



Hampton Roads As A Center Of Economic Activity For Sea Level Rise Adaptation

Hampton Roads has experienced the highest measured rate of sea level rise on the Atlantic Coast: 1.45 feet over the last century. This is producing increasing “nuisance flooding” events, higher and higher storm surges, negative ecosystem impacts, and economic pressures in the form of higher flood/homeowner insurance rates, infrastructure challenges, and real estate market changes.

The historic rate of sea level rise has apparently doubled, starting in the mid-1990’s, and planning estimates being issued by state and federal agencies in Virginia call for another 1.5 feet of sea level rise by mid-century. The centennial rate has now been estimated at between 4 and 6 feet.

All of this could be very bad news for Hampton Roads. It can also be viewed as yet another challenge for the region to overcome and, if successfully met, show the way toward adaptation for other regions in the United States and the world. Viewing the region as an adaptation “test bed” can provide the focus for new economic growth opportunities and perhaps even generate a greater sense of region for Hampton Roads.

Examples from Elsewhere

Fixing flooding problems generates economic activity. The Dutch Government estimates that it receives around 4% of its Gross Domestic Product from water/flooding/sea level rise work worldwide (personal communication with Dale Morris, Royal Netherlands Embassy) Its commercial companies (Fugro, Arcadis, etc.) are already active in the Hampton Roads region and the Dutch are about to initiate a series of “Dutch Dialogues” in Hampton Roads patterned after a successful effort at regional “water planning” in New Orleans.

New Orleans is already taking a step forward in making plans to turn the challenge of flooding into an economic advantage in a sector they have dubbed, “water management.” In a 2014 study, the nonprofit Data Center identified the water management sector as a significant economic opportunity for the New Orleans region:

“Employing 64,587 in 2013, water management is the second largest of the economic sectors that regional leadership has targeted for growth, and importantly, since 2010 (the end of the Great Recession), it has added 7,832 jobs – more than any of the other sectors.” (THE COASTAL INDEX: The Problem and Possibility of Our Coast.)

A review from April, 2015 takes the economic potential even farther:

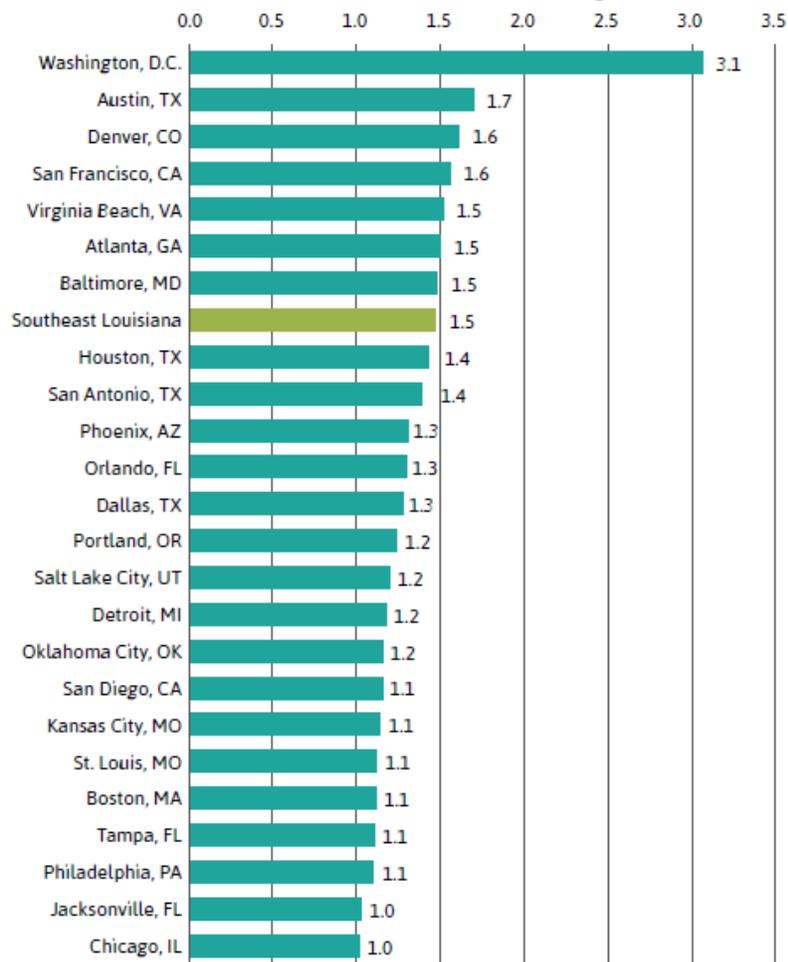
“Five years after the Deepwater Horizon oil spill, Southeast Louisiana is situated to capture the economic opportunity of a lifetime—an opportunity that’s derived from a water management

economy catalyzed by massive federal investment and augmented by state and local investments in coastal restoration, levees, and urban water innovations. Water management has the potential to be to Southeast Louisiana what software is to Austin, what biotech is to Boston, or what e-commerce is to Seattle.” (The Coastal Index: Tracking development of the water management cluster in Southeast Louisiana)

Opportunities in Hampton Roads

In the New Orleans study on water management, they evaluated the regions with potential specialization in “water management.” While New Orleans highlighted its capacity, the chart in the study (below) also identified the strong potential in “Virginia Beach, VA” – Hampton Roads.

