

SOUTHEAST FLORIDA
REGIONAL COMPACT

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IMPLEMENTATION GUIDANCE SERIES



*Regional Climate Action Plan Workshop #9
of the Southeast Florida Regional Climate Change Compact*

Reducing Climate Risk and Creating Economic Opportunity

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Acknowledgments

This publication of the **Southeast Florida Regional Climate Change Compact (The Compact)** is based on the findings of the **Regional Climate Action Plan (RCAP) Workshop #9** held at Florida International University's Florida Climate Institute on April 28, 2016. This well-attended workshop sparked dialogue among local leaders in government, risk management, finance, technology, building and development, and academia, and focused on risk reduction, regional economics and coordinated leadership. The concepts that emerged from the workshop and are presented in this paper, **address the financial, economic, and physical challenges – as well as the significant opportunities – in Southeast Florida's changing climate.** We thank all of our attendees and the following featured speakers for their insights:

Deepak Badoni, John Burkholder, Matis Cohen, Samantha Danchuk, Michael Daniels, Wendell Gaertner, Dorothy Gjerdrum, Bertha Henry, Jennifer Jurado, Alex Kaplan, Edward Marquez, Jimmy Morales, Jack Osterholt, Scott Robins, Mark B. Rosenberg, Susanne M. Torriente, Leonard Vialpando and Tony Vu.

This document was written in June 2016 by Karla Ebenbach, AICP on behalf of the Institute for Sustainable Communities, which provides implementation support to the Southeast Florida Regional Climate Change Compact.

“In our changing climate, the **risk management, finance, and building and development** sectors are of vital importance to the work that is needed for a stable and resilient future in our region. Professionals in these sectors shared the following insights and innovative ideas.”

– Jennifer Jurado, *Director of Environmental Planning and Community Resilience, Broward County, and Founding Member of the Compact*

View videos from the workshop at: <http://bit.ly/ECONresilience>

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For more on the Southeast Florida Regional Climate Change Compact:

www.southeastfloridaclimatecompact.org

For more on the Institute for Sustainable Communities: www.iscvt.org

About the Southeast Florida Regional Climate Change Compact

At a Glance: Current and Future Climate Risk in Southeast Florida

- ◆ Southeast Florida, the fastest-growing region in the United States, has experienced increased rain events, beach erosion and flooding in recent years. The region is particularly vulnerable to sea level rise, which is affecting coastal populations everywhere.
- ◆ Several well-regarded independent models forecast that our region, with its dense coastal development and flat, low-lying landscape, will face sea level rising to between **6–10 inches by 2030** and then **14–26 inches by 2060**.
- ◆ This changing relationship with water in our built environment requires that the region adapt or rebuild substantial portions of its public infrastructure and private property. There will be significant costs to private citizens, private enterprise and government alike. Just one foot of sea level rise is estimated to put \$4 billion of taxable property at risk in the four-county region, and \$31 billion by the time there is three feet of rise.
- ◆ Our communities need effective, comprehensive solutions to reduce water coming in and manage better the water that does come in, encompassing public infrastructure and private developments.

“Our communities have very intimate stories from this last year about the great dramatic impacts of prolonged flooding. Tropical storms are largely predicted to be more intense. With greater coastal development we have the risk of greater losses [from] higher wind intensity and damage, extreme rainfall increasingly. We're seeing intense storms occurring during historic dry winter months [and] more 100-year rainfall events and 500-year rainfall events. Two years ago, the State of Florida had two one-in-a-thousand year rainfall events, and more than 20 inches of rain in a single day.” – *Jennifer Jurado, Broward County*

Our Work Since 2010

The **Southeast Florida Regional Climate Change Compact** (the **Compact**), a voluntary and cooperative partnership, was formed in 2010 among Palm Beach, Broward, Miami-Dade and Monroe Counties to foster unified mitigation and adaptation strategies, develop common planning tools, and create a **Regional Climate Action Plan (RCAP)**, which was completed in 2012 and will be updated in 2017.

