



# Planning for Sea Level Rise: Broward County Responds

## Audio Options

### **TO USE YOUR COMPUTER'S AUDIO:**

When the Webinar begins, you will be connected to audio using your computer's microphone and speakers (VOIP).

### **TO USE YOUR TELEPHONE:**

If you prefer to use your phone, select "Use Telephone" after joining the Webinar.

## About 1000 Friends of Florida:

- Founded in 1986, 1000 Friends of Florida is a 501(c)(3) nonprofit membership organization.
- We work to save special places and build better communities.
- We educate, advocate and negotiate to protect Florida's high quality of life.
- Our bipartisan board of directors includes advocates and experts from across the state.
- Visit [www.1000friendsofflorida.org/alerts/](http://www.1000friendsofflorida.org/alerts/) to sign up for email alerts!
- Please join us at [www.1000friendsofflorida.org/donate-now/](http://www.1000friendsofflorida.org/donate-now/)
- Follow 1000 Friends on [Facebook](#) and [Twitter](#)!



**Thank You to Our Webinar Sponsors:**

**Florida Patron**  
**The Archibald Foundation**  
**Mosaic**

**President's Club**  
Cobb & Cole  
Perkins Charitable Foundation  
William Howard Flowers, Jr. Foundation

**Sponsor**  
American Planning Association, Florida Chapter  
Ronald Book, PA  
Dover Kohl & Partners  
Kitson Evergreen, LLC  
Thomson Brock Luger & Company



## Upcoming DeGrove Webinars:

- **Registration Open: November 12, 2014, Noon to 1:30 p.m.**  
**Planning for Complete Streets in Florida**
- **Wednesday, December 10, Noon to 1:30**  
**Planning for Greenways: Florida's Expanding System of Regional Connectors**
- **January 14, 2015, Noon to 1:30 p.m.**  
**Planning for Sea Level Rise: Legal Issues Facing Florida**
- **February 11, 2015, Noon to 1:30 p.m.**  
**Victor Dover on Street Design: The Secret to Great Cities and Towns**
- **March 11, 2015, Noon to 1:30 p.m.**  
**2015 Florida Legislative Update**





# Sea Level Rise Survey:

10-question anonymous Florida Sea Level Rise Survey  
on local and regional planning efforts at  
[www.surveymonkey.com/s/FloridaSeaLevel](http://www.surveymonkey.com/s/FloridaSeaLevel)





Receive Email Alerts

Search

Gallery



Member Login

Contact Us

Join Us



About Us

Building Better Communities

Saving Special Places

Planning Tools

Outreach



Donate  
Now



Current Foresight

## Our Vision for Florida's Future...

Picture a Florida with vibrant cities and towns, thriving and livable neighborhoods, and an outstanding quality of life. Imagine communities where kids can ride their bikes to school or the park, and parents can walk to the store or take a bus to work if they wish. [Read More >](#)

### 1000 Friends Honors Lee Constantine

Constantine honored for his "leadership on critical conservation and water resource protection in Florida."

[Read More >](#)



Register Now for  
Fall Webinars



## What's New

### Planning for Sea Level Rise in Broward County Webinar on October 8

The PowerPoint is now available

[Read More >](#)

### Scale Back Minto West

Massive development planned for western Palm Beach County

[Read More >](#)

### Survey on Climate Change/Sea Level Rise

Take a few minutes to share what your community is doing

[Read More >](#)

Please Vote Yes on

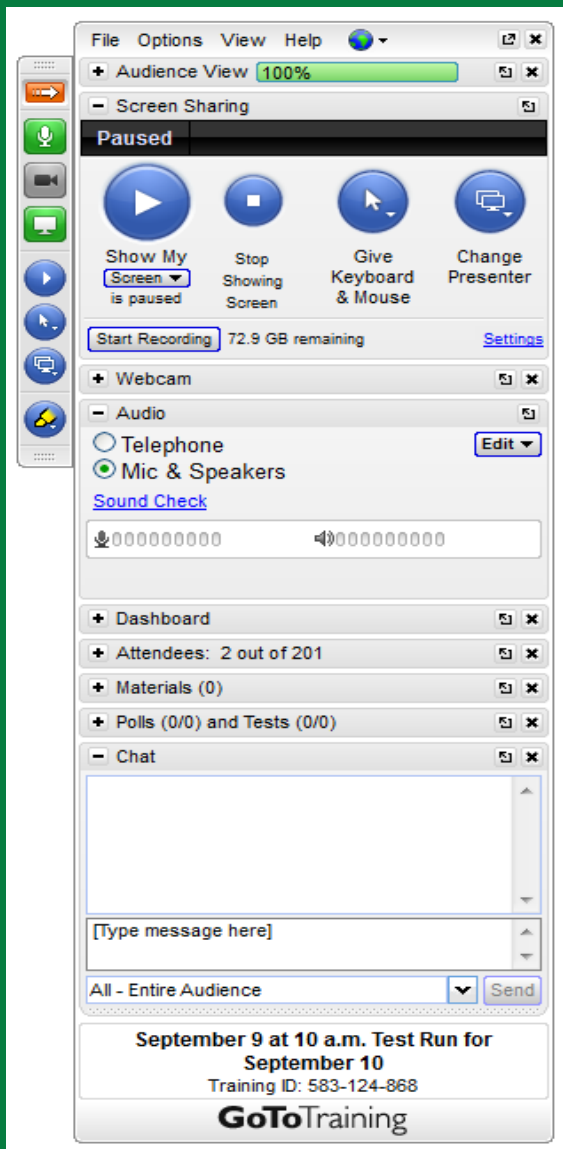


## **This Webinar Has Been Approved For:**

- **2.0 AICP CM ([#e.27939](#)) for Planners**
- **2 contact hours for Certified Environmental Health Professionals**
- **1 CEC for Certified Floodplain Managers**
- **CLE ([#1405924N](#)) for Florida attorneys**



# QUESTIONS



- Your webinar control panel includes a “Chat” box
- Please click on “+” sign and type any questions in this box
- Please refer to the slide number and/or speaker when you post your question
- Please keep your questions succinct!
- Staff will ask the presenters questions, as time permits
- Please complete the survey in the post-webinar email

# Presenters





# Dr. Jennifer Jurado, Director

## Broward County Natural Resources Planning and Management Division



- County-wide water resource policy and planning; advance County's regional climate initiatives; administer stewardship programs; environmental monitoring.
- Oversaw development of Broward's county-wide integrated water resources plan, convened regional water and climate change task forces, advanced multi-jurisdictional initiatives for sea level rise.
- Recognized by the White House as a Champion of Change for her leadership in climate resilience
- Currently lead staff for the Presidential Task Force on Climate Resilience and Preparedness Built Systems Work Group
- Original member of Steering Committee to the Southeast Florida Regional Climate Change Compact, co-authored Regional Climate Action Plan
- Ph.D. in Marine Biology and Fisheries from the University of Miami.



# James Cromar, Director Broward County Metropolitan Organization (MPO)



- Over 20 years of professional experience with focus on the integration of transportation and land use planning
- Combines private and public sector experience
- Spent twelve years as a Denver-based consultant
- More than ten years of planning at the municipal and County level in South Florida
- Responsible for planning activities of the Broward MPO with emphasis on increasing transportation options in communities and leveraging public investment to improve quality of life and address the environment.



## Julie Dennis, Community Program Manager Florida Department of Economic Opportunity



- Focuses on asset-based community economic development through the Competitive Florida Initiative.
- Provides technical assistance on working waterfronts preservation, post-disaster redevelopment planning and sea level rise adaptation.
- Has written published articles and reports and presented to local, state and national audiences on subjects such as long-term recovery, asset-based economic development, coastal community planning, adaptation planning and hazard mitigation.
- Received Master's Degree in Urban and Regional Planning from Florida State University.





# Susanne M. Torriente, Assistant City Manager

## City of Fort Lauderdale



- Oversees Sustainable Development, Transportation & Mobility, Public Work, Parks & Recreations and Structural Innovation.
- Previously Sustainability Director at Miami-Dade County, leading County's first sustainability & climate action plan, *GreenPrint*.
- Member of the Southeast Florida Regional Climate Compact steering committee. major contributor to regional climate action plan
- 2012 ICMA Sustainable Communities Fellowship (Wellington, New Zealand)
- 2013 ICMA CityLinks Cooperative Agreement with Durban, South Africa
- Member of FDEO Community Resiliency Focus Group and ICI FI's



# Jim Koeth, LEED AP BD+C

## City of Fort Lauderdale



- With City of Fort Lauderdale since 1994, serving in Planning & Zoning, Building, and Public Works Departments
- Principal Environmental Strategist/ Core Visioning staff team member with City's newly created Public Works Department's Sustainability Division
- Authored *We Are Ready: We are a resilient and safe coastal community*  
*Fast Forward Fort Lauderdale: Our City, Our Vision 2035* adopted in 2013
- BS with Certificate in Planning Studies from FSU
- Master of Urban and Regional Planning with Environmental Specialization from FAU





# Regional Collaboration on Climate Resilience: The Southeast Florida Regional Climate Change Compact

*Dr. Jennifer Jurado, Director*

*Broward County Natural Resources Planning and Management Division*



# Regional Collaboration on Climate Resilience:

## *The Southeast Florida Regional Climate Change Compact*

**1000 Friends of Florida  
Webinar  
October 8, 2014**



# Introduction to Broward County



## Characteristics

- 1.8 Million Residents
- 31 Cities
- 23 miles of coastline
- Flat and low-lying
- Dense coastal development
- Porous geology
- Built out





# The Riches of Broward County





# Growth in the 21<sup>st</sup> Century



Interstate 595 Expansion



Fort Lauderdale – Hollywood  
International Airport Runway Expansion



Port Expansion – Miami-Dade and Broward



# Climate Trends and Predictions for South Florida

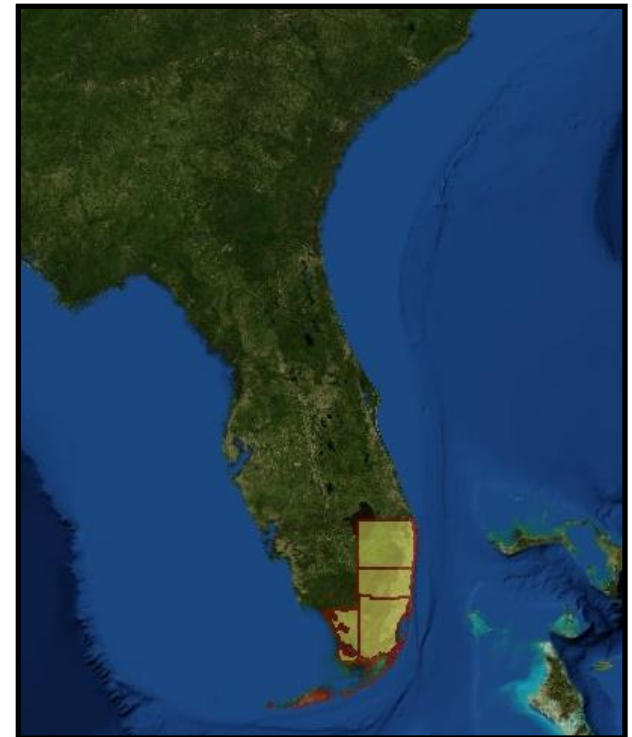
- Sea level rise
- Rising Temperatures
- Extreme rainfall and drought
- Coastal and inland flooding
- Increased storm intensity
- Beach erosion
- Saltwater intrusion
- Ocean acidification



# Vulnerabilities are Compounded Regionally

## Southeast Florida

- 4 Counties, 109 Cities
- 5.8 million residents
- Interconnected
- Accounts for 1/3 state GDP
- Major ports and airports
- Tourist driven economy



# Compact Background

- Initiated in October 2009
- Product of 1<sup>st</sup> Annual Summit
- Response to shared challenges and needs
- Voluntary collaboration



# Compact Commitments

## Framework:

- Collaborate on Policy
- Develop Regional Baselines for Planning
- Create Regional Climate Action Plan
- Host Annual summits





# Expansion of Steering Committee

- Two representatives from each county government
- One municipal representative from each county
- Non-voting representatives
  - Environmental
  - Regional Water Management
  - Facilitators/Advisors





