Beyond the Wall

An examination of practical and natural alternatives for the Charleston seawall

THE CRITICAL ISSUE

The Charleston peninsula floods a lot.

In the past few years, <u>Charleston has flooded</u> about <u>once a week</u>. Water rises over our roads, sloshes across sidewalks and sometimes infiltrates our businesses and houses. It strands us at work, damages our cars, and costs us money.

The water comes into our city many ways. The main culprits are rising seas with higher tides and rainfall from stronger, more frequent storms. But low-lying Charleston is also vulnerable to occasional storm surge from tropical systems. Let's be clear: Storm surge is a major hazard to Charleston. <u>Twice a year</u>, Charleston can expect tropical systems, although hurricanes seldom make direct landfall in the city. But storm surge represents only a fraction of the city's flooding.

Deflecting storm surge is the primary purpose of the Corps' proposed eight-mile concrete wall. The Corps' plan might mitigate waves and help with surge from some hurricanes, but not all.

More important, this expensive seawall solution nearly \$2 billion—would do little to stop the many other ways water saturates our city. And it has the potential to make some types of flooding worse.



Flooding that closes roads and disrupts life has become commonplace in Charleston. Water inundates the city in many ways, but the Corps' proposal is only focused on storm surge. Photo by Sean Rayford/Getty Images.

Here is what a comprehensive flooding solution for Charleston needs to solve:

- Storm surge
- Inland flooding
- Flooding from more intense rainstorms
- Sea level rise
- Erosion and subsidence
- Loss of marshes and wildlife habitat
- Resilience as the coast changes

Here is what the Army Corps of Engineers hopes to solve:

• Storm surge



The Charleston-based firm Robinson Design Engineers shows that, in many places, the planned seawall would block the view of the harbor. Illustration courtesy of Robinson Design Engineers.

The Corps' proposal is no doubt well-intentioned but it lacks imagination. It is a one-size-fits-all solution that comes at a high cost for questionable return. It will forever dim the views of our historic harbor. Tourists will remember our gem of a city for the colorless concrete slab stretching across our shores.

This proposal from the Corps places Charleston at a critical crossroads. There is no longer a deliberation about whether flooding is a problem; the debate is how to solve it. With the potential for an influx of federal money—and with the eyes of many coastal towns upon us—we have the opportunity to completely re-imagine how Charleston co-exists with water.

The Corps' option—a utilitarian concrete barrier enclosing much of the peninsula like a drab fortress wall—is shortsighted, expensive, and destined to fail.

Our report, Beyond the Wall, will show:

- We can more effectively address all the ways Charleston floods—not just one way—and do it in a manner that retains the city's charm and historic character.
- Charleston leaders can direct the Corps' considerable building expertise and federal money into greener, more natural solutions that will be both protective and attractive.

• Charleston can be an innovative national leader in creatively solving a problem plaguing coastal cities.

HISTORY

Downtown Charleston is one of the great urban jewels in this country. Present-day Charleston is steeped in history, smartly scaled and walkable. These traits cement Charleston as a national tourist attraction and an economic driver for the state.

Charleston's connection to the water dates to its founding. The

Charleston Harbor is one of the reasons the city first grew and prospered, and it is a reason growth and prosperity continue today. But that proximity to water, and development on the water's edge, also means Charleston has long been a city of seawalls. The peninsula has been fortified at times with walls of timber, earth, brick and stone.

In the 1600s, the Charleston peninsula was a far different place than it is today. The coastline was marshy and natural. As the city grew, seawalls created an engineered edge while many wetland areas were filled with dredged materials and sediment to make way for new construction.

Now, centuries later, Charleston's land is sinking



Charleston's coastline has changed dramatically over the years, as this historic map from the 1880s shows. Image from the Army Corps of Engineers Feasibility Study.

while the sea is rising. This combination means Charleston is <u>flooding more often</u> than many Atlantic Coast cities.

It is <u>hard to put a cost</u> on Charleston's chronic flooding but by some estimates a major flood can cost the city \$12 million. Yet the Corps' seawall solution will still leave us susceptible to the kinds of routine, damaging flooding that have become part of our lives.

