



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

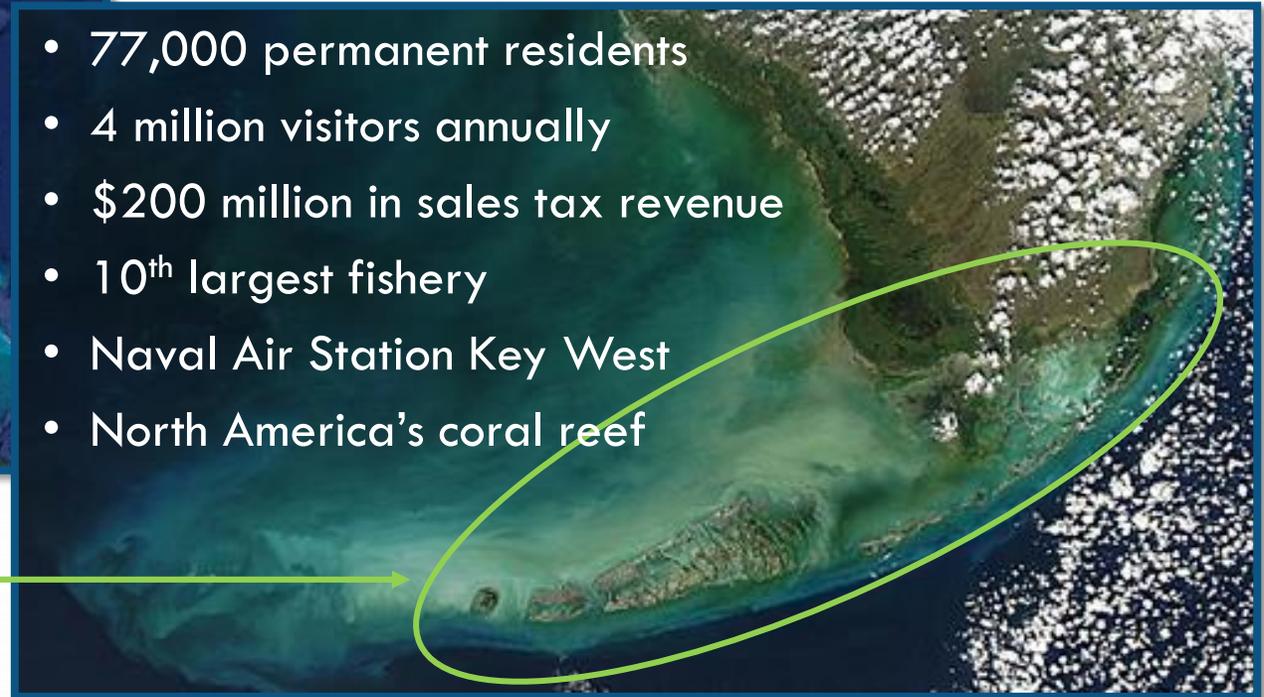
MONROE COUNTY, FLORIDA



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

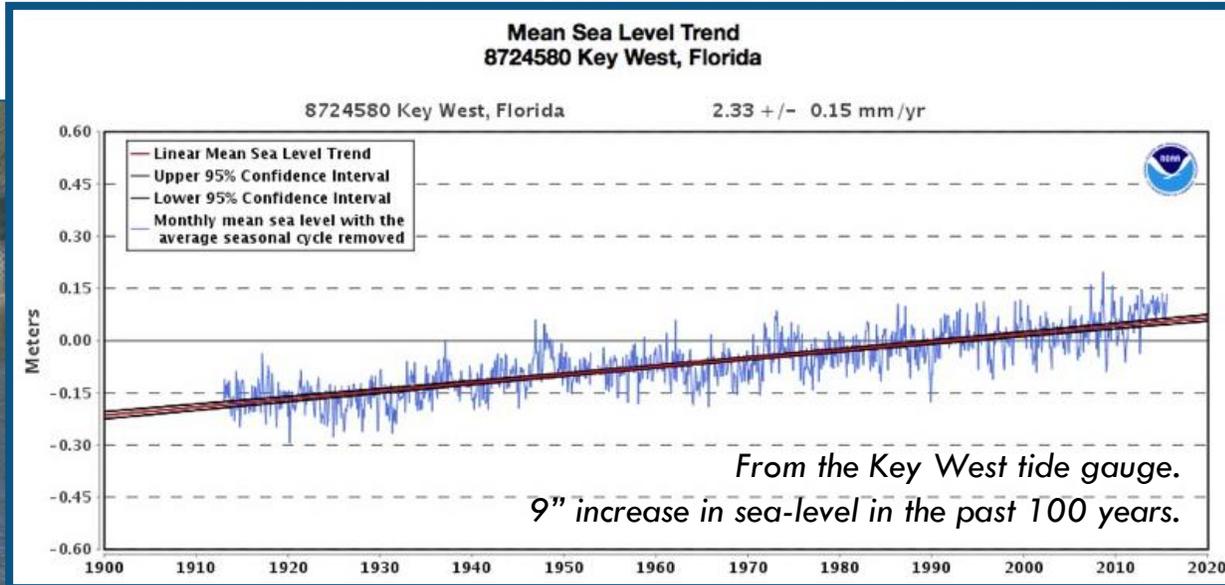


- Home to **39%** of Americans
- Generate **\$6.6T** in **GDP** –46% of national GDP
- House **51M jobs**
- Generate **56%** of our nation's **energy**, home to all of our **ports**, responsible for **\$1.16T** in **imports**
- Home to our commercial and recreational **fishing** industries

