

Thinking Ahead: Understanding Flood Risks In the Future

NOAA's Strategy to Help Communities



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Resilient America Roundtable Flood Insurance Meeting
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Managing risk: What is impacted?

Communities



Businesses



Local forecast by
"City, St"

Site Map

News

Organization

City, St Go**RSS** RSS Feeds

Warnings

Current

By

State/County...

UV Alerts

Observations

Radar

Satellite

Snow Cover

Surface

Weather...

Observed Precip

Forecasts

Local

Graphical

Aviation

Marine

Hurricanes

Severe Weather

Fire Weather

Text Messages

By State

By Message Type

National

Forecast Models

Numerical

Models

Statistical

Models...

MOS Prod

GFS-LAMP Prod

Climate

Past Weather

Predictions

Weather Safety

Weather Radar

National Observations

Warnings & Forecasts

Graphical Forecasts

National Maps

Radar

Water

Air Quality

Satellite

Climate

River Observations

River Forecasts

Experimental Long-Range River Flood Risk

Precipitation

River Download

Other Information

Auto Refresh is OFF



Print this map

Permalink



All Locations



Click on the map or select one of the data views below:

- United States
- NWS Weather Forecast Offices
- NWS River Forecast Centers
- Water Resources Regions

Probability and Hydrograph Available
 Hydrograph Available

7301 total gauges

Show all locations in flood (91)

- 7 Gauges: Major Flooding
- 12 Gauges: Moderate Flooding
- 72 Gauges: Minor Flooding
- 101 Gauges: Near Flood Stage
- 4892 Gauges: No Flooding
- 1948 Flood Category Not Defined
- 2 At or Below Low Water Threshold
- 248 Gauges: Observations Are Not Current
- 19 Gauges: Out of Service

