept has also been applied more widely, to describe the expectations of a healthy ecosystem and the overall goals of marine conservation. Do I sense an American dream of wild and pristine nature?

As a key to come to grips with Bolster's description and construction of knowledge of the past, I use the aim of the HMAP project, in the way its goal was formulated in 2012 by its coordinators, the historian Poul Holm et al., as a point of reference.²² Holm et al., who joined the fisheries biologists in setting the reference points, argued that knowledge of the social, economic and cultural frameworks of the data is necessary, in order to gain a balanced understanding of the numbers of the past. The authors also stated that historical information in itself is valuable for enriching the understanding of human interaction with the marine environment. In my view, cooperation across disciplinary borders is valuable, and funding from external sources is in principle no hindrance for undertaking excellent scholarly studies. Nevertheless, in the HMAP project, the fisheries biologists' need for temporal reference points seems to have influenced the internal historiography of marine history. First, several methodological challenges are raised by assuming that data from a distant past are precise numbers by contemporary standards.²³ Finding historical data is no easy task, and constructing statistics on the basis of incomplete past data is a difficult undertaking. The historian Joseph Taylor along with other peers have, rightly so, warned against the uncritical use of inaccurate historical numbers as a basis for establishing a new baseline – in the sense intended by Pauly and fisheries biologists. Agreeing with Taylor, I here point toward an interlinked and potential intellectual implication of the HMAP project on marine history, as seen in Bolster's book. First, in the approach to compose history as a summary of material collected from available files one may see a turn to positivism and old-fashioned German empiricism. Then I am left with a hunch that inaccurate and incomplete numbers are presented as accurate statistics and documentation, and

²⁰ <http://marine.unh.edu/people/faculty/bolster-jeffrey.html>, accessed April 24 2013.

²¹ Daniel Pauly (1995) "Anecdotes and the shifting baseline syndrome of fisheries", *Trends in Ecology and Evolution*, 10(10): 430.

²² Poul Holm, Marta Coll, Alison Mac Diarmid et al., «HMAP Response to the Marine Forum», *Environmental History*, 18 (January 2013): 121.

²³ Joseph E. Taylor III, "Knowing the Black Box: Methodological Challenges in Marine Environmental History", *Environmental History*, 18 (January 2013): 60–75.

used to support an overall hypothesis of a steady decline over centuries. Reflections on the particular economic, societal and cultural situations in which changes took place may get lost in the drive to quantify history. In spite of Holm et al.'s intentions of providing historical information in itself valuable for enriching the understanding of man's interaction with the ocean, reading Bolster's book raises basic questions about how historians deal with situations where few or no numbers and/or archival files are available, and how they handle and reflect upon other forms of information, such as intuitive and introspective knowledge.

My second comment concerns economy and conservation, and a basic issue: was the fishing sustainable or non-sustainable? An important component of environmental history is to deal with the ways humans used nature, including the environmental consequences of increasing population, more effective technology and changing patterns of production. Bolster applies this element to the marine environment. With his resource-centered perspective – the study of utilization of fishing and whaling resources – Bolster follows up a vogue in marine environmental history.²⁴ Disembarking from a Norwegian historiographical tradition where the fisheries habitually are included in the history of economics, I find the North-American and Bolster's environmental approach refreshing, but also challenging.

As indicated by the title, *The Mortal Sea*, a decline in fishing resources has taken place. Bolster argues that a decrease occurred in the age of sail, but claims that a rapid drop came in the beginning of the twentieth century. According to Bolster this severe decline was caused by man-made factors, triggered by the adoption of a new economic system in the fisheries, innovations involving new technologies, and a neglect of fishers' own, local and experienced-based knowledge of the state of the marine resources. He states: "Between 1900 and 1920 fishermen regularly adopted technologies that their parents and grandparents had protested because of their ruthless efficiency and because they sensed there were fewer fish in the sea (10).

Bolster is eager to identify when fishers began to view nature and its resources as a source of economic wealth, and not only as a source for subsistence, this change often being viewed as a turning point from sustainable fisheries to a non-sustainable fishing industry. In doing so he tends to create a dichotomy between fishermen as conservationists and fishermen as capitalists. Brian Payne has argued that environmental historians should view fishermen as both capitalist producers and resource stewards.²⁵ I agree with him; and by taking into consideration fishermen's latent dual interests, historians will provide themselves with a useful tool when

²⁴ Point taken from Helen M. Rozwadowski, "Oceans: Fusing the History of Science and Technology with Environmental History," in Douglas C. Sackman, ed., *A Companion to American Environmental History*, Chichester (Wiley-Blackwell), 2010: 442-456.