SOURCE: <http://stateofthecoast.noaa.gov>



SEEING SEA-LEVEL RISE TODAY



Non-storm-related flooding



Photo by The New York Times



PREPARING TODAY FOR TOMORROW



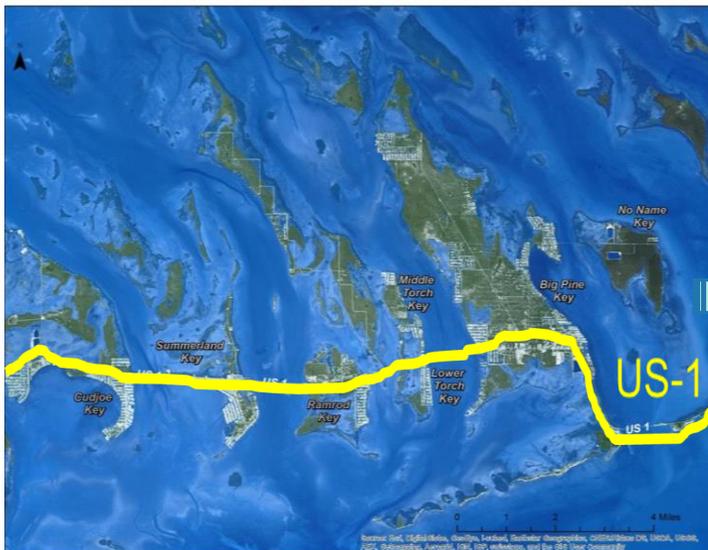
- Researching & sharing best practices
 - Member, Southeast Florida Regional Climate Compact
- Projecting sea-level into the future
 - Varying estimates
 - Funded in part by NOAA
- Evaluating vulnerabilities
- Reducing greenhouse gas emissions
- Identifying adaptation strategies
- Conducting cost-benefit analyses
- Making investments



