

Governance Challenges and Sea Level Rise Adaptation: the US Experience

Bruce Cain and Leonard Ortolano¹

Bill Lane Center for the American West.
Stanford University, Stanford, California

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California's efforts at adapting to sea level rise (SLR) lag behind those in other parts of the US. One reason for this may be that California is not as prone to the destructive hurricanes and major flooding events that have caused widespread damage in the south and east and unlocked federal emergency funds. Nor is any major military facility in California as severely impacted by SLR as some bases in the east, such as Naval Station Norfolk. It is easier to mobilize political officials and public opinion around the impacts of actual disasters than around the cause of preventing likely, yet unrealized, future events.

What can California and the Bay Area in particular learn about adapting to sea level rise from the experiences of cities and coastal areas in the east and south? This paper draws lessons from attempts to deal with SLR and coastal flooding at several US locations: Boston, New York and Norfolk as well as communities on the coasts of Florida and Louisiana. We selected these locations because they have a long history of attempting to address SLR and coastal flooding. Information used in preparing this policy brief is mainly from government websites, reports and media accounts.

Many cities in the US deal with flood management issues using green and gray infrastructure, zoning and building codes, and flood insurance; these topics are not the subject of this paper. Instead, we examine some of the approaches used by cities that are instructive in terms of: (i) sources of funding; (ii) work with community groups; (iii) engagement of climate scientists and other climate change experts; and (iv) multi-jurisdictional collaboration.

Funding and Community Engagement

Table 1 summarizes salient features of the examples considered: funding, citizen outreach, university-level expert engagement and regional collaboration. In New York City and Coastal Louisiana, disaster aid from the US Department of Housing and Urban Development (HUD) has been available in the form of block grants, and that has supported design and construction. In places that have not received disaster aid, progress on design and

implementation has been much slower. Boston has plans for neighborhoods facing significant danger from SLR (e.g., East Boston and Charleston), but lack of funding has blocked the city from taking significant steps. Norfolk has flooding problems that are well known and of major significance to the US Department of Defense, but little action has been taken because the federal government has not allocated funds for dealing with SLR issues.

Table 1. Adaptation to sea level rise and other causes of coastal flooding:

Examples from the East and South²

	Coastal LA Isle de Jean Charles, LA SAFE Project	Coastal LA Six parishes, LA SAFE Project	Boston East Boston	NYC East Side Coastal Resiliency Project	NYC Staten Island Living Breakwaters Project	Miami- Dade County, FL	Norfolk, VA
Funding	CDBG-DR (\$48.4m)	CDBG-DR (\$39.8m)	Not eligible for CDBG- DR grants (post disaster)— major funding challenges (\$100k for deployable flood walls- East Boston)	CDBG-DR (\$338m) Total cost (\$750m)	CDBG-DR (\$60m) Total cost (\$72m)	Ad valorem tax coastal land acquisition (\$198 m) General obligation. bonds – road elevation, pumps etc. (\$200m) (1)	USACE(300m) seawalls, storm surge barriers and other infrastructure (2)
Citizen Outreach	100 residents Relocation	1500 residents	70 trained leaders/ >500	RBD Competition/ Extensive and	RBD Competition /	Varies	Several hundred— preparation of

	for about 100 families		residents	ongoing	Extensive and ongoing		Norfolk Vision 2100
University-level Expert Engagement			BRAG	NPCC	NPCC	Florida Intl. University	Old Dominion University
Regional Collaboration		LA SAFE coordinates activities among six parishes		Port Authority NY/NJ		SE FL Regional Climate Change Compact	Hampton Road Planning District Commission
Approximate planning start date	2000	2017	2014	2013	2013	2012	2016-Vision 2100 2018—USACE plans \$1.7 b in projects (3)
Completion target	2022	2022	No target	2023	2022	Varies	No target
Status/Last Minute changes	Resettlement planning and land purchase is ongoing	Works in progress	Deployable Wall Long term projects await funding	Revised by Mayor's Office in Sept. 2018	Works in progress	Works in progress	USACE \$1.3b project awaits funding

Acronyms [Sources for items (1) –(3) are in Endnote No. 2]

BRAG Boston Research Advisory Group

CDBG-DR: HUD Community Development Block Grant-Disaster Recovery funds (NYC and LA must spend funds by 2022)

LA SAFE: Louisiana's Strategic Adaptations for Future Environments

NPCC: New York City Panel on Climate Change

RBD: Rebuild by Design

USACE: US Army Corps of Engineers

Major destructive climate events open up windows of opportunity for actions that would otherwise be delayed or entirely obstructed by conflicting interests, inertia or apathy. In the Bay Area, this would mean a flooding event such as happened in 1998 combined with a higher sea level. It would of course be best if preventive steps could be taken before an event of this sort, but we have to accept that this may not happen until a triggering event mobilizes serious efforts at sea level rise adaptation.

