

Measuring the Sea: Oceanography and the Problem of Marine Sovereignty

Jessica Lehman

Geography, Environment and Society

PhD

Project Summary

A new generation of autonomous sensing technologies is revolutionizing oceanography. In concert with satellites, underwater robots roam every corner of the world ocean and remotely deliver temperature, salinity and other data, for a fraction of the cost of ship-based measurements. The data these technologies collect are invaluable to oceanographers trying to unravel the mysteries of climate change and other challenges. They also make oceanographic information available to an unprecedentedly wide audience. However, these new technologies pose serious challenges to conventional regimes of maritime sovereignty, contesting the capacities of individual nations to control who enters their territorial waters and what data is collected there. Through interviews with government and scientific experts, this research analyzed attempts to measure the sea in the context of changing notions maritime sovereignty.

In this research, I learned that new observational technologies are greatly complicating the politics and pragmatics of doing oceanographic research, even as they present tantalizing new opportunities. Within the field of oceanography, new technologies present challenges for data collection and sharing, as well as design obstacles. More broadly, these technologies have become an outlet for the expression of state power, as nations strive to make use of them on one hand, increasing their international scientific credibility and benefiting from targeted data collection, and exercise caution on the other, wary that they are collecting and distributing data on matters of national security, from military information to fisheries data. My research revealed some of the pitfalls and potentials of these new technologies, and showed some of the points at which scientific diplomacy must be exercised. The ultimate aim of this project is to further strategies for international scientific collaborations adequate to changing technological and geopolitical regimes.

Financial Summary

The award from the Consortium on Law and Values in Health, Environment, and the Life Sciences was used to fund two research trips, one to Cape Town and Pretoria in South Africa, in February 2016, and one to Scripps Institute of Oceanography in San Diego, CA, in April 2016.

In South Africa, I interviewed expert users of new marine observational technologies, including the director of the Earth Observation division of the Council for Scientific and Industrial Research (CSIR), a Senior Research in Oceanography at CSIR, and the head of the oceans project of the South Africa Environmental Observations Network.

In San Diego, I interviewed the scientists and engineers who have developed many of the new ocean observing technologies, including several who were involved in the development of many earlier generations of remote and autonomous instruments. They

were able to reflect on the trajectory of these developments and how the challenges and opportunities of putting them into global use have evolved.

This award funded airfare for these trips (~\$1600 for South Africa and \$270 for San Diego), accommodations (~\$850 for South Africa and \$1200 for San Diego) and per diem (~\$1700 for South Africa and \$900 for San Diego). In total I conducted twelve expert interviews, as well as site visits and document analysis.

Results

I presented some very preliminary results from this study at the Marine Research Institute at the University of Cape Town while in South Africa.

I also presented a paper that included some of the data collected during this project at the Annual Meeting of the Association of American Geographers in San Francisco, March 29-April 1, 2016.

A paper based on this research is currently under review for the journal *Political Geography*.

This research informed two chapters in my dissertation, *Planetary Sea: Oceanography and the Making of the World Ocean*.

Future Plans

Papers resulting from this research have been accepted at two workshops: “Ocean Frontiers,” at York University in March 2017, and “Ocean Legalities: The Law and Life of the Sea,” at SUNY Buffalo in February 2017.

I successfully defended my dissertation on May 23, 2016. I have been awarded a Mellon Postdoctoral Fellowship in the Center for the Humanities at the University of Wisconsin-Madison for 2016-2018. I plan to develop outcomes of this research further, by including results in a book project resulting from my dissertation, and further exploring some findings of the research, especially the intersection of scientific earth observations and oil and gas development in South Africa.