PROJECTING SEA-LEVEL RISE Big Pine Key

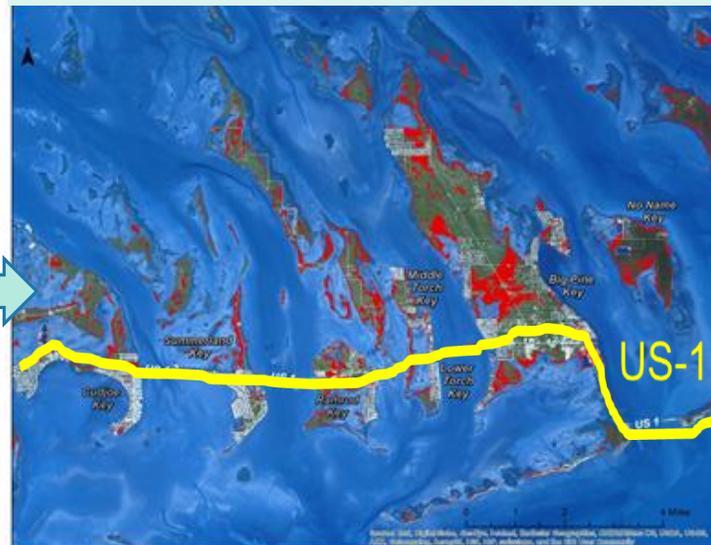


TODAY

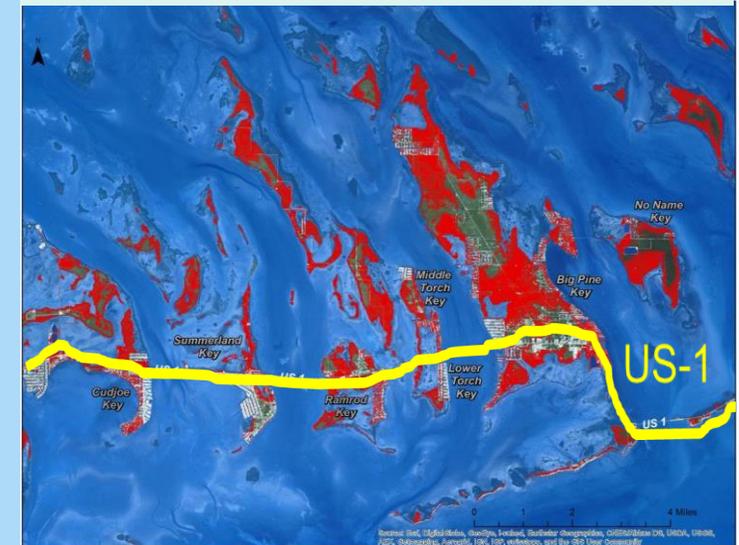


TOMORROW – 2060 PROJECTIONS

Best Case Scenario: 9" SLR



Worst Case Scenario: 24" SLR



Red areas represent inundated land.