# Collaborating Partners



# Regional GHG Baseline

Figure 2: Five-Year Average Regional GHG Emission by Sector

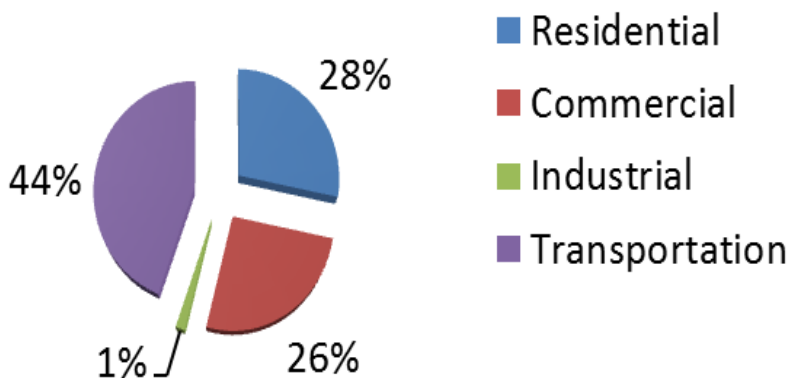
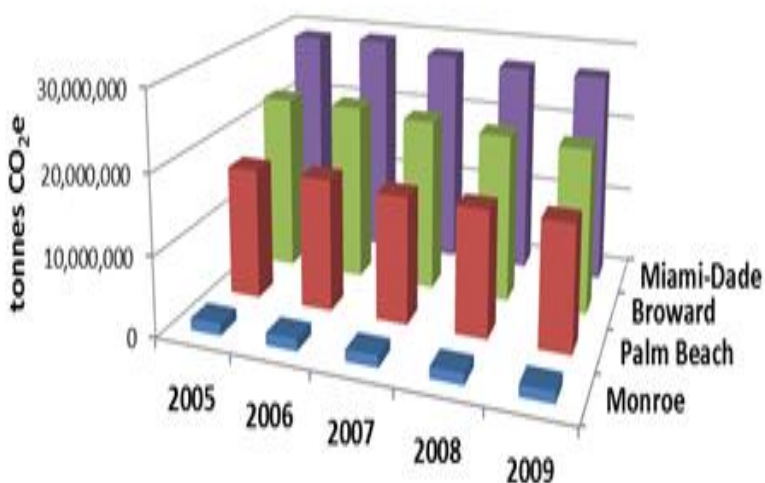


Figure 1. GHG emissions by Year and County



## Southeast Florida Regional Climate Compact

Regional Greenhouse Gas Emissions Inventory  
Baseline Period: 2005 - 2009

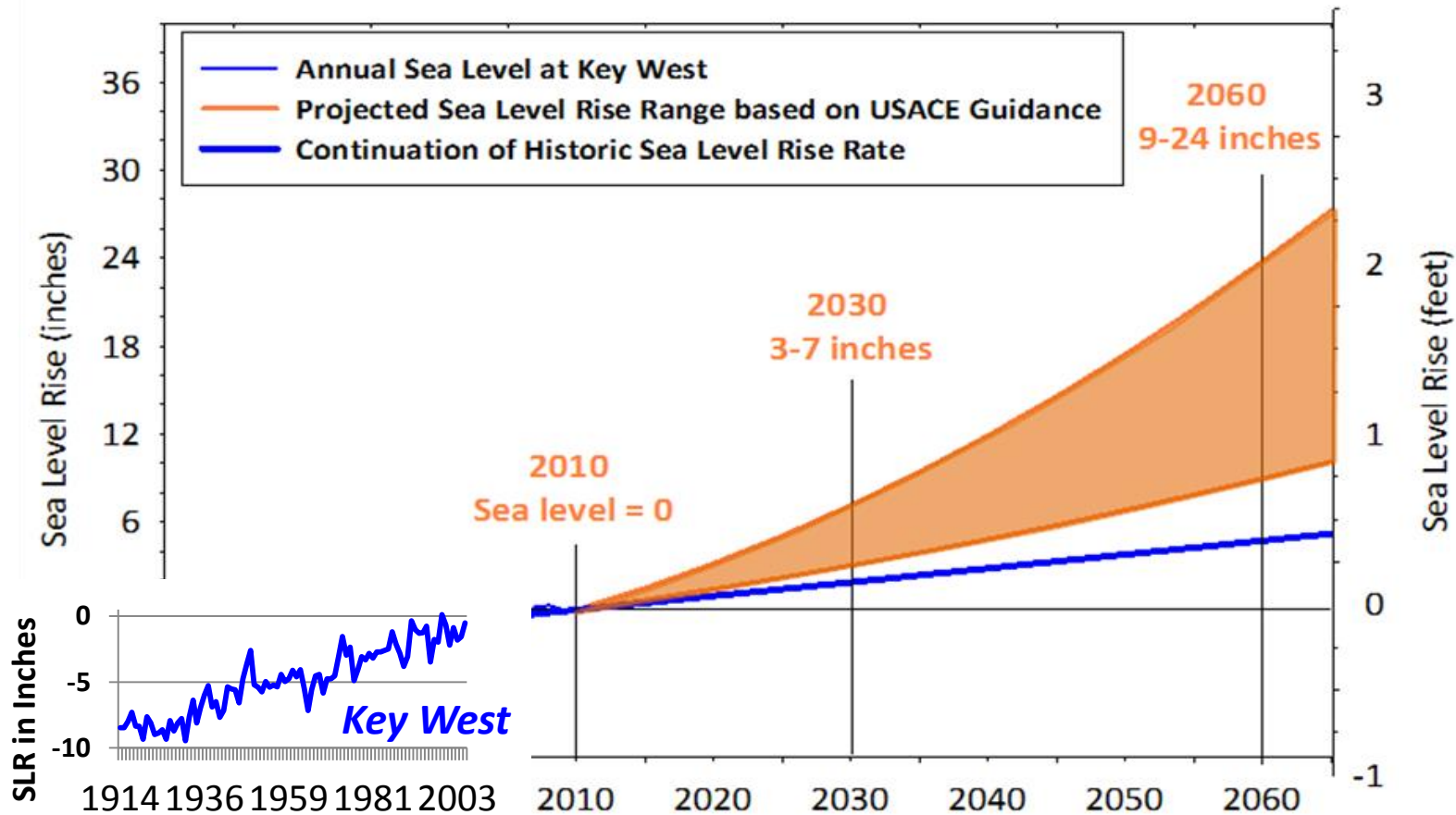


Produced by the Regional Compact  
GHG Inventory Working Group

November 2011



# Unified Sea Level Rise Projection





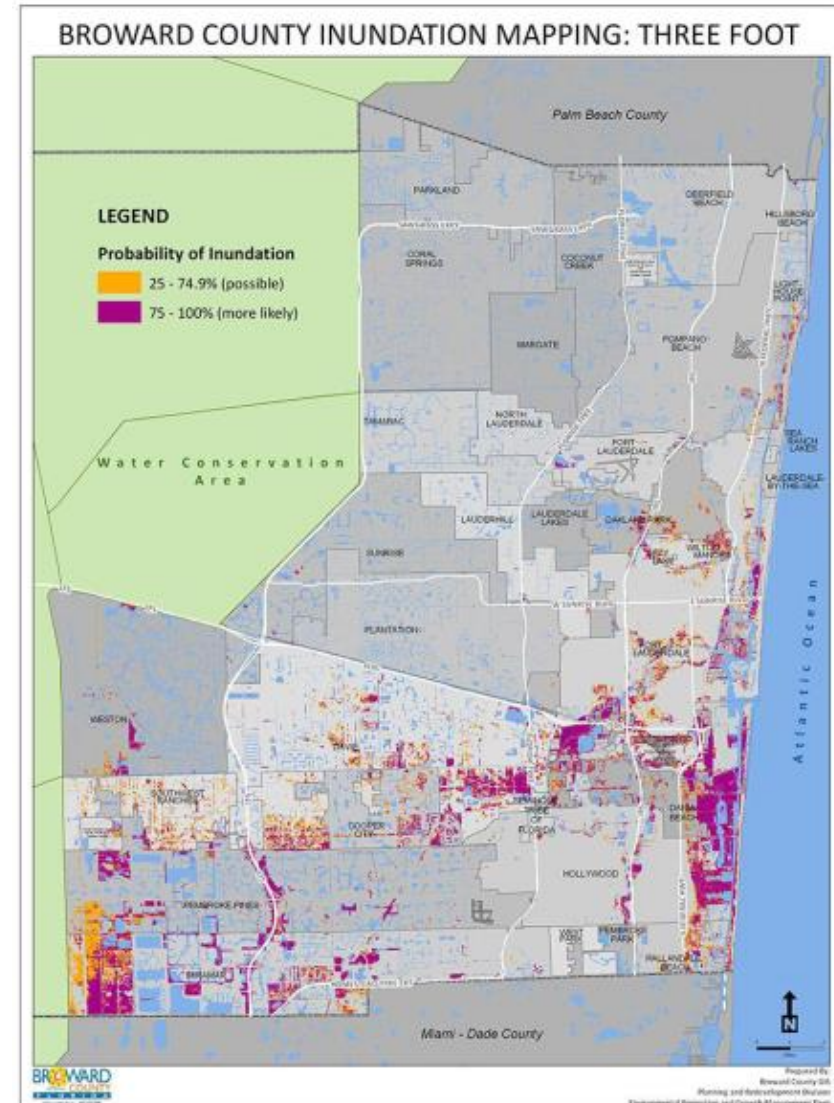
# Vulnerability Assessments

- **Inundation Mapping**

- Regional digital elevation model
- 1, 2, and 3 foot scenarios
- Common method to express potential risk

- **Vulnerability Analysis**

- Prioritized infrastructure for analysis
- Included uncertainty





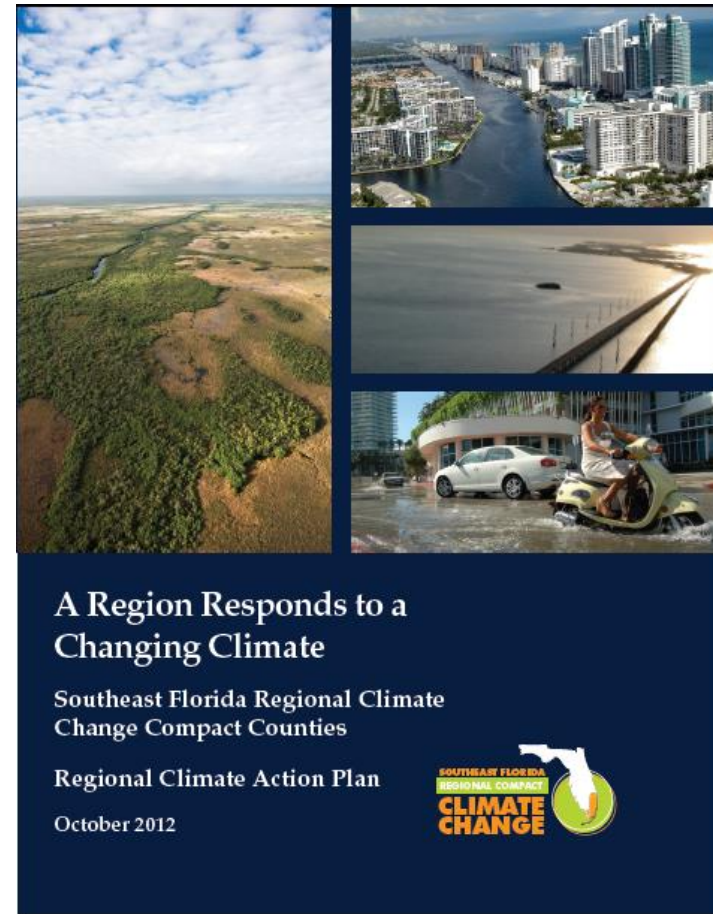
# Economic Assessment

Taxable Value of Property						
	Monroe		Broward		Palm Beach	
1 foot	\$	2,763,294,786	\$	403,069,831	\$	396,618,089
2 foot	\$	8,388,138,219	\$	1,751,104,870	\$	1,251,877,561
3 foot	\$	15,087,755,147	\$	6,900,509,868	\$	3,559,471,158



