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Marine Forum

HMAP Response to the Marine Forum

In the introduction and in contributions by Joseph Taylor and Christine Keiner to the Marine Forum in this issue of *Environmental History*, the authors refer to the History of Marine Animal Populations (HMAP) project.[1] As HMAP coordinators, we have been invited by the journal editor to respond. A few words on the HMAP project may therefore be of value.

The HMAP project originated in 1999 out of a call for a historical reference point for the Census of Marine Life, an ambitious natural science program to establish a contemporary baseline of marine life. The census leadership realized early on that an assessment of the health of the ocean ecosystem needs historical reference points to be meaningful. Historians argued that social, economic, and cultural frameworks would be needed to understand these reference points, and that the historical information would be of value in itself for enriching our understanding of the interaction of humans with marine life. Participants in two workshops in 2000 and 2001 of historians and marine scientists agreed on a broad research agenda that was subsequently developed and funded to the tune of a total of $15 million US by several major funders.[2] The original project ended in 2010, but the Oceans Past conferences continue as regular conferences (the latest held in Fremantle, Australia, in November 2012 and the next to be held in Tallinn, Estonia, in 2015), and HMAP continues as a network organization.[3]

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HMAP is a big tent. With backgrounds as diverse as ecologists and historians, statisticians and archaeologists, modelers and art historians, we gain insight from different approaches and methodologies, and enjoy learning from each other. Particularly in the early years, the focus was very much on the training of young researchers to help interdisciplinary understanding. We note that Jay Taylor taught at one of these training workshops that included such brilliant postgraduate students as historian Matt McKenzie and biologist Loren McClenachan, all contributors to this forum.

In general, we welcome the recognition by the forum editors that the field is rapidly developing and that both scholarly and contemporary concerns need to be addressed and discussed. However, we have a few concerns. To our mind, the forum overstates the divide between human and natural sciences. We do not see a fundamental epistemological difference between the sciences, and we would include history as part of the scientific family. We strongly feel that for too long archaeologists, historians, and ecologists have worked in isolation from one another on different aspects, and usually on different time periods, of what is in fact a continuum of human interactions with the marine environment. By bringing these different perspectives together, real progress can be made in understanding human impacts on the marine environment over the "long view." This is what HMAP has attempted to do, and the growing list of publications produced since 2000, frequently coauthored by historians and ecologists, is a testament to the success of this approach.

Environmental change will alter the world we live in over the next few decades. While climate change may be denied by sceptics today, there is no doubt that forces of demographics and economics alone will put the planet under severe stress. We live in a time when we need to come to terms with perhaps the biggest ever challenge of the human race. There are, therefore, not just good epistemological reasons for collaboration between the sciences and humanities—there is a real need to muster all relevant knowledge if we as a species are to survive.

Through most of the twentieth century, science and history made all possible efforts to become dissociated from each other. Pure science was ahistorical in principle: only recurrent phenomena were of interest because they could be made to fit and be tested by theory. The rest, unpredictable and arbitrary events, defied the balance of models and therefore had to be discarded, and they were best left to nature's storytellers. To the humanists, in contrast, nature was irrelevant in relation to what was perceived as their real object of interest, and humanists often permitted themselves to regard nature as a given, an unchanging scene for human action.

This "historical myopia," disdain for, or ignorance of the historical perspective, has been acknowledged by some scientists as the "shifting

baseline syndrome" where the current status of an ecosystem, species, or fish stock is assumed to be normal by contemporary observers unaware of its previous states.[4] Pauly observed that equilibrium or steady-state models are based on a given data set, often established by scientists within the last generation. He argued that longer historical data series may dramatically challenge an equilibrium model and that we cannot know from recent information the extent of the losses that may have happened. What happens to the equilibrium if the model is established on the basis of earlier data? Here's a simple example: historians and archaeologists have documented that as recently as fifty to a hundred years ago, large fish such as sturgeon, tuna, and swordfish were indigenous to the European North Sea. Previously, marine ecological models did not consider these species. When the natural sciences recognize a need for historical depth, it is an ideal starting point for cooperation with the humanities. This approach can be seen as part of a larger historical turn within marine science, where important contributions to historical marine ecology appear more and more frequently.[5]