PROJECTING SEA-LEVEL RISE Big Pine Key

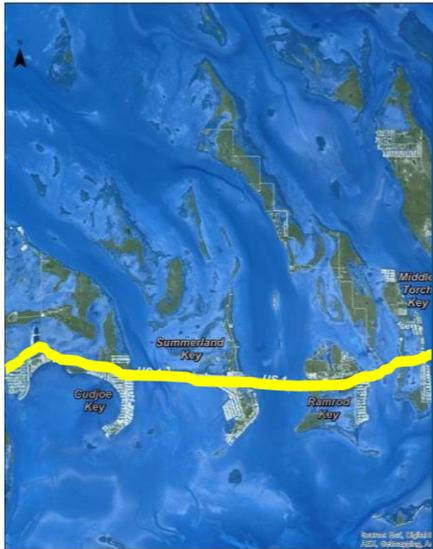


TODAY

TOMORROW – 2060 PROJECTIONS

Best Case Scenario: 9" SLR

Worst Case Scenario: 24" SLR





IDENTIFYING VULNERABILITIES

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

Current Condition



2060 – 24" SLR

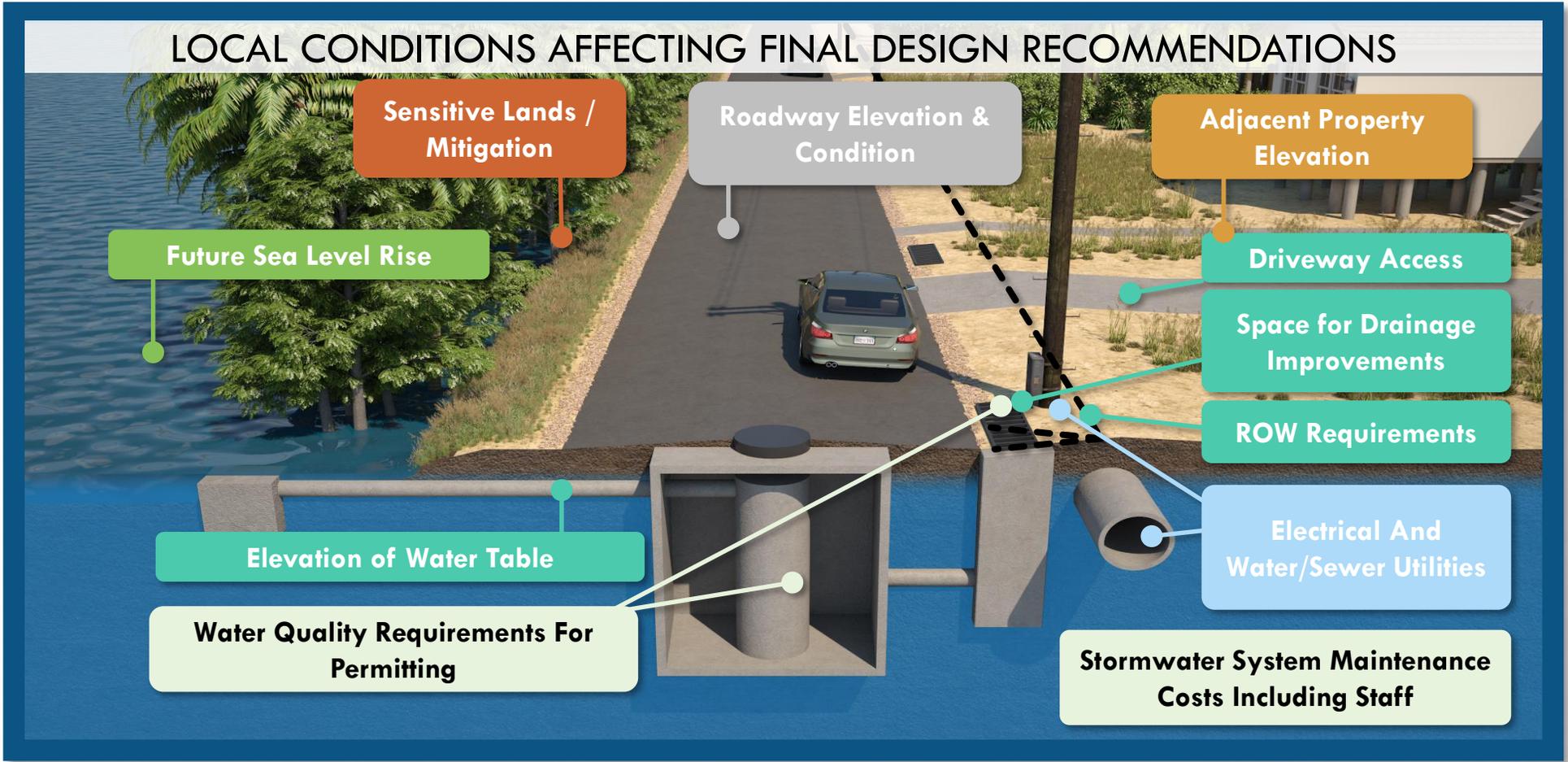


24" SLR + Wilma Storm Surge



Bay Point Wastewater Treatment Plant. Blue areas indicate inundation.