The RCAP, adopted by all four counties and by many municipalities, provides 110 actionable recommendations, including recommendations related to reducing vulnerability, making plans consistent, developing strong codes and enacting region-wide programs. The RCAP supports adaptation strategies for the region while also serving to protect its economy and quality of life and respecting the autonomy of the region's many governing bodies.

The Compact adopted a Unified Sea Level Rise Projection in 2015, merging independent scientific projections into one practical and coherent model for our region, in an effort to facilitate coordinated action. The Compact successfully prevailed on the state to adopt Adaptation Action Areas (AAAs) and gained federal recognition of the same for infrastructure funding. The Compact has supported cross-regional learning and action through workshops, resources, and outreach – to advance recommendations of the RCAP.

“The fact that the Compact has come together, [even by] just supporting the science [around climate change forecasting] – and [by the way] our City Commission has recently adopted that [forecast] and will model our storm water program on it and build it into our codes – helps because no one city has the resources to deal with the science and to create that kind of awareness. We can learn from each other and build collective resources.”

- Jimmy Morales, City Manager, City of Miami Beach

Learn more about the Compact at: <http://southeastfloridaclimatecompact.org>

Managing Climate Risk

The [National Flood Insurance Program](#) and the private insurance industry are intrinsically linked to how communities recover from severe weather events, as these entities determine nearly all the factors around payment for replacement (e.g. who, when, and how much). To facilitate quick and full recovery, counties, municipalities and property owners must advocate for risk evaluations that account for climate factors from the outset, but advocacy is not their only option. Technology also enables communities to proactively put a price tag on the climate risk within the region and engage in strategically selected mitigation and adaptation projects. This is especially critical as FEMA does not provide disaster assistance for the **secondary home market**, a major economic driver in Southeast Florida.

“The federal government is going to be stressed out and we’re going to have to be on our own. We are going to be acting as a little city-state.” – *Edward Marquez, Deputy Mayor of Miami-Dade County*

“The number of federally declared disasters has increased dramatically in the last four decades. FEMA is becoming spread way too thin... The message is: you cannot depend exclusively on FEMA and the federal government to respond. You must **own your risk** and take actions locally and regionally.

Government traditionally raises funds for these losses by raising taxes, raiding the budget, or going to the capital markets and issuing bonds post-event... Why would [we] use these three inefficient methods to pay for things that we know are going to occur? So let's pre-finance the disaster, do our adaptation measures and put a financial plan in place to ensure that we can absorb those shocks over time [and] also protect our economic trajectory.” - *Alex Kaplan, Senior Vice President of Swiss Re, specializing in innovative risk transfer strategies.*

Risk Management: The Traditional and the Innovative

<p>Traditional Risk Management has a transactional focus, primarily addressing flooding and rebuilding in response to events...and only deals with about 20% of the full array of risk exposures.</p>	<p>Enterprise Risk Management (ERM) is a newer approach that addresses the full spectrum of an organization's risks and, as it relates to climate risk, includes the use of secondary insurance (collateralized re-insurance), in the form of instruments such as “catastrophe bonds” or “parametric insurance” funded through the capital markets. These tools kick in to provide aid after a higher-than-usual chosen threshold of weather impact has been reached. ERM defines risk as the effect of uncertainty on an organization's objectives and spreads responsibility for managing it to all accountable, or to the “risk owners.”</p>
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Risk Management in this section is defined as the advisory services, insurance programs and regulatory processes that surround weather and climate risk in our region.

Enterprise Risk Management in Action

After Superstorm Sandy, New York City's Metropolitan Transportation Authority (MTA) created a [first-of-its-kind \\$200 million catastrophe bond](#) when traditional reinsurance became difficult, employing tidal gauges in its subway system (monitored by USGA and NOAA) to “trigger” the reinsurance following a flood event. Pension funds, hedge funds and other investors looking for ways to diversify their portfolios are potential funders of catastrophe bonds and other secondary insurance.

“Standard and Poor’s recognized ERM as a positive credit enhancement to [the University of California's] program. The same thing with Benton, Arizona's Public Utility District. So, they are looking at entities such as ourselves [e.g. Broward County], making sure that we are doing ERM, that we are thinking in the long term, that we are accounting for climate change and... other risk exposures that are beyond the ‘traditional.’” - John Burkholder, Director, Risk Management Division, Broward County

In a future secondary or catastrophe bond market in Southeast Florida, measurable weather impacts on ports, airports or convention centers – some of the region’s key economic engines – could be the trigger for this type of insurance following a weather event.

