

Incorporating Equity into Coastal Research and Planning

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Globally, about 40% of the world's population lives in shoreline communities [i]. As coastal areas around the world urbanize, impacts of climate change on urban areas will also increase in frequency and intensity (Revi et al. 2014)[ii]. Many scholars have examined how disaster risks, sea level rise, and other environmental changes do not affect coastal areas evenly. Coastal regions often house diverse populations at the frontline of ecological and social transformation, whose livelihoods depend on policymakers' decisions to manage ecological and economic change. Social scientists who evaluate coastal research have found that attention to racial, ethnic, economic, and other social inequities is underrepresented in coastal planning efforts and, furthermore, that much interdisciplinary (coupled social and natural science) coastal research fails to discuss or analyze equity considerations. When discussed, equity is often analyzed within the context of vulnerability frameworks and assessments, metrics that are limited in their capacity to situate the ways historic events or cultural values influence local risk perceptions or buy-in for adaptation policies. To a certain extent, this reflects a disconnect between scientists' development of research agendas and models, and the realities of communities who live the impacts of environmental change on a daily basis.

Given conceptual and methodological challenges for incorporating equity objectives and questions into research on coastal environmental change, the Coastlines and People Program should prioritize research proposals asking: **How will climate change (e.g., sea level rise) exacerbate and change existing inequalities in coastal areas, and through which mechanism?**

Study plan and differentiated recommendations

To understand the equity impacts of climate change on coastal communities, researchers first need to define and identify existing mechanisms of inequity and how they operate across diverse coastal areas. As such, we propose a study plan that integrates several key recommendations for guiding multidisciplinary research.

Locating geographically and economically diverse research sites (case studies): The geographic scale and biophysical conditions of coastal areas

are variegated across regions and around the world. While coastal areas contain the bulk of populations globally, coastal areas are unevenly developed as a result of regionally specific physical, historic, and political conditions. For example, rural coastal areas with limited points of access and minimal federal flood protection investments are often home to culturally distinct fishing and water resource communities who have co-evolved in their relationship to the environment. In more densely urbanized areas, hard infrastructures and urban development increasingly cut-off urban residents from more intimate and regular contact with coastal waters and landscapes. In this context, the coast is interpreted more of a recreational and aesthetic amenity than an ecosystem of culturally distinct livelihoods shared across generations. Coastal communities also have distinct planning and land use practices influenced by their location, use, and development histories. With these differences in mind, this research program should select several (2-4) geographically, demographically, and environmentally distinct areas through which to apply a shared set of research inquiries.

Identifying key axes of social and economic difference. As research sites are chosen, the research team should consider the different social and economic differences within and across case study sites. While axes of difference can vary, researchers should aim to focus on key structures linked to the creation and maintenance of social inequality established in critical social science literatures including, but not limited to: Racial and ethnic difference, wealth and economic class, gender and sexuality, citizenship status/nationality, and age. Secondary source literature, demographic statistics, and environmental change analyses should aim to understand the recent historical contexts through which social and environmental change have unfolded in each case study and help researchers narrow-down the most pressing and materially palpable forces contributing to the production of social and physical inequities in coastal areas. In order to provide further expertise and localized understandings of the mechanisms that contribute to creation and maintenance of existing inequalities, the research team should include a budget to hire scholars from local universities and communities within the case study area.

Impacts of social inequities on coastal change and adaptation processes and practices: Once contexts and axes of social and economic difference are identified, members of the research team will work with community researchers to analyze the relationship between localized social inequities to acute and long-term physical and social changes related to coastal climate

change. This can include, but is not limited to: Changes in real estate/property values (insurance, taxes, etc.) and resident migration patterns, changes to coastal economies and livelihoods, adaptation plans/projects adopted by local governments (including voluntary flood protection, relocation, as well as distribution of public funds for mitigation and adaptation, etc.), and the associated economic and political impacts of ecosystem and coastal changes (including changes to ecosystem services and anticipated biophysical changes to the coastal area).

Novel collaborations. One of the goals of this multi-part research design is to facilitate communication between residents and scientists to define and refine the social and environmental factors that drive and potentially exacerbate social inequality. This is not only a model for research design, but a means of circulating results to planners and policymakers to develop a series of recommendations on ways of confronting coastal change.

Impact and Value of Research

The proposed research will not only improve the research on equity related to coastal planning strategies, but also broaden participation of underrepresented communities in research on coastal adaptation. A key outcome of this will be more inclusive coastal adaptation planning processes that place equity considerations upfront. By including local participants from potentially impacted communities as funded members of the research activities, the project would also lead to outcomes targeted at addressing equity concerns in coastal communities facing diverse climate-related drivers of change. The project will also be at the forefront of efforts to partner with underrepresented communities and incorporate their feedback into research on equity, rather than simply examining them through secondary data from a quantitative, Census data-based perspective.

This project will facilitate the removal of barriers to communication, both those inhibiting the transfer of climate adaptation strategies from scientists and decision makers to underserved members of communities and vice versa. By identifying the reasons that information does not flow in both directions and providing solutions to address those challenges, the project will provide a toolkit of strategies to communities facing similar change drivers that risk exacerbating inequities.

The research broadens the typical focus of coastal research on biophysical systems and their dynamics to more fully incorporate the dynamics of

coastal communities that are experiencing climate change-related equity issues. Rather than representing these communities by simple metrics or indices, the project will provide a fuller view of the mechanisms by which inequities across human systems develop, are sustained, and may be exacerbated by changing coastal conditions. It will simultaneously advance methodologies for undertaking participatory, equity-focused coastal adaptation research and increase awareness among ocean scientists of the potential for their research to intersect with potentially impacted human communities.

Finally, case studies across multiple types of communities facing equity challenges will provide a set of strategies that can be applied in the range of communities facing similar challenges across the United States. This ensures that the research will have a broader impact beyond the communities that are the focus of the study. As other communities take up the outputs of this project, their experience applying the knowledge generated will further flesh out the range of experiences related to equity within the context of climate change.

[i] http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/oceans_seas_coasts/pop_coastal_areas.pdf

[ii] Revi, A., D.E. Satterthwaite, F. Aragón-Durand, J. Corfee-Morlot, R.B.R. Kiunsi, M. Pelling, D.C. Roberts, and W. Solecki, 2014: Urban areas. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 535-612.