

STAYING AFLOAT:

Adapting Waterfront Business to Rising
Seas and Extreme Storms



PROCEEDINGS FROM THE 2014 RONALD C. BAIRD
SEA GRANT SCIENCE SYMPOSIUM

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Rhode Island Sea Grant and the Coastal Resources Center, both at the University of Rhode Island Graduate School of Oceanography, and the Pell Center for International Relations and Public Policy at Salve Regina University.

Planning Committee

With appreciation to our planning committee: The Rhode Island Marine Trades Association, Commerce RI, R.I. Statewide Planning, the Rhode Island Nursery and Landscape Association, NOAA Office for Coastal Management, EPA Smart Growth, the URI Marine Affairs and Landscape Architecture programs, the Narragansett Bay National Estuarine Research Reserve, and Tetra Tech



Introduction

For more than a decade, Rhode Island Sea Grant and the Coastal Resources Center (CRC) at the University of Rhode Island Graduate School of Oceanography have partnered with coastal communities to examine how to live on a changing shoreline, where flooding and erosion are key impacts of storms and sea level rise, and go hand-in-hand with climate change. Local businesses are important partners in any comprehensive adaptation effort for coastal communities, not only for their contribution to the local economy and beyond, but for the services they provide to their communities.

The forum, “Staying Afloat: Adapting Waterfront Businesses to Rising Seas and Extreme Storms/The 2014 Ronald C. Baird Sea Grant Science Symposium” brought businesses, government decision-makers, and experts in various fields such as insurance, landscape architecture, and community planning together to examine adaptation problems and solutions.

Symposium Overview

Baird Symposium brings best climate adaptation practices to flood-prone coastal businesses

Living on the coast requires understanding the challenges of climate change, especially flooding and erosion caused by storms and sea level rise. These impacts can threaten public safety and homes, buildings, and infrastructure. Coastal businesses face their own set of challenges in determining if or how they should continue to operate on shorelines in flux.

These business challenges were explored during “Staying Afloat: Adapting Waterfront Businesses to Rising Seas and Extreme Storms,” the 2014 Ronald C. Baird Sea Grant Science Symposium, held December 9 -10, 2014. The forum examined several examples of businesses’ efforts to protect themselves from flooding and erosion. It engaged participants – business people, local and state level decision-makers, researchers and adaptation specialists – in considering these goals:

- Learn from experts about practical tools and approaches to be applied in Rhode Island
- Move from knowledge and awareness to action
- Use what’s available to make smart adaptation decisions for businesses and communities

Symposium Spotlight

“New England pragmatism” can help Rhode Island adapt to rising sea level, says symposium keynote speaker

John Englander, sea level rise expert and author of High Tide on Main Street says Rhode Island’s “New England pragmatism” can foster a level-headed approach to adapting to rising sea level. “While rising sea level is a long-term trend and will be a



huge challenge, we have time and must find ways to adapt. The world will always need coastal access and infrastructure. Rhode Island can be a leader in adaptation,” said Englander.

Session 1: What is happening today and what are we expecting tomorrow?

In Rhode Island, businesses beginning to undertake adaptation practice are doing so in an increasingly supportive public policy environment. Rapidly emerging science is explaining the phenomenon of climate change while informing community partnership efforts to provide useful planning tools to shoreline communities facing flooding and erosion.

“For some areas, today’s one-in-100-year storm event could be a one-in-3-year event by 2100,” said Austin Becker, assistant professor in the URI College of Environmental Life Sciences. Businesses are taking heed. For example, Lisa Konicki, executive director of the Greater Westerly-Pawcatuck Area Chamber of Commerce, said that adaptation practice has, since “Superstorm” Sandy of 2012, centered on providing a “one-stop-shop” assistance model. The model has enabled 28 of the town’s 29 flood-damaged or destroyed businesses to reopen – with five undergoing significant reworking. Other kinds of support are available, too; Pam Rubinoff, senior coastal manager for Rhode Island Sea Grant and CRC pointed to new leadership, per the Rhode Island Executive Climate Change Coordinating Council; legislation, such as the Resilient Rhode Island Act; and recent projects, such as the Rhode Island Shoreline Change Special Area Management Plan. New mapping and planning aids are emerging as well, with Grover Fugate, executive director of the R.I. Coastal Resources Management Council (CRMC) and Malcolm Spaulding, professor emeritus of the URI Department of Ocean Engineering, explaining how STORMTOOLS™ offers communities web-based coastal resilience analysis and planning.

Climate Change in Rhode Island

DO NOTHING, PAY BIG: Rhode Island's potential damages associated with climate change impacts could total \$4.4 billion by 2100 if no adaptation actions are taken. The good news? Adaptation practice could reduce the damages by \$3.2 billion—so reports Industrial Economics, Inc., in its recent national analysis of the damages associated with sea level rise and storm surge. (Citation: Baird Symposium Presentation, James E. Neumann, Principal, Industrial Economics, Incorporated (IEc), <http://www.slideshare.net/riseagrant/neumann-economics-baird>)

Session 2: What can you do? Site planning and preparedness

If understanding basic climate change science and Rhode Island's web of support resources is the critical first step in building business resiliency, the next step focuses on the business itself: developing and implementing a plan to protect the property and its assets. Symposium speakers emphasized that plans needn't break the bank, but should clearly identify and prioritize building and infrastructure weaknesses to flooding or erosion, match adaptive solutions to those specific problems, and outline the likely costs necessary to carry out and maintain the solutions over time.