ROAD ADAPTATION ANALYSIS EXAMPLE



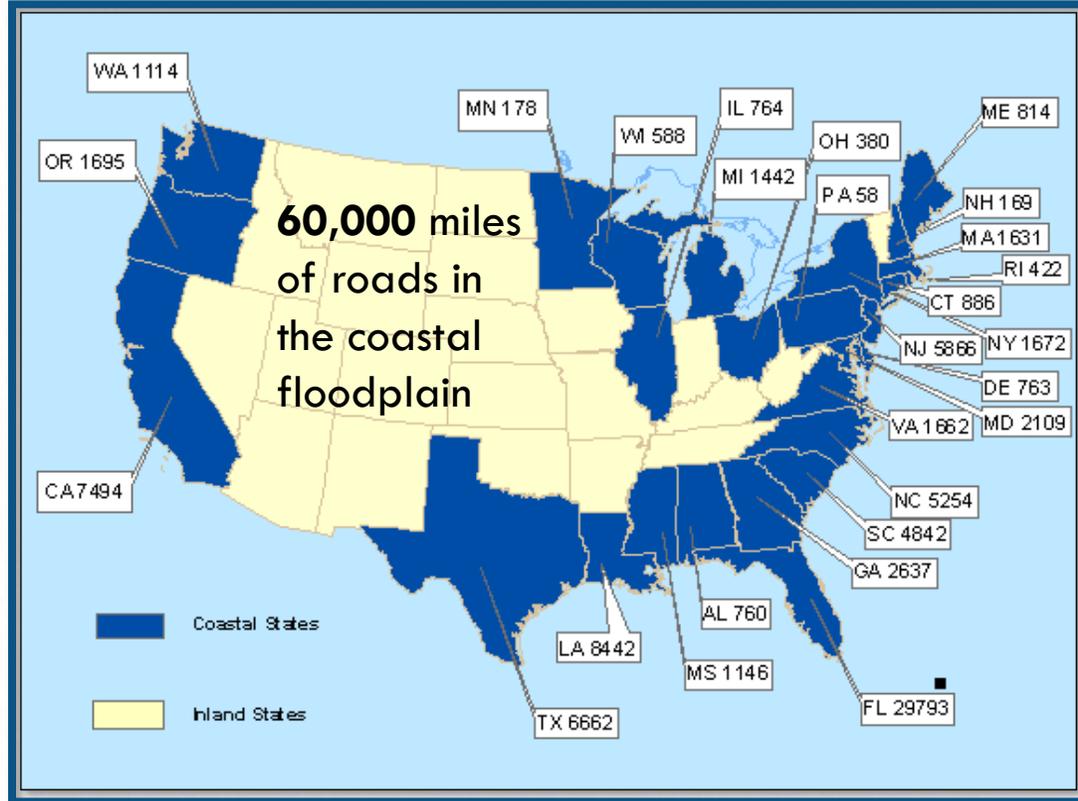
BUDGETING



	Twin Lakes – Key Largo		Sands Community – Big Pine	
Elevation	Length of Roadway Elevated	Total Roadway and Drainage Cost	Length of Roadway Elevated	Total Roadway and Drainage Cost
6"	0.25 miles	\$0.92 million	0.3 miles	\$2.22 million
12"	0.7 miles	\$4 million	0.35 miles	\$2.63 million
18"	0.8 miles	\$5.8 million	1.3 miles	\$8.9 million
28"	0.9 miles	\$7.3 million	1.5 miles	\$10.5 million

As sea levels rise, the length of road needing elevation and cost of adaptation increase. These costs fall to local government.

MANY MILES OF COASTAL ROADS



“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



SOURCE: “Highways in the Coastal Environment: Second Edition, by the Federal Highway Administration

PROTECTING PRIVATE PROPERTY



“Actuarially sound” NFIP flood insurance premiums are unaffordable.



**Premium increased
from \$1,989 to
\$49,252**



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



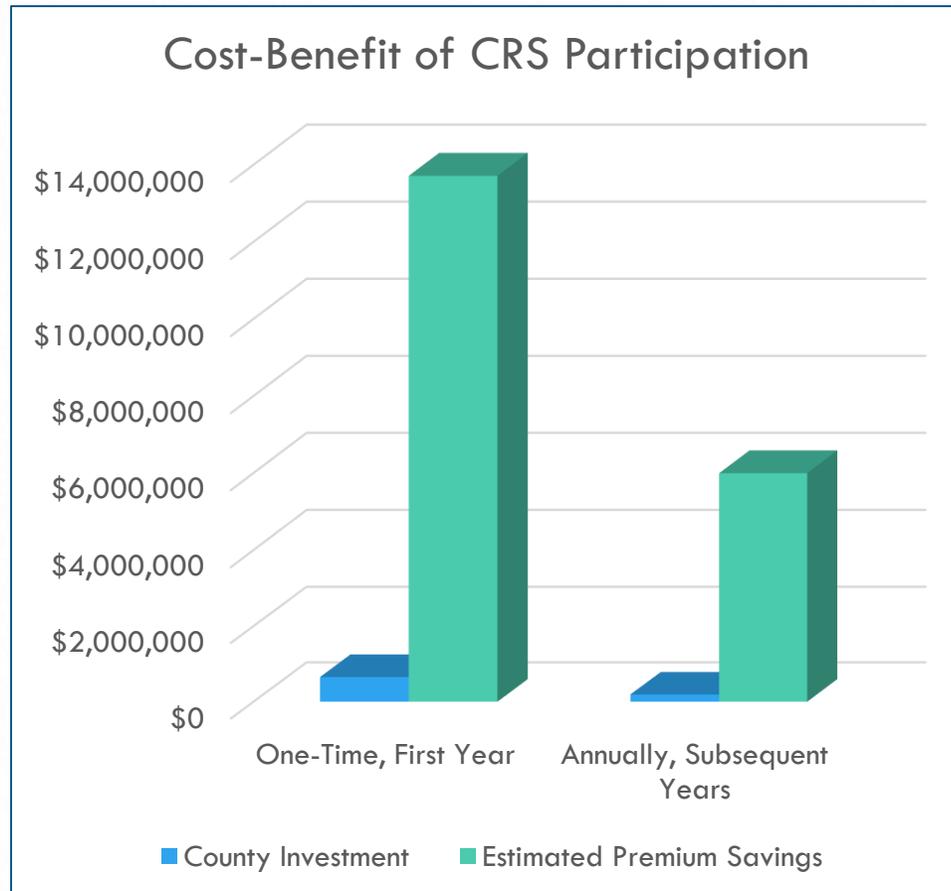
Even with HFIAA, rising flood premiums will negatively impact property values and local tax revenues (which fund sea level rise adaptation, emergency response to severe weather, and much more).

