

Consortium on Law and Values in Health, Environment & the Life Sciences

2014-15 Student Proposal Cover Page

Applicant Information

Applicant name: Jessica Lehman Email: Lehma287@umn.edu

Project title: Measuring the Sea: Oceanography and the Problem of Maritime Sovereignty

Department: Geography, Environment and Society College: Liberal Arts

Degree program: PhD Faculty advisor name & email: Bruce Braun
braun038@umn.edu NA

Dept. Head: Abdi Samatar Dept. Head's email: samat001@umn.edu

Dean: John Coleman Dean's email: coleman@umn.edu

How did you hear about this funding opportunity?

Consortium e-mail The Brief Advisor Dept. email/newsletter OVPR website Other

Funding

Total amount of funding requested: **\$6,950**

Executive summary (maximum 200 words)

Climate change, fisheries collapse, ocean pollution, and other transboundary marine challenges call for novel, intensified, and increasingly cooperative means of collecting and analyzing oceanographic data. For these reasons, oceanographic research now favors the use of drifting floats, remotely operated vehicles, and satellites over costly ship-based measurements. Yet these techniques present challenges to the sovereignty of coastal states. This project examines the relationship between new autonomous ocean sensing technologies and changing legal and practical regimes of maritime sovereignty. The research has two components: expert interviews and analysis of project and technology design documents at Scripps Institute of Oceanography, a leading center of technology development and deployment; and expert interviews and analysis of legal and project documents in South Africa, a major recipient of capacity-building funds and a key Global South collaborator for oceanographic research. Using this innovative approach, this research hopes to provide insight into possible challenges and opportunities for international oceanographic collaborations that utilize new technologies in a contemporary era of global environmental crisis and ongoing geopolitical tensions and inequalities.

Approvals

Check all appropriate approvals required for your proposal. Approvals must be obtained prior to receipt of funding. If you have applied for approval but have not yet received it, indicate that below.

IRB Yes No NA Application pending Project was deemed to not require IRB approval. Documentation available upon request.

Other Yes No NA Application pending Specify:

Checklist

- The proposal is 1000 words or less excluding budget, biographies, references and citations.

- The proposal includes a work plan with a specific timeline using months or quarters to identify work to be done and completion dates.

- The proposal includes a 1-2 paragraph biography of the applicant and all co-investigators.

- The budget form is complete including the funds sought for this project, other pending applications for this project, and the amount/source of matching or other funds.

- The applicant's faculty advisor is copied on the application email. Professional students w/o advisors check NA.

- All necessary approvals are pending or received.

Measuring the Sea: Oceanography and the Problem of Maritime Sovereignty

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. This research analyzes attempts to measure the sea in the context of changing notions maritime sovereignty, with the ultimate aim of suggesting strategies for international scientific collaborations adequate to changing technological and geopolitical regimes.

Background and problem statement:

Oceanography is considered to be inherently international for two reasons. First, due to the large-scale unbounded nature of the sea, contemporary oceanographers must collaborate on developing and maintaining global observing systems and creating integrative global models. Second, oceanography attempts to address issues that have broad impacts across territorial boundaries, such as global fisheries stocks, waste disposal, weather, and climate.¹ Enabled by new and emerging technologies, internationalism in oceanography has perhaps reached unprecedented levels. Satellites, drifting floats, and autonomous or remotely controlled underwater vehicles have drastically changed oceanography, a discipline that previously relied on costly and infrequent ship-based expeditions to collect relevant data. Furthermore, the high quality datasets produced by these new technologies are available for free online; hence researchers can analyze and model data without ever going to sea themselves. Finally, a suite of capacity development programs enhances efforts to build global oceanographic expertise in order to address climate change and other pressing issues to which the ocean is increasingly recognized as central.²

However, regimes of maritime sovereignty and international legal frameworks have a fraught relationship to new oceanographic methods. Under the United Nations Convention on the Law of the Sea (UNCLOS), oceanographic expeditions intending to enter another country's territorial waters must provide notification in advance, and allow that country to send an observer on the cruise.³ This requirement proves nearly impossible to honor or enforce when it comes to drifting floats or remotely operated underwater vehicles, analogous to undersea drones.⁴ While a provisional system of notification has been negotiated, it is widely recognized that a more effective and permanent protocol must be developed, particularly as these instruments proliferate and

¹ Edwards, P. N. (2010). A vast machine: Computer models, climate data, and the politics of global warming. MIT Press; Jappe, A. (2007). Explaining international collaboration in global environmental change research. *Scientometrics* 71(3), 367-390.