Even when a window of opportunity opens and a vulnerable area executes a well-funded and carefully designed planning effort, the actual execution can be delayed. In all of the cases we examined, the planners took great care in consulting with residents and stakeholder groups that could potentially be affected by sea level rise. In theory, this type of public and stakeholder outreach should lessen the obstacles to implementation after a consensus is reached.

In reality, it is sobering to realize that despite many years of planning, most of these adaptation projects have not yet been fully implemented. One reason is funding. Where federal disaster aid funding has been absent (e.g., Boston and Norfolk), progress in implementing plans has been slow. Recognizing the absence of federal SLR adaptation funding, except for disaster relief, some states have attempted to fill in gaps by providing funding as well as technical assistance.³ For example, Maryland has a “Coast Smart” program that includes community assistance through grants, resource materials and training programs.

Collaboration with climate change specialists and regional bodies

Some communities have taken innovative steps to engage climate specialists from universities to downscale climate model projections by the Intergovernmental Panel on Climate Change (IPCC) so that projections are applicable at the local level. New York City has the most ambitious of these partnerships with climate scientists. In 2012, before Hurricane Sandy, the City Council passed Local Law 42 establishing the New York City Panel on Climate Change as an ongoing body serving the City.⁴ By law, the Panel meets biannually to review recent scientific climate-change related data; the Panel also updates climate projections within one year of new IPCC Assessment Reports⁵ or at least every three years. Boston, Norfolk and Miami-Dade County also have had formal relations with university climate specialists, but they have been ad hoc.

Cities have also engaged climate specialists to evaluate their adaptation plans. For example, in 2018 Miami Beach obtained Rockefeller Foundation funding (via the Foundation's 100 Resilient Cities Program) to have the Urban Land Institute (ULI) conduct an external evaluation of the city's SLR adaptation strategy. The review panel made a number of detailed recommendations for improving resilience, a few of which concern:⁶

- Enhancing public trust and increasing transparency;
- Elevating public aesthetics and function to perpetuate the city's cultural relevance; and
- Using the city's "resilience brand" ("Miami Beach Rising Above") to distinguish itself from other coastal cities as an international leader in resilience, thereby gaining a competitive advantage and encouraging economic development.

Using various foundation grants, ULI has also conducted evaluations of resilience strategies in several other cities: Norfolk, Virginia and Portland, Maine among others.⁷

In addition to collaborating with climate specialists at universities and elsewhere, some cities have recognized the value of regional collaboration. This is illustrated by the Southeast Florida Regional Climate Change Compact, a partnership between Broward, Miami-Dade, Monroe and Palm Beach counties. That partnership has been characterized as "one of the leading examples of U.S. regional collaboration..."⁸ The Compact developed a process for coordinated climate action in Southeast Florida and information on shared best practices to allow localities to create a regional agenda.⁹ In addition, Miami-Dade County, the City of Miami Beach and the City of Miami teamed up to become part of the Rockefeller Foundation's 100 Resilient Cities program, which allows them access to the resources provided by that program.¹⁰ The three jurisdictions have developed a 20-year strategy.

Notwithstanding the advantages of regional cooperation on coastal flooding issues, many areas in the US lack the governance structures that would permit it. Consider two examples: the broader New York-New Jersey-Connecticut metropolitan region around New York City, and the Boston-Cambridge area. Both of these major metropolitan areas are similar to the Bay Area in that sea level rise adaptation measures among local jurisdictions can have unintended effects on neighboring jurisdictions. As in the Bay Area, institutions for effective coordination on SLR-related issues are lacking.¹¹

Timing

Even significant funding and extensive public engagement may not suffice to move things forward quickly. For example, the several years of years of planning that went into the East Side Coastal Resiliency project in New York City (NYC) was significantly altered by the Mayor's office just prior to the release of an environmental impact statement, causing major turmoil and throwing the fate of the community's effort into considerable doubt. As another example, the attempt to resettle Isle de Jean Charles residents, which had been discussed initially nearly two decades ago, will likely not be completed until 2022. In addition, after several years of work, Boston has mustered only a short-term solution (i.e., a seven-foot deployable wall) in East Boston while it looks for ways to fund a longer-term solution.

That does not mean that community outreach and collaboration with elected officials are unnecessary or ineffective. It is likely that the failure to do either would have made the task for these plan developers even more difficult. However, the NYC case illustrates that when local stakeholders are consulted and think they have an agreement, this generates a considerable amount of sunk political cost, which limits future choices. New York City might have had justifiable reasons for altering the community's carefully negotiated designs at the last minute, but in retrospect, those factors should have been considered in earlier discussions before expectations hardened.

