CLIMATE CHANGE, SEA-LEVEL RISE AND FLOOD INSURANCE: IMPACTS ON LOCAL GOVERNMENT

U.S. HOUSE OF REPRESENTATIVES
CLIMATE CHANGE SOLUTIONS CAUCUS MEETING
MAY 24, 2017

Presented by Commissioner Heather Carruthers, Monroe County Florida
MONROE COUNTY, FLORIDA

The Florida Keys

- 77,000 permanent residents
- 4 million visitors annually
- $200 million in sales tax revenue
- 10th largest fishery
- Naval Air Station Key West
- North America’s coral reef
ABOUT COASTAL SHORELINE COUNTIES

• Home to 39% of Americans
• Generate $6.6T in GDP – 46% of national GDP
• House 51M jobs
• Generate 56% of our nation’s energy, home to all of our ports, responsible for $1.16T in imports
• Home to our commercial and recreational fishing industries

SOURCE: http://stateofthecoast.noaa.gov

If America’s coastal shoreline counties were their own country, that country would rank third in global GDP, behind the U.S. and China.
Non-storm-related flooding

From the Key West tide gauge.

9” increase in sea-level in the past 100 years.

Photo by The New York Times
PREPARING TODAY FOR TOMORROW

• Researching & sharing best practices
  • Member, Southeast Florida Regional Climate Compact

• Projecting sea-level into the future
  • Varying estimates
  • Funded in part by NOAA

• Evaluating vulnerabilities

• Reducing greenhouse gas emissions

• Identifying adaptation strategies

• Conducting cost-benefit analyses

• Making investments
PROJECTING SEA-LEVEL RISE
Big Pine Key

TODAY

TOMORROW – 2060 PROJECTIONS

Best Case Scenario: 9” SLR

Worst Case Scenario: 24” SLR

Red areas represent inundated land.
PROJECTING SEA-LEVEL RISE
Big Pine Key

<table>
<thead>
<tr>
<th>TODAY</th>
<th>TOMORROW – 2060 PROJECTIONS</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Best Case Scenario: 9” SLR</td>
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<td>Worst Case Scenario: 24” SLR</td>
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Red areas represent inundated land.
IDENTIFYING VULNERABILITIES

Analyze roads, utilities, public buildings, etc. for vulnerability to flood risk from sea level rise.

Bay Point Wastewater Treatment Plant. Blue areas indicate inundation.
ROAD ADAPTATION ANALYSIS EXAMPLE

LOCAL CONDITIONS AFFECTING FINAL DESIGN RECOMMENDATIONS

- Sensitive Lands / Mitigation
- Future Sea Level Rise
- Elevation of Water Table
- Water Quality Requirements For Permitting
- Roadway Elevation & Condition
- Adjacent Property Elevation
- Driveway Access
- Space for Drainage Improvements
- ROW Requirements
- Electrical And Water/Sewer Utilities
- Stormwater System Maintenance Costs Including Staff
As sea levels rise, the length of road needing elevation and cost of adaptation increase. These costs fall to local government.

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Twin Lakes – Key Largo</th>
<th>Sands Community – Big Pine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length of Roadway Elevated</td>
<td>Total Roadway and Drainage Cost</td>
</tr>
<tr>
<td>6&quot;</td>
<td>0.25 miles</td>
<td>$0.92 million</td>
</tr>
<tr>
<td>12&quot;</td>
<td>0.7 miles</td>
<td>$4 million</td>
</tr>
<tr>
<td>18&quot;</td>
<td>0.8 miles</td>
<td>$5.8 million</td>
</tr>
<tr>
<td>28&quot;</td>
<td>0.9 miles</td>
<td>$7.3 million</td>
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</table>
“Two of American society’s most storied love affairs – beaches and cars – come together on coastal highways. Some of our coastal roads are famous to the point of being a part of the national culture.”

- 60,000 miles of roadways in the lower 48 states occasionally exposed to coastal waves and surge today
- 36,000 bridges exist within 15 nautical miles of the coast
“Actuarially sound” NFIP flood insurance premiums are unaffordable.

