

PLANNING FOR FLORIDA'S COASTAL FUTURE:

NOW OR LATER?

Why Plan?

29% 
Of the national population inhabits coastal counties.¹

 Coastal counties' contribution to annual GDP.¹ **45%**

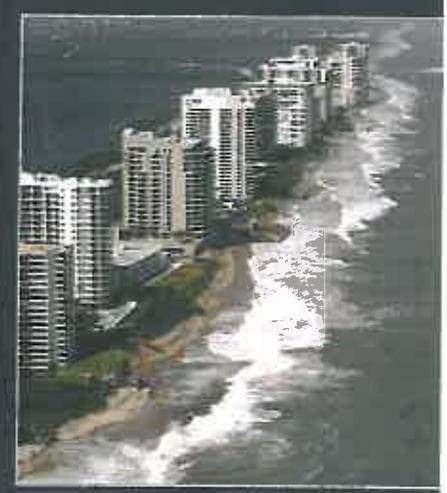
U.S. Atlantic coastlines have a wide variety of uses, from complex urban areas like Miami and New York, to hundreds of smaller coastal cities, to undeveloped parks and recreation areas.

Coastal counties include **5 out of the 10** largest cities in the U.S.¹ 

Low elevation areas experience flooding and storm surge events that are becoming more common and expensive.²

How can we plan for our coastal future?

With science based adaptation planning.



Singer Island, Florida

WHAT IS COASTAL ADAPTATION PLANNING?

Adaptation planning is using coastal management tools to develop long term plans to improve resiliency.

Adaptation planning is a flexible process in which citizens and agencies:

- Assess vulnerabilities to coastal change
- Plan and implement responses
- Modify as needed based on results

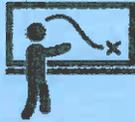


Planning is fundamental to managing risk in systems that change rapidly, like coastlines, the most dynamic part of the earth's crust.

GOOD GOVERNMENT IS PROACTIVE: COASTAL ADAPTATION PLANNING

Local Adaptation in Action

The City of Punta Gorda in Southwest Florida is implementing adaptation planning based on citizen participation with regional, state and federal partners. This includes diverse land use planning actions and a living shoreline program. More information is at the web site of the [Southwest Florida Regional Planning Council](#).



Hundreds of American cities and counties are actively planning for coastal change.

Many cities apply science and web based planning resources including:

- [NOAA's Digital Coast](#)
- [Georgetown Climate Center](#)
- [Virtual Climate Adaptation Library](#)
- [Surging Seas](#)
- [Ecosystem Based Management Tools](#)
- [Climate Adapt. Knowledge Exchange](#)

It makes sense to plan for the future.



BEST PRACTICES FOR ADAPTATION:

There are **over 1500 reports and guidelines** on science based adaptation planning around the world, with over **700** in the United States alone.³

Planning Based Tools:

- Comprehensive Planning Documents
- Zoning and Overlay Zones
- Floodplain Practices and Incentives
- Building Codes with Resilient Design
- Setbacks/Buffers
- Conservation and Rolling Easements

Market Based Tools:

- Community Rating Systems
- Capital Improvement Programs
- Acquisitions and Buyout
- Development Incentives
- Coastal Real Estate Disclosures
- Transferable Development Rights

(Adapted from [Georgetown Climate Center, 2011](#))



SCIENCE-BASED SCENARIOS FOR COASTAL CHANGE

Published science overwhelmingly suggests that climate change will continue to accelerate in coming decades.^{4,5}

In Florida, it is very likely that sea-level rise in the 20th century occurred faster than any century in the last 2600 years.⁶

Coastal areas will likely see 1-2 feet of sea level rise in approximately 50 years.⁷



CLIMATOLOGY



OCEANOGRAPHY



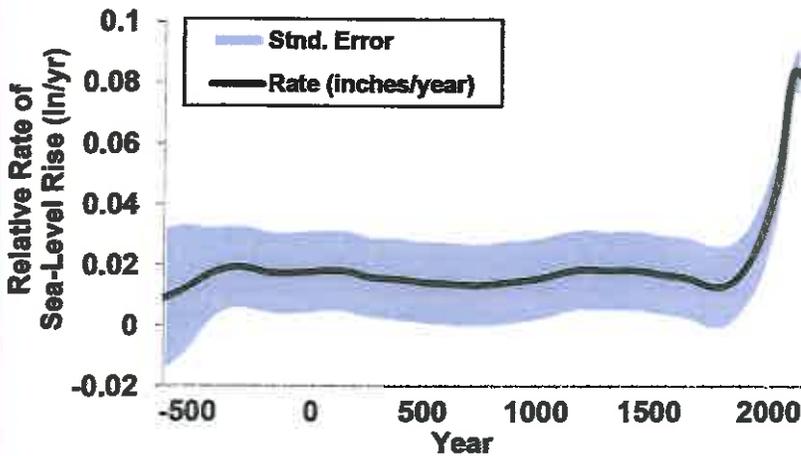
GEOLOGY

Data from NASA's and NOAA's climate websites reinforce the scientific consensus that rising global temperatures are accelerating sea-level rise in most regions by melting land ice (glaciers in areas like Greenland and Antarctica), the expansion of ocean water as it warms, and many other factors.^{5,7}

www.climate.nasa.gov
www.climate.gov



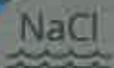
HISTORICAL CHANGE IN RATE OF SEA LEVEL OVER THE LAST 2600 YEARS IN NORTHEAST FLORIDA⁶



Along with sea level, other threats will amplify including:



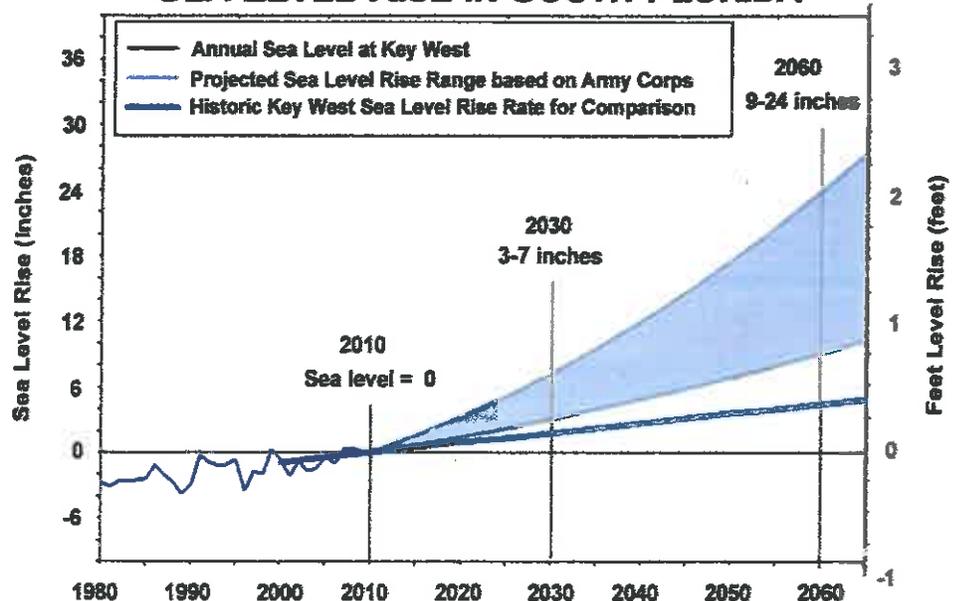
Ocean acidification



Salt water intrusion

Proactive coastal planning and CO₂ reductions can help lessen impacts over the long term.^{5,7}