# SE Florida Regional Climate Change Action Plan

- Completed October 2012
- Adopted Spring 2014
- Reflects contributions of 135+ Work Group members
- Details 110 recommendations across 7 planning areas
- Implementation across the region



Download at [www.southeastfloridacclimatecompact.org](http://www.southeastfloridacclimatecompact.org)

# Action Strategies

- Focal areas:
  - Sustainable Communities and Transportation Planning
  - Water Supply, Management, and Infrastructure
  - Natural Systems
  - Agriculture
  - Energy and Fuel
  - Risk Reduction and Emergency Management
  - Outreach and Public Policy

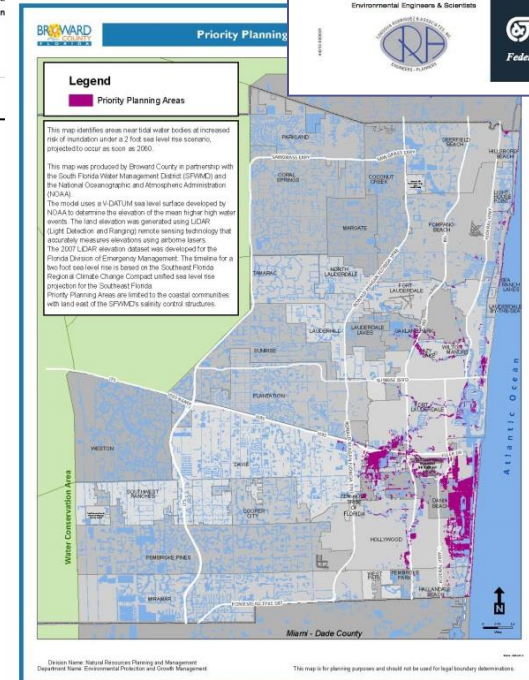
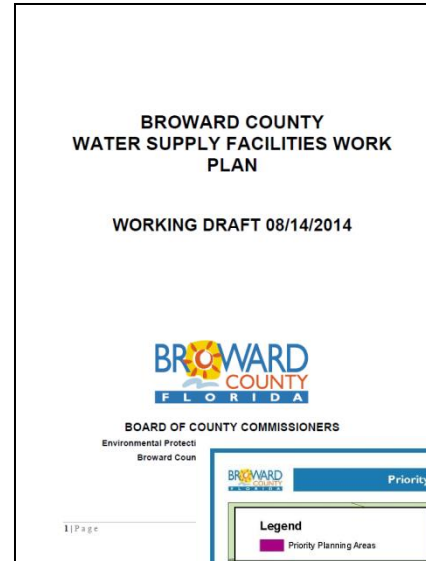


# Broward projects & Regional efforts



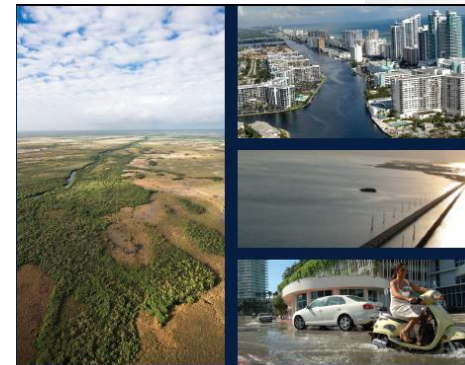
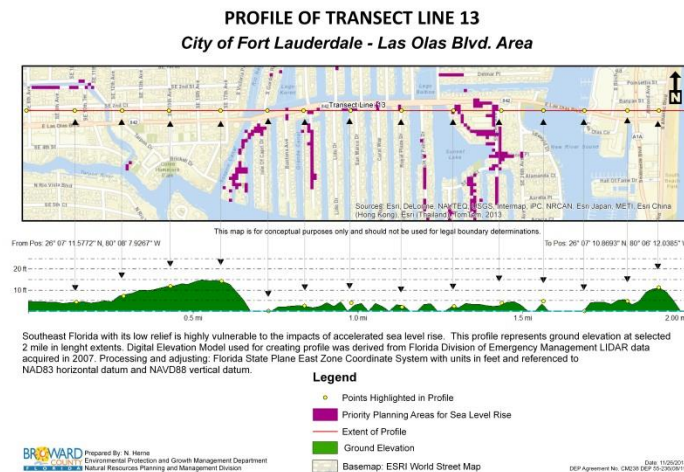
# Progressive Planning

- Integration of Climate Change Across Planning Processes
  - Comprehensive Plan
  - Land Use Plan
    - Mapping of areas at risk of sea level rise
  - 10-Year Water Supply Plan
  - Local Mitigation Strategy
  - Capital Budget Process



# Resilient Communities Project

- Outreach to 13 coastal municipalities
- Development of individual assessments (maps, elevations, infrastructure)
- Delivery of policy and planning resources

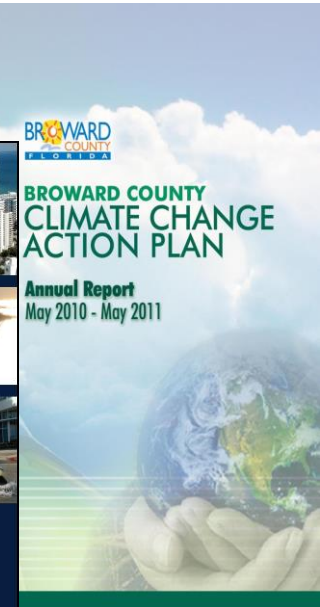


## A Region Responds to a Changing Climate

Southeast Florida Regional Climate Change Compact Counties

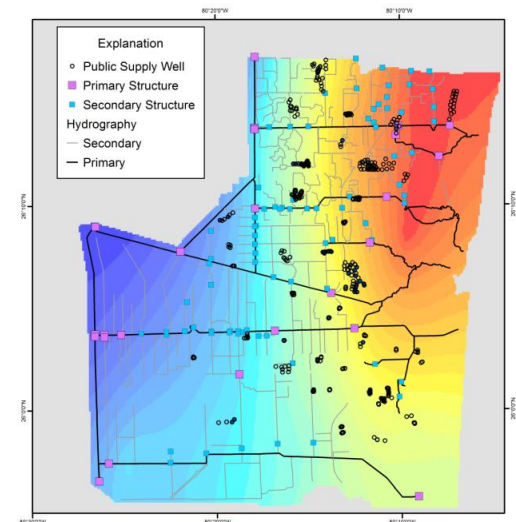
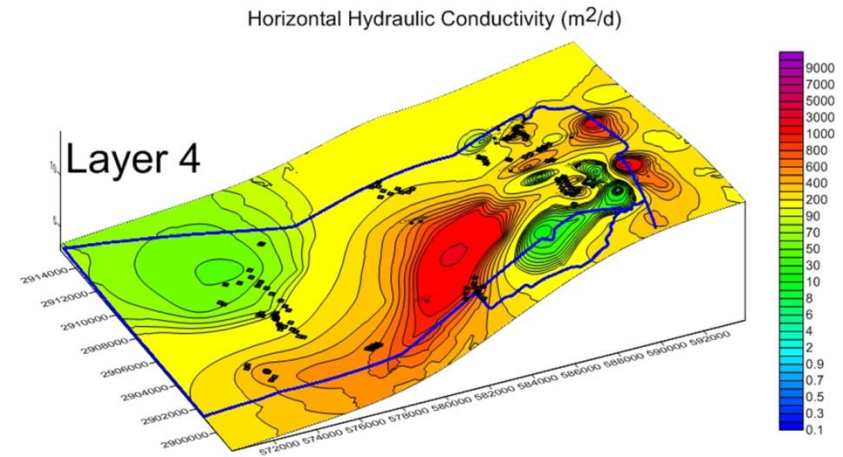
Regional Climate Action Plan

October 2012

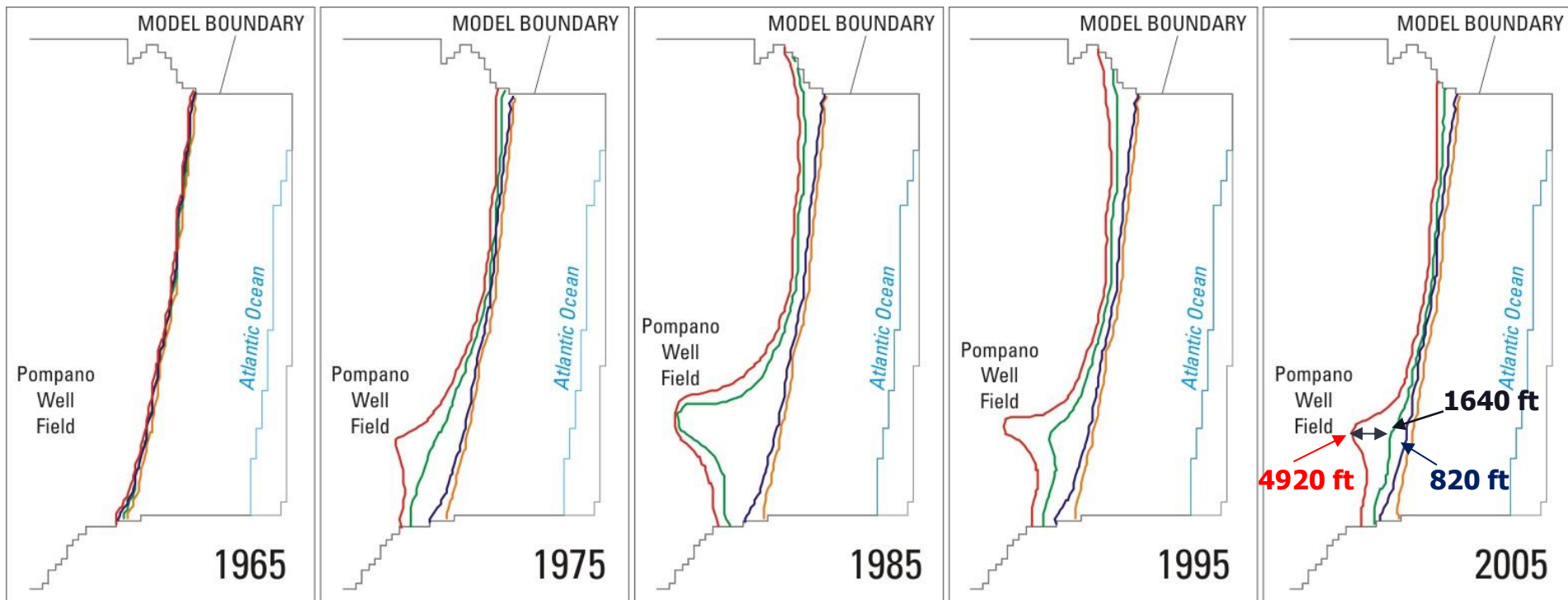


# Hydrologic Modeling

- Integrated models
  - Sea level rise
  - Storm events
  - Extreme tides
- Analysis of impacts
  - Flooding and water supply
- Testing of adaptation strategies
- Update standards