² See for example: Intergovernmental Oceanographic Commission. (2012). IOC Capacity Development, <http://www.ioc-cd.org/>; Scientific Committee on Oceanographic Research. (n.d.). Capacity Building and Development for Ocean Sciences, Observations, and Data/Information Management, http://www.scor-int.org/SCOR_CB_PORTAL.htm.

³ *Convention on the Law of the Sea*, Montego Bay, 10 Dec 1982, *United Nations Treaty Series*, vol. 1833, no. 31363, p. 120-121, available from <https://treaties.un.org/Pages/showDetails.aspx?objid=0800000280043ad5>

more sophisticated yet intrusive biogeochemical sensors are introduced.⁵ Furthermore, ideas of maritime sovereignty are changing due to a combination of factors, not least the imperative to gather comprehensive data to address planetary problems.⁶ New technologies also make possible novel collaborations and capacity-building opportunities that serve to unite the global oceanographic community. To account for these challenges and opportunities, it is important to gain a detailed understanding of the relationships between oceanography, international law, and maritime sovereignty, to better understand how possible breaches of sovereignty are weighed against ideas of the common good and the benefits of increasingly globalized oceanographic data.

South Africa is an ideal site for this research, due to its political and geographical position. Not only does it have a lengthy coastline and opportune location at the convergence of two major ocean currents (the Agulhas and Benguela) and the Southern Ocean, but its developing nation status and strength in oceanography also make it a focus of capacity-building efforts and an important place for developing and testing new oceanographic technologies.⁷ Building on prior contacts at relevant agencies, this project targets the experiences of experts in the US and South Africa who have negotiated questions of sovereignty and collaboration throughout their careers, as they have participated in the design of new technologies and associated projects and have considered the changing significance of international collaboration for finding solutions to emerging maritime challenges.

Methodology:

A grant from the Consortium would support two weeks of expert interviews and document analysis at the Scripps Institute for Oceanography (SIO) in La Jolla, California, a leading center for the development of new oceanographic technologies; and a month of interviews and document analysis with capacity building experts, maritime lawyers, and government officers in South Africa. This research would be supplemented by interviews with bureaucrats at the United Nations Intergovernmental Oceanographic Commission and scientists at Woods Hole Oceanographic Institute and the Marine Research Institute at the University of Cape Town, conducted in 2014. The research would result in one or more journal articles and would comprise a chapter of my doctoral dissertation.

This research focuses on the following questions:

1. How are new marine technologies used to produce scientific information, and how is it disseminated?
2. What challenges do emerging technologies pose to existing regimes of maritime sovereignty?
3. What solutions do oceanographers and policy makers imagine for these challenges? What are the barriers to enacting these solutions?
4. What can we learn from oceanography that might inform other international scientific efforts to address planetary concerns?

⁵ Fischer, A. personal communication, Paris, 12 March 2014; Piotrowicz, S. personal communication, Silver Spring MD, 6 August 2014.

⁶ See for example Dodds, K. (2010). Flag planting and finger pointing: the law of the sea, the Arctic and the political geographies of the outer continental shelf. *Political Geography*, 29(2), 63-73; Steinberg, P. E. (2009). Sovereignty, territory, and the mapping of mobility: A view from the outside. *Annals of the Association of American Geographers*, 99(3), 467-495.

⁷ See for example: Lutjeharms, J. (2006). *The Agulhas Current*. Springer; Lutjeharms, J. R. E.

Contribution:

This research contributes to and brings into conversation emerging geographical literature on the nature of marine space and the materiality of ‘big data.’⁸ Moreover, it addresses interdisciplinary concerns regarding the increasingly global character of knowledge production that is required to tackle issues such as climate change, and responds to recent calls for social scientists to engage with the Earth sciences.⁹ Working at the interstices of environmental policy, political geography, and science and technology studies, I hope to contribute to efforts to adapt scientific practices to a changing natural and geopolitical environment.

Timeline:

August 2015 Research at SIO: interviews, document collection.

September-November 2015 Analyze documents and transcribe SIO interviews; prepare for South Africa research.