THE ARMY CORPS OF ENGINEERS' PROPOSAL

The Corps plans to surround most of the Charleston peninsula with a concrete seawall that, in some places, will be 12 feet tall. In addition, the Corps is proposing:

- Elevating an unknown number of houses
- Buying an unknown number of homes that cannot be saved and relocating the residents
- Floodproofing other unspecified structures

The main feature, <u>or at least the one that will be</u> <u>most noticeable</u>, is the concrete, gray wall that will envelop the peninsula. There are portions of the peninsula where a seawall makes sense. But there are other areas where it does not. It is important to understand the Corps is not telling Charleston to "take it or leave it." Federal funding will not go away just because city leaders and Charleston neighbors ask for something better, something more practical, more enticing.

It might be best to think of the Corps' proposal as a starting place rather than a finished product.

Here is what else could happen:

BEYOND THE WALL PROPOSAL

Instead of an ominous, gray seawall, our report explores more modern, nature-based approaches to create a more resilient Charleston. In fact, some of what we propose is modeled after natural solutions the Corps has already recommended for other projects around the country, like the <u>Living Breakwaters</u> <u>Project</u> in Raritan Bay, New York.

The *Beyond the Wall* proposal completely re-thinks the peninsula's western edge along the Ashley River. Its central theme for saving Charleston is a layered protection plan that will last generations longer and look better than a seawall that <u>might have a life</u> <u>expectancy</u> of 50 years. It shows how some neighbor-



By adding "living breakwaters" adjacent to the peninsula, Charleston could add storm-surge protection while also creating habitat for wildlife.

hoods like Rosemont are left out of the Corps' wall but also deserve protection.

And like the Corps' proposal, this report is not meant as a mandate. It is a starting point to consider creative ideas, bold brainstorming and transformative thinking that also can be applied to other parts of the city.

THE BATTERY



In its initial proposal, the Corps included an offshore breakwater flanking the tip of the peninsula to blunt surging waves. That idea was later dropped from Corps documents. It should be reinstated and re-imagined.

Instead of simply a bar of lifeless rocks, the structure should be a <u>"living breakwater</u>" like the one under development on the south shore of Staten Island. A living breakwater provides not just protection, but also habitat for fish, birds and oysters, along with recreational opportunities and a vibrant vista.

This type of breakwater increases its size over time as it captures sand and sediment, creating new marsh habitat. The living breakwater approach is adaptive and can evolve over time as sea levels and other conditions change.

Already <u>construction workers are fortifying</u> and raising sections of the century-old Low Battery wall. The possible addition of removable panels affixed atop the wall could bolster the level of storm



Adding glass panels or another removable panel to the historic battery walls could help keep out rising water while maintaining the view, like this example in Keswick, England. Image from the BBC.

surge resistance, protecting the views while protecting the city.

Together, these solutions at the Battery will:

- Weaken storm waves and reduce wave height
- Mitigate storm surge
- Reduce erosion
- Create marsh and wildlife habitat
- Maintain the cultural and scenic role of the Battery
- Protect the southern tip of the peninsula from flooding and repetitive damage
- Enhance the iconic view

LOCKWOOD CORRIDOR AND MEDICAL DISTRICT



The Lockwood Corridor and the Medical District are usually among the first areas to flood when the tides are high or potent storms dump lots of rain.

At Lockwood, encroaching water often traps neighbors in their homes. At the Medical District, flooding



A levee on the peninsula's western edge would provide both protection for the Lockwood Corridor and Medical District and a promenade or park for neighbors and visitors.

routinely overtakes streets and leaves health-care providers stranded at work. Worse, floods can prevent doctors, nurses and ambulances from getting to the hospital. These neighboring areas should be adapted to co-exist with water.

It is worth considering whether Lockwood's frequently flooded roads should remain or be replaced by water-absorbing marsh while traffic is re-routed to drier streets. Another solution would create a levee bordering the Ashley River, topped with a promenade of walkways, bicycle paths and parks. Traffic would run on roads east of the levee or could be routed through a tunnel within the levee.