SEA LEVEL RISE IN SOUTH FLORIDA⁴



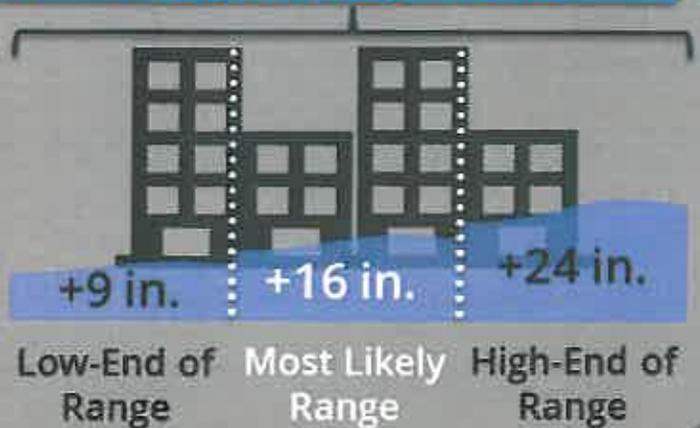
ALTERNATIVES FOR THE FUTURE

Sea-level rise is accelerating.^{4,6,7}
Our grandchildren will deal with
the decisions we make now.



Without science based planning,
challenges to life and property
can be amplified.

Today through 2060^{4,7}



CHANGE HAPPENS... PLANNING HELPS

- Planning to address impacts is fiscally responsible.
- Unplanned responses to flooding increase taxpayer costs.
- Public, federal, and state flood insurance can be available at rates that do not reflect the long-term risks.
- Ensuring subsidies and markets accurately reflect long-term risk is fiscally responsible for taxpayers and governments.⁸



"Sunny day flooding" is becoming more common in South Florida. Science based planning can reduce many risks.

LITERATURE CITED

- 1 Wilson & Fischetti. 2010. Coastline population trends in the U.S. *NOAA Rept.*
- 2 Strauss et al. 2012. *Environ. Res. Letters.*
- 3 [Virtual Climate Adaptation Library](#); [Climate Adapt. Knowledge Exchange](#)
- 4 [S. Fl. Regional Climate Compact, 2011](#). Unified SLR projection for SE Florida
- 5 [Intergovernmental Panel on Climate Change 2013 & 2014](#). *5th Assess. Rept.*
- 6 Kemp, A.C. et al. 2014. *Mar. Geology.*
- 7 [National Climate Assessment, 2014.](#)
- 8 [SmarterSafer.org](#) - Americans for Smart Natural Catastrophe Policy

This document with all links is online at: t.fit.edu/fl-infographic

INFOGRAPHIC DESIGN: J. HANCOFF



This document was made possible by funding from the NOAA Climate Program Office and partners including:



Flood Exposure Snapshot Volusia County, Florida

COASTAL COUNTY SNAPSHOTS
www.coast.noaa.gov/snapshots/

People + Floodplains = Not Good High-Risk Populations + Floodplains = Even Worse

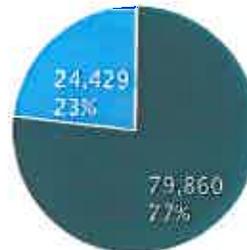
The more homes and people located in a floodplain, the greater the potential for harm from flooding. Impacts are likely to be even greater when additional risk factors (age, income, capabilities) are involved, since people at greatest flood risk may have difficulty evacuating or taking action to reduce potential damage.

Based on 2010 U.S. Census records and 2006-2010 American Community Survey 5-year Summary File data.

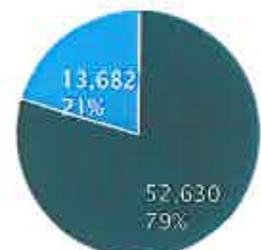
Population
Total: 494,593



Population over 65
Total: 104,289



Population in Poverty
Total: 66,312



■ Inside FEMA Floodplain ■ Outside FEMA Floodplain

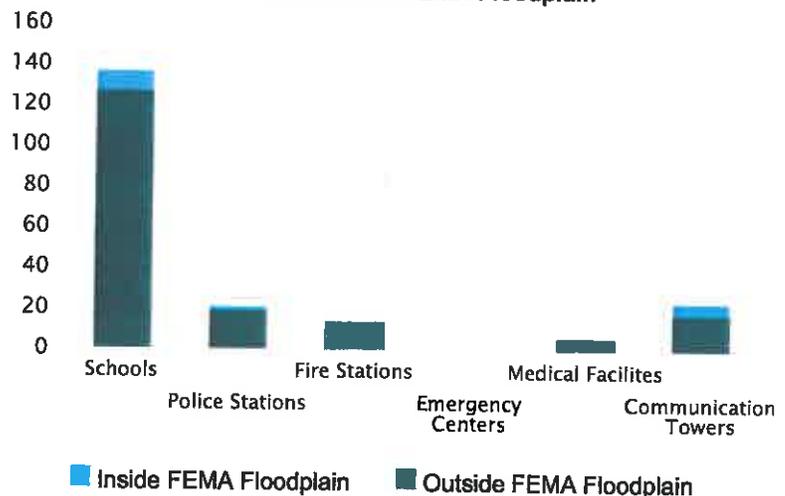
Community Infrastructure + Floodplains = Bad News

9% of critical facilities in Volusia County, Florida, are within the floodplain.

Hospitals. Roads. Schools. Shelters. These facilities play a central role in disaster response and recovery. Understanding which facilities are exposed, and the degree of that exposure, can help reduce or eliminate service interruptions and costly redevelopment. Incorporating this information into development planning helps communities get back on their feet faster.

Based on Critical Facilities from FEMA HAZUS.

Critical Facilities in FEMA Floodplain



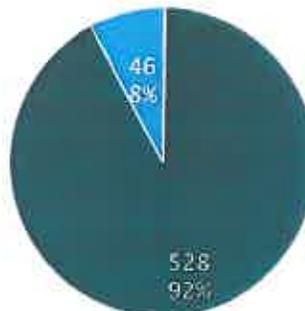
■ Inside FEMA Floodplain ■ Outside FEMA Floodplain

Increasing Development in Floodplains = More People in Harm's Way Loss of Natural Buffers = Less Protection

A county with more natural areas (wetlands, forests, etc.) and less development within floodplains typically has lower exposure to flooding. A county that monitors land cover changes within the floodplain will detect important trends that indicate whether flood exposure is increasing or decreasing. Armed with this information, local leaders can take steps to improve their safety and resilience.