²⁵ Brian Payne, "Local Economic Stewards: The Historiography Debate of the Fishermen's Role in Resource Conservation", *Environmental History*, 18 (January 2013): 29-43.

examining fishermen's attitudes and the values which influenced their interaction with nature, including their motives for worrying over fishing resources and overfishing. Their statements could be based on economic motives – to protect their own fishing grounds and economic system, and/or on ecological motives, i.e. more altruistic motives over the fish in “their waters.” Bolster, in my opinion, idealizes the fishermen and their unselfish concerns: i.e. the way they thought about nature, and their purpose to go fishing and earn an outcome. He constructs a history where the shift from sustainable to non-sustainable fisheries came from outside the fishing communities. Innovations and new technologies are largely seen as a way to deal with overfishing and exploitation of the resources. Bolster's considerations may be based on assumptions about the situation today, namely that the depletion of stocks is the main reason for fishermen seeking new fishing grounds.²⁶ Embedded in *The Mortal Sea* is a defense of (semi-) subsistence fishers situated in local communities rather than commercial fishers.

Since the 1970's anthropologists and historians in the USA and Canada have established a scholarly tradition of portraying a dichotomy between local, traditional, or experience-based knowledge on one hand, and scientific knowledge on the other. In this view, the values and knowledge of the local population differ from those underlying science-based management from the government. Bolster in his history employs this dichotomy to examine how depleted fish species were evaluated by scientific expertise, with consequences for the management of fisheries and the whole ecosystem.

By contrast, Norway is a country whose economy and relative wealth was (and is) to a large extent is based on a strong public management and the utilization of natural resources, including waterfalls, oil, shipping, rich fishing grounds and marine farming.²⁷ The export of air dried cod – stockfish – from Norway in the twelfth century, noticed by Bolster as a starting point of large scale commercial fisheries, still represents an important source of income for the local and national fishing industry.

I admit to finding it difficult, both as a professional historian and as a native of Norway, to support fully Bolster's view of the general devastating effects of modernization processes, scientific expertise, and management. This is *not* to say that environmental concerns are unimportant, but to question the fruitfulness of the dichotomy: the local fishing communities versus the government, including its attempts to modernize with scientific expertise, in order to reach insight about the various dynamics in the development of the use of the fish species. Bolster provides

²⁶ Among other publications, see Ray Hilborn and Carl Walters, *Quantitative Fisheries Stock Assessment: Choice, Dynamics and Uncertainty*, London (Springer), 1992.

²⁷ For an elaboration of the argument, please see: Vera Schwach, “The sea around Norway: Science, resource management and environmental concerns in Norway, 1860–1970”, *Environmental history*, 18 (January 2013): 101–110.

the reader with his considerable knowledge of marine life beneath the surface of the Atlantic coast and ocean, and what the sea meant for the population on the seashores. Still, I would welcome elaboration of the role of fishermen as economic actors, and not only as ecological actors by Bolster and in marine environmental history.

Comments by Helen M. Rozwadowski, University of Connecticut, Avery Point

Jeffrey Bolster's *The Mortal Sea* represents a significant contribution for several fields of history, including maritime history, colonial American history extending through U.S. history of the 19th century, and environmental history. For the latter, the book provides an excellent example of the benefit to historians of addressing natural boundaries, not political ones, and time frames relevant to a particular story, which do not always match the more usual divisions of professional history. Bolster examines the area of the North Atlantic from Cape Cod to Newfoundland, from the arrival of Europeans, bringing their personal experience of a similar but depleted ecosystem, through the early twentieth century.

Himself a professional mariner, Bolster brings his own intimate experience and insight to bear in this book as he did so deftly in his previous work, *Black Jacks: African American Seamen in the Age of Sail*.²⁸ An evocative example is his comment on the irony of fishermen facing devastated fisheries: "No profession has ever placed more emphasis on avoiding disaster than seafaring."²⁹ I commend to readers a book by Kenneth F. Brooks, Jr., *Run to the Lee*, for an exploration of the importance to mariners of relying on habits of comprehensive preparation, deliberate anticipation of problems and strict attention to one's surroundings rather than luck.³⁰

As a Bancroft Prize winner, this book has received, and will appropriately continue to attract, analysis and dialogue from many historians; I would like to focus on Bolster's work as a contribution to a vibrant interdisciplinary partnership that is forging links between the humanities and the natural sciences to better understand past, present and future marine environments. This enterprise aims to influence policy by pushing relevant interests to think historically. *The Mortal Sea* particularly addresses a significant gap in our understanding of the period before fisheries industrialized.