Managing Climate Risk Resources

Technological Tools

In contrast to many traditional risk analytics tools, new non-proprietary tools are emerging that promise greater speed, detail, accessibility, universality, adaptability and collaboration. Examples of this type of tool include:

- ◆ [EigenRisk](#), a risk analytics and software development firm started in 2014, has developed an open source tool by the same name, which is a prime example of this new breed of software tools. It empowers users to maintain control – and have the ability to adjust – assumptions that go into analyses, projecting decades into the future and easily examining economic impacts of adaptation investments at the aggregate level or parcel-by-parcel.
- ◆ PreventionWeb offers the open source Economics of Climate Adaptation tool called [Climada](#), which provides decision-makers with a fact base to understand the impact of climate on their economies and to identify actions to minimize that impact at the lowest cost to the community.
- ◆ [ISO 31000](#) is a family of risk management standards, adopted by public and private entities (including 43 countries) across the world that provides benchmarks to measure our own standards against. There 24 standards relating to security and resilience.

Policy Guidance and Peer Successes

The **Compact** provides a formal framework for policy development, implementation and evaluation that also enables learning over time. The 110 recommendations of the [Regional Climate Action Plan \(RCAP\)](#), the [RCAP Implementation Guide](#), and a library of resource documents about other initiatives, case studies and plans can be found on the [Compact website](#).

Human Resources

The seating of a **Chief Resiliency Officer (CRO)** in each county and in several municipalities has allowed better coordination of risk management and public sector actions. The CRO's role is to take a long-range view of aging infrastructure, housing stock, and public transportation systems – in addition to fast-emerging threats in our changing climate. While CRO's are the latest trend in risk management, municipal and county sustainability offices remain a major regional resilience backbone. For example, the West Palm Beach Office of Sustainability was created in the Public Utilities Department in 2008 by Mayor Lois Frankel, and in 2014, with Mayor Jeri Muoio's emphasis on the importance of resiliency and sustainability, the sustainability office moved into the Mayor's Office, providing increased access and involvement in city activities and initiatives.

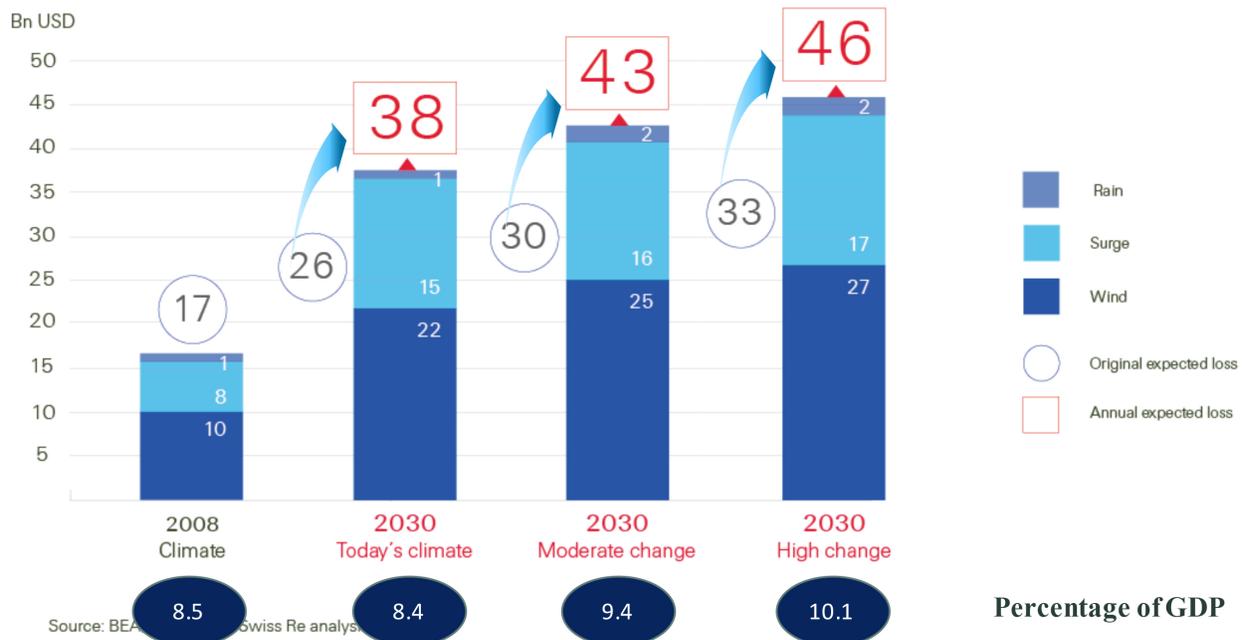
Recommendations from Risk Managers to Local Government