Water-level Observations

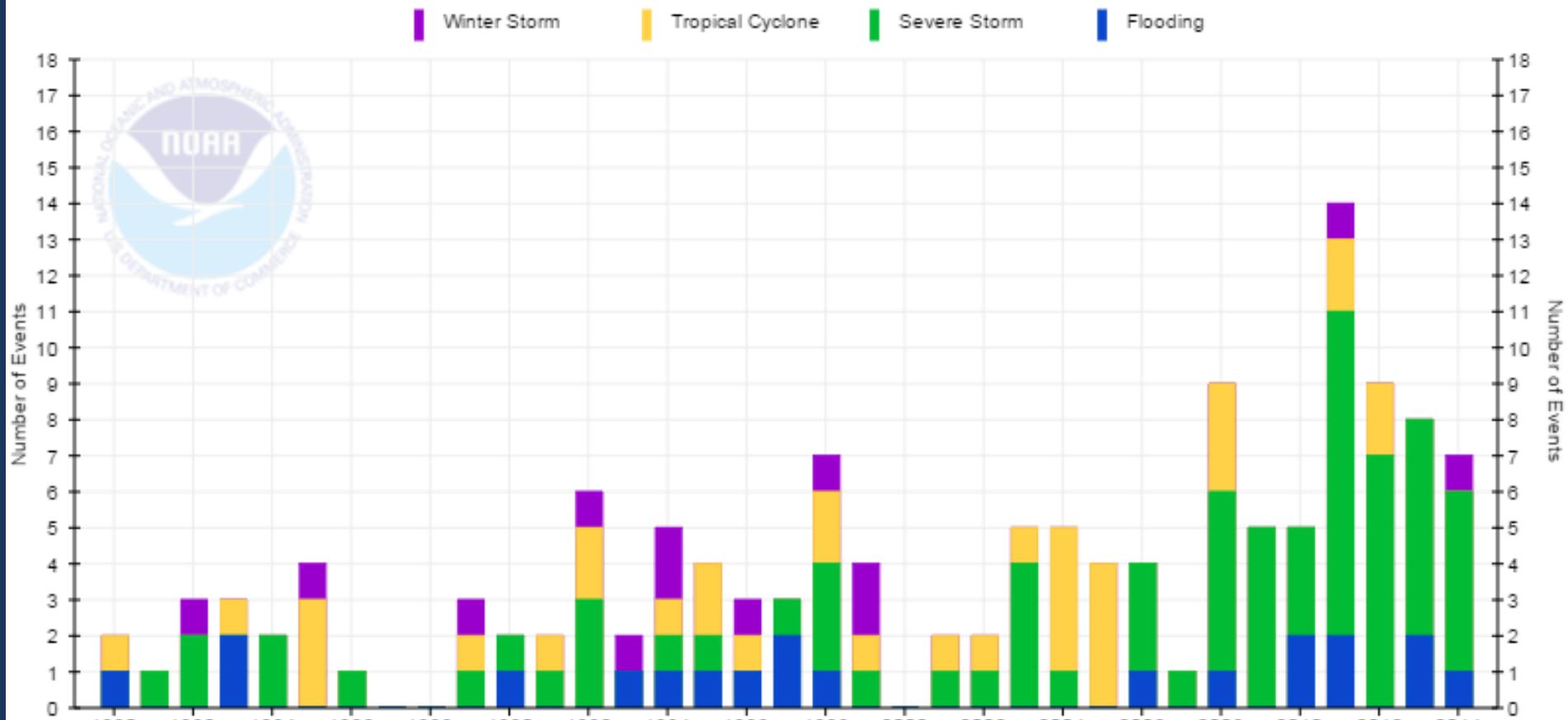
Water-level Forecasts



Who is at risk and why?

Billion Dollar Disasters: Fact of Life

Billion-Dollar Disaster Event Types by Year (CPI-Adjusted)



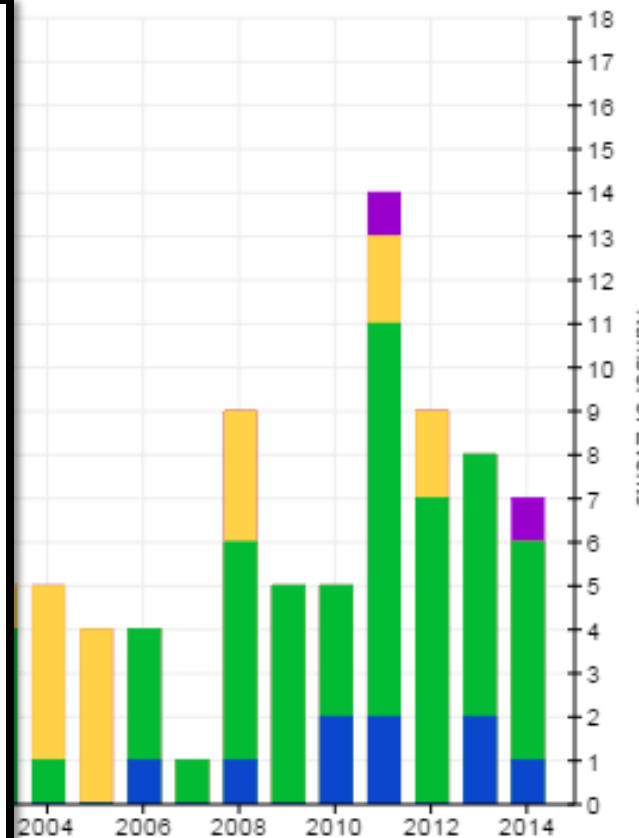
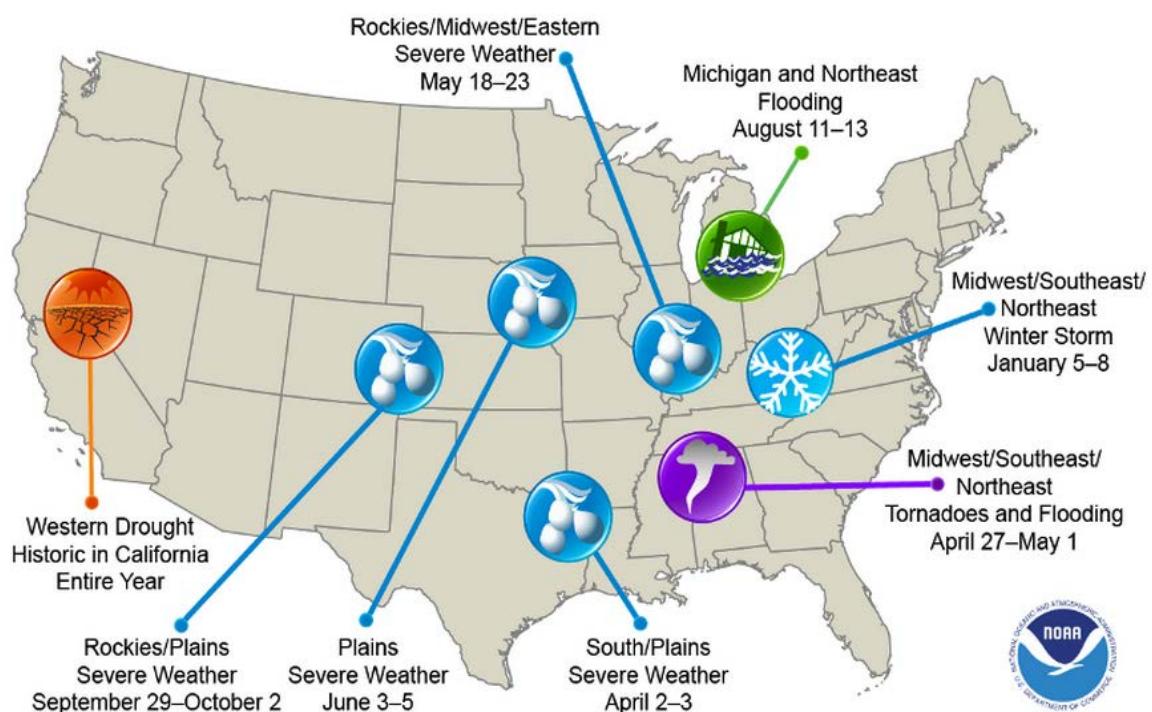
Source: NOAA/NCDC