December 2015-Jan 2016 South Africa research: interviews, document collection.

January-April 2016 Transcribe and analyze South Africa materials; follow-up interviews via phone or email; write manuscript.

April 2016 Present results at annual meeting of Association of American Geographers; prepare manuscript for journal publication; submit report to Consortium.

Biography:

I am a doctoral candidate in the Department of Geography, Environment and Society, where I am currently preparing a dissertation called *Planetary Sea: Oceanography and the Making of the World Ocean*. I also earned a Masters of Arts in Geography from the University of British Columbia in 2010, and a Bachelor of Science in Geography, with honors from the Pennsylvania State University in 2008. My MA research, which sought to understand how Sri Lankans displaced by both armed conflict and the 2004 tsunami thought about future environmental change, suggested that the ocean was a particularly rich environment for considering transnational geopolitics. My interest in large-scale environmental issues was further incited through an internship in 2011 with Friends of the Earth Middle East, an organization with offices in Jordan, Palestine, and Israel that focuses on environmental challenges and peace-building in the region. I am also committed to interdisciplinary dialogue, as evidenced by my lead role in organizing the Workshop on Critical Climate Change Scholarship at the University of Minnesota in 2013, and my participation in the Graduate Climate Conference at the Woods Hole Oceanographic Institute later that year. In addition to my dissertation project, I am a research assistant on a project investigating the current oil boom in North Dakota, and I am also a freelance documentary radio producer for a community radio station (KFAI) in Minneapolis.

⁸ See for example Kinsley, S. (2014). The matter of ‘virtual’ geographies. *Progress in Human Geography*, 38(3), 364-384; Peters, K. (2010). Future promises for contemporary social and cultural geographies of the sea. *Geography Compass*, 4(9), 1260-1272.

⁹ Smith, H. D. (2002). The role of the social sciences in capacity building in ocean and coastal management. *Ocean & coastal management*, 45(9), 573-582; Sowman, M., Scott, D., Green, L. J. F., Hara, M. M., Hauck, M., Kirsten, K., Paterson, B., Raemaekers, S., Jones, K., Sunde, J., and Turpie, J. K. (2013). Shallow waters: social science research in South Africa's marine environment. *African Journal of Marine Science*, 35(3), 385-402.

Budget for Student Proposals

Project Title: Measuring the Sea: Oceanography and the Problem of Maritime Sovereignty

Instructions: Provide justification along with costs.

			Requested funding	Matching/other funding	
	Category	Description & justification	Amount	Amount	Source
1	Your stipend	<i>What is hourly wage & fringe based on--departmental, community or other rate?</i>			
2	Speaker honoraria	___ speakers x \$ _____ honorarium			
3	Supplies & Services	International health insurance (one month) \$30 Cell phone service Cape Town \$50 Photocopying and misc. \$20	\$100		
4	Equipment	Identify and explain use.			
5	Travel	Airfare (return): MSP - SAN \$500, MSP-CPT \$1600* Accommodation: Scripps \$1400 Cape Town \$750 Per Diem: Scripps \$900 Cape Town \$1700**	\$6,850		
Subtotal research expenses (2-6)			\$6,950	\$0	
TOTAL BUDGET			\$6,950	\$0	

*MSP-SAN travel for research at SIO Aug 10-25 2015; MSP-CPT for research in South Africa December 26-Jan 20 2015; both prices estimated from www.kayak.com with small allowance for variability

**Accommodation and per diem for same periods as above. Prices are estimated from the web, with small allowance for variability; both are less than housing costs and per diem listed at <http://travel/umn.edu>

Budget Guidelines

1. Stipend justification. You must justify the amount of stipend you are requesting by identifying the number of hours you plan to work on the project and the hourly wage used for research assistants in your department. Include fringe benefits.
2. For colloquia, identify the number of speakers and the amount of honoraria you will provide.
3. Supplies and services. List out all supplies and their estimated costs. Explain in line 7 or in the body of your proposal what the supplies will be used for.
4. Equipment costs are allowable only if the justification clearly shows that the equipment is necessary for the project. Include explanation of what will happen to equipment at completion of project.
5. Travel costs must include a description of the purpose of the travel, start and stop dates of travel, transportation costs, housing costs, and allowable per diem (use University rates found at <http://travel/umn.edu>).