# Broward North County Variable Density Model

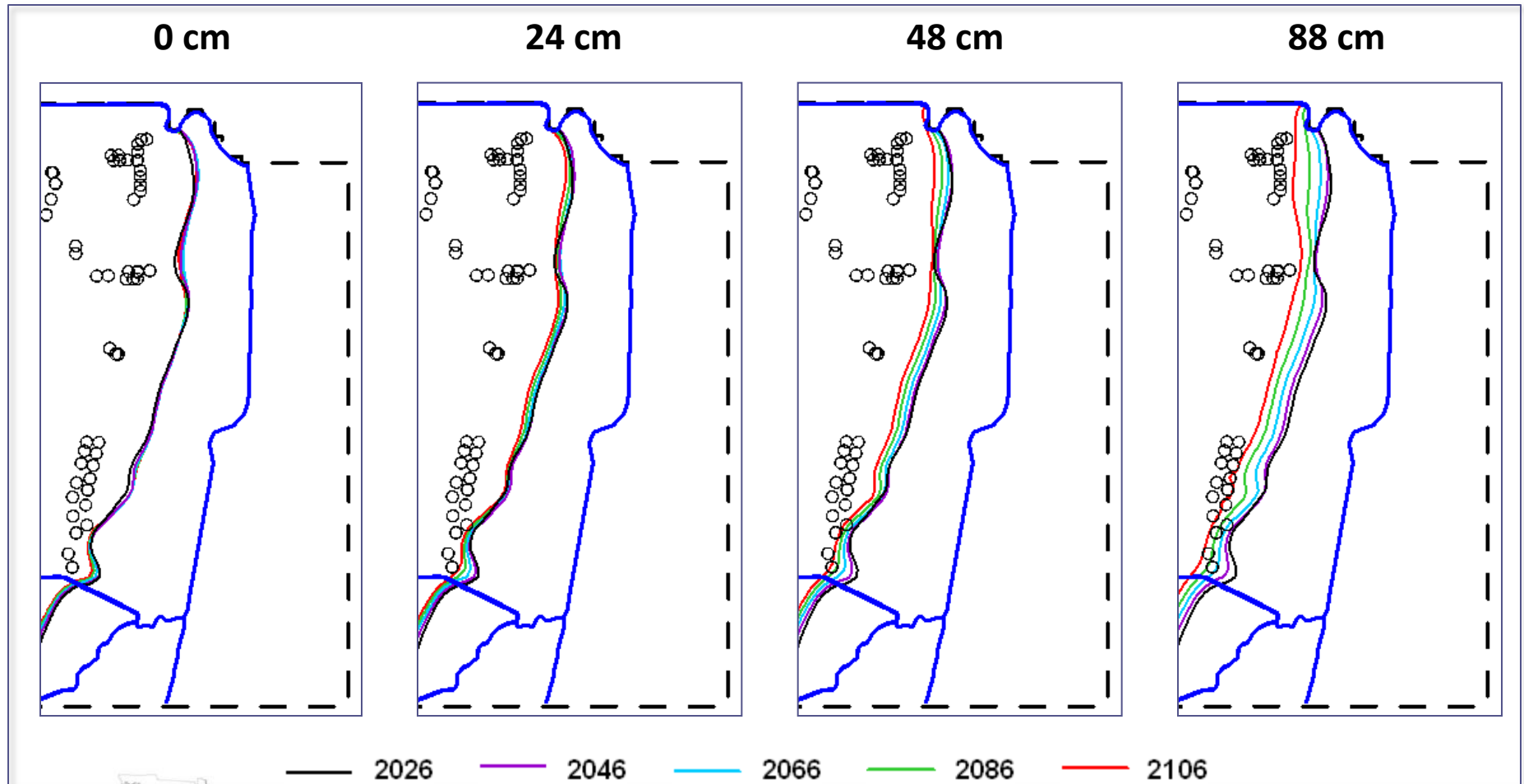


## EXPLANATION

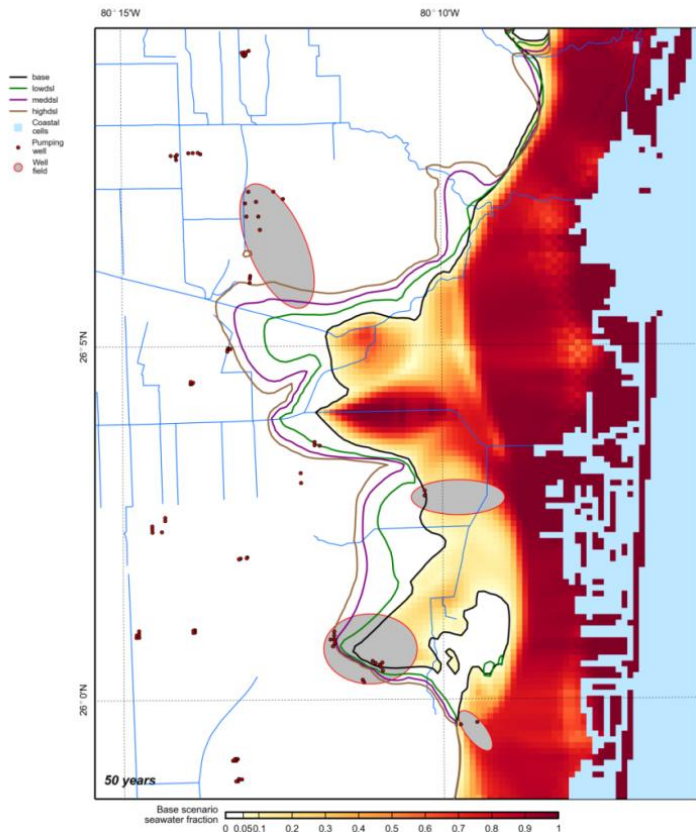
- Base historical
- No sea level
- No withdrawals
- No sea level rise and no withdrawals



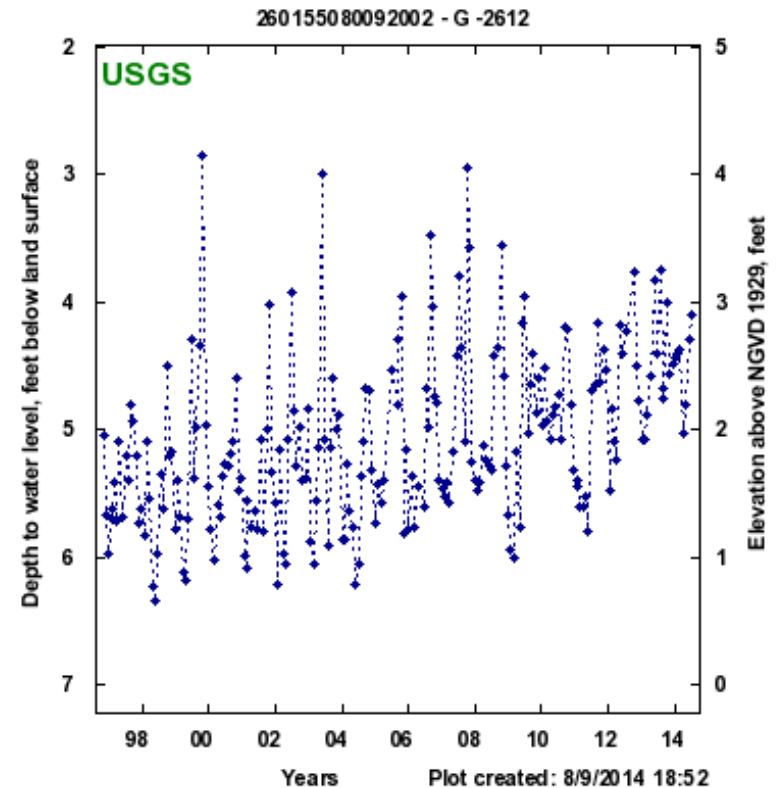
# Movement of 250 mg/L Salt Front with Varying Sea Level Rise Estimates



# South County Trends and Predictions



R  
E  
S  
U  
L  
T  
S  
  
C  
I  
T  
E  
  
P  
R  
O  
V  
I  
S  
I  
O  
N  
A  
L  
  
N  
O  
T



20 year trend  
> 1 ft increase

# Water Resources and Infrastructure



Proposed C-51 Reservoir:

- Flood management
- Alternative water supply
- Reduced freshwater discharges
- Saltwater abatement





# Beach Management

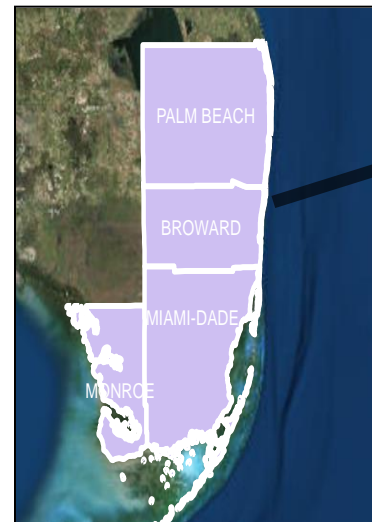
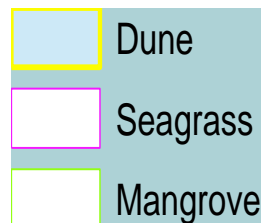
- New strategy for future projects
  - Smaller, targeted, truck haul projects
- Planned sand bypass at Port Everglades
- Prominent use of dunes, regionally and locally





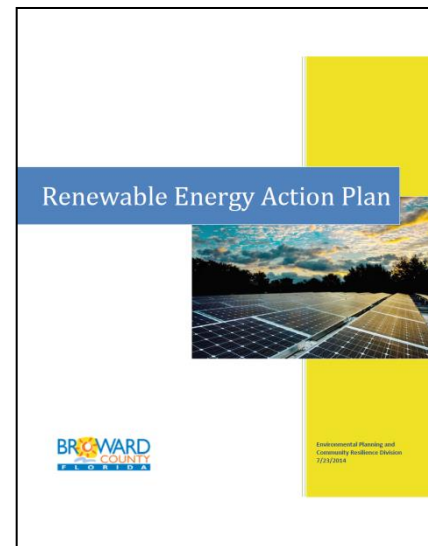
# Shoreline Resilience Work Group

- Coordinate “living shorelines” as part of local and regional planning efforts
- Supported by The Nature Conservancy
- Participants include cities and counties
- Map existing features
- Identify and prioritize projects for future investments



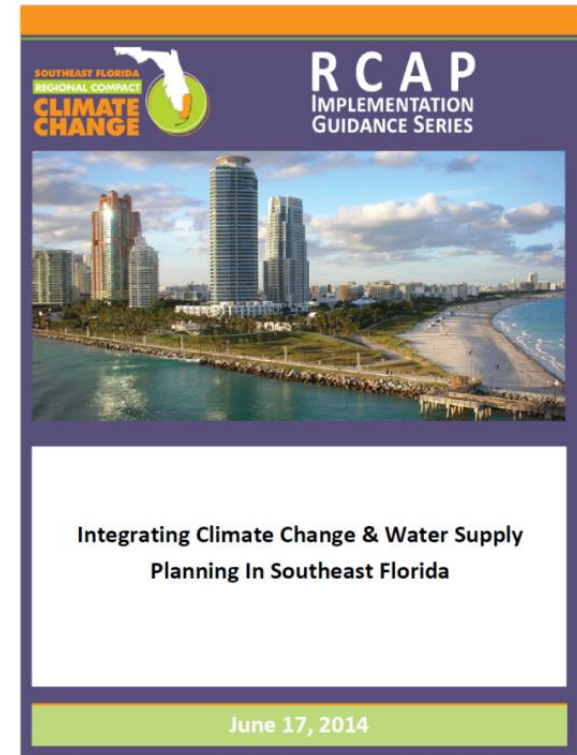
# Mitigation Activities

- 20% renewable energy goal
- Renewable Energy Action Plan
- Plans for county-wide PACE program
- Florida Go Solar Project
  - Permitting
  - Design
  - Financing
- Community Energy Strategic Plan



# Regional Convenings

- Community Solar
- Comprehensive Planning
- Water Supply and Climate
- Adaptation Action Areas
- Work Groups
  - Shoreline Resilience
  - Sea Level Rise
  - Climate Indicators



# South Florida Resilient Redesign

- Compact convening focused on integration of resilient design concepts in the urban landscape
- Analysis of three model sites with objective to develop transferable design solutions for landscapes common to south Florida
  - Dense urban- Miami Beach
  - Urban/commercial – Dania Beach
  - Suburban – Unincorporated Miami-Dade



# Policy Advancements

- Annual Summits
- Annual Development of Joint Legislative Programs
- Resolutions and Advocacy
- Joint Delegation Meetings
- Successful Legislative Amendment



# Benefits of Regional Process and the Compact

- Expanded access to resources
- Enhanced capacity as a region
- Accelerated planning
- Better leveraging of resources
- Improved communications
- Credibility
- Momentum

# Questions?

Jennifer L. Jurado, Director  
Environmental Planning and Community Resilience  
Broward County  
[jjurado@broward.org](mailto:jjurado@broward.org)