Billion Dollar Disasters: Fact of Life

Billion-Dollar Disaster Event Types by Year (CPI-Adjusted)

Winter Storm Tropical Cyclone Severe Storm Flooding

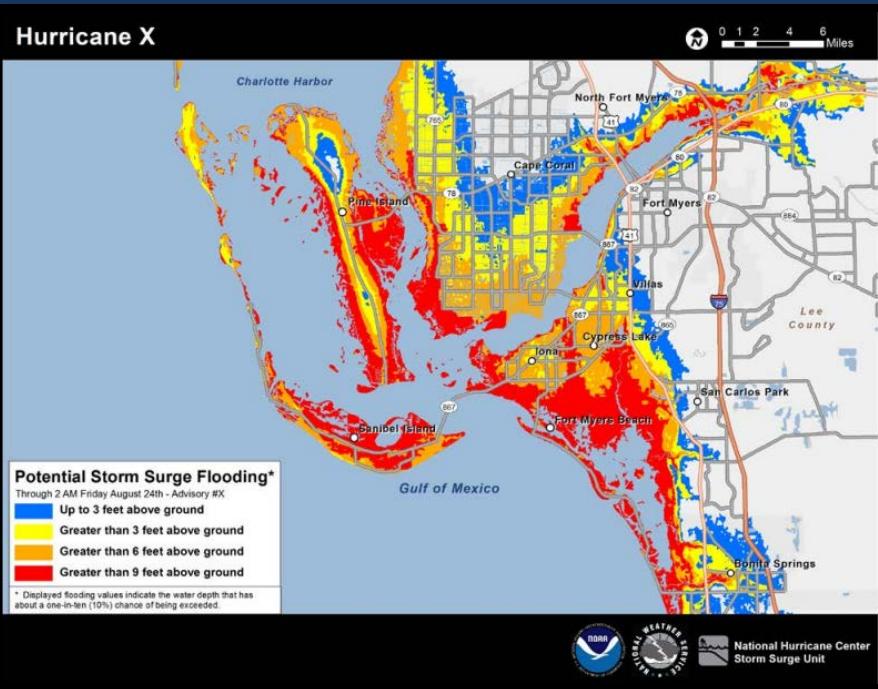
U.S. 2014 Billion-Dollar Weather and Climate Disasters



Source: NOAA/NCDC

Coastal Inundation/Storm Surge

Hurricane X



What are we at risk to?

Nuisance Flooding

UCN Unitarian Church of Norfolk

Moving forward and growing

[Home](#) [About](#) [Articles](#) [News](#) [Calendar](#) [Links](#) [Sermons](#) [Sacred Space](#) [Site](#) [Contact UCN](#)

Meeting Times

- 09:00 Adult discussion
- 09:30 Teen RE
- 10:30 Worship
- 10:30 Youth RE
- 11:30 Coffee Hour

This Week

- [Sunday RE](#)
- [Sunday's discussion](#)
- [Sunday's service](#)
- [Pastoral Care](#)
- [From the President's Desk](#)
- [Upcoming Events](#)

Visiting UCN

- [Info and Directions](#)
- [Office Hours](#)
- [Visiting RE classes](#)
- [Yarmouth Tide Predictions](#)

The tides, they are a changing...

Flood Level	No. of Floods (days/year) (1956-60)	No. of Floods (days/year) (2006-10)
Nuisance (~ 1')	3	35
Moderate (~ 2')	0	3

Storm Surge
In 1950 it would take a considerable amount of water caused by a large storm such as a hurricane to cause nuisance flooding. Nuisance flooding was infrequent.

High Tide
2010 sea level
In 2010, with higher relative sea level, it no longer takes a strong storm or hurricane to cause flooding. Now, **nuisance flooding is frequent** and can be caused merely by high tide.



How is local elevation important to nuisance flooding?

The relationship between local elevation and the high tide line determines the rate of nuisance flooding. If they are close to the same in elevation, flooding is frequent. If they are not close, flooding is infrequent.