Speakers said that committing to adaptation is the hardest part of the process—actually moving ahead with a plan can be done gradually, within a range of cost options. Louis Gritzko, vice president of research for FM Global, a commercial and industrial property insurer based in Johnston, R.I., said clients have had success with a seven-step approach to site planning and preparedness that “isn't difficult, but does require you to take some time and do your homework.” Developer Mark Van Noppen, of Rising Sun Mills, a residential and commercial complex in Providence, agreed, saying that the effort it took to investigate and erect a flood barrier at the complex's main doors was a small investment compared to the peace of mind it conferred. Chuck Miccolis, senior engineering manager for commercial lines at the Insurance Institute for Business & Home Safety (IBHS), which created a voluntary resiliency standard for businesses called “FORTIFIED Commercial™,” said that “a building built to common construction standards may experience significantly more damage than a stronger building which has been constructed with safer wind-resistant installation techniques; in the case of the IBHS test (a wind test performed on a common and a FORTIFIED building) the common building experienced 10 times more damage than the stronger building—\$44,769 versus \$4,660.”

James Houle, outreach coordinator and program manager for the University of New Hampshire Stormwater Center, recommended that companies consider green infrastructure—at the simplest level, vegetative filters and rock infiltration formations—for nature-based stormwater absorption. He also encouraged businesses to pick “multi-purpose” solutions that combine streetscape or landscape aesthetics and stormwater controls, and to volunteer, if possible, to serve as business community pilot projects. Lauren Land, sustainability coordinator at the Louisiana Sea Grant College Program, recommended that businesses make use of tools such as resilience checklists, and Michael Keyworth, a director of the Rhode Island Marine Trades Association and general manager of Brewer Cove Haven Marina in Barrington, agreed that such tools are critical: “I've been doing this a long time—you have to be ready, it's as simple as that.”

Steps for Storm Resilience

Drawn from: Dr. Louis Gritzko, vice president of research for FM Global

1. Know your risk from wind and water from storms
2. Know what's covered under your insurance policy
3. Design to minimize risk using proven standards
 - Keep water away from or out of buildings using certified flood barriers
 - Elevate equipment and key parts of buildings to protect from water
 - Protect building envelope from wind and strap down rooftop equipment
4. Invest in backup power
5. Consider green landscape design to deal with stormwater
6. Have a comprehensive preparedness plan, and practice it
 - Use a business continuity planning toolkit
 - Ensure employees are aware and ready, both at home and at work

For more information, visit <http://www.fmglobal.com/default.aspx>

The Gulf of Mexico Clean & Resilient Marina Initiative offers a Clean & Resilient Marina Guidebook that is a three document set providing marina owners and operators with useful information on tools and recommended practices. In addition, a Clean & Resilient Marina Policy Guide and an educational tri-fold brochure are available. See <http://www.gulfofmexicoalliance.org/2013/05/gomas-clean-resilient-marina-initiative/>

Session 3: What can we do? Public planning and action

The third tier of preparedness—community resiliency—provides further support to businesses seeking to prepare for climate change impacts. Significant partnership efforts are making it possible at the local level to use adaptation tools and techniques that are proven and replicable, and can be shaped to suit a coastal area’s specific challenges to flooding and erosion. Teresa Crean, extension specialist for Rhode Island Sea Grant and CRC talked about the university and state agencies that have partnered with the pilot project town of North Kingstown, R.I., to assess the municipality’s vulnerability to storms and sea level rise,

recommending options for integrating adaptive solutions into key town planning policies, and creating model guidance for other coastal communities. Likewise, In Hoboken, N.J., said city Assistant Business Administrator Stephen Marks, the municipality has implemented, as a result of Superstorm Sandy, a nine-point resiliency plan that emphasizes using vegetation, where possible, to absorb stormwater. And in Boston, Mass., the city is working to ensure that business development or construction plans address hazard mitigation, said John Dalzell, a senior architect of the Boston Redevelopment Authority who administers a Climate Change Preparedness and Resiliency Checklist for New Construction.

Adaptation Advice for Coastal Communities

“Our secret is to be a resilient city, and it is part of our economic plan.”

—John Dalzell, senior architect of the Boston Redevelopment Authority

Coastal communities with storm and flooding experience are sharing their recovery know-how—from Westerly, R.I., with a tourism-heavy economy, to Boston, which is investing in solutions both flood tolerant and environmentally sound, to Hoboken, N.J., which has launched its Nine-point Resiliency Plan.