Bolster's epilogue summarizes events from the 1910s, when his detailed history ends, to the 1990s, when the dramatic crash in the northwestern Atlantic cod fishery drew the world's attention, finally, to the extent of human impact on the marine environment. The broad outlines of the story of twentieth-century fisheries are familiar to many groups of people, far beyond the fishers themselves and their communities. Fisheries managers, politicians and policy-makers, scientists and social scientists have all participated in, or studied, post World War Two fisheries

²⁸ W. Jeffrey Bolster, *Black Jacks: African American Seamen in the Age of Sail* (Harvard University Press, 1998).

²⁹ Bolster, *Mortal Sea*, 2.

³⁰ Kenneth F. Brooks, Jr., *Run to the Lee* (Johns Hopkins University Press, 1988).

problems, while media coverage has ensured that few engaged citizens are unaware of the depleted state of many fisheries today. Historians have begun the process of researching and writing about recent fisheries problems; of many possible examples, I would call readers' attention especially to Carmel Finley's *All the Fish in the Sea* as a noteworthy example of the history of postwar industrial fisheries for Pacific salmon and tuna which explores their relationship to international diplomacy.³¹ In short, fisheries problems of the twentieth century attract attention from many quarters, scholarly and otherwise, including from historians.

As Bolster convincingly demonstrates, understanding the roots of the contemporary fisheries crisis demands a look back to the period before industrialized fisheries. He explained about the twentieth century, "What changed during those years from 1912-1992 was simply the scale of humans' impact on the living ocean, in both time and space. The prevailing pattern had been established long before." He elaborated, "Industrialized fishing merely accelerated a process of overexploitation already set in motion by centuries of policy decisions, market transactions, and human desires."³² *The Moral Sea* chronicles those decisions, transactions and desires. The single most notable strength of the work is its concentration on fisheries prosecuted under sail, with primitive or relatively simple gear, that made deep inroads into marine populations and also established attitudes and patterns of resource use that continued into the era of industrialized fisheries.

Bolster is not the first scholar to look back in time at long-past fisheries; his book is valuable precisely because it synthesizes and extends a robust trajectory of inquiry that has attempted to gain an understanding of past marine environments. In 2000, historical ecologists initiated a partnership with historians as part of the international project Census of Marine Life.³³ That effort aimed to enumerate, globally, what did, does, and will live in the sea. The historical component of the project, named HMAP for History of Marine Animal Populations, involved historians and other researchers in this ambitious effort to document how the diversity, distribution and abundance of marine populations changed in response to human actions.³⁴ Historians have debated the value of this project for the discipline of history, but it did produce a series of conferences titled "Oceans Past" and a hefty bibliography.³⁵ Individual historians associated with HMAP have written excellent

³¹ Carmel Finley, *All the Fish in the Sea: Maximum Sustainable Yield and the Failure of Fisheries Management* (Chicago: University of Chicago Press, 2011).

³² Bolster, *Mortal Sea*, quotes on 267, 277.

³³ <http://www.coml.org/about-census>.

³⁴ <http://hmapcoml.org/about/>.

³⁵ Lance van Sittert, "The Other Seven Tenths," *Environmental History* 10(2005): 106-109. Katherine Anderson, "Does History Count?" *Endeavour* 30(4)(2006): 150-155. For a complete bibliography of the project, visit: <http://hmapcoml.org/publications/>.

monographs, of which Matthew McKenzie's *Clearing the Coastline* is a wonderful example.³⁶

Among the outgrowths of this initiative has been an extension of this trajectory of investigation into the deep past, the result of a new alliance forged between historical ecologists and coastal archaeologists.³⁷ This work, which even in its current preliminary stages, already demonstrates that humans have almost always had some impacts on marine systems they exploit, at least local effects, but sometimes rather dramatic effects of trophic cascades set off by the removal of key predators such as sea otters. This work on the far-distant past bookends Bolster's work on the starting end of *The Mortal Sea* just as the considerable attention given today to twentieth-century fisheries challenges does for the end of his time period.