Sea Level Rise & Population Impact



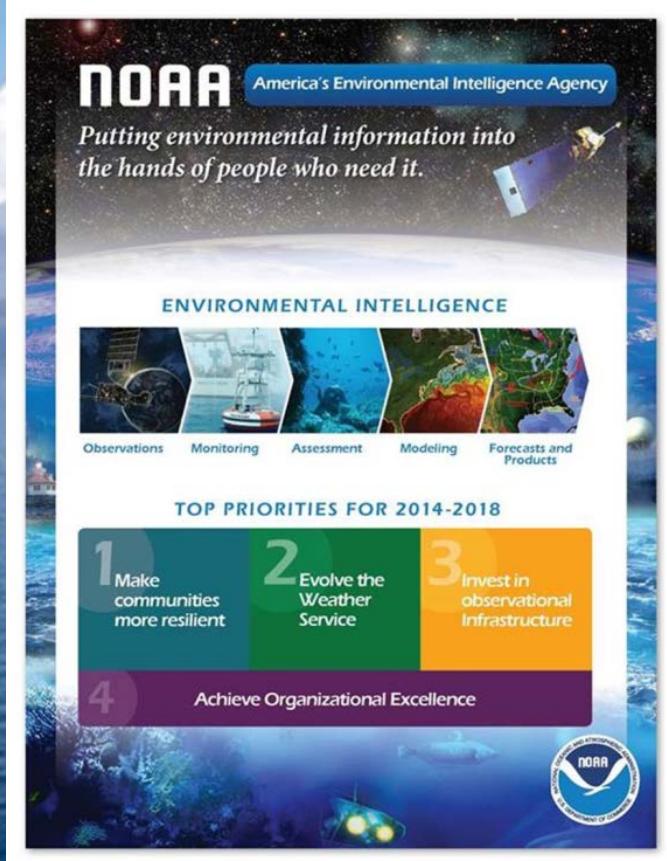
Today's Population Living Below
Projected High-Tide Line

CLIMATE  CENTRAL

Source: National Oceanic and Atmospheric Administration and Climate Central
Population numbers are based on 2010 U.S. Census data for the contiguous U.S..



How can NOAA help communities become more resilient



Coastal Planning Tools for the Future

Flood Exposure Snapshot

Miami-Dade County, Florida

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.

Community Infrastructure + Floodplains = Bad News

40% of critical facilities and 46% of road miles (4429 miles) in Miami-Dade 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.

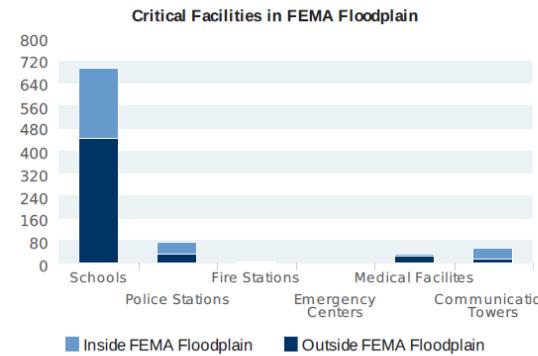
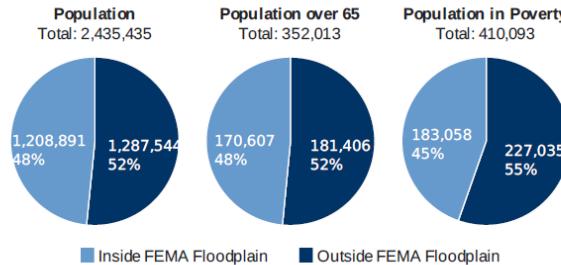
Based on Critical Facilities from FEMA HAZUS.

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

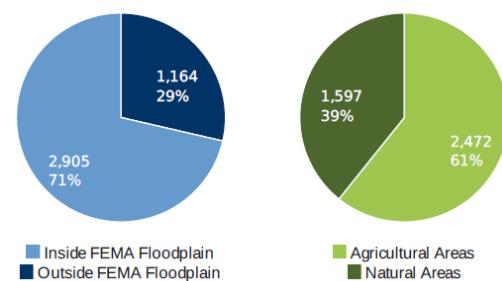
A county with more natural areas (wetlands, forests, etc.) and less development within floodplains typically has lower exposure to flooding. A county that monitors land cover changes within the floodplain will detect important trends that indicate whether flood exposure is increasing or decreasing. Armed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

Based on NOAA Land Cover Data.

