



Editorial: Coastal Cities in a Changing Climate

Craig E. Colten^{*1}, Bruce C. Glavovic² and Scott A. Hemmerling³

¹Department of Geography and Anthropology, Louisiana State University, Baton Rouge, LA, United States, ²School of People, Environment and Planning, Massey University, Wellington, New Zealand, ³Water Institute of the Gulf, Baton Rouge, LA, United States

Keywords: climate change, cultural adaptation, coastal cities, resilience, sea-level rise

Editorial on the Research Topic

Coastal Cities in a Changing Climate

In recent years, we have found ourselves apologizing to students for the failures of earlier generations, including our own. We were each taught about climate change, albeit it in rudimentary terms going back in some cases to the early 1970s, and relayed that message to students and young researchers since the 1980s. Yet, here we are with COP26 in the rear view mirror and rising public awareness of the realities of climate change, but with little real accomplishment in terms of driving down greenhouse gas emissions.

The science of climate change has made profound advancements since the 1980s. Examples include our ability to collect and analyse environmental data, model future trends, and deploy machine learning and powerful visualization techniques. Additionally, emerging technologies allow much greater energy efficiencies at all scales. Alternative energy, including wind and solar, have also experienced major improvements.

Despite these technical advances, coastal cities still face increasing risks due to our inability to put these accomplishments into widespread use. For centuries, urbanization has concentrated in coastal regions where marine resources sustained population centers, where maritime trade opportunities thrived, and in recent years where amenities lured ever increasing numbers of people toward the shore. Many cities with millions of residents line the littoral lands around the globe. These cities, their residents, and economies are at the doorstep of the impending climate-driven sea-level rise we have been hearing about for decades. Some are already experiencing increasing impacts from more violent weather and blue-sky flooding.

Much of the climate change science has concentrated, rightly, on the processes of global warming, the impacts to ocean chemistry and currents, to atmospheric circulation, and to the melting of glaciers. It is essential to grasp the pace and extent of these interrelated processes. Where climate change inquiry has lagged, has been in the social and cultural arenas. How will place-based cultures adapt to slow moving environmental change? How will risk cultures incorporate an understanding of the newly emerging challenges? How will governance systems respond to the science and the changes to those they govern? How will societies adapt existing coastal protection systems to previously unknown conditions? How will countries deal with the dislocation of coastal populations? How will societies and governing bodies deal with the narrowing range of options as change proceeds? These questions must draw on the humanities and social sciences—the areas of academic expertise dedicated to such topics. In recent IPCC assessments, and the last two decades, there has been much more attention focused on these kinds of questions, with important contributions from the social sciences and humanities. However, these questions are far from fully answered.

The papers in this special topic of *Frontiers in Science* arose from a workshop on Coastal Cities hosted by Shanghai University Center for the History of Global Development in 2019 (Global

OPEN ACCESS

Edited by:

Roshanka Ranasinghe,
IHE Delft Institute for Water Education,
Netherlands

Reviewed by:

Ali Dastgheib,
IHE Delft Institute for Water Education,
Netherlands
Marjolijn Haasnoot,
Deltares, Netherlands

*Correspondence:

Craig E. Colten
ccolten@lsu.edu

Specialty section:

This article was submitted to
Land Use Dynamics,
a section of the journal
Frontiers in Environmental Science

Received: 18 February 2022

Accepted: 13 April 2022

Published: 02 May 2022

Citation:

Colten CE, Glavovic BC and
Hemmerling SA (2022) Editorial:
Coastal Cities in a Changing Climate.
Front. Environ. Sci. 10:878888.
doi: 10.3389/fenvs.2022.878888

Environment, 2021). The organizers sought to bring together scholars from around the world to explicitly consider the place of society and culture in transforming the environments of coastal sites into major cities and how human-initiated environmental change in the creation of cities provides a foundation for adapting to current environmental change. Also, they sought to foreground how the social and cultural processes that occurred over centuries provide insight into current responses to increasingly turbulent storms and rising sea levels. These processes are deeply rooted in beliefs, attitudes, and values that shape how societies face risk and respond to change.

The biggest challenges we face today with climate change is not understanding the science—although much remains to be understood—but mobilizing the myriad social and cultural institutions to act in a coordinated way. Traditional science approaches alone cannot bring us to a unified transition aimed at a sustainable future. These papers scratch the surface of that challenge by starting with questions about the human role in dealing with environmental change in coastal settings. Planners, geographers, historians, and a range of scientists pose critical questions about how government institutions and public policies have altered coastal environments and how they have changed their approaches over time. Authors probe the role of risk culture in shaping adaptation to changing conditions and how that modifies mitigation projects in littoral regions. Such adaptations produce long-lasting infrastructure that becomes an impediment to subsequent adaptations and consequently prompts alterations in governance. Relocation is a major component of the coastal cities challenge and attachments to place and locally based natural resource economies defy simple plans to resettle threatened communities. Financing adaptation further

complicates matters. It is not just a matter of economics, imposing accountability on those who created maladaptive practices in the past can prompt social conflicts. Increasing risks can narrow the adaptation options, but culturally conservative communities may be slow to respond to heightened risks that are largely imperceptible in daily life. Each article underscores how societies and cultures are dynamic and have purposefully imposed their will on the environment, and also reacted to past environmental change in dramatic ways. The resulting complex and dynamic social processes are magnified in the most urbanized areas with low lying coasts and huge populations. To enable viable responses requires more than science.

Scholars from the social sciences and humanities have been urging their colleagues to speak more directly to the scientists who have led the climate change inquiries. Now more than ever, there are compelling reasons to foster an exchange and to expand collaborations that tap the expertise of humanities scholars and social scientists. While a truly unified response might be a fanciful notion, by understanding how societies and place-based cultures cope with environmental change we stand a better chance of summoning a more coherent response to the threats faced in coastal cities, and to the opportunities that lie in these places and their communities to chart new pathways towards transformative climate resilient development.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Colten, Glavovic and Hemmerling. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

REFERENCES

Martinez and Grit (2021). "Coastal Cities" (special issue) *Global Environment* 14:3, 434–625.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of