“The costs of disasters are increasing over time... It's not the rising cost that's the concern; it's the divergence between the insured and uninsured portions – or the insured portion versus the total economic cost of the disaster. Globally, on average, 30% of [all] disasters are insured. The other 70% falls on the back of the rest of society. Overwhelmingly, that [means] citizens and the public sector.” – Alex Kaplan, Senior VP, Swiss Re

- ◆ Secure multi-year insurance packages that add predictability by smoothing out budgetary fluctuations and provide rebates when losses have been averted.
- ◆ Use ERM insurance instruments where and when possible, to gain fuller coverage.
- ◆ Collaborate across risk management, planning and budget divisions of local government to coordinate strategic investments.
- ◆ Utilize innovative technological tools to put a price tag on projected risks and possible adaptation scenarios in your community.

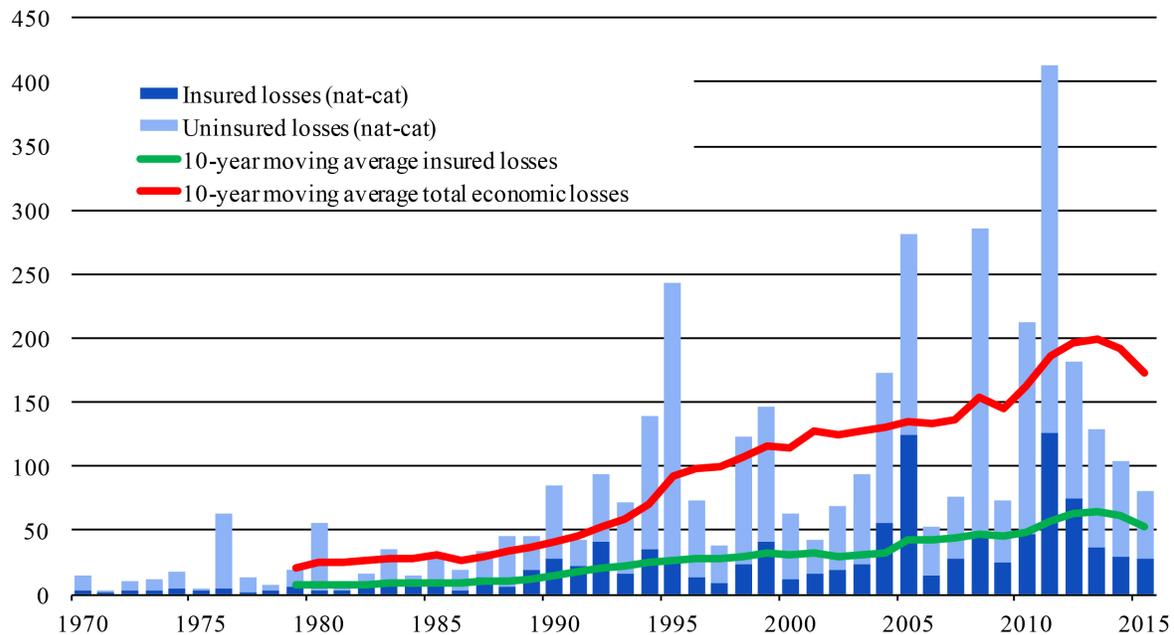
Managing Climate Risk by the Numbers

Annual expected losses



The Growing Burden of Uninsured Losses

Natural Catastrophe Losses 1970 – 2015 (in 2015 USD)



Source: Swiss Re Economic Research & Consulting and Cat Perils.