COASTAL COUNTY SNAPSHOTS



Amount of Land Converted to Development 2001-2006 (acres)
Total: 4,069



Local Community Snapshots

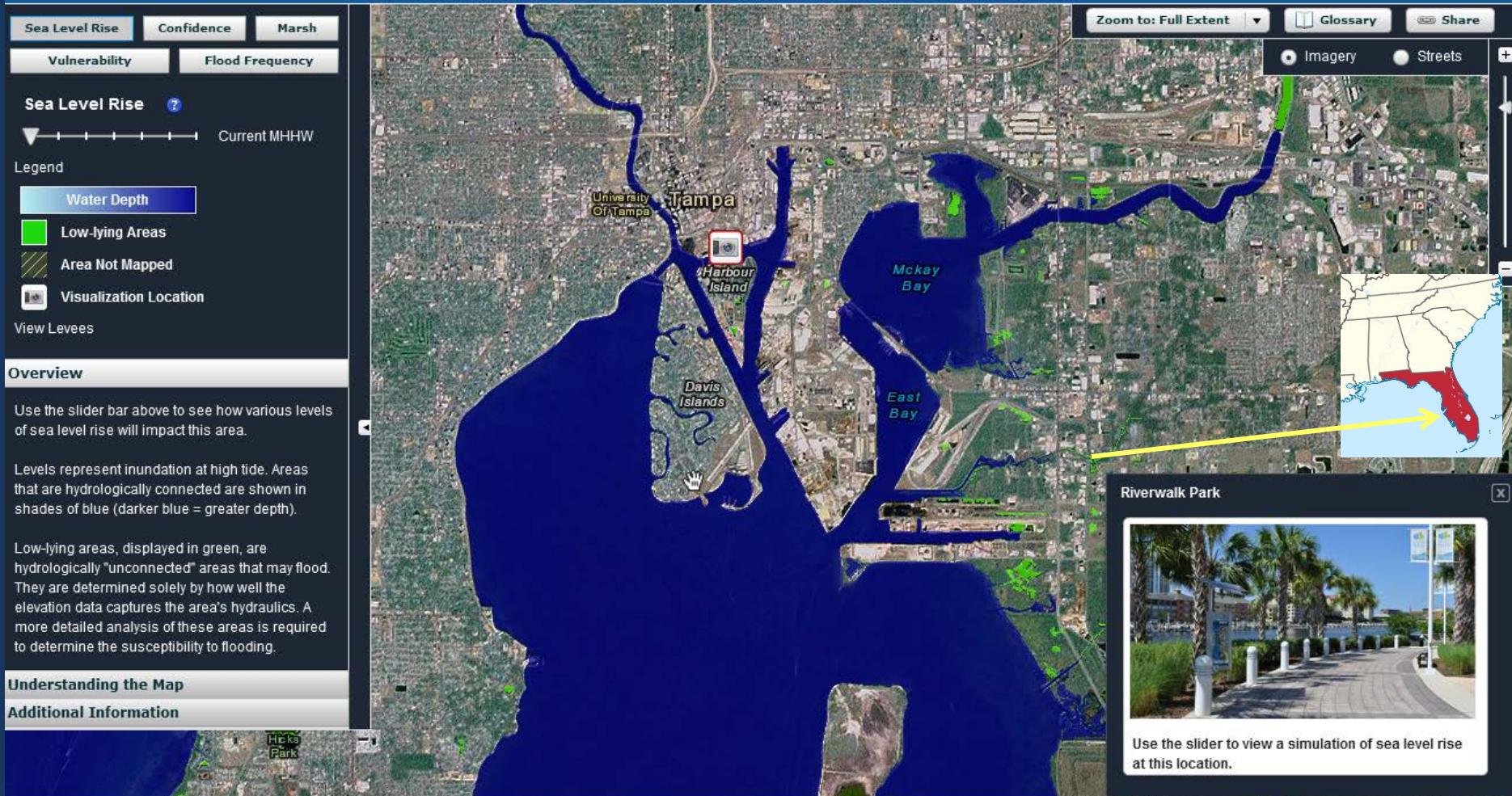
- People**
 - Who they are
 - Where they live
- Places**
 - Floodplain
 - Natural vs. Agriculture
- Coastal dependent economy**
- Comparison across local communities**
- Downloads can serve as handout/ educational tool**