Insurance Premium
 ↑ \$500 =
 Property Value
 ↓ \$10,000

Source: The Rand Corporation

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

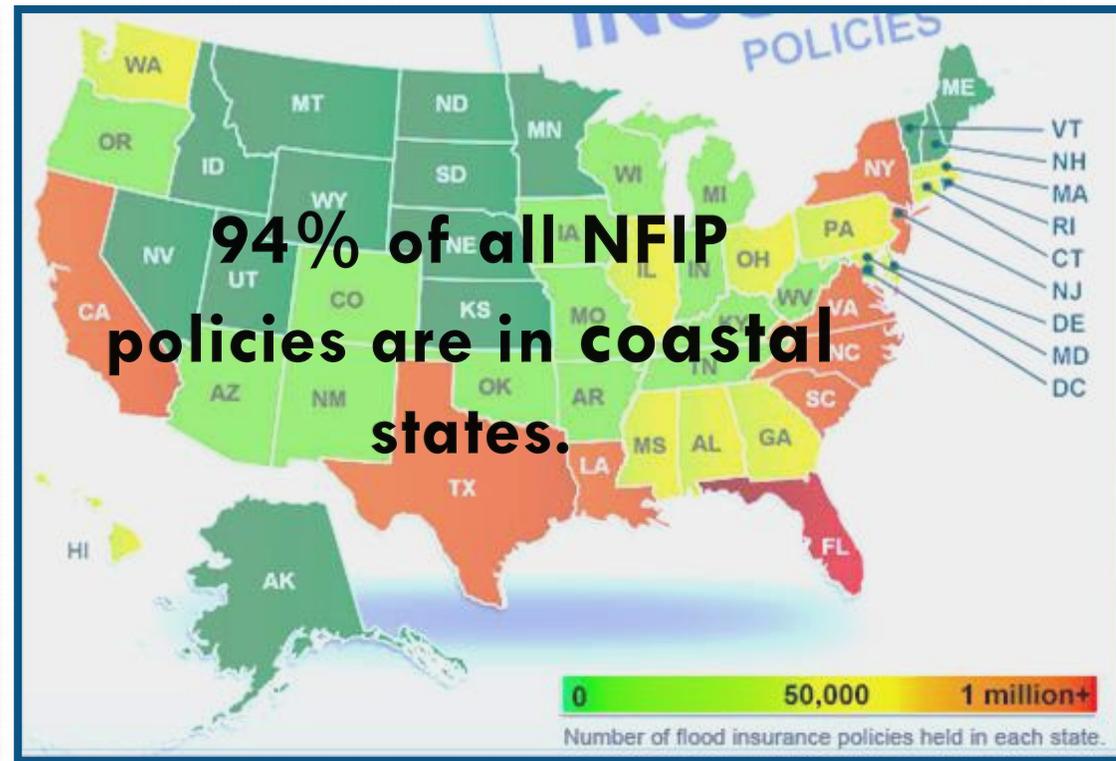
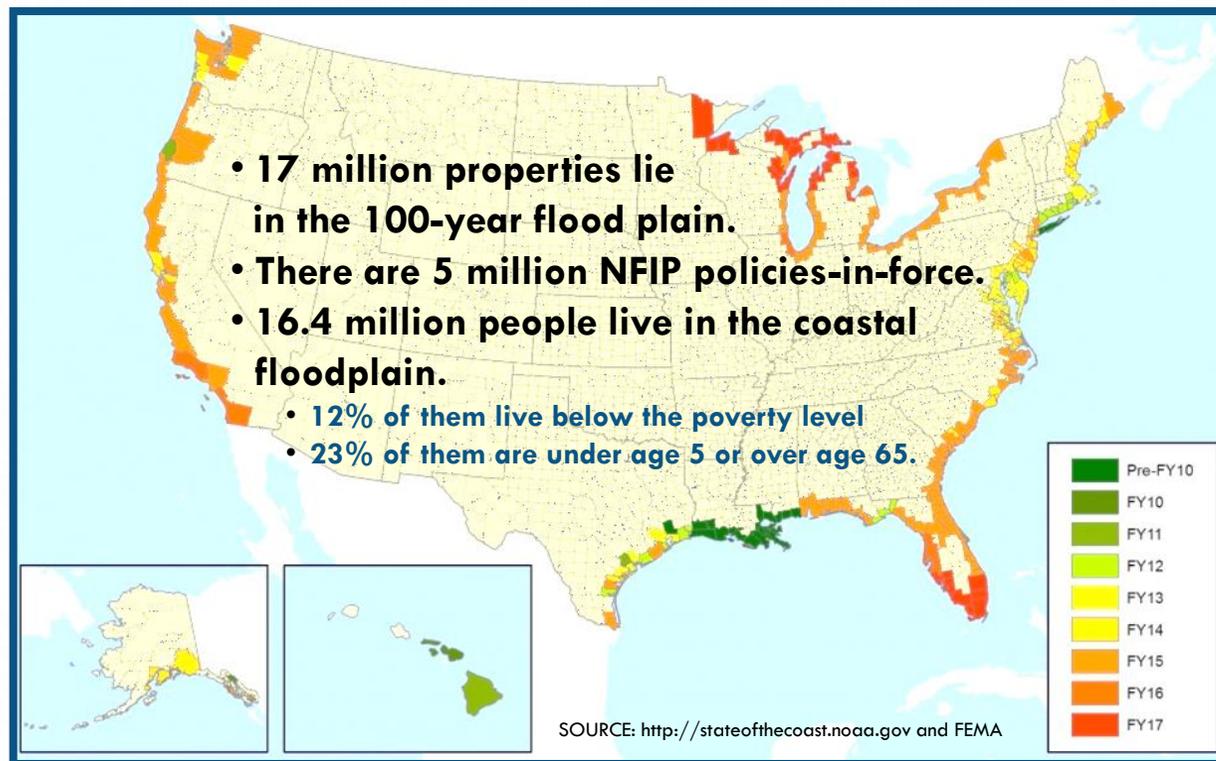
COMMUNITY RATING SYSTEM