- ◆ Economic impact of climate change in Miami-Dade, Broward and Palm Beach Counties in 2030 will be **\$25 billion** annually (at our current economic growth rate of about 2-1/2%).
- ◆ Equivalent to 4x Miami Dade's current budget.
- ◆ In the maximum climate change scenario, that figure will be \$46 billion annually.
- ◆ Equivalent to 10% of the Tri-County area's current GDP.
- ◆ In other words, \$1 out of every \$10 made in the Tri-County area washes out to sea, quite literally.

(From Alex Kaplan and Swiss Re's *Climate Change and Resilience Building: A Reinsurer's Perspective*, which includes findings of the *Economics of Climate Adaptation Working Group*)

Economics of a Changing Climate

The **municipal bond and residential mortgage markets** are an integral part of the economic health of our community. Partnering with market professionals to maintain **bond ratings**, make **sound investments**, and support the region's **homeowner base** is critical to social and economic stability through the coming challenges of a changing climate.

Southeast Florida's robust economy has proven it recovers well from economic setback – such as after the recession of 2008 – but is also highly dependent on tourism and second home ownership, which raise real estate values and which may prove sensitive to the reductions in quality of life possibly incurred via increases in major storm events and sea level rise if the region fails to continue adapting to climate risk. One major disaster can change it all, as was seen in New Orleans after Hurricane Katrina left 80% of that city under water.

The Municipal Bond Market

“In 2005, before Hurricane Katrina, New Orleans was rated BBB+ by Standard & Poor's. After the storm, they were downgraded to BB, which is below investment grade, very unusual for a U.S. municipality. They spent four years below investment grade...once [a storm] happens, there are significant costs and long term implications for...borrowing costs going forward.” – *Wendall Gaertner, Senior Marketing Director, Public Resources Advisory Group*

Consideration of sea level rise and flood risks in the municipal bond market is currently low. Disclosure requirements do not yet include tidal flooding. Given that bonding is one of local government's primary means of securing project funding, it is important that climate factors become reflected in the process so that municipalities are encouraged to select strategic investments and maintain strong bond ratings to meet future needs.

Challenges in Funding Municipal Projects:

The Current Municipal Bond Market

The bond market is not yet attuned to long-range climate concerns and does not adequately support the necessary long-range view of investments.

- ◆ In practice, 30-year municipal bonds are really viewed on a five-year horizon.

Structure of the Market

The Municipal Bond Market is comprised of:

1. **Bond issuers**, selling their debt.
2. **Bond investors**, buying the debt.
3. **Investment bankers**, making a deal between the two.
4. **Rating agencies**, providing outside oversight.

- ◆ Bond ratings fluctuate following a major weather event.
- ◆ Under current municipal bond analytics, there is an incentive to hold onto cash rather than to spend on risk reduction, since liquidity is valued as a strength for catastrophes.
- ◆ Rating agencies recently began to employ new standard criteria for their evaluations, though thus far, those criteria have little to do with changing climate conditions. The new criteria include:
 - Liquidity for short-term losses.
 - Strength of tax base to support long-term stability.
 - Municipal plans, though this last item is presently lacking a robust long-range horizon.

Government Funding Streams

The long range, cross-disciplinary nature of mitigation and adaptation investment calls for a collaborative approach to planning and funding projects. Yet, government funding streams are often siloed and difficult to leverage across divisions.

“Governments historically have been siloed. Computerization is helping us break down those silos so that we can manage information better across departments. However, our funding sources are all siloed... Over time, we need to talk about how we make our money more fluid between projects.” – *Edward Marquez, Deputy Mayor, Miami-Dade County*