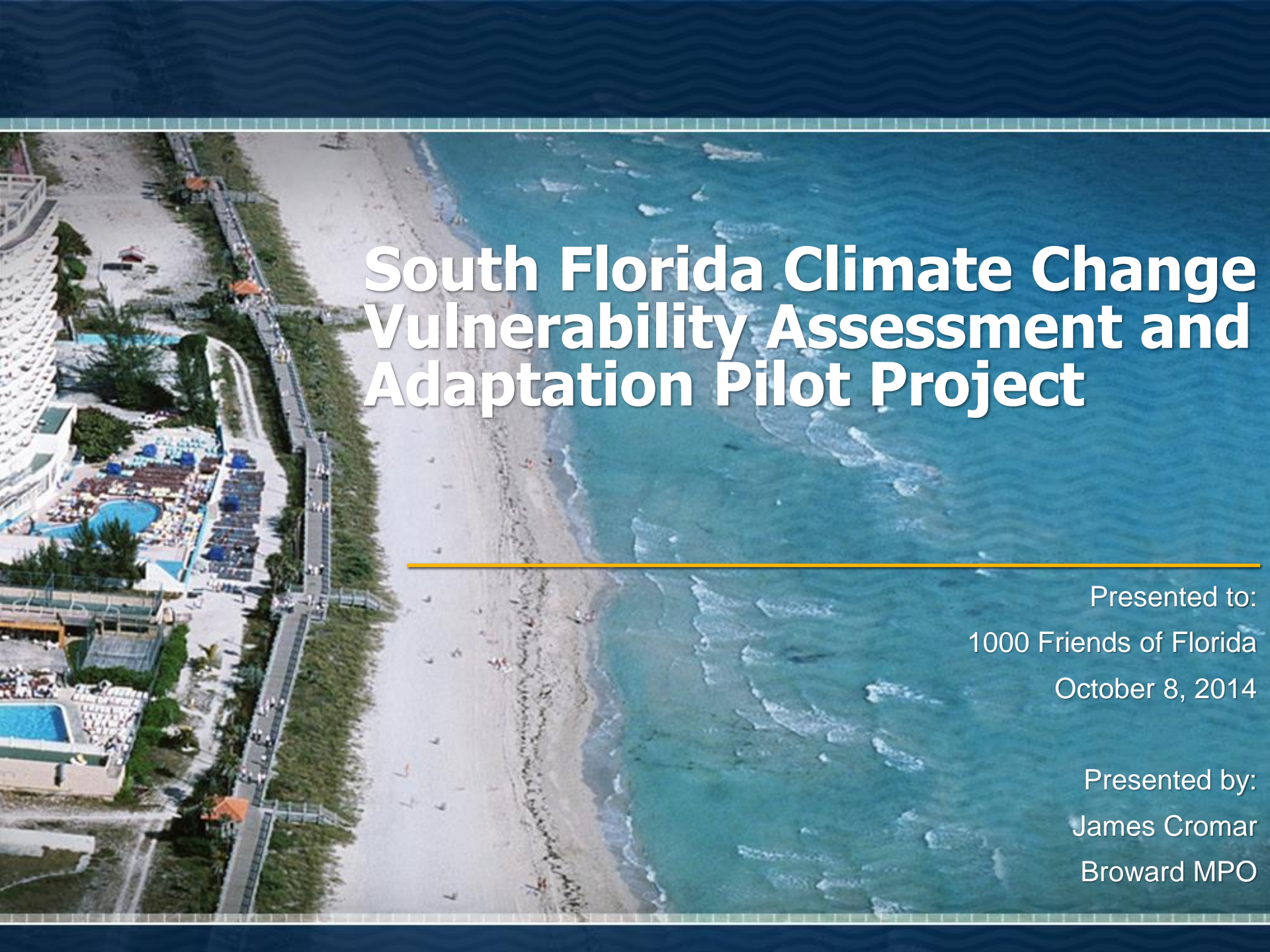
<http://southeastfloridacclimatecompact.org>

# The Federal Highway Administration's Climate Resiliency Project

*James Cromar,  
Broward County Metropolitan Planning Organization*





An aerial photograph of a coastal resort area. On the left, there are several swimming pools, lounge chairs, and a multi-story building. A paved walkway runs along the beach. The beach is sandy and populated with people. The ocean is a vibrant blue with white waves breaking onto the shore. The title text is overlaid on the right side of the image.

# South Florida Climate Change Vulnerability Assessment and Adaptation Pilot Project

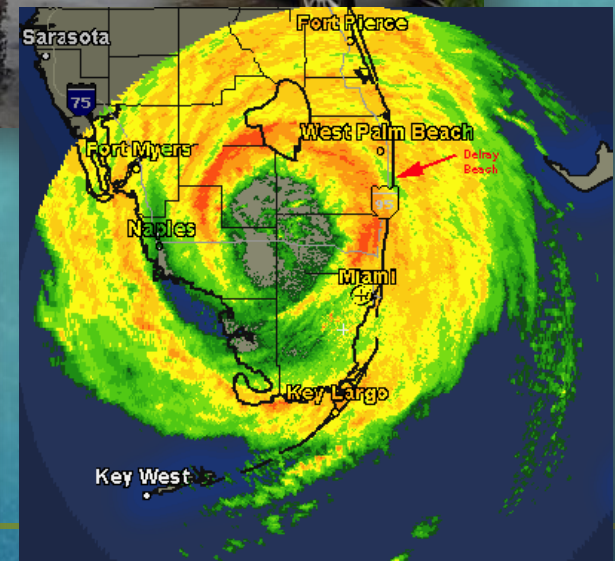
---

Presented to:  
1000 Friends of Florida  
October 8, 2014

Presented by:  
James Cromar  
Broward MPO



# Early Warning Signs



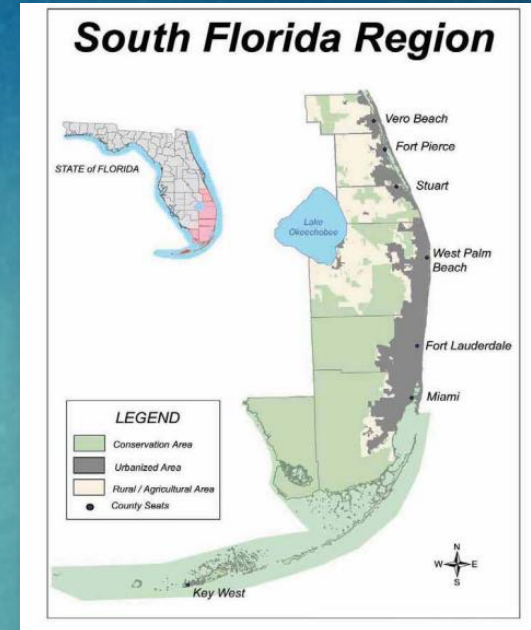


# Climate Stressors

- ❖ Sea level rise (SLR)
- ❖ Storm surge and related inundation
- ❖ Heavy precipitation and related flooding  
(including impacts from SLR – groundwater interactions)



# Regional Coordination



Monroe County

Southeast Florida Regional Climate Change Compact (Compact)

South Florida Regional Transportation Authority (SFRTA)

South Florida Regional Planning Council (SFRPC)

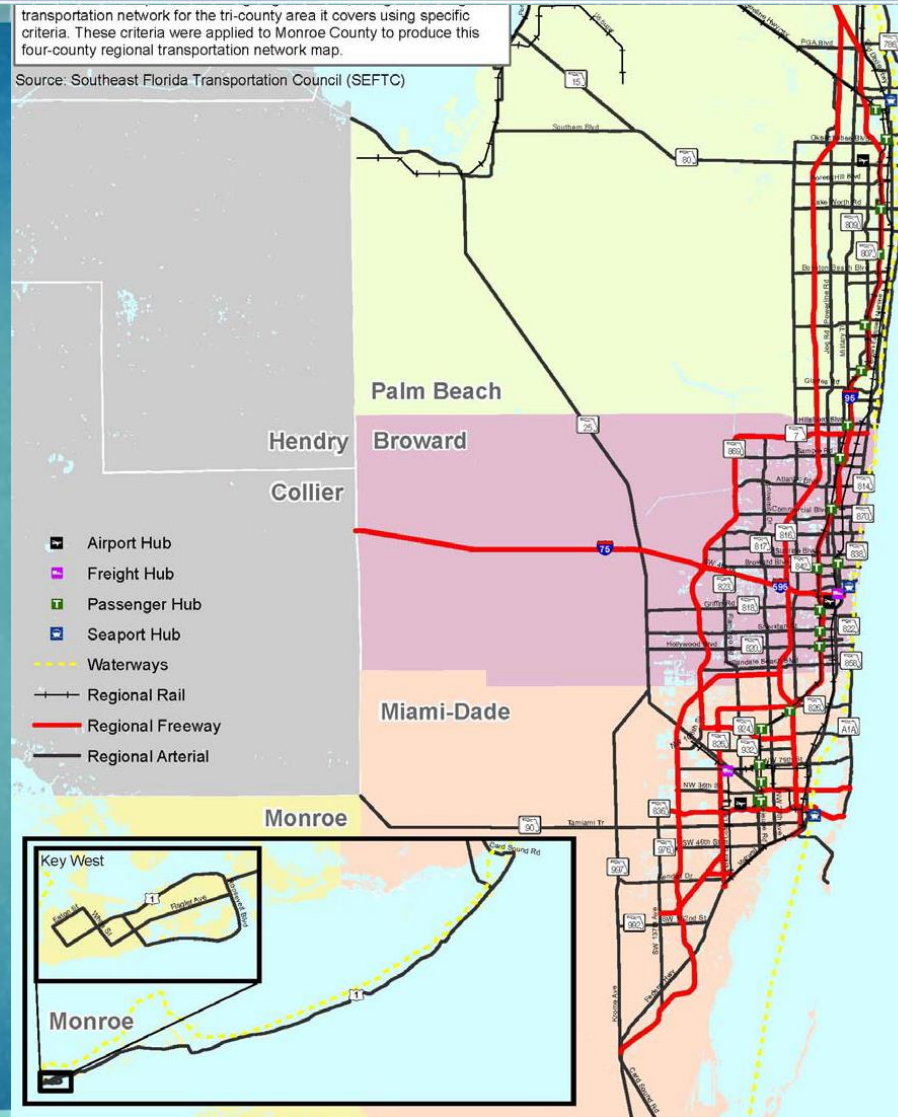
Treasure Coast Regional Planning Council (TCRPC)

Florida Department of Transportation District IV/District VI



# Study Area

- ❖ Palm Beach County
  - ❖ Broward County
  - ❖ Miami-Dade County
  - ❖ Monroe County
- ❖ Focus on regional transportation network



# Goals

- ❖ Build upon existing vulnerability assessments.
- ❖ Minimize impacts of extreme climate events and Sea Level Rise (SLR) on regional transportation network.
- ❖ Develop tools that integrate climate change adaptation goals into the transportation decision making process.
- ❖ Prepare a climate change adaptation model for other public transportation agencies.