<http://coast.noaa.gov/digitalcoast/tools/snapshots>

Decision Support Tools: Sea Level Viewer

Sea Level Rise and Coastal Flooding Impacts

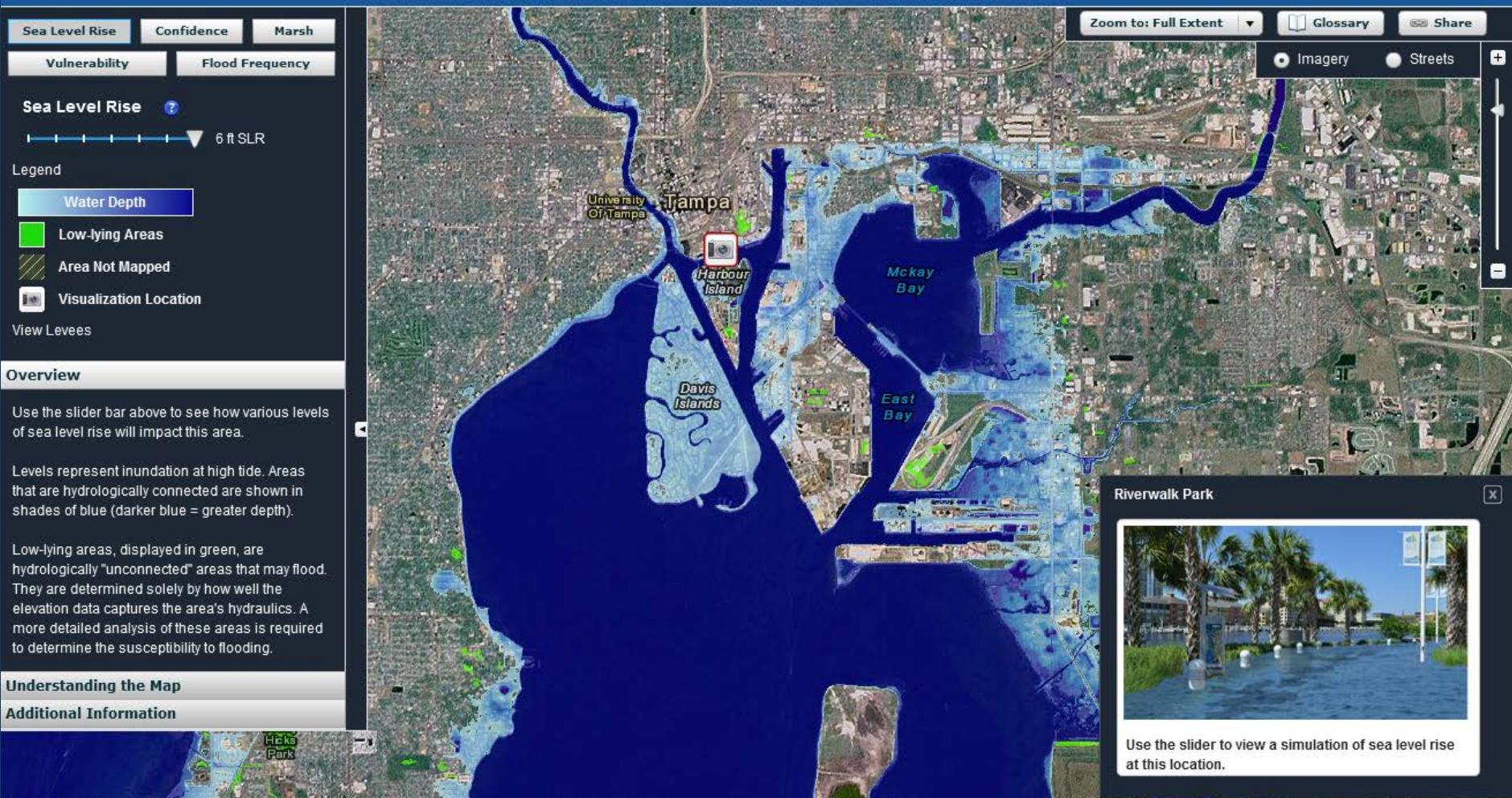
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