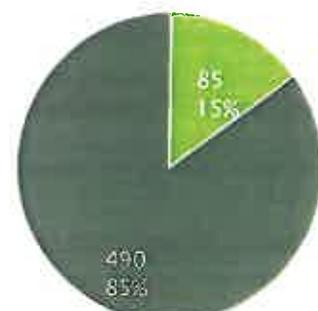
Based on NOAA Land Cover Data.

**Amount of Land Converted to
Development 2001-2006 (acres)**
Total: 574



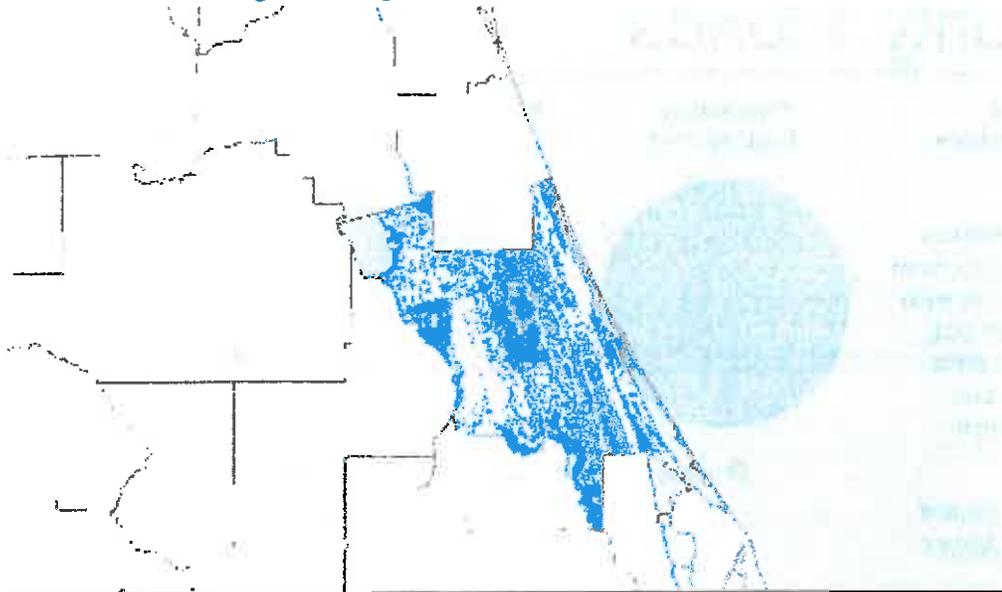
■ Inside FEMA Floodplain ■ Outside FEMA Floodplain

**Type of Land Converted to
Development 2001-2006 (acres)**
Total: 574



■ Agricultural Areas ■ Natural Areas

Volusia County Floodplain



Outside FEMA Floodplain
 Inside FEMA Floodplain
 Water

Note: This map may not represent the county's entire floodplain.

Next Steps

Through adaptation planning, all communities can be better prepared to face coastal hazards. While each community is different, there are some basic steps that all communities can follow to become more resilient.

Training that will lead your organization through this task can be brought to your office. Visit the [Roadmap for Adapting to Coastal Risk training](http://www.coast.noaa.gov/digitalcoast/training/roadmap) (<http://www.coast.noaa.gov/digitalcoast/training/roadmap>) to learn more. Many of the components of this course (which are outlined below) can be found within the Digital Coast's [Coastal Inundation Toolkit](http://www.coast.noaa.gov/digitalcoast/inundation/understand) (<http://www.coast.noaa.gov/digitalcoast/inundation/understand>).

1. **Know your risks** – If your county has a hazard mitigation plan, get a copy of it from your county emergency management office or the [Federal Emergency Management Agency \(FEMA\)](http://www.fema.gov/plan/mitplanning/status.shtm#1) (<http://www.fema.gov/plan/mitplanning/status.shtm#1>). Having county information about potential hazards, vulnerabilities, and priority hazard mitigation projects is important.
2. **Develop a team** – To see the issues and opportunities from as many perspectives as possible, engaging a diverse group of stakeholders is always a good idea. The [County Snapshots](http://www.coast.noaa.gov/snapshots) (<http://www.coast.noaa.gov/snapshots>) are used to help people visualize the issues.
3. **Know what resources are available** – Federal and state agencies have funds available for risk reduction activities. See the funding opportunities listed below to learn more. There are also data and tools available to help people visualize the issues and solutions. For information on creating inundation maps for your community, visit the Visualization section of the [Coastal Inundation Toolkit](http://www.coast.noaa.gov/digitalcoast/inundation/visualize) (<http://www.coast.noaa.gov/digitalcoast/inundation/visualize>).

Funding Sources

- [FEMA](http://www.fema.gov/government/grant/hmgp/) (<http://www.fema.gov/government/grant/hmgp/>)
- [NOAA Coastal Management Program](http://coastalmanagement.noaa.gov/funding/welcome.html) (<http://coastalmanagement.noaa.gov/funding/welcome.html>)

4. **Discover what others are doing** – See how other communities are addressing these issues. Visit the discover section of the [Coastal Inundation Toolkit](http://www.coast.noaa.gov/digitalcoast/inundation/discover) (<http://www.coast.noaa.gov/digitalcoast/inundation/discover>). You may also contribute a story about your community efforts.

[Frequently Asked Questions](http://www.coast.noaa.gov/snapshots/faq/flood-exposure.pdf) (<http://www.coast.noaa.gov/snapshots/faq/flood-exposure.pdf>)

Data Sources for This Snapshot

- **Flood Zones** (<http://msc.fema.gov>) – Based on FEMA 1% annual chance flood zones
- **Critical Facilities** (<http://www.fema.gov/plan/prevent/hazus/>) – FEMA HAZUS-MH data
- **Roads** – Based on ESRI 2005 streets data
- **Demographic Data** (<http://coast.noaa.gov/digitalcoast/data/acs>) – NOAA
- **Land Cover Data** (<http://coast.noaa.gov/dataregistry/search/collection/info/ccapregional>) – NOAA

The article “Drowning in Place: Local Government Costs and Liabilities for Flooding Due to Sea-Level Rise” is available for free at: <http://bit.ly/17xtJW1>.

The screenshot shows the website for The Florida Bar Journal. At the top, there is a navigation bar with links for 'ABOUT THE BAR', 'NEWS & EVENTS', 'FOR THE PUBLIC', 'MEMBER SERVICES', 'LOG IN', and 'FIND A LAWYER'. A search bar is located on the right side of the navigation bar. Below the navigation bar, the page title 'The Florida Bar Journal' is displayed in a large, serif font. Underneath the title, there are links for 'Advertising Rates', 'Submission Guidelines', 'Archives', 'Subscribe', and 'News'. The main content area features the article title 'Drowning in Place: Local Government Costs and Liabilities for Flooding Due to Sea-level Rise' by Thomas Ruppert and Carly Grimm. The article is identified as Page 35 of Volume 87, No. 9, dated November 2013. The article text discusses the impact of sea-level rise (SLR) on Florida's coastal areas, the challenges local governments face in addressing flooding, and the potential legal liabilities for local governments. It mentions that many areas of Florida are experiencing increased tidal flooding due to SLR, and that Florida has experienced eight to nine inches of SLR over the past 100 years. The article also discusses the costs of addressing flooding and the potential for local governments to be held liable for damages caused by flooding.