The Mortal Sea not only presents the results of Bolster's own research but it also integrates research done by scientists, historians and interdisciplinary teams, many under the auspices of HMAP and some independently. The result is the nuanced history of an ecosystem, the story of a coherent place and time. In contrast, some efforts by scientists pursuing HMAP's mission, such as Callum Roberts' fine book, *The Unnatural History of the Sea*, miss telling human stories in their focus on marine animal populations, or sketch the outlines of the general pattern of fisheries decline without the historian's attention to time and place. By contrast, Bolster balances attention to people, technology, economics and culture, as well as the many trophic levels of the ecosystem.

As a historian of science, I would like to see more systematic scholarly scrutiny of the fisheries science of the nineteenth century, one that extends beyond the scope of this already ambitious book. Bolster quotes individual scientists and attempts to characterize the institution of the US Fish Commission, but more deeply analytical work on fisheries science of this period is needed, because this was the moment when science was professionalizing, when governments first began funding science at all (intriguingly, mostly maritime-related science³⁸), and newly-formed scientific institutions began flexing their intellectual and cultural muscle.

As Michael Reidy has pointed out, the very word "scientist" was coined by William Whewell in the context of his study of global tides in the 1830s.³⁹ This observation suggests the value of asking questions such as: Why did governments begin funding

³⁶ Matthew McKenzie, *Clearing the Coastline: The Nineteenth-Century Ecological and Cultural Transformations of Cape Cod* (University Press of New England, 2011.)

³⁷ Jon M. Erlandson and Torben C. Rick, eds., *Human Impacts on Ancient Marine Ecosystems: A Global Perspective* (University of California Press, 2008).

³⁸ Harold Burstyn, "Seafaring and the Emergence of American Science," in Benjamin W. Labaree, ed., *The Atlantic World of Robert G. Albion* (Middletown, CT: Wesleyan University Press, 1975), 76-109.

³⁹ Reidy, Michael S. *Tides of History: Ocean Science and Her Majesty's Navy*. Chicago: University of Chicago Press, 2008.

fisheries science? What effects did this patronage have on the questions scientists investigated? Why did the qualms about restricting fisheries articulated by scientists have so much political heft? Several recent books demonstrate the value of the approach of considering the history of fisheries science alongside the history of fisheries, including Christine Keiner's *The Oyster Question* and Carmel Finley's *All the Fish in the Sea*.⁴⁰ Bolster notes that the advice and views of scientists prevailed while memories of particular depleted fisheries faded as the fishermen who had experienced these declines turned to other species or other work. Serious and comprehensive attention to the institutionalization of science might explicate this observation.

The Mortal Sea is not only a noteworthy contribution to historical scholarship, it also links history more closely to the marine environment, particularly for the crucial period before and as fisheries were modernizing into the industrialized fisheries we have been so quick to blame for the present state of the marine environment.

⁴⁰ Christine Keiner, *The Oyster Question: Scientists, Watermen, and the Maryland Chesapeake Bay since 1880*. Athens, GA: The University of Georgia Press, 2009, and Finley, *All the Fish in the Sea*.

Response by W. Jeffrey Bolster, University of New Hampshire

A hearty thanks to Professor Jacob Hamblin for organizing this roundtable; and to Professors Poul Holm, Vera Schwach, Christine Keiner, and Helen Rozwadowski for taking time from their busy schedules to read and comment on *The Mortal Sea*. I appreciate their insights, and hope that between their comments and my response, we contribute to on-going discussions about the nature of marine environmental history. I find it especially appropriate that two of the four commentators are European, for Americans and Europeans often have somewhat distinct ideas about producing environmental history.

Writing this book made a monkey out of me for over a decade. I often thought I had bit off more than I could chew, trying – as I did – to incorporate history and science, to cover both sides of the Atlantic (even if my coverage of the European coast was somewhat superficial), and to cover more than 1,000 years of time, though the heart of the book addresses only four centuries. One of the challenges in tackling a subject with such a broad compass is “what to leave out.” I omitted a great deal, some things by explicit design, and others for lack of space. It is no surprise that my interlocutors found certain things missing.

On the whole, however, what I wanted to do more than anything was to tell a story. I don’t think of myself as a theorist, or an empiricist; nor am I concerned primarily with historiographical engagement. Without having read a great deal of environmental history, both terrestrial and marine, I would not have been able to write this book. But I did not desire to split hairs with other practitioners.