- 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



COASTAL COMMUNITIES TAKE FLOODING SERIOUSLY





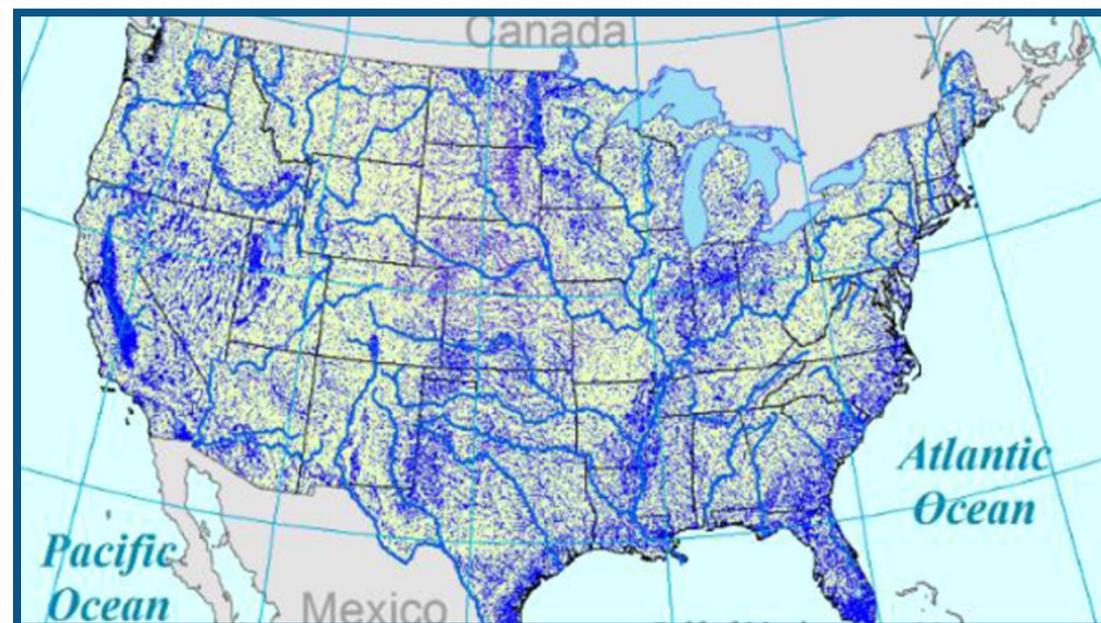
WHERE IS THE FLOOD RISK?