November 2014

1. Background information on sea-level rise and science available at <https://www.flseagrant.org/climatechange/coastalplanning/resources/science-gen-info/>.
 - a. The International Panel on Climate Change's "Climate Change 2013: The Physical Science Basis, Summary for Policymakers" available at <http://www.ipcc.ch/>. The IPCC predicts 11" to 39" of sea-level rise by 2100.
 - b. Predictions of sea-level rise from other sources
 - i. United State Army Corps of Engineers: 20 inches to 5 feet by 2100. At the website <http://www.corpsclimate.us/ccaceslcurves.cfm#>, users can enter information to create sea-level rise curves based on the USACE methodology.
 - ii. Southeast Florida Climate Compact: 3-7 inches by 2030 and 9-24 inches by 2060
2. Sea-level rise viewers: A number of organizations have developed web-based viewers that utilize geographic information systems (GIS) technology that work with elevation data to create "viewers" that simulate how rising sea levels would inundate land. It is important to note that these viewers do not account for how shorelines might change through coastal processes such as erosion and accretion along the coast. Most of the viewers listed here are based on similar, if not identical, datasets but do vary in their functionality and user interface. Some of the more used viewers include:
 - a. Sea Level Rise and Coastal Flooding Impacts Viewer (product of the National Oceanic and Atmospheric Administration), available at <http://coast.noaa.gov/digitalcoast/tools/slr>
 - b. The "Surging Seas" tool by Climate Central, available for Florida at <http://sealevel.climatecentral.org/ssrf/florida>
 - c. The "Coastal Resilience" mapping tool, available for the Gulf of Mexico at <http://maps.coastalresilience.org/gulfmex/#>
 - d. The Florida Department of Transportation has worked with the GeoPlan Center at the University of Florida to create the Sea Level Scenario Sketch Planning Tool. This tool uses the sea-level rise scenario methodology of the US Army Corps of Engineers and is specifically designed as a coarse-level planning tool for transportation infrastructure. Available at: <http://sls.geoplan.ufl.edu/about/>
3. Recent changes to flood insurance have left many confused. Information about the changes is available at <https://www.flseagrant.org/climatechange/coastalplanning/insurance-issues-coast/>

SELECT BACKGROUND AND HISTORY ON THE NATIONAL FLOOD INSURANCE PROGRAM

By: Thomas Ruppert, October 2013

Flooding has always affected rivers; the impact on people has varied depending on where and how they live. During the flood of 1927, the Mississippi River reached 50 to 100 miles wide as it spilled over levees; the river formed a “chocolate sea” that stretched from Illinois to the Gulf of Mexico—over 1,000 miles of flooding that left 700,000 homeless and damaged or destroyed 137,000 buildings. Then, as now, flooding resulted in major federal expenditures for disaster relief. Over the next eight decades, the pattern was repeated over and over, despite billions of dollars of federal expenditures on flood control measures: a major flood kills many, destroys property, and the federal government provides millions in disaster relief.

Even as the federal government increased its role and investment in flood protection, flood damages continued to increase because more and more people and development continued to move into flood plains. In 1891, W.J. McGee wrote in “The Floodplains of Rivers” that “as population has increased, men have not only failed to devise means for suppressing or escaping this evil [flood], but have with singular short-sightedness, rushed into its chosen paths.” In fact, some observed that federal flood control measures encouraged development in areas subject to flooding because if a flood problem developed, certainly the federal government would have to build something to decrease the flood risk. To battle this counter-productive dynamic, a movement developed to promote land-use planning that discouraged development in floodplains. One problem with this model was a lack of good information about flood risk. Thus, on a regional scale beginning in the 1950s and nationally in the 1960s, the federal government funded studies to delineate flood hazard areas around the country.

Even as flood risks were growing, private insurers were dropping flood risk from their policies. This occurred for various related reasons. First, insurers realized that their payouts for flood loss were far higher than the premium income they received relative to flood risk. Second, insurers lacked sufficient information to accurately price flood risk. Third, the flood insurance market was subject to “adverse selection,” or the phenomenon whereby only those most likely to flood would buy the insurance, thus making it harder to lower premiums and make coverage affordable by effectively spreading the risk broadly.

In response to continually increasing federal outlays for flooding disaster relief, the lack of a private insurance market offering flood coverage, and a desire to promote better development practices, Congress established the National Flood Insurance Program (NFIP) in 1968. The program offered communities the option of participating in the program so that the community’s

Florida A & M University, Florida Atlantic University, Florida Gulf Coast University, Florida Institute of Technology, Florida International University, Florida State University, New College of Florida, University of Central Florida, University of Florida, University of Miami, University of North Florida, University of South Florida, University of West Florida, Nova Southeastern University, Mote Marine Laboratory, Harbor Branch Oceanographic Institution

residents could have flood insurance. In exchange, participating communities had to agree to minimum regulations for floodplain management, including limitations on development in floodplains. Through the NFIP, the federal government sought to protect taxpayers' interests and put the risk and cost of development in floodplains back onto the local government and property owner by providing flood risk information through maps and insurance premiums. Many argue that the NFIP failed in this mission and, in fact, encouraged further development in floodplains, but a comprehensive review of the literature on the NFIP failed to either clearly support or contradict this view (Evatt, Dixie Shipp, National Flood Insurance Program: Issues Assessment, A Report to the Federal Insurance Administration, 31 January 1999.).

Since its inception, the premiums for many policies in the NFIP have not been based on any sort of calculation of flood risk. Rather, many policies were clearly "subsidized." In part this was done out of political necessity: if pre-existing development that was built in floodplains prior to the first NFIP Flood Insurance Rate Maps (FIRMs) had not been offered lower, subsidized rates, the program would not have garnered sufficient political support. Additionally, it was hoped that temporarily offering subsidies would encourage more properties to purchase flood insurance. Finally, it was assumed that eventually, subsidized properties would "go away," but that has not been the case.

Because rates were not always set to reflect risk and because of the high cost of creating flood maps, for much of its history the NFIP has been supported by general taxpayer revenues. Then, starting in about 1985, the NFIP was actually more or less self-supporting for several years. In other words, the premiums being collected were, on average, sufficient to pay for administration and claims. This was clearly no longer the case beginning in 2005 with Hurricane Katrina. With extensive loss of life and billions in damage, the disaster cost the NFIP over \$16 billion in payments, or more than eight times as much as it had ever paid out in a year. The NFIP had not made much headway on repaying the U.S. Treasury for the approximately \$18 billion it had borrowed before Superstorm Sandy ravaged the NE Atlantic coast. Sandy resulted in \$37 billion of damages in New Jersey alone and about \$7 billion in total NFIP-insured losses in the affected region. Again, the NFIP had to borrow money to pay these claims, so the NFIP is now about \$26 billion in debt.