The Greater Westerly-Pawcatuck Area Chamber of Commerce

Drawn from: Lisa Konicki, The Greater Westerly-Pawcatuck Area Chamber of Commerce

The chamber advises coastal communities to:

- Have a local one-stop-shop for post-storm recovery operations where business owners can connect with town and state officials, federal emergency management representatives, and volunteers to facilitate the assessment and recovery process.
- Consider rebuilding in new ways that are more adaptive to potential storms, such as replacing damaged structures with mobile, portable, or scaled-down versions. For example, a coastal hotel severely damaged by Super Storm Sandy now functions only as a seasonal restaurant and patio, reducing risk from future storms.
- Take pre-storm inventory photos to prepare for filings for federal grants and insurance claims.
- Participate in development of municipal emergency permitting procedures to prevent post-storm backlogging and jumpstart recovery.

Hoboken, N.J.: A Nine-point Resiliency Plan

Drawn from: Hoboken City Assistant Business Administrator Stephen Marks

1. Energy Resiliency- designing micro-grids within the city to deal with power outages following a storm
2. Coastline Protection- using armored levees and seawalls in areas necessary to keep the water out, but also making them attractive public open space
3. Pumps to Control Flooding- especially in areas that cannot be exposed to flood waters.
4. Stormwater Management through “Green Infrastructure”—developing multi-functional public spaces that combine green space and underground parking that can also be used to store water during a storm.
5. Resilient Communications Systems—Having phones and internet is a necessity today, especially following a storm. Wifi-enabled kiosks are one idea for how to provide a community with access to the internet when power is out.
6. Flood-proofing critical community facilities—Using flood gates and other measures to keep electrical substations and other utilities up and running.
7. Resilient zoning and building codes—following on the recommendations of the Hurricane Sandy Rebuilding Task Force established by the White House.
8. Public information campaign: “Emergency preparedness begins at home!”
9. Create a City Resiliency Task Force (Community Emergency Response Team) to ensure that resiliency is a priority in the future.

Find out more about adaptation planning in Boston and Hoboken:

BOSTON: <http://www.bostonlivingwithwater.org/> HOBOKEN: <http://www.hobokennj.org/resiliency/>



The use of temporary structures (here, a hotel bar and deck that can be removed) helped Misquamicut Beach in Westerly, R.I., adapt to the effects of Superstorm Sandy.

Session 4: How can we understand the drivers and create incentives for action?

“When you are resilient, you are in business,”
—*Louis Gritzko, vice president of research, FM Global*

A business that chooses to invest in adaptation practice works to strike a balance between effective mitigation and manageable cost. Often, adaptations require a larger investment up front, with the payoff of reduced damages only realized years later. Then too, some items can be insured, like the loss of inventory or property damage, while others can't—like the loss of market share or revenue experienced during post-storm business closures. Still, taking measures to be prepared for the long haul may provide a competitive advantage to a business by allowing it to recover more quickly and get back to normal operations before competitors can. Generally, said James Neumann, principal of consultancy for Industrial Economics, Inc., investing in adaptation is going to save businesses money over time, although there will always be “residual risks” in trying to respond to Mother Nature: “Don't assume you can adapt to all climate change,” said Neumann, although “Adaptation in the coastal zone, in general, is a cost-effective option, particularly in densely populated areas. But the sooner you start, the better off you'll be.” Gritzko, of FM Global echoed this, adding that businesses need to think of their total risk—beyond the cost of building damages—including the aftermath effects on corporate image and reputation, community and employee relations, and work productivity. “Get clarity on the broader benefit in addition to what good happens to your insurance premiums if you take action,” said Gritzko. Speakers also said that adaptation can be valuable outside of its protective worth—a greenway or garden can improve company morale, for instance.

Session 5: Next steps

“Climate change adaptation is largely a land use problem; therefore it is up to municipalities to incorporate it into their planning and decision making.”

—*Grover Fugate, executive director, R.I. Coastal Resources Management Council*

Adaptation is far from easy, said RIMTA's and Cove Haven Marina's Keyworth, adding that Rhode Island needs more tax incentives and adaptation assistance to help its coastal economy. Still, said government leaders, such as R.I. Department of Environmental Management (DEM) Director Janet Coit, CRMC Executive Director Grover Fugate, and I-195 Redevelopment District Commission Executive Director Jan Brodie, there are plenty of signs that the state is serious about helping coastal communities prepare for change. They pointed to the state's launch of an interdepartmental climate change policy and practice board, the Rhode Island Executive Climate Change Coordinating Council (EC4), as a primary support. “It's significant that we're working across departments and with the local communities on this,” said Coit. Brodie pointed to the Master Environmental Permit for the 195 land that required collaboration between CRMC, the Narragansett Bay Commission, and DEM: “This master permit allows for an across-the-board set of regulations that can save a developer a year or two in predevelopment time and cost.” Fugate agreed and stressed the importance of all sectors taking part in helping each other with community adaptation. “We are all facing the same future, so we're all going to have to start planning and acting now.”

For more information about the symposium, visit <http://seagrant.gso.uri.edu/special-programs/baird>. For climate change adaptation information, visit <http://www.beachsamp.org/>.