

Environmental justice and community health in coastal urban watersheds

OVERVIEW

Urban health disparities linked to unequal exposure and vulnerability to environmental risks (e.g., polluted waterways, flooding) are tied to historical and ongoing disinvestment, especially in lower-income communities and communities of color. New community-focused urban waterway revisioning projects aim to reconnect urban communities with their waterways. These projects provide opportunities to assess and redress underlying distributional injustices, while also providing avenues for procedural and restorative justice by centering communities in planning and implementation of projects. Our goal is to (re)connect communities and the waterway at the frontlines of environmental injustices through environmental research.

IMPORTANCE

Coastal communities are the most densely populated and fastest growing areas in the United States. Urban development and economic activities dramatically shape watershed and coastal ecosystems, with important impacts on human well-being and health. For example, stormwater and wastewater are discharged to waterways, affecting flood risk, water quality, and the abundance and diversity of human and zoonotic pathogens. These environmental changes are exacerbated by climate change impacts including increased precipitation intensity, storm surge, and sea level rise. Particularly in urban areas, these risks are borne disproportionately by poor and disadvantaged populations, who may be more vulnerable to environmental risks. Yet these communities have typically received less infrastructure investment or implementation of innovative green solutions than nearby wealthy neighborhoods.

Urban waterway development projects that merge economic, community, and environmental revitalization are becoming common in major US cities. These projects are opportunities to move towards environmental justice, not just distributively, but procedurally and restoratively providing access to decision-making power and resources. The Middle Branch of the Patapsco River in Baltimore, Maryland serves as a stark example. The South Baltimore communities surrounding this waterway have historically faced and continue to face discrimination and environmental injustices, including poor air and water quality. Today, developers are essentially building a new city on the Middle Branch of the Patapsco River on the South Baltimore peninsula. Done properly, the infusion of capital and development could reconnect communities to their waterfront. This reconnection would provide an opportunity for community members to increase their knowledge about the science of the river and connect them to both the water and each other. Such a reconnection could provide opportunities for them to monitor their own health exposures and connect with the scientific institutions working in the community, but who do not necessarily know its residents. A major challenge for these types of development projects that aim to connect communities to waterways is that many urban communities lack sufficient data about local environments to advocate for needed changes. Waterways need to be safe for community use and planning needs to consider many ways of recreating (e.g., swimming, family gatherings, fishing) such that increased access to waterways does not exacerbate disproportionate risks. Finally, reconnecting to the waterway could prepare communities to guard against displacement, recognize and reclaim the natural resources in their communities, and work to improve the environment for themselves and future generations.

POTENTIAL RESEARCH THEMES

SERC seeks to support a postdoctoral researcher interested in pursuing innovative science to advance issues related to environmental health in urbanized waterways of the Chesapeake Bay. Potential research themes include, but are not limited to:

1. Examining the linkages between green and gray infrastructure on land to water quality issues (e.g., enterococci abundance, POM/DOM abundance)
2. Assessing data gaps in water quality information required for communities to successfully advocate for their environments

We especially encourage inter-disciplinary proposals that link chemical and biological components of water quality issues into a single integrated approach to address environmental health.

PROGRAMS AND ASSETS

The Chesapeake Bay, especially around the DC and Baltimore metropolitan areas, is rich in environmental data, including long term water quality monitoring data on fecal coliform counts, detailed land cover, environmental variables (e.g., temperature, salinity), and infrastructure data, all of which could be leveraged to develop an innovative research proposal.

Ongoing research by SERC scientists provides opportunities to use novel approaches to understanding human pathogen risks such as using river otters as public health indicators (i.e., [Urban Otters project](#)) and oysters to filter human pathogens (i.e., Biofilters project) from local waters. These data evaluate the distribution of human pathogen exposure risk, data availability about risk, and the distribution of mitigation measures such as green stormwater infrastructure across space and demographic groups.

Through our Urban Estuaries Research Initiative, the Smithsonian Environmental Research Center (SERC) and its partners from the University of Maryland's Institute of Marine and Environmental Technology, the South Baltimore Gateways Partnership, and the Environmental Justice Journalism Initiative, provide additional opportunities to work directly with communities to collect locally relevant data, with a focus on local water quality issues, to help document the environment in the Middle Branch, assess the ways that the environment is changing, and support residents in using that information to promote changes and improvements in their communities. Similarly, the Anacostia Watershed Society and the 11th Street Bridge project have similar ambitions and engagement with communities in the Anacostia River watershed, allowing for research in one or both areas as appropriate.

ADVISORS

The following SERC staff may serve as advisors for the environmental justice fellows, facilitating access to community organizations, datasets, and project assets, including Rebecca Hale, Katrina Lohan, and Alison Cawood along with other scientists across the Smithsonian as appropriate.