This dynamic of low-probability but extremely high-loss events—also known in the insurance industry as "black swans"—demonstrates a challenging dynamic: it is very difficult to accurately calculate both the probability of such events and their actual cost as such events occur so infrequently that we have insufficient data. The life insurance industry's opposite situation can put this in perspective. Life insurance pays when you die. Everyone dies eventually, and many people die every day, so the life insurance industry has a vast amount of data that allows extremely accurate calculation of the statistical probability that a given person will die at a certain age. In the insurance industry, this is called an "actuarial calculation" and insurers have actuarial tables for all kinds of risk they insure against. These actuarial tables help insurers understand the likelihood of an event and the cost of the event so that insurers can set a price on insuring against that event. Actuarial tables do not work well with "black swans" like catastrophic flooding and extremely large hurricane events due to their inherent infrequency.

On the topic of risk, a consistent challenge for the NFIP has been the mapping of flood risk and delineation of flood plains. The federal government has spent billions of dollars and mapped thousands of miles of floodways along streams and rivers. Nonetheless, mapping of flood plains is often fraught with technical challenges, especially when being done on such a large scale. This inevitably results in maps that are not perfect representations of what actually occurs in a flood. Because these maps have regulatory and economic impact, this has led to many challenges to the Flood Insurance Rate Maps (FIRMS) used by the NFIP.

National Flood Insurance Resource List for Property Owners

August 2014

Flooding losses in the United States have averaged over \$2 billion per year for over a century and with the most recent decade (2000-2009) reaching \$10 billion per year average. In 1968 Congress established the National Flood Insurance Program to help address this problem. Today the NFIP is about \$25 billion in debt, prompting Congress to again take action.

In 2012 Congress enacted reforms that eliminated or phased out subsidies, resulting in significantly higher premiums for a small, but important, number of policy holders. Affected parties reacted strongly, including local governments worried about the impact on property values and property tax revenues for local governments, especially in light of the real estate market after the crash in values that began in 2007. An intense lobbying campaign resulted in passage of the Grimm-Waters Act in 2014. Also referred to as the Homeowner Flood Insurance Affordability Act of 2014 (HFIAA), the new law eliminated some of the 2012 changes, modified some, and left others in place.



This has resulted in significant confusion on the part of policy holders and the public.

Many materials exist that can help property owners better understand the NFIP and the changes that have occurred in the program in 2012 and 2014. Some are listed here.

Finally, a word of warning: Everyone lives in a floodzone since almost any place can flood under the right circumstances. Just because you do not live in a "Special Flood Hazard Area" that requires you to have flood insurance to get a mortgage does not mean you are "safe" from flooding.

Federal Emergency Management Agency (FEMA) (web page)

www.fema.gov/national-flood-insurance-program/flood-insurance-reform

FEMA: Changes to the National Flood Insurance Program—What to Expect (web page with link to pdf of PowerPoint presentation)

www.fema.gov/media-library/assets/documents/96449

FEMA: Audio-enhanced PowerPoint presentation on the 2014 "Homeowner Flood Insurance Affordability Act" changes to the NFIP(PPT)

http://riskmap6.com/documents/resource/HFIAA_Webinar_AudioFINAL.pptx

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National Flood Insurance Resource List for Property Owners (continued from front)

August 2014

FEMA: NFIP Definitions (web page)

www.fema.gov/national-flood-insurance-program/definitions

Association of State Floodplain Managers: Analysis of the Homeowners Flood Insurance Affordability Act (pdf document)

www.floods.org/ace-files/documentlibrary/2012_NFIP_Reform/HFIAA_Analysis_ASFPM_4-17-14_Final.pdf

FEMA: Reducing Insurance Costs (video)

www.fema.gov/media-library/assets/videos/84728

Flood Insurance Manual

www.fema.gov/flood-insurance-manual

FEMA: Flood Insurance Premium Refunds: Who Gets Them and Who Does Not? (pdf)

https://s3-us-gov-west-1.amazonaws.com/dam-production/uploads/1404830857286-60cdd9d1e7b83d90cf2da35935d239a0/FEMA_HFIAA_Refund_FactSheet_070714.pdf

FEMA: What is a Subsidized Rate? (video)

www.fema.gov/media-library/assets/videos/84716

FEMA: Flood Zones (link to definition page): www.fema.gov/floodplain-management/flood-zones

Community Rating System

www.crsresources.org

For More Information:

Thomas Ruppert

Coastal Planning Specialist, Florida Sea Grant

truppert@ufl.edu

727-582-2109



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National Flood Insurance Program: Selected Definitions from FEMA

August 2014

The Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) is, like most insurance, complex. To help understand some of the basic terminology and acronyms you will encounter, here are some selected definitions. To find additional definitions, you may visit FEMA's website for definitions at www.fema.gov/national-flood-insurance-program/definitions.

Base Flood Elevation (BFE): The computed elevation to which floodwater is anticipated to rise during the base flood. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium.

Elevation: Communities must require that all new construction and substantial improvements of residential structures within Zones A1-30, AE and AH Zones on the community's Flood Insurance Rate Map (FIRM) have the lowest floor (including basement) elevated to or above the Base Flood Elevation (BFE). Common elevation techniques include elevation on file, elevation on piles, piers or columns, and elevation on extended foundation walls such as on a crawl space.

In areas designated as Zone A, the community must obtain, review, and reasonably utilize BFE data available from a Federal, State, or other source and use these data as criteria for requiring that new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated to or above the BFE.

All new construction and substantial improvement in Zones V1-30, VE, and also Zone V (if BFE data is available), must be elevated on pilings and columns so that the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the BFE.

For residential structures in AO Zones, the lowest floor (including basement) must be elevated at least as high as the depth number specified in feet on the community's map, or at least two feet if no number is specified.

Elevation Certificate: A community's permit file must have an official record that shows new buildings and substantial improvements in all identified Special Flood Hazard Areas (SFHAs) are properly elevated. This elevation information is needed to show compliance with the floodplain management ordinance. FEMA encourages communities to use the Elevation Certificate developed by FEMA to fulfill this requirement since it also can be used by the property owner to obtain flood insurance. Communities participating in the Community Rating System (CRS) are required to use the FEMA Elevation Certificate.

Flood Zones: Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

Lowest Floor: The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; Provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Sec. 60.3. Communities are required to obtain the elevation of the lowest floor (including basement) of all new and substantially improved structures. All new and substantially improved structures must have the lowest floor elevated to or above the Base Flood Elevation (BFE). Non-residential buildings may be floodproofed below the BFE.