Municipal Financial Tools to Watch and Use

- ◆ **Traditional Municipal Bonds:** Although there's nothing new about these bonds, some projects can be done on a tax-exempt basis such as revenue bonds or general obligation bonds.
- ◆ **Catastrophe Bonds:** These bonds are effectively an insurance policy obtained through the capital markets, as described in the Risk Management section, and may attract investors because they are not correlated to other financial risks.
- ◆ **Green Bonds:** More prevalent internationally until recently, these financial tools appeal to investors seeking environmentally beneficial investments and who are willing to earn less on an “enlightened” investment. One U.S. rating agency has announced it will certify bonds as “green” as a service to investors. Washington D.C. led the way for green bond financing in the United States with its “[100-year Tunnel](#),” built as part of the water and sewer system: D.C. Water issued \$350 million in taxable, green century bonds. The 100-year final maturity is the first municipal century bond issued by a water/wastewater utility in the U.S. It is also the first “certified” green bond in the U.S. debt capital markets with an independent second party sustainability opinion.

Examples of Risk and Bond Management

- ◆ Example #1: Miami-Dade County enjoys a AA bond rating due to its cash on reserve and its well managed programs and plans. The County has a \$13.5 billion [Multi-Year Capital Improvement Plan](#) for water, including sea level rise, but also facilities such as the airport. Deputy Mayor Edward Marquez characterizes this as “setting global priorities on a local level.”
- ◆ Example #2: In **Norfolk, Virginia**, where there's been massive flooding coupled with challenges of poverty and infrastructure deterioration, the [City Council voted to devote a sizable portion of its budget surplus](#) from 2015 to risk reserves as well as strategic investments in community and infrastructure projects. The City was able to [attain a bond rating of AA+](#) in the fall of that year, due to ongoing economic diversification in the City's downtown area, sound financial performance, moderate long term debt burden and the economic stability of a military presence.

The Residential Mortgage Market

The economic strength that Southeast Florida derives from its appeal to vacationers and home buyers – coupled with confident forecasts of continuing population growth – gives hope that there will be ongoing interest in investing in our region. However, our positive economic growth trajectory depends on our attractive quality of life, which is derived from both the desirable, coastal environment as well as the perception of social and economic opportunity to be found here.

“It is important [to understand] risk and have the right association with price.” – *Michael Daniels, Mortgage Loan Originator at Christensen Financial*

The current residential mortgage market in Florida does not fully account for near-term flooding risks, let alone the longer-term risks of sea level rise. Only flood zone location, not tidal flooding, is a required disclosure through the home financing process. In the process for obtaining the required inspection, appraisal, survey and title, there are missed opportunities for a more complete accounting of climate-related risk. Future major weather events will likely trigger greater attention to tidal flooding and other water-related disclosures.

“The total amount that Florida has paid into the [National Flood Insurance Program] could very easily be wiped out with one good direct “hit” down here in Miami-Dade... so I think it's hard to compare it to the actuarial tables that we use, say, for life insurance or homeowner's insurance which are a lot [easier] to calculate.” – *Thomas Ruppert, Coastal Planning Specialist, Florida Sea Grant*

Volatility in flood insurance rates, and Florida's major presence in the National Flood Insurance Program – as **about 35% (1.8 out of 5.1 million) of all flood policies in the US are written in Florida** – may serve as a warning that a substantial amount of our real estate value is vulnerable to climate impacts. **Florida**

flood insurance rates have risen dramatically recently, raising concerns about the decreased affordability of financing home purchases ([FEMA program changes](#)). As the costs of protecting against risk continue to rise and building standards change, it may only become harder to afford to buy and retain a home in our region. Homeowners will increasingly face a “rebuild vs. relocate” dilemma following a weather disaster. It may be unfeasible for some to rebuild a home to new, more stringent standards and also insure it.

The Great Recession’s Ongoing Effect on Residential Mortgage Markets

The great recession of 2008 resulted in the expulsion of less responsible home mortgage companies from the mortgage market, but most of the remaining companies are not well-versed in climate risk. Regardless of a mortgage broker’s focus on climate risk, the rise of cash purchases in the residential market is moving some of the decision-making from brokers who are trained professionals in risk assessment to those with a potentially more speculative focus.

When property value drops in an economic downturn, many properties go into a short sale or foreclosure, attracting cash buyers choosing to invest in property. Banks often favor cash buyers, even if the sale price is lower, because they can settle in 10 days, compared to 45 days for a FHA loan homebuyer.