I wanted to construct a deeply-researched and factual narrative featuring real people doing real things at real times and places, even as I covered enough time that I would be able to reveal changes in the sea. So I wanted scientific accuracy and human-interest, but I wanted to present what I knew as a narrative. The farther I got into the project, the more I realized that my narrative was a parable. That had not been the intent, but as I reconstructed the changing nature of fisheries and the coastal marine ecosystem, the moral of the story became more and more clear.

Authors are always delighted when reviewers “get it,” and Jonathan Yardley, of *The Washington Post*, got it. The final two lines of his review, published in the *Post* on October 27, 2013, quoted me, and then inserted a kicker of his own. I wrote, “Ultimately the scale of this story, spanning centuries and stretching across the North Atlantic, reveals, as few other tales can, the tragic consequences of decisionmakers’ unwillingness to steer a precautionary course in the face of environmental uncertainties.” Then Yardley wrote, “Anyone who thinks that passage – or this book – is only about fish is living in a fool’s paradise.”

Contributors to this roundtable did not all react to *The Mortal Sea* as enthusiastically as Yardley. I'll respond now to their range of reactions.

Poul Holm, a respected Danish historian with whom I worked for more than a decade on the Census of Marine Life's History of Marine Animal Populations project, was both congratulatory and somewhat skeptical in his assessment of *The Mortal Sea*. I must thank him straight away for pointing out an omission of mine. Noting that my "explanatory model does raise a few questions," Holm explained that my comparison of the primary productivity of Europe's Wadden Sea and America's Gulf of Saint Lawrence was correct in that measurements of primary productivity – milligrams of carbon per square meter – were similar in both regions. However, as he points out, the Gulf of Saint Lawrence is ten times as large as the Wadden Sea, a fact I failed to state when I compared the historic productivity of boreal European systems with that of boreal American ones. Scale matters. I should have made clear the differences in scale, and Holm was right to point that out. I owe a great deal to HMAP, which Holm co-founded. And I am honored that he thinks I "set the bar high for marine environmental history."

That said, we have not always seen eye-to-eye about what is important in the production of history. Methodology and interpretations matter. So does evidence. In his contribution to the roundtable, Holm conveys that I overstated the extent of overfishing in coastal European waters by the sixteenth century. I respectfully disagree, and believe that my interpretation of the evidence is warranted. As he sees it, "the reason for European admiration of conditions in the NW Atlantic was simply that these waters were so much more productive than anything they had seen at home." He makes the case, by implication, that harvesting pressure in European coastal seas had done little to degrade the ecosystem's productivity, and states boldly – to contrast with my "anecdotal" evidence -- that we "have quantitative evidence to gauge the fishing pressure in European waters and it does not support a claim of depletion." The quantitative evidence on which he relies to make this case is from the Dutch herring fishery. As Holm argues, "it is highly unlikely" that the early modern Dutch fleet depleted North Sea herring stocks.

He is right. But the problem is that I never said it did! On page 31 of *The Mortal Sea* I wrote "Some European species were being fished sustainably." Citing an impressive book on the Dutch herring fishery from 1600 to 1860 by Bo Poulsen – Poul Holm's graduate student and my friend – that paragraph presents seventeenth-century European herring landings as "sustainable." In other words, while I argued from a variety of sources that many European coastal species' populations had been degraded by the early modern era, including eider ducks, sturgeon, harbor seals, right whales, and inshore flatfishes, the herring fishery was a sector that I said had not been depleted. Holm may stand his ground if he wishes, and continue to insist that "Bolster's claim that Old World waters had been fished down is unsubstantiated," but if he is going to do so he should find examples in my book where I got it wrong, not places where I am in agreement with him.

Professor Holm remains more skeptical than I do about the utility of anecdotes and stories from the past. As he sees it, “such is the flow of [Bolster’s] narrative and the many stories we are told that it is difficult to fully assess the ecological impact of early modern fisheries.” He wants the smoking gun of “quantitative evidence,” and notes that “Bolster largely tells his story of the fishing down of NW Atlantic waters by means of anecdotes.” As I see it, the History profession is a big tent: practitioners can have a preference for one type of methodology over another. In defense of my approach, I will say that whenever I had reliable quantitative evidence I used it. But I was also content to excavate as many stories as I could, and to use them as the foundation for my book. There is power in those tales, especially when story after story, petition after petition, court case after court case, logbook after logbook, and government document after government document reinforces each other in an expanding pattern of veracity.