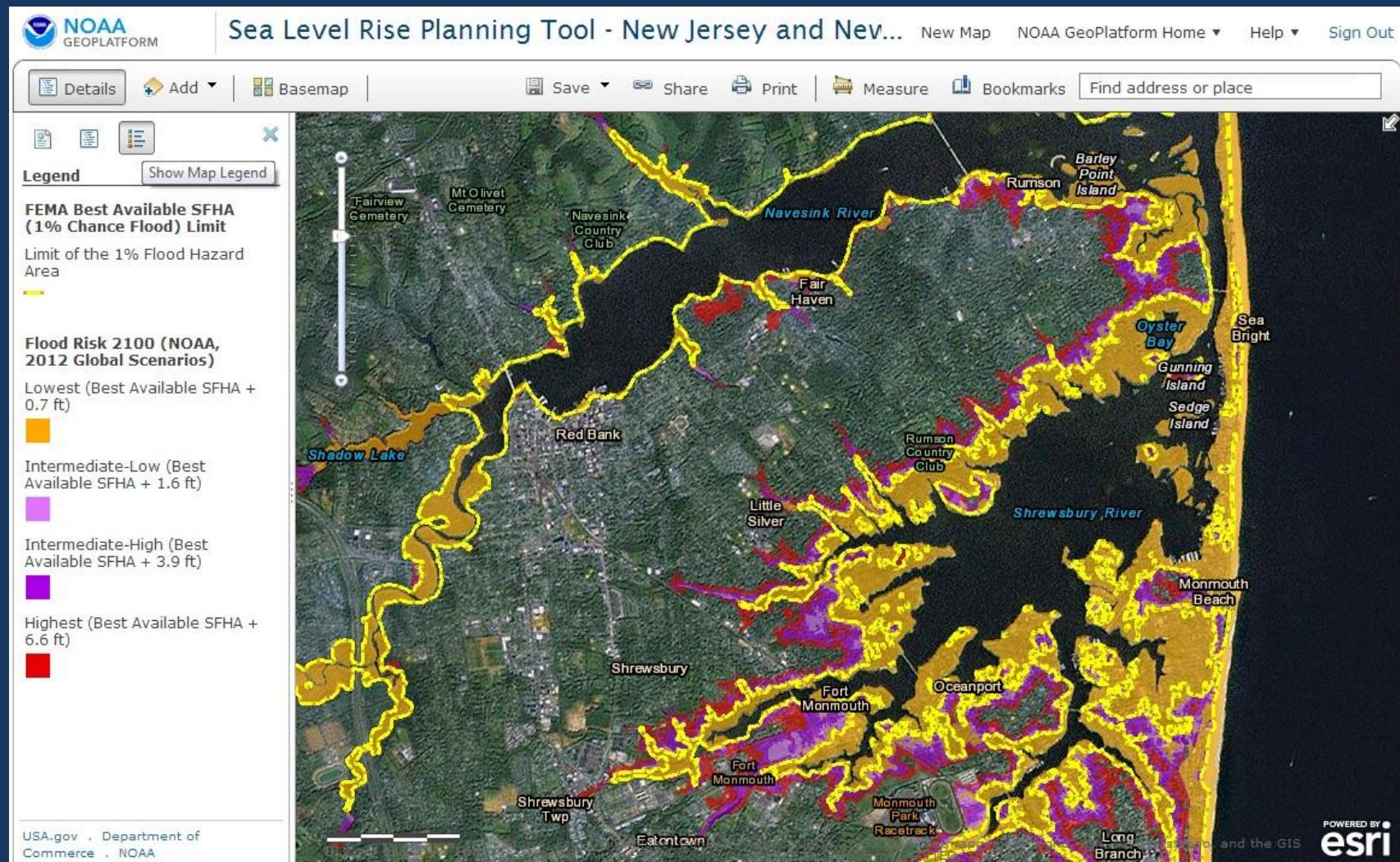
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Sea Level Rise and Coastal Flooding Impacts