# Overall Approach

Inventory and exposure  
assessment



Examine adaptive capacity



Assess risk



Integrate into decision  
making



# Task 1: Inventorying Exposed Assets

- ❖ Goal: Inventory/map assets exposed to key climate stressors
- ❖ Sea level rise, options.....
  - Compact methodology and results
  - FDOT/U of F Geoplan tool
  - ClimateCentral tool
- ❖ Precipitation and surge induced flooding
  - Overlay current FEMA floodplains
- ❖ Exposed assets carried forward into Task 2



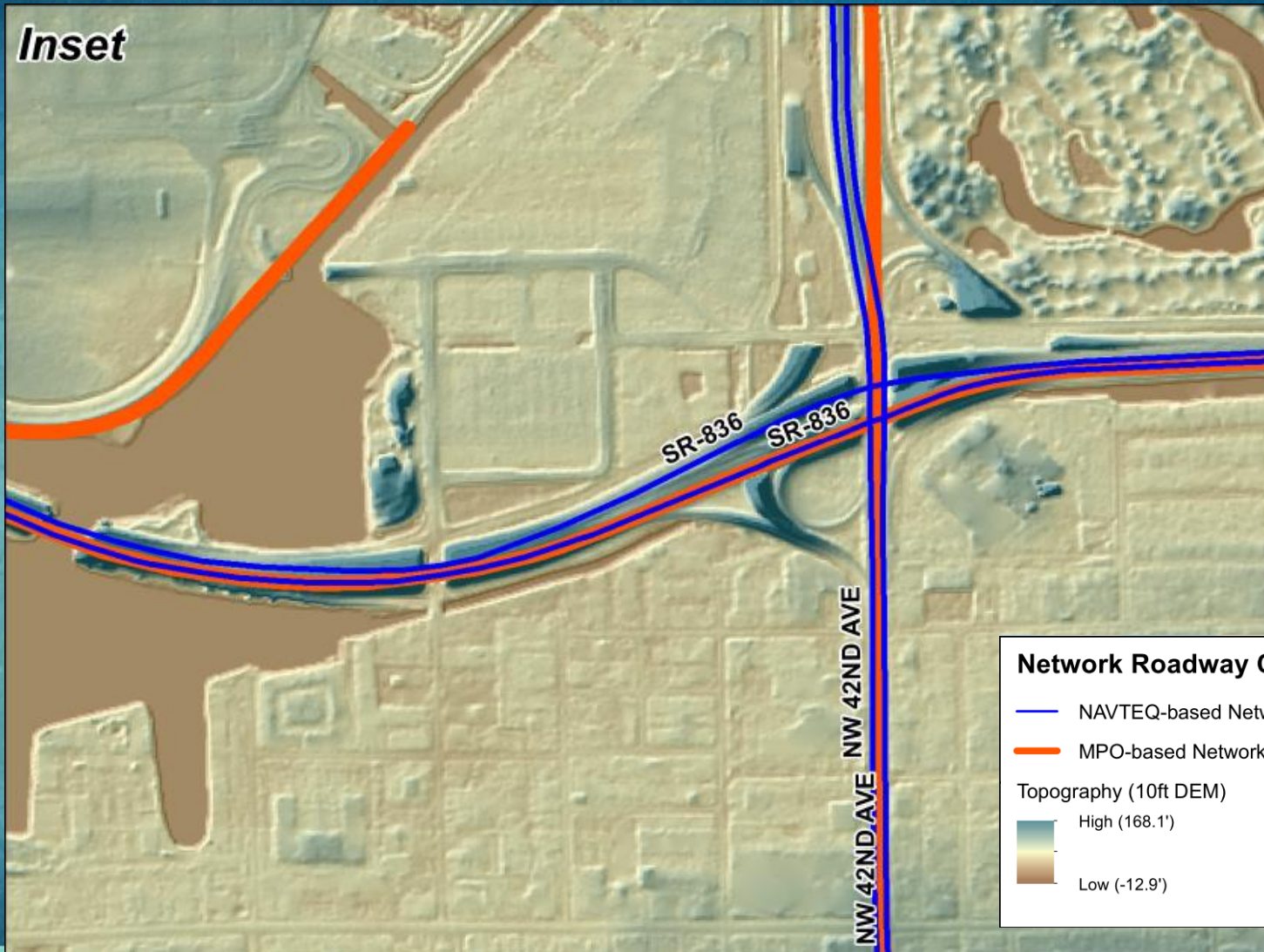
# Data Collection Efforts to Date

Name/Type	Data Collected	Accuracy	Source
LiDAR Derived Elevation Contours and DEM	DEM-FLiDAR Mosaic	5-meter mosaic for the entire Florida state	FGDL
	DEM's	10-ft DEM's available for all 4 counties	SFWMD
	Elevation Contours-FDEM	2-ft Contours available for all 4 counties	FGDL
NED	NED 1/9th Arc Second Data	1/9 arc second available for Miami Dade, Broward, Palm Beach and Monroe County Coast	USGS
FEMA	Flood Zone Maps for Miami Dade and Monroe		FEMA-NFHL
	Official & Preliminary Flood Zone Maps for Broward County		Broward County GIS
	Official & Preliminary Flood Zone Maps for Palm Beach County		Palm Beach County & FEMA

# Data Collection Efforts to Date, cont'd

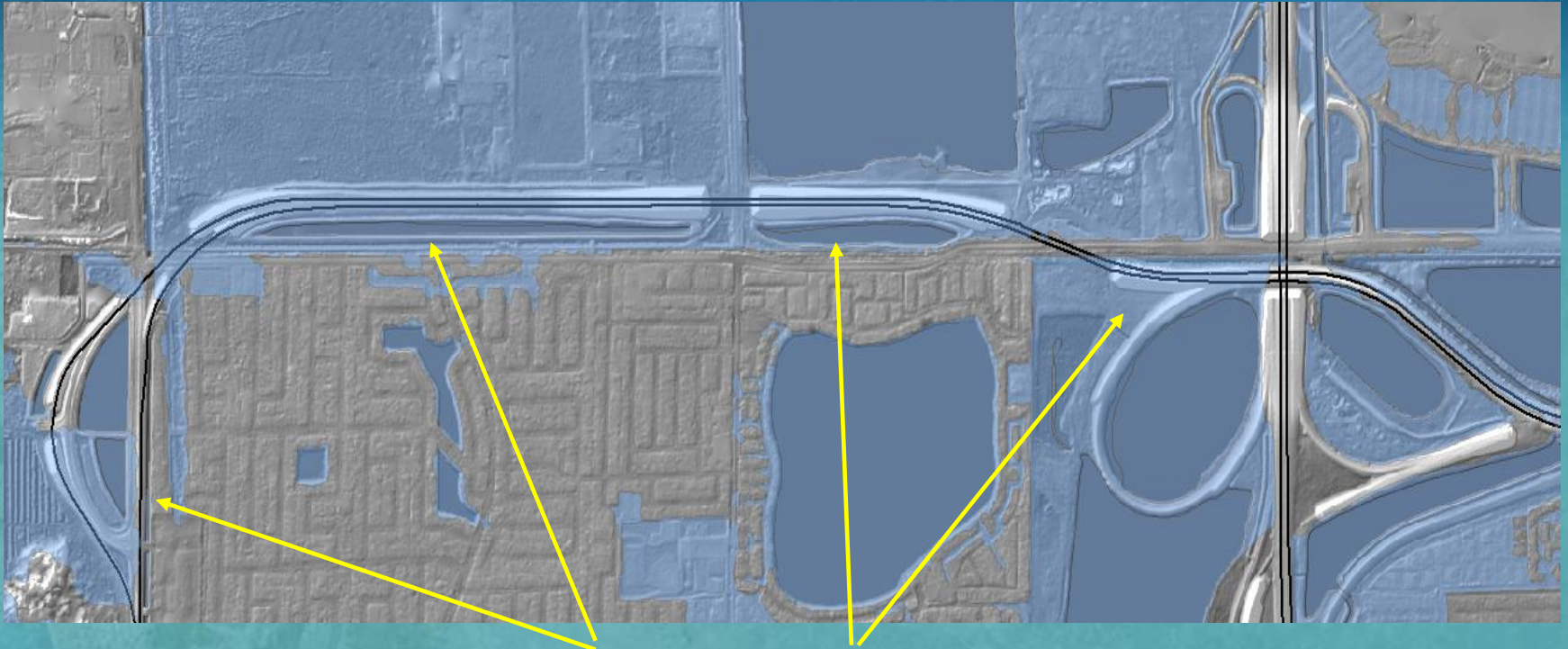
Name/Type	Data Collected	Accuracy	Source
LiDAR Derived Elevation Contours and DEM	DEM-FLiDAR Mosaic	5-meter mosaic for the entire Florida state	FGDL
FDOT-UFL-Geoplan Tool	Inundation Surfaces		UFL-Geoplan Website
	Affected Infrastructure		UFL-Geoplan Website
Transportation Network	Transportation Data		FDOT-GIS
SLR Scenarios based on NOAA Tidal Surface information	1ft, 2ft, 3ft SLR for Miami Dade, Broward, Monroe County's		Broward County GIS