Keiner and Taylor both refer to an essay against the HMAP approach by Lance van Sittert that appeared in this journal in 2005. Van Sittert criticized HMAP for reducing historians to "data serfs" who were expected to facilitate the "model overlords" in marine science.[6] His criticism seemed to imply that HMAP is solely about historians digging into archives and offering their data to ecologists for their use in ecological modeling. Clearly van Sittert saw this as an impure applied dimension of historical labor. We believe that such a practice is not bad in itself and is actually widely used. The applied dimension of historical archival work is used in many contexts such as in city planning that relies heavily on historians digging up documentation of past industrial use of a site. Similarly, in climate studies, historical data are indispensable. Van Sittert went even further and implied that the quantitative interest of HMAP was in itself incompatible with the qualitative assessment that evidently he believed was the prerogative of historians. This part of his criticism was met by a forceful rebuttal by Katherine Anderson in her 2006 paper, "Does History Count?"[7] Jeffrey Bolster and Glenn Grasso demonstrated the value of combining ecology and history in essays in *Environmental History*.[8]

Taylor and Keiner both stress that natural and human scientists are separated by fundamental epistemological differences, and they appear skeptical about collaboration between natural scientists and historians. Here is perhaps an epistemological disagreement with us. Our point of departure would be that both natural and human sciences combine models and narrative, and we do not see them as defining traits of one or the other. We believe that real benefits may come from interdisciplinary collaboration. Of course there are great differences between the approaches of an ecologist and an art historian,

but we find that both parties benefit from more exposure to each other. Collaboration will enable us to address questions not just about how humans impacted the marine environment, but also why changing relationships with the sea were related to social, economic, and cultural developments. In between the extremes, there is a lot of middle ground, and historians, archeologists, and biologists often draw on each others' work.

HMAP played a particular role in providing training at several summer schools and workshop for graduate students who later have made valuable contributions to environmental history. Among many, we may name early career researchers such as Glenn Grasso, Matthew McKenzie, and Loren McClenachan from the United States; Martin Wilcox, Bo Poulsen, and René Taudal Poulsen from Europe; Julia Lajus and Alexey Kraikovski from Russia; and Lif Jacobsen, Jo Acebes, and Joseph Christensen from Australia. They went on to write valuable books and papers that bear witness to the value of interdisciplinary training.

Human coastal societies are shaped by strategies for engaging with the sea while the marine environment may be fundamentally impacted and indeed altered by human extraction. The HMAP approach provides opportunities for improving our understanding, both qualitative and quantitative, of historical changes in marine populations under different ecosystem regimes and for understanding human strategies for ocean resource use. We encourage time series analysis across the full time scale of human history. We are happy when time series and reference points can inform policymakers and managers about new targets for species distributions and biomasses of marine organisms, and thereby increase our understanding of long-term variability and trends (shifting the ecological baseline). Similarly, a better understanding of human dependence on marine resources may help the historical sciences to overcome their focus on terrestrial resources for understanding human strategies for survival (what we would call a sea change of history).

Comparative studies across continents and long time scales are perhaps the biggest opportunity for marine environmental history. HMAP funded fifteen regional case studies, and publication of several of these is still ongoing. We stand to learn much more about human and natural drivers of change in marine ecosystems when we compare areas with differing timings of human settlement and exploitation. Late settled, isolated, large island systems have much to offer in this context. For example, humans did not settle New Zealand until 1250 (give or take twenty-five years), but they rapidly changed both its terrestrial and marine megafauna.[9] In other places where the archaeological record of the ancient interactions of humans with coastal seas has been lost through rising sea levels over the last ten thousand years, the opportunity to study this phase of

human impacts on marine environments is impossible or highly problematic. A major integrated study of the marine environmental history of New Zealand is on the way that will bear testament to the power of collaboration between historical ecologists and environmental historians.

We congratulate the authors on a forum that will certainly stimulate further debate within the wider global community. We are delighted to see the continuing growth of American marine environmental history, and we look forward to contributions at future Oceans Past conferences and submissions to the *PLOS One HMAP Collection*, which welcomes marine environmental history papers.