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National Flood Insurance Program: Selected Definitions from FEMA's Website (continued from front)

August 2014

Special Flood Hazard Area: The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA) on NFIP maps. The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The SFHA includes Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V.

Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone AE and A1-30: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone AH: Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone AO: Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Some Zone AO have been designated in areas with high flood velocities such as alluvial fans and washes. Communities are encouraged to adopt more restrictive requirements for these areas.

Zone AR: Areas that result from the decertification of a previously accredited flood protection system that is determined to be in the process of being restored to provide base flood protection. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone A99: Areas subject to inundation by the 1-percent-annual-chance flood event, but which will ultimately be protected upon completion of an under-construction Federal flood protection system. These are areas of special flood hazard where enough progress has been made on the construction of a protection system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes. Zone A99 may only be used when the flood protection system has reached specified statutory progress toward completion. No Base Flood Elevations (BFEs) or depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone V: Areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone VE and V1-30: Areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

For More Information:

Thomas Ruppert

Coastal Planning Specialist, Florida Sea Grant

truppert@ufl.edu

727-582-2109

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FLOOD INSURANCE FOR BUSINESS: IMPACTS OF RECENT LEGISLATION >>>



FEMA



The National Flood Insurance Program (NFIP) is in the process of implementing reforms required by the Homeowner Flood Insurance Affordability Act of 2014 and the Biggert-Waters Flood Insurance Reform Act of 2012 (Biggert-Waters). The 2014 law repeals or modifies some provisions of Biggert-Waters. However, it maintains the requirement that flood insurance rates for business properties in high-risk areas reflect true risk. This means that the subsidized rates that previously applied to some older business buildings will continue to be phased out.

This fact sheet provides an overview of the changes business owners should expect, including a one-time refund for some policyholders.

PHASING OUT FLOOD INSURANCE SUBSIDIES

A **flood zone** is a geographical area shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding in the area. Prior to Biggert-Waters, many older business buildings in Special Flood Hazard Areas and Zone D, constructed before the effective date of the community's first FIRM and never substantially damaged or improved, were eligible for subsidized rates. On October 1, 2013, the subsidized rates for these pre-FIRM buildings began to phase out. At renewal, non-residential policyholders received a 25 percent rate increase. As required by both the 2012 and 2014 laws, the 25 percent rate increases are set to continue until rates reflect the property's true risk.

From 2008 to 2012, the average National Flood Insurance Program (NFIP) commercial flood claim was more than \$87,000. Flood insurance continues to be an important safeguard and financial planning tool for business continuity and recovery.

However, a provision of the 2014 law temporarily slows that rate of increase. Currently, business properties and other non-residential buildings such as schools, churches, hospitals, and apartment buildings are included within a single non-residential policy rating class. The 2014 law caps increases for these other buildings at 18 percent a year. Until FEMA determines how best to identify and separately classify businesses, all non-residential properties—including businesses—will receive no more than an 18 percent annual increase starting October 1, 2014.

HOW CHANGES TO SUBSIDIZED RATES AFFECT BUSINESS BUILDINGS IN HIGH-RISK AREAS¹

POLICY TYPE	IMPACT ON RATES
Policies for post-FIRM buildings, constructed in compliance with NFIP standards	Already pay full-risk rates.
Existing policies for pre-FIRM business buildings	Policies can be renewed at subsidized rates. When FEMA is able to separate businesses from other properties, future rates will increase by 25 percent per year until reaching full-risk rates.
Newly written policies for pre-FIRM business buildings or for newly purchased pre-FIRM buildings	Policies can be issued and renewed at subsidized rates. When FEMA is able to separate businesses from other properties, future rates will increase by 25 percent per year until reaching full-risk rates.
Policies for pre-FIRM buildings re-issued after a lapse	<p>Policies that lapsed due to a late renewal payment (received after the 30-day grace period but less than 90 days after expiration) can be re-issued and renewed at subsidized rates. When FEMA is able to separate businesses from other properties, future rates will increase by 25 percent per year until reaching full-risk rates.</p> <p>Also note that in the future, the exception allowing policies to be issued using subsidized rates after a lapse will only apply to policies that lapsed because coverage was no longer required by the lender (e.g., the mortgage was paid off). The bottom line: Don't let a policy lapse. It could cost you more when you reinstate it.</p>
Policies for business buildings in moderate- to low-risk areas	Already pay full-risk rates.

¹ Shown on the FIRM as a flood zone beginning with the letter "A" or "V"; in addition, this affects pre-FIRM properties in Zone D.

REFUNDS

Biggert-Waters required an immediate move to full-risk rates when a pre-FIRM building that had been eligible for subsidized rates was sold or purchased, when a policy was issued for the first time on a pre-FIRM building, or when a pre-FIRM-rated policy was reissued after being allowed to lapse. The new law reinstates subsidized rates under these conditions, and calls for refunds of the difference between the subsidized rates and the higher, full-risk rates that policyholders first paid. The new 18 percent cap on increases for non-residential policies will also result in refunds for some policyholders who experienced a 25 percent increase. Insurance companies will begin issuing the one-time refunds in October 2014.

SURCHARGES

A Congressionally mandated surcharge will be added to all policies to offset the subsidized policies and achieve the financial sustainability goals of Biggert-Waters. A policy for a business property will include a \$250 surcharge. The fee will be included each year on all policies, including full-risk-rated policies and those in moderate- to low-risk areas, until all pre-FIRM subsidies are eliminated. The surcharge is not considered part of the premium and is not included in the annual caps on premium increases. Implementation of this surcharge is expected in 2015.

AFFORDABILITY

The 2014 law (Section 29) requires FEMA, within 18 months and then semi-annually, to report to Congress on the effects the pre-FIRM subsidy phase-outs and surcharge are having on small businesses, non-profits, houses of worship, and certain residences. If FEMA determines the rate increases and surcharges are having a detrimental effect on affordability, FEMA must submit appropriate affordability recommendations to Congress.

REDUCE YOUR RISK, REDUCE YOUR RATE

Flood risk and associated flood insurance rates vary by property, based on a number of factors. Two important factors that could affect your flood risk and business building rates are elevation and floodproofing.