Location quotients of business services and construction products and services
Metropolitan areas with potential specialization in water management



Source: U.S. Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School.

Assuming that this evaluation is valid, it seems that our region is poised to take full advantage of the challenges that nature has dealt us. Of the regions rated at or above Hampton Roads in

potential, only us and Southeast Louisiana are experiencing significant impacts from sea level rise and flooding today.

Meeting Today’s Needs Generates Jobs

We also have a strong pressing need to address this issue. In a recent study (“The Challenge of Mitigating Virginia’s Flooding and Sea Level Rise Impacts”) Wetlands Watch identified nearly \$431,000,000 in structural repair and flooding mitigation needs in five Hampton Roads localities. These “repetitive loss” properties are only a part of the cost of flood mitigation and sea level rise adaptation but funding is in short supply. An analysis in the study showed that relying on Federal Emergency Management Agency hazard mitigation funding grants would leave property owners stranded for as long as 188 years before assistance could be obtained (below).

TABLE 2 - REPETITIVE LOSS DATA BY LOCALITY					
LOCALITY	# OF REPETITIVE LOSS PROPERTIES	AVERAGE COST OF MITIGATION	TOTAL COST OF MITIGATION	AVERAGE ANNUAL FEMA FUNDING	# OF YEARS TO MITIGATE W/ FEMA FUNDING ALONE
Chesapeake	409	\$250,000	\$102,250,000	\$787,500	130 years
Hampton	863	\$75,000*	\$64,725,000	\$833,333	78 years
Norfolk	900	\$162,500	\$146,250,000	\$778,000	188 years
Portsmouth	186	\$75,000*	\$13,950,000	NA	NA
Virginia Beach	561	\$185,000	\$103,785,000	\$725,000	143 years
TOTAL	2,919	NA	\$430,960,000	NA	NA
*No average mitigation costs were available, so the statewide average of \$75,000 was used.					
FEMA Funding Levels: <ul style="list-style-type: none"> • Hampton has received \$2,500,000 since 2011 • Chesapeake has received \$6,300,000 since 2006 • Norfolk has received \$3,890,000 since 2009 • Virginia Beach has received \$2,900,000 since 2010 					
Note: The most recent data available for Chesapeake, Norfolk, and Virginia Beach is from September 2014; for Hampton, data is from 2013.					

Research shows a number of models for securing the needed funding for this work, using private sector lending in ways similar to energy efficiency mortgage programs. Wetlands Watch identified a state flooding mitigation fund in Connecticut and Virginia Sen. Lynwood Lewis introduced legislation to create such a revolving loan fund here. The bottom line? If funding can be found to meet the outstanding needs, that \$431,000,000 represents 9,200 jobs.

Designing for Solutions Creates Professional Opportunities

The potential for economic activity around the issue of flooding and sea level rise is most evident in the design and engineering professions. There is little design and engineering work “on the shelf” that will work for implementing adaptation in a built out neighborhood before a storm hits. An early design effort was undertaken in Chesterfield Heights, an historic neighborhood in Norfolk along the Eastern Branch of the Elizabeth River. Using a community of design professionals as advisors, a team of Hampton University architecture students and Old Dominion University engineering students undertook a year-long process of designing an adaptation approach for this community.

Still in process, the effort demonstrated how much work was involved in a single neighborhood for the design phase of this work, let alone the actual implementation phase. The work has resulted in both HU and ODU putting this kind of design work into the ongoing curriculum for their institutions and generated a great deal of professional design and engineering firm interest. If this effort can be continued, the region could graduate and attract adaptation design professionals in sufficient numbers to become a center of excellence in this work.

Training, Innovation, Systems Approaches to Solving Flooding Problems

So much of the work on flooding adaptation occurs *after* the storm has hit. Building resilience before the storm in Hampton Roads is the key to success and can also generate economic activity.

Building upon the experiences of New Orleans post-Katrina and New York/New Jersey post-Sandy, we can begin to design systems and knowledge networks that build resilience – economic, social, and environmental – in our region, assuring our response and recovery to a storm event and to the long, slow progress of sea level rise.

Engaging the community in understanding the extent of the problem and in possible solutions is made much easier with modern communications technology. Wetlands Watch and Norfolk-based Concurtive Corporation developed a smart phone app and community deployment system to engage citizen in collecting flooding information. The “Sea Level Rise” app prototype has been used in a number of neighborhoods and during flooding events to identify potential trouble spots and then document the extent of flooding. Updating the app is underway and expanding its applications and training communities in its use involve a potential area of economic activity for Hampton Roads.

There is also the potential for developing networks of businesses affected by flooding for whom this app and other smart networks of information could assure business continuity during flood events. This area of activity involves innovative processes that can generate income and also protect the economic activity that is being threatened by our more frequent flooding events.

Bottom Line is the Bottom Line

Change, when viewed with the perspective of a future's trader, is a good thing, but only if you come out on the right side of the change. That is the challenge facing Hampton Roads as it deals with sea level rise and more frequent flooding events. Making efforts now to adapt to our flooding can generate solutions for the people and businesses of Hampton Roads, and generate a large potential for economic activity for the region.

Resources

The Data Center Coastal Index - http://www.datacenterresearch.org/reports_analysis/the-coastal-index-2015/

Wetlands Watch, "The Challenge of Mitigating Virginia's Flooding and Sea Level Rise Impacts." - <http://tinyurl.com/flood-fix>