The experiences discussed here make it clear that sea level rise adaptation requires a long gestation period. Many of the cities examined have been working on these issues for several years and still are having trouble making progress. California's sea level rise problems will not be solved quickly, especially in areas that have multiple exposed cities such as the Bay Area. Collaboration and consultation involves significant transaction costs and considerable patience. The windows of opportunities caused by storms and flooding events close predictably as time elapses and memories fade. It would be prudent for cities and other communities to take steps now rather than wait for an emergency with all the property and personal loss that entails. If cities wait until significant problems become apparent, they may find themselves unable to have effective adaptation measures in place when needed.

Land Use Controls

At a fundamental level, land use decision-making is at the center of challenges linked to coastal flooding and sea level rise. For many places (e.g., New York City) managed retreat is impossible to consider because of the high density of development in at-risk zones. Risk can be managed by restricting new development in high-risk locations, but that requires political will. In places like Miami Beach, for example, the lure of living on the coast appears to have trumped the reality that flooding risks can be reduced, but not eliminated. Rapid real estate development in Miami Beach continues unabated. Indeed, the city is experiencing a boom in real estate development in locations that will be in harm's way if sea level rises as predicted. Current developers and buyers may have plans to be somewhere else in thirty years, but that may turn out to be a costly strategy if sea level rise occurs faster than planning studies assumed.

Vulnerable communities and cities can learn much from each other. As discussed, some jurisdictions have pioneered in innovative techniques to work with citizens and build consensus around adaptation measures. Others have found productive ways to engage climate researchers at universities in creating local forecasts of climate variables. Still others have brought in climate-adaptation specialists to evaluate their plans. A number of cities and counties have created effective ways to collaborate and coordinate their climate resilience efforts. The challenge in *mitigating* climate change is to a large degree technical. Improvements in renewable energy efficiency and cost reduction are critical to meeting the goals set out by the international community in the Paris Agreement of 2015. The challenge of climate change *adaptation* is to a greater degree one of finding the political will and resources to take the steps that people are reluctant to take even though they know they are necessary. Simply put, it is primarily a challenge to governance at all levels.

¹ The authors contributed equally and are listed in alphabetical order. Bruce Cain is Professor of Political Science and the Spence and Cleone Eccles Family Director of the Bill Lane Center for the American West; and Leonard Ortolano is UPS Foundation Professor of Civil Engineering. This policy brief was inspired by student presentations in the class on Environmental Governance and Climate Change at Stanford University (Winter Quarter, 2018-19).

² Notes for Table 1

(1) <https://www.miamiherald.com/news/politics-government/election/article183336291.html>
<https://www.miamidade.gov/green/library/sea-level-rise-executive-summary.pdf>;

<https://www.miamiherald.com/news/local/community/miami-dade/article222651895.html>

- (2) <https://insideclimatenews.org/news/15052018/norfolk-virginia-navy-sea-level-rise-flooding-urban-planning-poverty-coastal-resilience>
- (3) <https://www.nao.usace.army.mil/Media/News-Stories/Article/1470838/efforts-to-make-the-city-of-norfolk-more-resilient-against-coastal-storms-passe/>

³ A 2014 review of state-level activity on SLR contains information of reports produced by the following states: Maine, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Delaware, Virginia, North Carolina, Florida, California, and Oregon. Howard, K. 2014, [Planning for sea-level rise: state-by-state. Prepared for the New Hampshire Coastal Risk and Hazards Commission. Accessed December 20, 2018 at http://www.nhcrhc.org/wp-content/uploads/2014-07-18-CRHC-slr-planning-state-by-state.pdf](http://www.nhcrhc.org/wp-content/uploads/2014-07-18-CRHC-slr-planning-state-by-state.pdf)

⁴ <https://nyaspubs.onlinelibrary.wiley.com/doi/10.1111/nyas.12625>

⁵ <http://www.ipcc.ch>

⁶ <https://americas.uli.org/press-release/miami-beach-can-improve-resilience-with-strategy-that-expands-beyond-stormwater-management-and-includes-livability-economic-issues-urban-land-institute/>

⁷ <https://americas.uli.org/press-release/miami-beach-can-improve-resilience-with-strategy-that-expands-beyond-stormwater-management-and-includes-livability-economic-issues-urban-land-institute/>

⁸ https://ia71z1oozio1p7cpp37o43o1-wpengine.netdna-ssl.com/wp-content/uploads/sites/125/ULI-Documents/Miami-Beach_Panel-Report_lo-res.pdf and <http://www.southeastfloridaclimatecompact.org/>

⁹ <http://www.southeastfloridaclimatecompact.org/regional-climate-action-plan/>

¹⁰ <https://www.100resilientcities.org/resilient-greater-miami-the-beaches/>

¹¹ For examples of possible projects with interacting effects in the New York area, see <https://www.riverkeeper.org/blogs/ecology/storm-surge-barriers-for-ny-harbor-threaten-life-of-the-hudson-river/>. In the Boston area, it is only necessary to consider how changes in the size of the Boston's Charles River Dam would affect the communities like Cambridge and others that border the Charles River <https://www.wbur.org/cognoscenti/2018/09/25/boston-climate-change-fred-hewett> .