KEY FACTORS INFLUENCING FULL-RISK RATES

FACTOR	EFFECT ON RATES
ELEVATION used for rating is the building's Lowest Floor Elevation compared to the Base Flood Elevation (BFE; the elevation reached by a flood with a 1 percent annual chance of occurring, known also as the "100-year" flood)	<p>The higher the Lowest Floor Elevation (LFE) is above the BFE, the lower the risk and typically lower the rate, which may be lower than the subsidized pre-FIRM rate. However, a building whose lowest floor is below the BFE is at higher risk, and full-risk rates can be substantially higher than the subsidized rates.</p> <p>To learn the building's elevation, the owner will need to obtain an Elevation Certificate. To learn more about Elevation Certificates, go to fema.gov/national-flood-insurance-program-2/elevation-certificate, or talk to an insurance agent. With an Elevation Certificate, the agent can calculate the full-risk rate.</p>
FLOODPROOFING to make a building watertight also influences flood insurance rates for businesses	<p>Dry-floodproofing a building can lead to lower rates, if an engineer certifies that the design, construction methods, and materials make the building watertight to at least one foot above the BFE. The higher above BFE it can be certified, the lower the rates.</p> <p>To obtain the rating credit, the design professional must complete a Floodproofing Certificate form. To learn more, information can be found in the NFIP Technical Bulletin 3, Non-Residential Floodproofing – Requirements and Certification found at: fema.gov/media-library/resources-documents/collections</p>

FOR MORE INFORMATION

Learn more about flood risk and find an agent at FloodSmart.gov

To keep current as FEMA implements changes to the NFIP based on recent legislation, visit fema.gov/flood-insurance-reform

Policyholders who have questions about their flood insurance policies should contact their insurance agents.

HOW RECENT LEGISLATIVE CHANGES AFFECT FLOOD INSURANCE >>



FEMA



The National Flood Insurance Program (NFIP) is in the process of implementing Congressionally mandated reforms required by the Homeowner Flood Insurance Affordability Act of 2014 that repeal and modify the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12). This fact sheet provides an overview of the changes to flood insurance rates under the NFIP. While the new law is implemented, policyholders are encouraged to maintain and keep their current flood insurance policies. Allowing policies to lapse will leave policyholders unprotected.

Policyholders who have questions about their flood insurance policies should contact their insurance agent.

CHANGES TO FLOOD INSURANCE SUBSIDIES

Several provisions of both the 2012 and 2014 laws apply to older buildings constructed before the effective date of the community's first Flood Insurance Rate Map (FIRM). Such buildings are referred to as "pre-FIRM." Many pre-FIRM buildings located in high-risk flood zones have flood insurance policies with subsidized rates. Most subsidies remain, although they will be phased out over time. The rate of phaseout will depend on the type of policy. The following charts explain how premium rates are affected for different policy types.

PRE-FIRM PRIMARY RESIDENCE POLICIES IN HIGH-RISK AREAS

For Most Pre-FIRM Primary Residences in High-Risk Areas, Subsidized Rates Remain in Effect, but with Newly Required Minimum Increases—and an 18 Percent Increase Limit for Any Individual Policy—Until Premiums Reach Their Full-Risk Rates.¹

Policy Type	Impact On Rate
Existing policies	Policies can be renewed at subsidized rates. ²
Newly written policies	Policies can be issued and renewed at subsidized rates.
Policies on newly purchased buildings	Policies can be issued and renewed at subsidized rates.
Policies re-issued after a lapse ³	Policies for pre-FIRM buildings in high-risk areas that lapsed due to a late renewal payment (received after the 30-day grace period but less than 90 days after expiration) can be re-issued and renewed at subsidized rates.

PRE-FIRM BUILDING POLICES IN HIGH-RISK AREAS

For Other Pre-FIRM Buildings in High-Risk Areas, Subsidized Rates Continue, but Will Increase More Quickly to Reach Full-Risk Rates.

Policy Type	Impact On Rate
Policies for non-primary residences (secondary or vacation homes or rental properties)	25% annual increases at policy renewal until premiums reach their full-risk rates.
Policies for business buildings	Future 25% annual increases at policy renewal.
Policies for Severe Repetitive Loss properties	25% annual increases at policy renewal for severely or repetitively flooded properties that include 1 to 4 residences.

¹ Full-risk rates are determined using data from an Elevation Certificate.

² Full-risk rates could be lower than subsidized rates.

³ Buildings with lapsed policies are not eligible for the subsidy unless the lapse was the result of the policy no longer being required to retain flood insurance coverage.

OTHER POLICIES

For Most Other Policy Types, Rates Will Increase by No More than 18 Percent for Any Individual Policy.

Policy Type	Impact On Rate
Policies for newer ("post-FIRM") buildings in high-risk areas	Not affected by subsidies; already paying full-risk rates.
Policies for buildings in moderate- to low-risk areas	Not affected by subsidies; properties in these areas (shown as B, C, or X zones on flood maps) do not pay subsidized rates.
Policies for buildings "grandfathered in" when map changes show higher flood risk	Grandfathering remains in effect at this time. Buildings constructed in compliance with earlier maps or continuously covered by flood insurance stay in their original rate class when maps change or properties are sold.
Policies for buildings covered by Preferred Risk Policy Eligibility Extension (PRP EE)	Properties continue to be eligible for lower, preferred-risk rates for the first year after a map change. Starting the following year, rates will increase by no more than 18% for any individual policy until premiums reach their full-risk rate.

REFUNDS

BW-12 required an immediate move to property-specific, full-risk rates when pre-FIRM properties were sold or new policies issued. Some policyholders saw significant premium increases. The new law allows a return to subsidized rates for most properties—and refunds of the difference paid between the subsidized rate and current full-risk rate. FEMA is working with participating insurance companies to start the refund process by the end of this year.

RATE CHANGES WHEN PROPERTIES ARE SOLD

The 2014 law protects policyholders from significant and unanticipated increases in flood insurance costs that could impact their property sales. Subsidized rates continue to apply, and as of May 1, 2014, both the policy and its subsidized rates can be transferred to the new owner. Grandfathered rates can also be transferred at the time of sale.

OTHER PROVISIONS OF THE NEW LAW

Surcharges. A new surcharge will be added to all new and renewed policies to offset the subsidized policies and achieve the financial sustainability goals of BW-12. A policy for a primary residence will include a \$25 surcharge. All other policies will include a \$250 surcharge. This new surcharge will be included on all policies, including full-risk-rated policies and Preferred Risk Policies. The surcharge will be implemented in 2015.

Deductibles. To help homeowners manage their premium costs, the law raises maximum residential deductible limits from \$5,000 to \$10,000.

To keep current as FEMA implements these and other changes to the National Flood Insurance Program, visit fema.gov/flood-insurance-reform.

Policyholders who have questions about their flood insurance policies should contact their insurance agents.

MEMORANDUM

Agenda Item No. 11(A)(17)

TO: Honorable Chairwoman Rebeca Sosa
and Members, Board of County Commissioners

DATE: May 6, 2014

FROM: R. A. Cuevas, Jr.
County Attorney

SUBJECT: Resolution setting policy for
Miami-Dade County; directing
the Mayor to require all County
infrastructure projects to consider
potential impacts of sea level rise
during all project phases
Resolution No. R-451-14

The accompanying resolution was prepared and placed on the agenda at the request of Prime Sponsor Chairwoman Rebeca Sosa, and Co-Sponsors Commissioner Sally A. Heyman and Commissioner Barbara J. Jordan.