# Network Irregularities





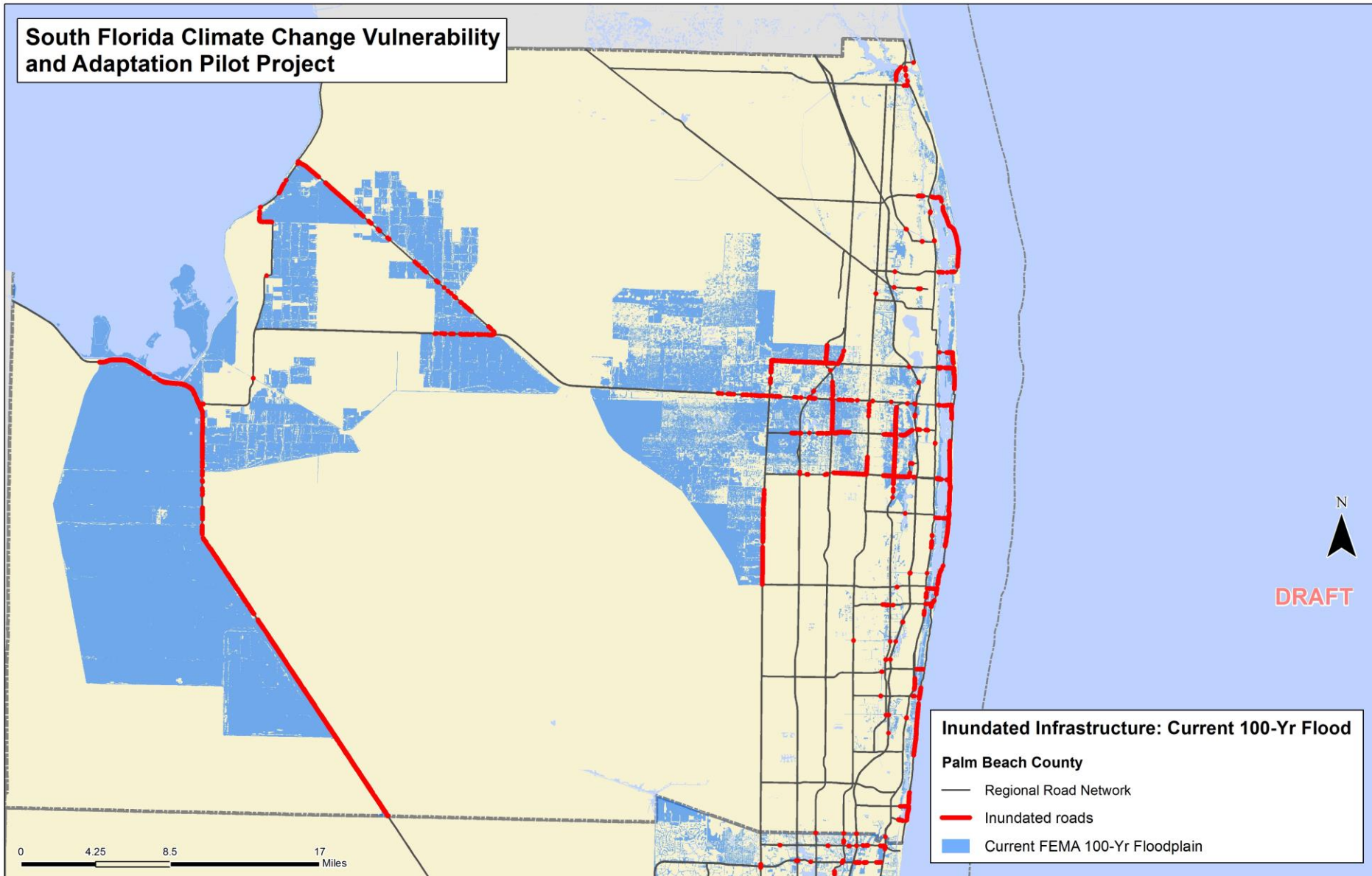
# FEMA Data Example



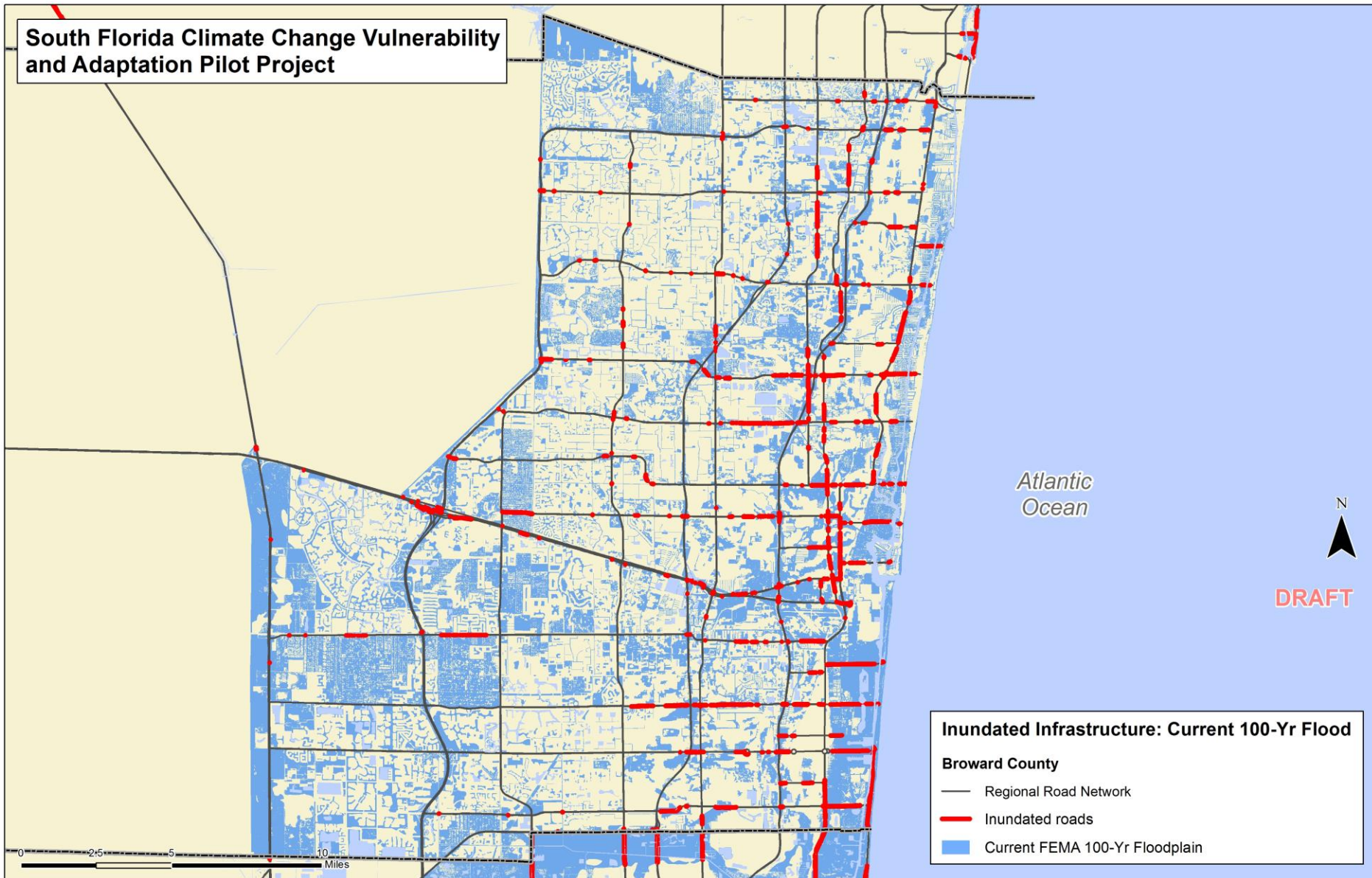
False inundation examples  
(road on embankment)



## South Florida Climate Change Vulnerability and Adaptation Pilot Project

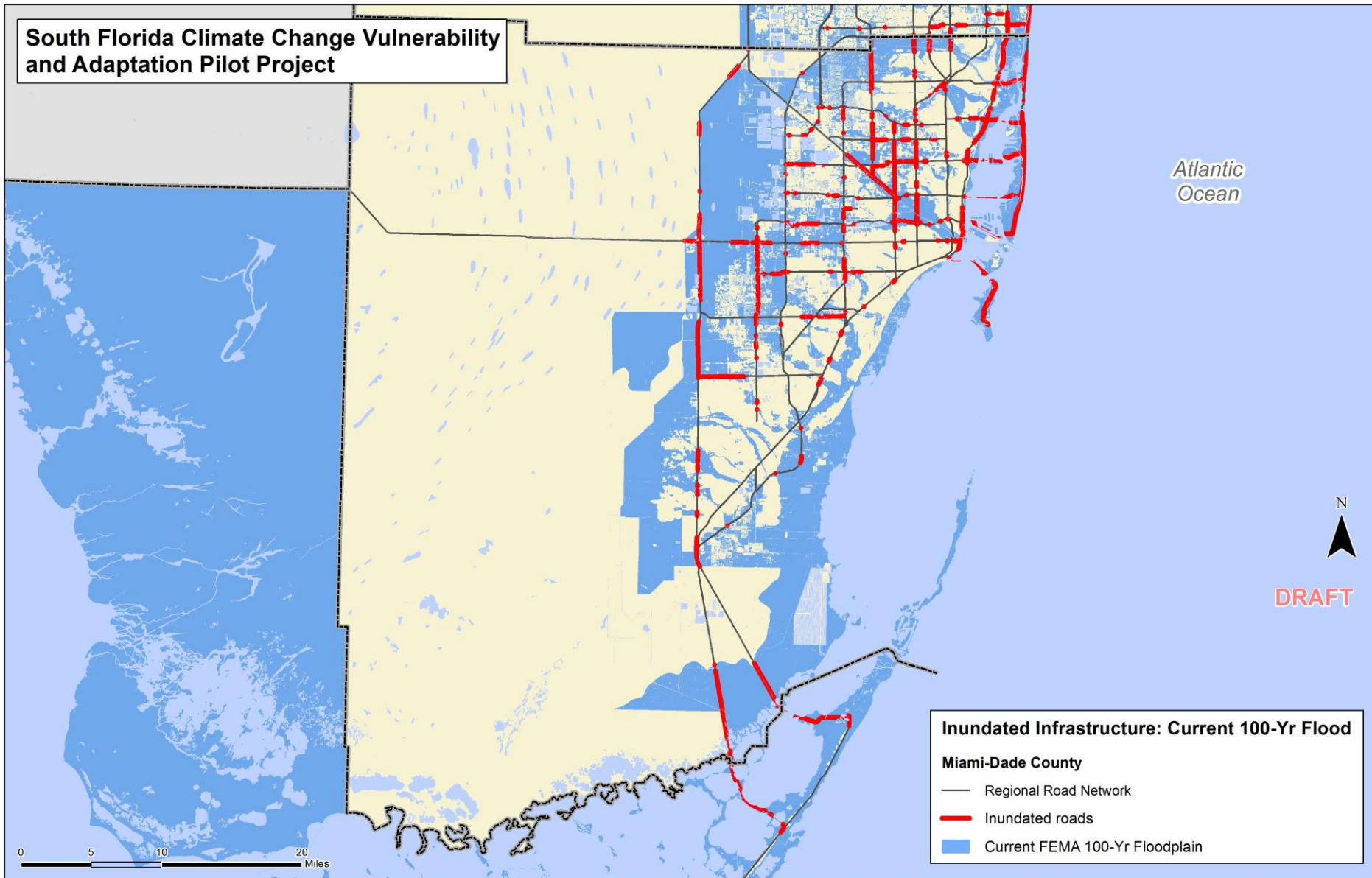


# South Florida Climate Change Vulnerability and Adaptation Pilot Project





# South Florida Climate Change Vulnerability and Adaptation Pilot Project

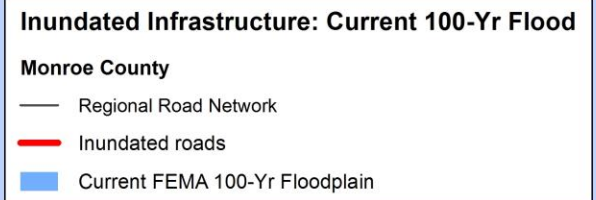


# South Florida Climate Change Vulnerability and Adaptation Pilot Project

Gulf of Mexico

Atlantic Ocean

DRAFT



0 5 10 20 Miles



# FEMA 100-Yr Storm Impacts

## ❖ Percent of regional network inundated by current 100-yr storm

- Palm Beach County: 10.7%
- Broward County: 9.3%
- Miami-Dade County: 21.0%
- Monroe County: 57.0%

# Additional Risk Elements

- ❖ **Sea Level Rise**
  - 1,3 and 5 foot increments
- ❖ **Storm Surge**
  - Following GeoPlan methodology
- ❖ **Inland Flooding**
  - Development of Index based on USGS input



# Task 2: Considering Adaptive Capacity

- ❖ Goal: Develop and apply an adaptive capacity index to the exposed assets
- ❖ Focus on road & passenger transit/rail assets
- ❖ Two components of the adaptive capacity index
  1. Loss of service / detour impacts
    - Added travel time
    - Cost to users
    - No SLR flooded routes to be used as detours
  2. Service restoration time
    - Estimate from historical experience
    - Multiplier to the user costs



# Task 3: Assessing Risk

**Goal: Develop a vulnerability ranking score for each asset to determine adaptation priorities**

❖ **Three components of vulnerability scores:**

1. Exposure: Degree to which a transportation facility is subject to adverse climate changes
2. Sensitivity: Capacity of an asset to deal with changes in a climate stressor
3. Adaptive capacity: Ability of the transportation network to deal with the loss of an impacted asset



# Task 3: Assessing Risk

## Identify Assets of Interest



Regional road network



Tri Rail network

## Calculate the Vulnerability Scores for Each Asset

### Exposure

- % of segment inundated by SLR (1, 2, & 3 Ft.)
- % of segment inundated by 100-yr surge (current, +1, +2, & +3 Ft. SLR)
- Inland flooding index (current, +1, +2, & +3 Ft. SLR)
  - Groundwater table depth
  - SLR impact distance-decay factor
  - Elevation & distance relative to FEMA 100-yr precip floodplain
- Location in VE zone
- Previous flooding issues

### Sensitivity

- Pavement condition rating (weighted average by segment) (roads)
- Bridge condition index
- Number of bridges per segment
- Scour rating (roads)
- Substructure condition rating (roads)

### Adaptive Capacity

- Average annual daily traffic (roads)
- Heavy commercial average daily traffic (roads)
- Bus ridership on segment (roads)
- Tri-Rail ridership on segment (rail)
- Detour length (roads)
- Maximum volume / capacity ratio on detour route (roads)

## Rank Flood Vulnerabilities by County

# Task 4: Integrating into Decision Making

- ❖ **Transportation Planning and Prioritization**
- ❖ **Rehabilitation or Reconstruction of Existing Facility in High Risk Areas**
- ❖ **New Facility on New ROW in High Risk Areas**
- ❖ **Operations**
- ❖ **Maintenance**





# DRAFT Strategy Options

## ❖ Transportation Planning and Prioritization

- Develop goal statement relating to climate change that can be used as part of the transportation planning process
- Identify Climate change-related prioritization criteria that can be used as part of the project priority/programming process
- Apply Tools that can be used to identify and assess climate change-related impacts



# DRAFT Strategy Options

## ❖ Rehabilitation or Reconstruction of Existing Facility in High Risk Areas

- Consider new road and transit design approaches and standards to minimize potential disruption due to extreme weather events (e.g., profile elevation)
- Near coastal areas and over longer term, consider sea level rise as a “given” in design of coastal facilities.
- Redesign drainage systems to handle larger flows.

# DRAFT Strategy Options

## ❖ Rehabilitation or Reconstruction of Existing Facility in High Risk Areas

- Harden or armor key infrastructure components (e.g., embankments or bridge piers) against additional extreme weather-related stresses.
- Incorporate “early warning indicators” for potential extreme weather-related risks into asset and maintenance management systems.



# DRAFT Strategy Options

- ❖ **New Facility on New ROW in High Risk Areas**
  - Apply design criteria - but in addition if possible, consider realignments or relocation away from high risk areas.



# DRAFT Strategy Options

## ❖ Operations

- Identify pre-planned detour routes around critical facilities whose disruption or failure would cause major network degradation.
- Although Florida already has well-tested emergency response action plans, in light of the results of this study, coordinate with FDOT and emergency responders to identify potential strategies for dealing with the identified risks.

# DRAFT Strategy Options

## ❖ Maintenance

- Avoid significant disruptions and maintenance demands by “hardening” such items as sign structures and traffic signal wires.
- Keep culverts and drainage structures debris free and maintained to handle flows.