Due to the 2008 recession, **cash buyers currently represent approximately half of all residential sales**, edging out buyers using financing because of the shorter timeframe and ease of a cash sale.

The prevalence of **cash buyers could be interpreted as a positive indicator in the bond market**, if not for private homebuyers in the mortgage market, because likely signifies money flowing into the community.

Residential Financial Tools to Watch and Use

- ◆ **Fannie Mae** presents an alternative to the low- to middle-income home buyer, called the [HomeReady Mortgage](#), which finances a home purchase with low down payments and flexible funding sources, private mortgage insurance (PMI), home ownership education, and underwriting flexibility that includes extended family and other members of a household.

Perhaps in direct response to the cash buyer market, Fannie Mae states on its website: “A foreclosed property can represent a great opportunity and a good value — but a HomePath property can offer even more.”

- ◆ **The Florida PACE Program**: PACE is a relatively new **State of Florida** program through which homeowners can get special assessments from investing in energy efficient improvements in the house. The rationale for PACE is to provide a uniform program that achieves economies of scale

and creates markets with little or no cost to local government treasuries. Miami-Dade County expects to join this program soon. At present, qualifying improvements are limited to energy efficiency, renewable energy and wind resistance improvements, and do not include adaptation measures for flooding.

Innovative Work: The **Financial Stability Board's [Task Force on Climate Related Disclosures](#)**, an international group of central banks and treasuries formed in early 2016, is examining how to institute disclosures of climate risk. Task Force Founder and New York City Mayor Michael Bloomberg says: "The work of the Task Force on Climate-Related Financial Disclosures will help to accelerate global investments in technological innovation and clean energy by increasing transparency. And, in doing so, it will help make markets more efficient, and economies more stable and resilient."

The Task Force identified **seven fundamental principles** central to an effective system of **climate-related financial disclosure**:

1. Present relevant information
2. Be specific and complete
3. Be clear, balanced, and understandable
4. Be consistent over time
5. Be comparable among companies within a sector, industry, or portfolio
6. Be reliable, verifiable, and objective
7. Be provided on a timely basis

While disclosure requirements in public and private transactions may not change dramatically until there is State or federal intervention, a **local government's financial resilience** to losses, both short and long term, can be bolstered by maintaining **financial liquidity** and practicing **sound financial management**. Strong bond ratings may be maintained by keeping risk reserve funds and demonstrating strong financial oversight of operations and investments.

Bricks and Mortar: Building the Future

Real estate developers – together with **builders of public infrastructure** – are manufacturing our built environment of the future. Whether our communities have lasting value and physical and economic resilience depends on what is produced by the building sector, on the provision of coherent standards and guidelines for construction, and on new design standards for managing water intrusion.

Incorporating sea level rise forecasts into **long range building and land development standards** will assure a more sound future, as will an evolution among the building community towards meeting a market **demand for resilient structures and design** that will only grow over time.

While many builders operate under a five-year build-and-sell time horizon, with little concern for long term risk, there are some who own and operate their properties (these may include public sector entities as well as private) and take a long range view risks associated with their property. They are invested in the ongoing character and stability of the community.

Real Estate Builders and Developers...

- ◆ Must quantify all costs and reduce uncertainty in building projects.
- ◆ Work best under clearly articulated rules applied consistently to all builders and projects.
- ◆ Are not all the same...

“We're going to have to spend a lot more time in the development community, helping them understand that they have a role in this; that they cannot wait for government to...get its act together in terms of [updating] its codes.”

- Bertha Henry, County Administrator, Broward County



The Costly Effect of Fluctuating BFE Standards

Changes in Base Flood Elevation (BFE), set by FEMA, over the lifetime of existing buildings has drastically altered the requirements and insurance costs borne by property owners. As the BFE has changed, some buildings that were above the BFE when built are later below it and subject to a greater insurance burden. Every foot of elevation below FEMA's BFE results in a **doubling of insurance rates**.

“[Previously,] FEMA grandfathered everything in and as long as you in good faith built at what the numbers were when your house was constructed they would let you pay the regular rate... And you see where that got them: \$24 billion in debt. So now we're moving to actuarial rates and it won't matter that your house was built in accordance with the standard if the [BFE] changes – [it is] projected to change at least every ten years. Then, you're going to be subject to whatever that new risk is and pay that substantially higher premium... It may be in the long term a resiliency issue just for affordability in the region.