I imagine “history” to be an interpretation of some aspect of the past, based on the best available evidence and on accepted methodologies. Because it is based on evidence it should be true, but because it is an interpretation it is subject to revision if better evidence or new methodologies emerge. I certainly pushed my evidence in places to make an interpretation, but I think that interpretation was more nuanced than Professor Holm’s somewhat skeptical tone suggests. Of course, it may simply be that we disagree because of the scholarly traditions in which we were raised, one an American environmental historian and the other a European environmental historian. The challenge for all practitioners is to be conscious of how we learn what we know, and how we tell it. I remain comfortable with the way I practice history, despite criticism of my reliance on anecdotal evidence.

The comments on *The Mortal Sea* by Professor Vera Schwach, a Norwegian historian of science, are the most critical of any I have seen in print, and I feel compelled to stand my ground and clarify my position in light of them. We agree on some things. Professor Schwach rightly senses my “undertone” of “political commitment towards conservation,” graciously states that she “enjoyed greatly reading the ambitious and comprehensive book,” and reiterates that “cooperation across disciplinary borders is valuable.” So far, so good.

But when she suggests that my reconstruction of fisheries history smacks of “positivism and old-fashioned German empiricism,” I am left scratching my head. Perhaps, as with Professor Holm, a fundamental disagreement exists about how to produce history. I am unapologetic that I sought to construct a multi-layered narrative relying on a wide variety of evidence, a narrative that swept across time and place, that fused history and science, that challenged certain romantic interpretations of traditional fishermen, and that explored ironies, paradoxes, and the unpredictability of the consequences of human actions. Perhaps that is what Professor Schwach meant by calling mine an “ambitious and comprehensive book.”

But when Professor Schwach writes that “inaccurate and incomplete numbers are presented as accurate statistics and documentation, and used to support an overall

hypothesis of a steady decline over centuries,” I reply, “*En garde.*” Where are the “inaccuracies?” Where did I err by supposedly fudging “incomplete numbers?” Where is the “steady decline” to which Professor Schwach refers? May I point to Figures 1, 2, and 5 in my appendices, figures on cod landings in the Gulf of Maine 1861-1928, mackerel landings in the United States 1804-1916, and menhaden landings in New England, 1880-1920. Not one of those figures represents “steady decline.”

Professor Schwach argues that reading my book “raises basic questions about how historians deal with situations where few or no numbers and/or archival files are available.” I am delighted that my work raises methodological questions. In defense of myself I can state that I worked very hard, in concert with members of our interdisciplinary research group at the University of New Hampshire, to contextualize our findings. All good historians should be alert to informants from the past who lied, and to others who said things that turned out to be wrong. All good historians should interrogate the validity of the statistical data they use. I would be glad to explain to Professor Schwach how our group generated the data that we used to reconstruct historical fisheries, data on which I relied in Chapter Four. The inference that such data consists of “uncritical use of inaccurate historical numbers” is a serious accusation, especially because Professor Schwach just leaves it hanging. She never once points to a specific inaccuracy in my book, or in the articles produced by our interdisciplinary HMAP group.

I have other bones to pick with her, too, notably her insistence that my book “idealizes the fishermen” and that it does too little to explain them as “economic actors.” I disagree. Allow me to suggest pages 127-133 of *The Mortal Sea*, along with pages 197-206, as just two of numerous passages where I worked diligently to not idealize fishermen, but to present them as multi-faceted economic actors and typically inconsistent human beings.

Towards the end of her critique, Professor Schwach writes that she finds “it difficult ... as a professional historian ...to support fully Bolster’s view of the general devastating effects” of “modernization” and “scientific expertise” on the fisheries. That statement strikes me as astonishing. Does she intend to argue that fisheries and marine ecosystems are in fine shape today? Or that modernization was not a culprit? Or that “scientific expertise” and “management” did not contribute to the current crisis? As I see it, societies across the boreal North Atlantic over the course of several centuries squandered what could have been a largely renewable set of marine resources. The tragedy is that this occurred in the face of a litany of complaints from fishermen, politicians, naturalists, and others – beginning during the 1850s and 1860s – about the “degradation” and “depletion” and “diminution” of marine resources. Of course catastrophic overfishing did not occur until the 20th century, in lockstep with scientifically managed fisheries. If Professor Schwach does not believe that the living ocean has been devastated, than we understand the present – as well as the past – in different terms.