The two primary lakes in the Lockwood Corridor— Long Lake and Colonial Lake—could be modified to store more stormwater. The expansion of inland stormwater storage would control the community's nuisance flooding and provide a park for the neighborhood.

This solution would be a bold reimagination of the Lockwood Corridor to provide adaptable flooding protection and add public amenities while maintaining neighbors' connection to the water. The opportunity to tackle such an imaginative solution coincides fortuitously with the U.S. Coast Guard moving out of its base between Lockwood Drive and the Low Battery Seawall. That presents Charleston with enticing opportunities to add more recreational and open space in a manner that makes the area more resilient to inundation.

These improvements in the Lockwood Corridor would benefit the neighboring Medical District. Increasing the capacity of Long Lake serves both areas. Additionally, plans are already under consideration to raise Courtenay Drive and Doughty Street in the Medical District. Those plans should move forward, with the possible inclusion of stormwater management strategies including lake modification.

ROSEMONT

The Rosemont neighborhood, where most of the residents are Black, largely has been left out of the Corps' plans. The seawall would end before the neighborhood's boundary. And even though the Corps identifies Rosemont as "at risk" from future coastal flooding, it offers no specific solutions for it.



<u>That area has been squeezed by interstates</u> and onramps, and hemmed in by nearby industrial development.

Rosemont was once a much larger community. The construction of Interstate 26 in the 1960s severed the neighborhood, and more recently, construction of the Leatherman Port Terminal placed highway access ramps and noise barriers in the community. Along the way, marshes and wetlands were lost. The community was literally cut off from the larger peninsula. The community once had historic connections to the marshes along the Ashley River but that access has been reduced. A dock that served the community was washed away by Hurricane Hugo in 1989 and not replaced. And unlike other communities in Charleston, Rosemont has no paths or easy access to the waterfront.

Over the past decades, Rosemont has borne the burden of new infrastructure serving other areas. This neighborhood must be accounted for as part of the Corps' new infrastructure proposal. It is critical that the Corps understand the community's needs and identify opportunities to make the community more adaptable to flooding threats other neighborhoods face.

Like other parts of Charleston, Rosemont is at risk from tidal flooding. But it is also at risk from inland flooding because there is no roadway drainage system in the neighborhood. Further, highway barriers restrict floodwater from retreating. That means floods in Rosemont will linger longer, keeping neighbors sheltered in their homes and delaying others from getting home.



Adapting streets, curbs and sidewalks to store and filter stormwater could help address flooding in Rosemont and other neighborhoods.

Any plan for flooding mitigation in Charleston should include Rosemont, and Rosemont neighbors must be involved in the conversation. Even modest solutions, like making streets and sidewalks more permeable to stormwater, would do much to improve the community's drainage.

There is also an opportunity to reconnect the community to the expansive natural marsh and add flood storage. These types of ideas should be weighed and vetted by the community. Like the rest of Charleston, Rosemont deserves a resilience and adaptation plan and access to its fair share of federal funding.

CONCLUSION

The ultimate purpose of our report is to offer ideas, to propose solutions that will truly solve Charleston's flooding challenges, and to help the city become resilient and adaptable.

Charleston's choices should not be limited by the Corps' desire to solve a single threat when many exist. And Charleston's choices of what neighborhoods to protect should not be limited by the confines of the proposed seawall. While the Corps' proposal is literally a concrete wall, we have the opportunity to envision a city enhanced and protected in many places by natural, subtle solutions that the public would embrace.

The Corps' proposal does none of that. It is not resilient nor adaptable. It does not honor the city's commitment to more thoughtfully live with water as envisioned in the Dutch Dialogues. It does not solve the myriad causes of flooding that routinely swamp the peninsula.

We urge the Corps to widen its lens, to consider an array of more natural innovations, and to partner with the community to arrive at aesthetic, practical solutions.

The report itself is technical and scientific, but at its core it is a document that implores Charleston decision-makers not to accept the predictable, gray bulwark from the Corps. It is a call for creativity, for thinking outside the box.

This is a once in a generation opportunity to capture federal funding paired with the Corps' construction competence. It is critical for Charleston's future we get this right.





Access the full report <u>here</u>.