CONSOLIDATED FEMA FLOOD MAP



- FEMA: Undetermined areas
- FEMA: Minimal flood hazard
- FEMA: 1% annual chance flood hazard (100-year)
- FEMA: 0.2% annual chance flood hazard (500-year)

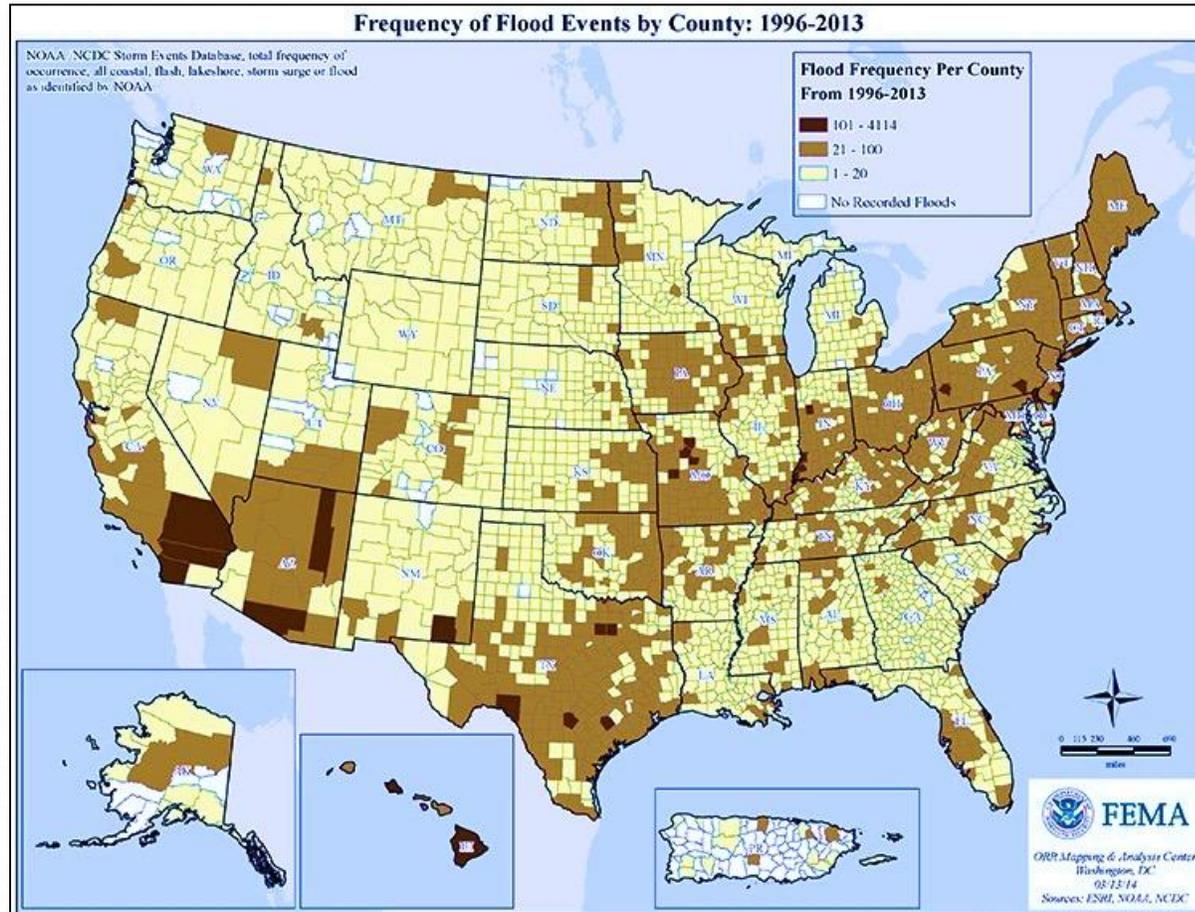
GOMORPHIC FLOOD INDEX MAP



- GFI: Areas not prone to floods
- GFI: 100 year flood-prone areas

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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