R. A. Cuevas, Jr.
County Attorney

RAC/smm

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 11(A)(17)
5-6-14

RESOLUTION NO. R=451-14

RESOLUTION SETTING POLICY FOR MIAMI-DADE COUNTY; DIRECTING THE MAYOR OR DESIGNEE TO REQUIRE ALL COUNTY INFRASTRUCTURE PROJECTS TO CONSIDER POTENTIAL IMPACTS OF SEA LEVEL RISE DURING ALL PROJECT PHASES INCLUDING BUT NOT LIMITED TO PLANNING, DESIGN, AND CONSTRUCTION, AND FURTHER DIRECTING THE MAYOR OR DESIGNEE TO EVALUATE THE EXISTING INFRASTRUCTURE IN THE FACE OF SEA LEVEL RISE

WHEREAS, Southeast Florida is considered one of the most vulnerable areas of the country to the consequences of sea level rise; and

WHEREAS, Miami-Dade County is composed of a large section of waterfront property and is a low-lying coastal community at the frontline to experience the impacts of sea level rise; and

WHEREAS, Miami-Dade County has various vital facilities and infrastructure that could be adversely affected by sea level rise; and

WHEREAS, local and regional tide data show a trend of rising sea levels and more recent data and factors suggest this trend may accelerate in the future; and

WHEREAS, climate scientists and other groups such as the Southeast Environmental Research Center and the National Oceanic and Atmospheric Administration's Coastal Services Center have predicted the potential erosion of dry land and loss of waterfront property in Miami-Dade County as a result of sea level rise; and

WHEREAS, according to the National Wildlife Federation and the Florida Wildlife Federation a mid-range sea level rise of fifteen (15) inches in Biscayne Bay would result in an 85% loss of cypress swamp, a 33% loss of inland fresh marsh, a 79% loss of tidal flats, and a 54% loss of salt marsh; and

WHEREAS, Miami-Dade County has been in the forefront of these issues for many years; and

WHEREAS, the Miami-Dade County Comprehensive Development Master Plan (hereinafter "the CDMP") was recently amended to address sea level rise and climate change, through policies which call for the consideration of sea level rise and climate change as an integral component of all planning processes, including incorporation into public investment processes and decisions; and

WHEREAS, Miami-Dade County is a member of the Southeast Florida Regional Climate Compact; and

WHEREAS, a "Unified Sea Level Rise Projection for Southeast Florida" was developed by a Sea Level Rise Technical Ad Hoc Work Group of the Southeast Florida Regional Climate Compact; and

WHEREAS, the Board of County Commissioners (hereinafter "the Board") had previously created the Miami-Dade Climate Change Advisory Task Force, established in July 2006 for a period of five years, through the adoption of Ordinance 06-113, which served as an advisory board to the Board on the issue of global warming climate change and was charged with identifying potential future climate change impacts to Miami-Dade County, while providing recommendations regarding mitigation and adaptation measures to respond to climate change; and

WHEREAS, the Miami-Dade Climate Change Advisory Task Force co-chaired the Interagency Climate Change Adaptation Task Force with the White House Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmosphere Administration, and released its interagency report in October of 2010 outlining recommendations to the President of the United States for how Federal Agency policies and programs can better prepare the United States to respond to the impacts of climate change; and

WHEREAS, in 2010, Miami-Dade County was featured as a best practice case study — Adapting to Sea Level Rise in Miami-Dade County, Florida — as part of the National Oceanic and Atmospheric Administration's Digital Coast Initiative and Inundation Toolkit; and

WHEREAS, the Miami-Dade Climate Change Advisory Task Force, sunset and dissolved in 2011, pursuant to Ordinance 06-113; and

WHEREAS, in 2012 the City of Miami Beach has developed a Stormwater Master Plan with estimated costs of over \$206,000,000 in infrastructure needs for its drainage system, which is being increasingly compromised by sea level rise; and

WHEREAS, in 2012 through Resolution No. R-240-13, the Board accepted the Regional Climate Action Plan, with recommendations for regionally coordinated climate change mitigation, adaptation strategies, and efforts in building community resilience; and

WHEREAS, local, regional, and national news media outlets have recently featured numerous stories with varied predictions on Southeast Florida's vulnerability to sea level rise; and

WHEREAS, in July of 2013 the Board created the Miami-Dade Sea Level Rise Task Force through the adoption of Resolution No. R-599-13; and

WHEREAS, the Miami-Dade Sea Level Rise Task Force is currently reviewing the relevant data and prior studies, assessments, reports, and evaluations of the potential impact of

sea level rise on vital public services and facilities, real estate, water and other ecological resources, water front property, and infrastructure; and

WHEREAS, the Miami-Dade Sea Level Rise Task Force will provide a comprehensive and realistic assessment of the likely and potential impacts to sea level rise and storm surge over time, which shall be used to help develop a set of recommendations relative to amendments to the CDMP, capital facilities planning, budgetary priorities and other County programs as necessary to ensure that Miami-Dade County is taking all appropriate actions to reduce its contributions to climate-induced sea level rise and to ensure its resiliency to the increase in sea level rise, storm surge and related impacts which are expected to occur,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that:

Section 1. It is the policy of Miami-Dade County that all County infrastructure projects, including but not limited to County building elevation projects, County installation of mechanical and electrical systems, County infrastructure modifications, and County infrastructure renovations, initiated from the effective date of this resolution shall consider sea level rise projections and potential impacts as best estimated at the time of the project, using the regionally consistent unified sea level rise projections, during all project phases including but not limited to planning, design, and construction, in order to ensure that infrastructure projects will function properly for fifty (50) years or the design life of the project, whichever is greater.

Section 2. This Board directs the Mayor or designee to establish recommended priorities for adapting existing County infrastructure located in areas at increased risk of flooding and tidal inundation with increases in sea level to the degree opportunity and resources allow, and shall present such recommended priorities to the Board for approval, including committee review, within one-hundred-twenty (120) days of the effective date of this resolution.

The Prime Sponsor of the foregoing resolution is Chairwoman Rebeca Sosa, and the Co-Sponsors are Commissioner Sally A. Heyman and Commissioner Barbara J. Jordan. It was offered by Commissioner **Dennis C. Moss**, who moved its adoption. The motion was seconded by Commissioner **Rebeca Sosa** and upon being put to a vote, the vote was as follows:

	Rebeca Sosa, Chairwoman	aye	
	Lynda Bell, Vice Chair	aye	
Bruno A. Barreiro	absent	Esteban L. Bovo, Jr.	aye
Jose "Pepe" Diaz	aye	Audrey M. Edmonson	aye
Sally A. Heyman	aye	Barbara J. Jordan	aye
Jean Monestime	aye	Dennis C. Moss	aye
Sen. Javier D. Souto	aye	Xavier L. Suarez	aye
Juan C. Zapata	absent		

The Chairperson thereupon declared the resolution duly passed and adopted this 6th day of May, 2014. This resolution shall become effective ten (10) days after the date of its adoption unless vetoed by the Mayor, and if vetoed, shall become effective only upon an override by this Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: **Christopher Agrippa**
Deputy Clerk



Approved by County Attorney as
to form and legal sufficiency.

Christopher A. Angell