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



Decision Support Tools: Sea Level Rise Planning Tool



FEMA



United States
Global Change
Research Program

Decision Support Tools: Interactive Flood Information Map

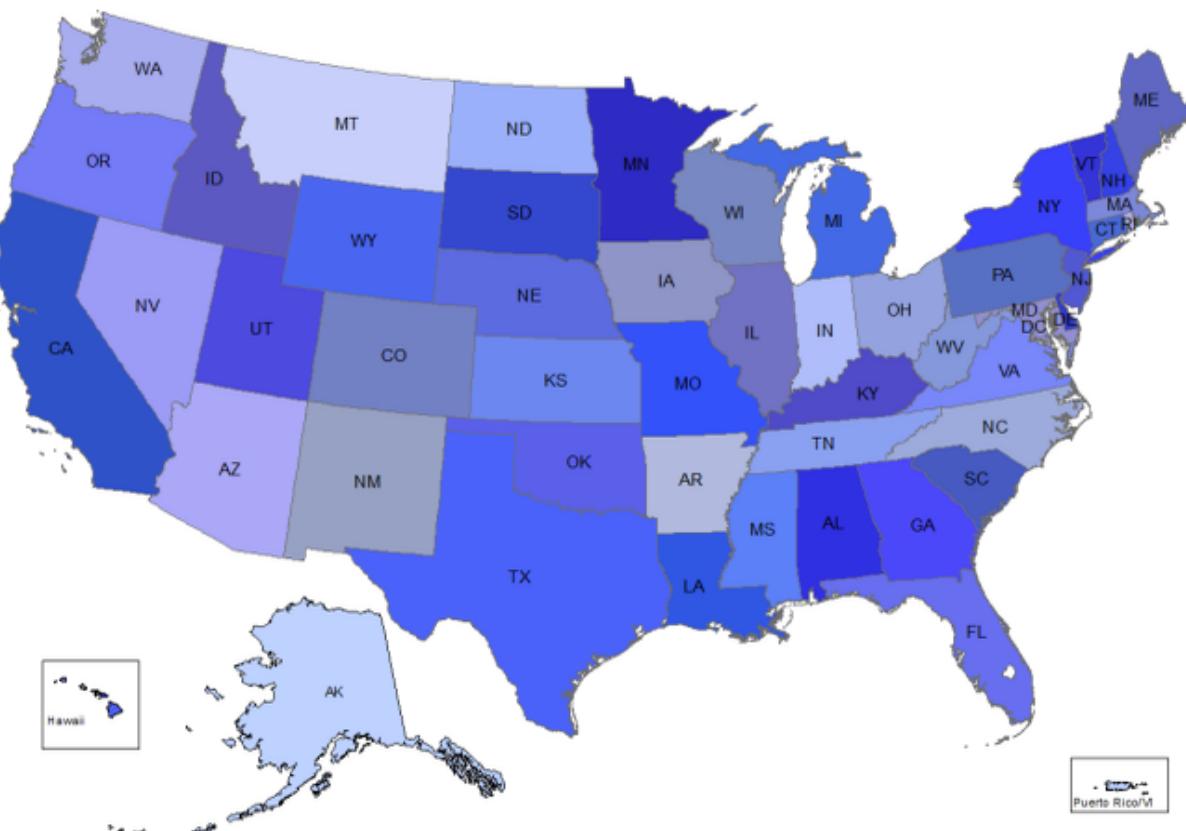


NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



HOME FORECAST PAST WEATHER WEATHER SAFETY INFORMATION CENTER NEWS SEARCH ABOUT

Interactive Flood Information Map



Flooding Resources

Flood Safety

Turn Around Don't Drown

State Flood Information

Flood Hazards

NWS Flood Related Products

Forecasts and Observations

Education and Outreach Materials

Partner Agencies

Decision Support Tools: Interactive Flood Information Map



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Flooding in Washington, D.C.

On this page you learn what types of flooding are typical in the Washington, D.C., and how do you protect yourself, your family and your home. You will also find out more about significant D.C., floods. Finally, you'll find links to NWS offices that provide forecast and safety information for D.C. as well as links to our partners who play a significant role in keeping you safe.



Flooding Resources

- Flood Safety
- Turn Around Don't Drown
- State Flood Information
- Flood Hazards
- NWS Flood Related Products
- Forecasts and Observations
- Education and Outreach Materials
- Partner Agencies

Significant Washington, D.C., Floods

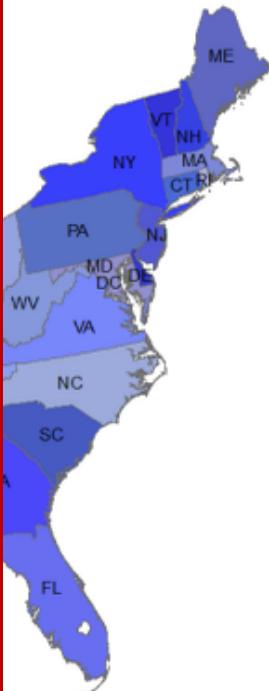
- Great Flood of 1889, May 30–June 2
- Great Potomac Flood of 1936, March 17–19
- Record Flood of 1942, October 14–17
- Hurricane Agnes, June 22–24, 1972
- Federal Triangle Flash Flood, June 25–26, 2006

Flood Hazard Information

- Flash Flooding
- River Flooding
- Tropical Systems and Coastal Flooding
- Ice/Debris Jams
- Snowmelt
- Dam Breaks/Levee Failure

Protect Life and Property

NWS Forecast Offices and River Forecast Center (RFC) Covering D.C.



WRN

Flooding Resources

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Initial Operating Capacity: May 26, 2015

A catalyst to transform NOAA's water prediction program



VISION: Scientific excellence and innovation driving water prediction to support decisions for a water resilient nation.

BENEFITS:

- State-of –the science model for global to street level prediction
- Operations Center to establish common operating picture within NOAA and among water agencies; decision support for floods to drought
- Proving ground to accelerate research to operations
- Data integration and service backup for entire water program

NOAA's Big Data Project

Research and development effort with major cloud providers to develop market ecosystems for NOAA environmental data.

- Each of the five collaborators anchors a “data alliance”
- Each alliance organizes companies and other organizations to drive demand for NOAA data
- Collaborators work with NOAA to address challenges of staging NOAA data on the cloud



- NOAA provides data and alliances develop market-based business models to sustain the effort at no net cost to government

Incorporation of Natural & Built Infrastructure



Dow Chemical: Wetlands vs. Wastewater Treatment Plant



Natural Capital Case Study

Change is Here: Time to Act is Now