From an actual flood insurance quote resulting from the “sale trigger” after Biggert-Waters in 2012. Considered “actuarially sound” by a FEMA actuary (but without documentation/data).
PROTECTING PRIVATE PROPERTY
– AND OUR TAX BASE

Even with HFIAA, rising flood premiums will negatively impact property values and local tax revenues (which fund sea level rise adaptation, emergency response to severe weather, and much more).

### Insurance Premium

↑ $500 = Property Value
↓ $10,000

Source: The Rand Corporation

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Premium Increase</th>
<th>2015 Value</th>
<th>2024 Value (based on premium impact only)</th>
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</thead>
<tbody>
<tr>
<td>Primary Pre-FIRM Home at BFE</td>
<td>$1,387.69</td>
<td>$350,000.00</td>
<td>$322,246.20</td>
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<tr>
<td>Non-Primary Pre-FIRM Home at BFE</td>
<td>$23,880.05</td>
<td>$350,000.00</td>
<td>$(127,601.00)</td>
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<tr>
<td>Primary Pre-FIRM Home at -3 BFE</td>
<td>$8,647.04</td>
<td>$350,000.00</td>
<td>$177,059.20</td>
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<td>Primary Post-FIRM Home at BFE</td>
<td>$674.27</td>
<td>$350,000.00</td>
<td>$336,514.60</td>
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<tr>
<td>Primary Post-FIRM Home at -3 BFE</td>
<td>$16,562.32</td>
<td>$350,000.00</td>
<td>$18,753.60</td>
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<tr>
<td>Commercial Pre-FIRM Property at BFE</td>
<td>$58,545.47</td>
<td>$500,000.00</td>
<td>$(670,909.40)</td>
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<tr>
<td>Commercial Post-FIRM Property at BFE</td>
<td>$19,280.79</td>
<td>$500,000.00</td>
<td>$114,384.20</td>
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</tbody>
</table>
COMMUNITY RATING SYSTEM

- Provides community-wide NFIP premium discounts
- Activities that reduce premiums include:
  - Enforcing floodplain regulations through building permitting process
  - Accurate elevation data gathering
  - Drainage planning
  - Repetitive Loss Property planning
  - Public outreach on flood hazard
  - Mitigation plans and support
  - FEMA Hazus analysis for sea-level rise
  - Continual updating of plans

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<tr>
<th>County Investment</th>
<th>Estimated Premium Savings</th>
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<tbody>
<tr>
<td>$0</td>
<td>$2,000,000</td>
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<tr>
<td>$2,000,000</td>
<td>$4,000,000</td>
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<tr>
<td>$10,000,000</td>
<td>$12,000,000</td>
</tr>
<tr>
<td>$12,000,000</td>
<td>$14,000,000</td>
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Cost-Benefit of CRS Participation

- One-Time, First Year
- Annually, Subsequent Years

May 24, 2017

House Climate Change Solutions Caucus Meeting – Monroe County Presentation
COASTAL COMMUNITIES TAKE FLOODING SERIOUSLY

- 17 million properties lie in the 100-year flood plain.
- There are 5 million NFIP policies-in-force.
- 16.4 million people live in the coastal floodplain.
  - 12% of them live below the poverty level
  - 23% of them are under age 5 or over age 65.

SOURCE: http://stateofthecoast.noaa.gov and FEMA

94% of all NFIP policies are in coastal states.
WHERE IS THE FLOOD RISK?

CONSOLIDATED FEMA FLOOD MAP

GEOMORPHIC FLOOD INDEX MAP

SOURCE: Dataset of 100-year flood susceptibility maps for the continental U.S. derived with a geomorphic method by Caterina Samela & Salvatore Manfreda (Università degli Studi della Basilicata, Potenza 85100, Italy) and Tara J. Troy (Lehigh University, Bethlehem, PA 18015, USA); published in ScienceDirect by Elsevier Inc., 2017
FLOODS ARE NOT JUST A COASTAL PROBLEM.

Climate change and sea-level rise will impact every American. Floods today are our #1 natural disaster. Finding a sustainable, long-term solution to provide affordable flood insurance, and helping to mitigate against flood damage, must be a nationwide priority. Our communities, our constituents and our economy depend on it.
THANK YOU

Presented by Commissioner Heather Carruthers

Monroe County Florida

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