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Notes

1 Michael Chiarappa and Matthew McKenzie, "New Directions in Marine Environmental History: An Introduction," *Environmental History* 18, no. 1 (2013): 3–11; Joseph Taylor, "Knowing the Black Box: Methodological Challenges in Marine Environmental History," *Environmental History* 18, no. 1 (2013): 60–75; Christine Keiner, "How Scientific Does Marine Environmental History Need to Be?" *Environmental History* 18, no. 1 (2013): 111–120.

2 Poul Holm, Tim Denis Smith, and David John Starkey, eds., *The Exploited Seas: New Directions for Marine Environmental History* (St. John's: International Maritime Economic History Association, 2001).

3 Poul Holm, Anne Husum Marboe, Bo Poulsen, and Brian R. MacKenzie, "Marine Animal Populations: A New Look Back in Time," in *Life in the World's Oceans: Diversity, Distribution, and Abundance*, ed. Alasdair D. McIntyre (Oxford: Blackwell, 2010).

4 For historical myopia, see Tim Denis Smith, *Scaling Fisheries: The Science of Measuring the Effects of Fishing, 1855–1955*, 2nd ed. (Cambridge: Cambridge University Press, 1995). For shifting baselines, see Daniel Pauly, "Anecdotes and the Shifting Baselines Syndrome of Fisheries," *Trends in Ecology & Evolution* 10 (1995): 430.

5 Holm et al., *The Exploited Seas*, 2001; Jeremy B. C. Jackson, Karen E. Alexander, and Enric Sala, eds., *Shifting Baselines: The Past and the Future of Ocean Fisheries* (Washington, DC, Covelo, and London: Island Press, 2011); J. K. Pinnegar and G. H. Engelhard, "The 'Shifting Baseline' Phenomenon: A Global Perspective," *Reviews in Fish Biology and Fisheries* 18 (2008): 1–16; Jeffrey A. Hutchings and Ransom A. Myers, "The Biological Collapse of Atlantic Cod off Newfoundland and Labrador: An Exploration of Historical Changes in Exploitation, Harvesting Technology, and Management," in *The North Atlantic Fisheries: Successes, Failures, and Challenges*, ed. R. Arnason and L. Felt (Charlottetown: Prince Edward Island, 1995), 37–92; Jeremy B. C. Jackson, Michael X. Kirby, Wolfgang H. Berger, Karen A. Bjorndal, Louis W. Botsford, Bruce J. Bourque, Roger H. Bradbury, Richard Cooke, Jon Erlandson, James A. Estes, Terence P. Hughes, Susan Kidwell, Carina B. Lange, Hunter S. Lenihan, John M. Pandolfi, Charles H. Peterson, Robert S. Steneck, Mia J. Tegner, and Robert R. Warner, "Historical Overfishing and the Recent Collapse of Coastal Ecosystems," *Science* 27 (July 2001): 629–37.

6 Lance van Sittert, "The Other Seven Tenths," in "Anniversary Forum: What's Next for Environmental History?" *Environmental History* 10 (January 2005): 106–9.

7 Katharine Anderson, "Does History Count?" *Endeavour* 30 (2006): 150–55.

8 W. Jeffrey Bolster, "Opportunities in Marine Environmental History," *Environmental History* 11 (July 2006): 567–97; Glenn M. Grasso, "What Appeared Limitless Plenty: The Rise and Fall of the Nineteenth-Century Atlantic Halibut Fishery," *Environmental History* 13 (2008): 66–91.

9 Janet M. Wilmshurst, Terry L. Hunt, Carl P. Lipo, and Atholl J. Anderson, "High Precision Radiocarbon Dating Shows Recent and Rapid Initial Human Colonization of East Polynesia," *Proceedings of the National Academy of Sciences USA, Early Edition* 108, no. 5 (2010): 1815–20; Antholl Anderson, *Prodigious Birds: Moas and Moa-Hunting in New Zealand* (Cambridge: Cambridge University Press, 1989), 241; Ian W. G. Smith, "Retreat and Resilience: Fur Seals and Human Settlement in New Zealand," in *The Exploitation and Cultural Importance of Sea Mammals*, ed. Gregory G. Monks (Cambridge: Oxbow Books, 2005), 6–18.