Professor Helen Rozwadowski, in her contribution to the roundtable, honored my attempt to produce interdisciplinary scholarship that could bridge the humanities and natural sciences. She and I agree that understanding today's fisheries crisis "demands a look back to the period before industrialized fisheries." And I am delighted that she sees the most "notable strength of the work ... its concentration of fisheries prosecuted under sail, with primitive or relatively simple gear, that made deep inroads into marine populations and also established attitudes and patterns of resource use that continued into the era of industrialized fisheries."

By the time I had finished writing *The Mortal Sea* my chief critique of the book was that I had not historicized "science" sufficiently well. Professor Rozwadowski points this out, writing that she "would like to see more systematic scholarly scrutiny of the fisheries science of the nineteenth century." I agree. The book would have been stronger had I had the patience or skill to do it. I will happily leave that task to someone else.

Rozwadowski and I are largely on the same page in many ways, including supporting interdisciplinary approaches, arguing that historical perspectives are crucial in current management decisions, hoping that scholarship in marine environmental history will influence policy, and believing that attention to the ocean must include attention to the people who have used it – and their cultures – as well as attention to chemical, physical, and biological oceanography.

I am in a position to answer one question she raised towards the end of her contribution to the roundtable. She asked "Why did governments begin funding fisheries science?" The simple answer is because of constituents' clamor. Whether at the state, provincial, or national level – and whether in the United States, Canada, Norway, or England – politicians around the 1860s and 1870s began to fund fisheries science because fishermen and others in fishing communities insisted that something was wrong, and worried that the resource on which they depended was shrinking. Obviously astute scientists such as the American Spencer Baird and the Norwegian Georg O. Sars capitalized on government patronage for their studies. Nevertheless, had no groundswell of public opinion insisted that there was a problem with fisheries, it is difficult to imagine so many governments on both sides of the Atlantic directing their attention and financial resources to fisheries investigations.

Professor Christine Keiner graciously referred to *The Mortal Sea* as a "magisterial model chronicling the ocean's common destiny with humans." She clearly liked the book, and I thank her for an enthusiastic review. I was impressed that she focused early on my second chapter, the one in which I explored how seventeenth-century emigrants and their children in Massachusetts viewed the ocean's bounty through the lens of depleted European coastal seas. There is not a lick of quantitative data in that chapter, yet I believe it is a sound interpretation based on many kinds of evidence and many examples. The key word is *interpretation*. As a scholar, I sought to generalize from all of the available evidence, including sixteenth- and

seventeenth-century documents from Europe and Massachusetts, and from contemporary marine science. My interpretation may not be the last word; but I believe it is sound in light of what we know now.

Professor Keiner was especially intrigued with nineteenth-century clashes between fishermen and scientists over who had the right to interpret marine ecosystems. Confessing her affinity for Thomas Henry Huxley, she nevertheless zeroes in on a “stunning irony” about evolutionary thinking in the late nineteenth century. This was not something about which I wrote explicitly in *The Mortal Sea*, and I am pleased that Professor Keiner, a historian of biology, was able to make an imaginative leap from material presented in my book, a leap that allowed her to re-think the ahistorical attitudes of Huxley and his followers vis-à-vis fisheries.

Toward the end of her critique Professor Keiner spoke of the need to give voice to preindustrial fishermen – something I tried to do throughout. She expressed modest surprise, however, that I had not relied specifically on maritime anthropological literature, notably work on the “tragedy of the commons.” And she noted that she would like to learn more about my views “on the applicability of cultural anthropology to scientifically-informed marine environmental history.” I certainly think cultural anthropology has a place in marine environmental history. I have taught the “tragedy of the commons” in my marine environmental history course at the University of New Hampshire, and read a fair amount of the literature on that debate. But as a writer, I chose to write a book that shone its spotlight on preindustrial fishermen, not on theory. It was a conscious choice, a preference that could have gone either way.

Assessing the four critiques together, it is clear that the European scholars were much more critical of my methodology and my findings than were the Americans. We are left wondering whether this is simply a function of personalities, or whether substantive differences in European and American epistemologies in environmental history explain the split. While I felt compelled to defend my book from some of the charges leveled against it in this roundtable, I am pleased that it has generated discussion, and I hope that it – and the roundtable – contribute to the on-going vibrancy of marine environmental history.

About the Contributors

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