In Broward, we do have a fairly robust FEMA model now... But I'm not sure [we'll] ever get to the point where the FEMA map fully includes sea level rise simply because of the economic impact on the premium before the risk is [fully] realized.”

- Leonard Vialpando, Director of Environmental Regulations and Building Permitting, Broward County

Recommendations from Building Professionals to Local Government

- ◆ Account for sea level rise in the official planning documents of **the community**.
- ◆ Develop maps showing **long range elevation requirements** in our communities, as in a 50 year timeframe, that account for sea level rise and storm event increases, and that create a standard of new base flood elevations that will protect new construction during its life cycle and provide clear direction for the building and development sector.
- ◆ Assure that building standards address the potential functional barriers caused by differing elevations in adjacent properties built according

Broward County was unusual in having what is called the Broward County 100-Year Map, created in the late 1970s (with information from the water management district) and showing projected buildout over future decades. This document was used in conjunction with maps from FEMA (also newly created at that time) and guided development in the County to BFE standards often three or four feet higher than FEMA's for many years. These maps have now outlived their useful life and never took sea level rise into consideration.

to different standards.

- ◆ Determine the desired relationship of privately built projects with potential infrastructure adaptation projects.
- ◆ Identify comprehensive solutions to reduce water coming in and to manage better the water that does come in, while protecting infrastructure.
- ◆ Review best practices of similar communities for building standards and technologies that suit your community's density and topography.
- ◆ Consider how to protect historic structures. Be mindful of the influence of insurance and financial markets upon whether and how historic and cultural resources are preserved.

Innovative Work: Miami Beach is making strides in partnership with the building community to respond to sea level rise and remain vibrant. Mayor Philip Levine's [Blue Ribbon Panel](#), led by Scott Robins, President of Scott Robins Companies, is striving to address water flow design with elegant drainage solutions encompassing the building site and street as one system as well as looking at new standards for elevating mechanical equipment. Robins believes the region and beyond are looking to the example they set.

Innovative Idea: Build into the code a requirement for engineering that would enable new single family houses to be raised when future needs dictate. (From **Scott Robins**, President of Scott Robins Companies during workshop)

Innovative Ideas: With support from the Kresge Foundation, the Urban Land Institute (ULI) published [Returns on Resilience: The Business Case](#) in 2015, a report featuring ten real estate projects around the country **designed to perform well in the face of climate-related threats**. The report illuminates how these investments in resilience strategies provide financial and other returns. Two of the case studies are located in South Florida.

“[Designing for risk reduction] not only makes sense, but...also makes money for developers and owners. Resilience plays out not just in managing risk, but also in maintaining value... The payback...can be measured in **cost savings from preventing damages and reducing operating costs**, as well as **revenue enhancements from improved marketing, company brand, and project image.**”

(From Returns on Resilience: The Business Case, 2-3)

Some of the **key building strategies for hurricane and tropical storm resilience** found in the report's case studies include impact resistant glass, desalination units with underground water storage, and on-site backup power capacity. For **storm surge, sea level rise and flooding resilience**, these include locating a building's power center above storm surge elevation (as on an upper floor or the roof), backup generators with fuel reserves, and landscape features such as berms and wetlands, to block and absorb water, respectively.

Finally, *Returns on Resilience* found these five **universally applicable themes** in its profiled projects and presents them as advice to builders:

1. Code is not always adequate – be innovative.
2. Learn from your own and others' experiences.
3. Taking a long-range view changes your perspective and actions... but a long hold period is not required for resilience strategies to generate value.
4. Sustainability and resilience are good partners, as in accomplishing LEED certification as well as climate resilience in one design.
5. Resilience makes a property more attractive and valuable.

“As [the BFE] keeps moving up, [the property] owner is going to be in a very hard economic situation... There is going to be a point when we create a standard for South Florida and whoever doesn't meet that standard is not going to be insurable.” – *Matis Cohen, CEO of Kahunah Properties, based in North Miami Beach*





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