# Process / Work Products

- ✓ Assess Inventory
- ✓ Determine Adaptive Capacity
- ✗ Assessing Risk from Climate Events
- Integrating Vulnerability in Decision Making: Sept-Dec
- Final Report: January 2015



# Responding to Change . . .



# THANK YOU!

---

**Broward Metropolitan Planning Organization**

James Cromar

Director of Planning

954-876-0038

[cromarj@browardMPO.org](mailto:cromarj@browardMPO.org)

[www.browardMPO.org](http://www.browardMPO.org)

# Adaptation through the Community Resilience Initiative

*Julie A. Dennis*  
*Division of Community Development,*  
*Florida Department of Economic Opportunity*







FLORIDA  
DEPARTMENT *of*  
ECONOMIC  
OPPORTUNITY

# Adaptation through the Community Resiliency Initiative

Julie A. Dennis  
Division of Community Development



# Adaptation Action Areas

## Section 163.3164(1), Florida Statutes

*“Adaptation action area” or “adaptation area” means a designation in the coastal management element of a local government's comprehensive plan which identifies one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning.*



# Adaptation Action Area

## Section 163.3177(6)(g)(10), Florida Statutes

*At the option of the local government, develop an adaptation action area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an adaptation action area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise. Criteria for the adaptation action area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean higher high water, which have an hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge*





# Project of Special Merit

- Implementing “Adaptation Action Area” Policies in Florida
- Partnership with City of Ft. Lauderdale, Broward County, South Florida Regional Planning Council and Southeast Florida Regional Climate Compact.
- Address AAA in City of Ft. Lauderdale Local Comprehensive Plan.
- Create guidance for statewide dissemination.





FLORIDA  
DEPARTMENT *of*  
ECONOMIC  
OPPORTUNITY

Julie A. Dennis

Julie.Dennis@deo.myflorida.com

(850) 717-8478

[www.floridajobs.org/adaptationplanning](http://www.floridajobs.org/adaptationplanning)



# Adaptation Action Area Planning: the Fort Lauderdale Journey

*By Susanne M. Torriente, Assistant City Manager  
Jim Koeth, Principal Environmental Strategist*








CITY OF FORT LAUDERDALE



An aerial photograph of Fort Lauderdale, Florida, showing the city skyline across a body of water. The sky is filled with large, white clouds illuminated by the setting or rising sun, creating a warm, golden glow. In the foreground, there are residential buildings and a large white boat on the water. The overall scene is a mix of urban development and natural beauty.

# **1000 FRIENDS OF FLORIDA WEBINAR**

## **Planning for Climate Change at the Municipal Level**

### **ADAPTATION ACTION AREA PLANNING**

#### **The Fort Lauderdale Journey**

**SUSANNE M. TORRIENTE, ASSISTANT CITY MANAGER  
CITY OF FORT LAUDERDALE**

**JIM KOETH, PRINCIPAL ENVIRONMENTAL STRATEGIST  
PUBLIC WORKS - SUSTAINABILITY DIVISION  
CITY OF FORT LAUDERDALE**

**OCTOBER 8, 2014**

# The Fort Lauderdale Journey

- 📺 Timeline
- 📺 Integrating
- 📺 Connecting the Dots
- 📺 Grant Timeline
- 📺 Outreach
- 📺 Draft Language
- 📺 Next Steps





# A snapshot of our City's story

## 2011

Florida State  
Community  
Planning Act

Start of new  
City  
administration

AAA grant  
awarded to  
City

Began Citywide  
Re-organization

## 2012

2012 Regional  
Climate Action  
Plan Adopted

Creation of  
Sustainability Office  
housed in Public  
Works

Began  
Neighborhood  
Surveys

Began Visioning  
Initiative Phase II

## 2013

Vision Plan and  
Strategic Plan  
Adopted

AAA Interlocal  
Agreement signed &  
executed

Began AAA  
Outreach

Outreach to City  
of Fort  
Lauderdale Civic  
Associations

## 2014

AAA Climate  
Adaptation Open  
House outreach

We Are Ready  
Climate Resiliency  
Booth outreach

AAA Reviews and  
Approvals

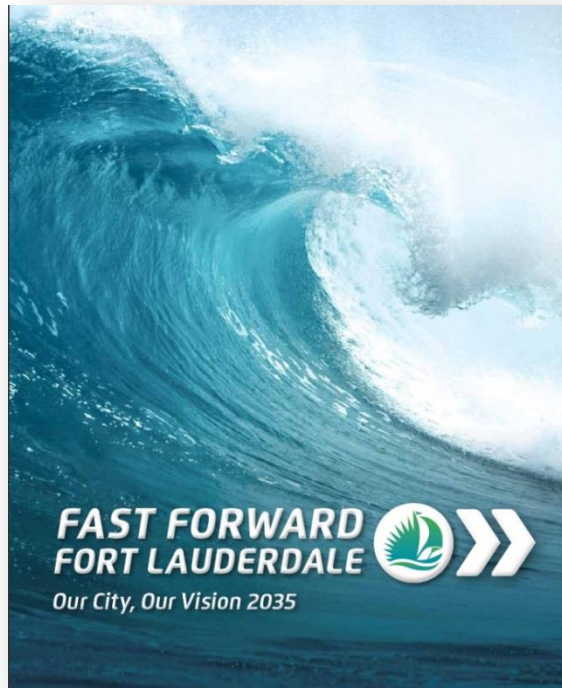
Proposed  
Comprehensive Plan  
AAA Goal Objective  
and Policies



# WE ARE READY

CONNECTING THE DOTS

*We are a resilient and safe coastal community*



## VISION AND STRATEGIC PLAN: CONNECTING THE DOTS



Direct Vision Ideas in the  
Strategic Plan in Progress



66%

2011

2012

2013

2014

# City Strategic Plan



## INFRASTRUCTURE

*GOAL 2: Be a sustainable and resilient community.*

**G2**

**02**

### OBJECTIVE 2:

Reduce flooding and adapt to sea level rise

STRATEGIC INITIATIVES:	LEAD:	PARTNERS:
1. <b>» Incorporate sea level rise and resiliency projections into the Stormwater Management Plan and the Flood Hazard Mitigation Program</b>	PWD	FLFR, BC, Compact, Seven50, SFWMD
2. Implement the Stormwater Management Plan and examine funding rate structures based on vulnerability	PWD	BC, Compact
3. Implement the Flood Hazard Mitigation Program for residents	PWD	CMO-BDGT, DSD, FLFR, BC, FDEM, FEMA
4. Utilize a multi-agency advisory group to evaluate and implement solutions to address flooding concerns	PWD	BC, Consultant
5. Identify potential Adaptation Action Areas (AAA) and develop AAA policies	PWD	DSD, FLFR, T&M, PNZ, CA, DEO, DEP, NOAA, SFRPC
6. Examine and update the Save Our Swales program to include bio-swale options	PWD	Neighbors

**»** Indicates an idea from the Vision Plan. For more information on strategic initiative partners, see [Cylinders of Excellence Community Partners](#).

Adaptation Action Areas are a Strategic Initiative in Press Play



# Neighbor Outreach

Oct 2013	Council of Fort Lauderdale Civic Associations
Jan 2014	Climate Adaptation Open House
Apr 2014	Sustainability Advisory Board
June 2014	Hurricane Expo Climate Resiliency booth



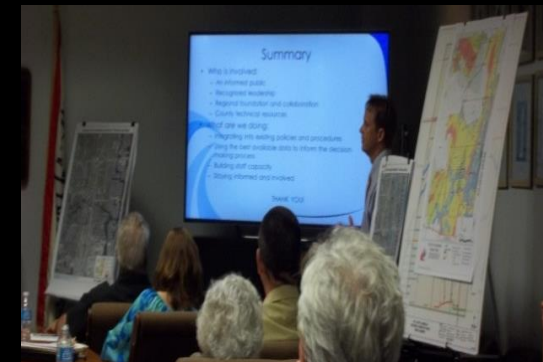
## Review and Approval Process

Jan 2014	Drafting of Policy Language	
Apr 2014	Development Review Committee	No public comment
May 2014	Planning and Zoning Board	Unanimously voted <b>YES</b> ✓ Recommendation to City Commission
June 2014	City Commission	Unanimously voted <b>YES</b> ✓ Transmittal to State

# Adaptation Action Areas | Outreach



Broward County Sustainability Stewards  
Broward American Planning Associations Workshop • June 2013



City of Fort Lauderdale Civic Associations • October 2013

In 2013, we started community outreach & dialogue with our Neighbors.





# WE ARE READY

*We are a resilient and safe coastal community*

## CLIMATE ADAPTATION OPEN HOUSE WE ARE READY

*We are a resilient and safe coastal community.*



**Tuesday, January 21, 2014**

Open House, Registration, View Maps | 5:30 - 6:00 p.m.  
Public Meeting, Q&A | 6:00 p.m. - 7:30 p.m.

City Hall, 1st floor Commission Chambers  
100 North Andrews Avenue | Fort Lauderdale, FL 33301

As a City surrounded by water, we are vulnerable to the effects of climate change. We value your input as we work to address climate change and make our community more resilient. Learn about Adaptation Action Areas and join a conversation about strengthening our City.

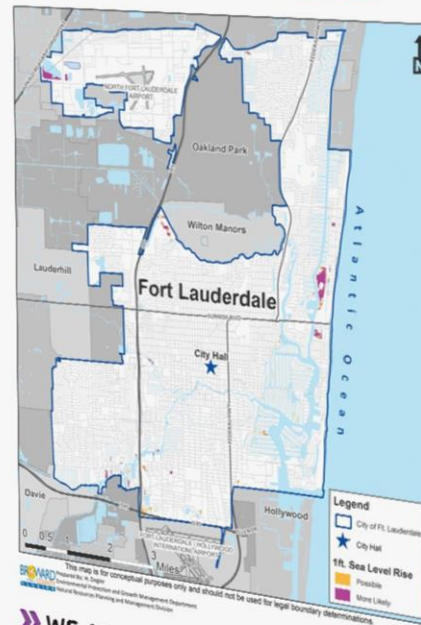
For neighbors unable to attend the meeting in person, there will be many ways to participate:  
Watch on TV: Comcast Channel 78 or AT&T U-Verse Channel 99  
Watch online: [www.fortlauderdale.gov/itv](http://www.fortlauderdale.gov/itv)  
Tweet your questions and comments using #ftladapt  
Submit questions for panelists via Twitter @FTLCityNews

For more information, contact the Public Works Sustainability Division at (954) 828-6190.



If you would like this publication in an alternate format or if you need reasonable accommodation to participate in this event, please call (954) 828-6755 or email [webmaster@fortlauderdale.gov](mailto:webmaster@fortlauderdale.gov).

## CITY OF FORT LAUDERDALE MUNICIPAL SCALE INUNDATION MAP ONE FOOT SEA LEVEL RISE



**WE ARE READY**  
*We are a resilient and safe coastal community.*



## CITY OF FORT LAUDERDALE PRIORITY PLANNING AREAS FOR PARCEL

## CITY OF FORT LAUDERDALE MUNICIPAL SCALE INUNDATION MAP TWO FOOT SEA LEVEL RISE



**WE ARE READY**  
*We are a resilient and safe coastal community.*



Broward County assisted with maps, on display at outreach events.





# » WE ARE READY

## CLIMATE ADAPTATION OPEN HOUSE

*We are a resilient and safe coastal community*

January 21, 2014



BROADCASTED LIVE ON FLTV

STREAMED ONLINE

INCORPORATED SOCIAL  
MEDIA: TWITTER & FACEBOOK



Dialogue with Neighbors at the Climate Adaptation Open House.



# WE ARE READY

## Review and Approval Process

*We are a resilient and safe coastal community*



**Accommodation:** Strategies that do not act as a barrier, but rather alter the design through measures such as elevation infrastructure system to strategies aim to reduce p Planning For Rising Sea Le

**Managed Retreat:** Strategy possible relocation to oth (Adaptation Action Areas: Florida Regional Planning)

**Avoidance:** Strategies that coastal hazards associated over time. (Adaptation Action South Florida Regional Plan

**Policy 3.1.10:**  
Align and be consistent with, to t adaptation strategy documents s Regional Climate Action Plan and plans, disaster mitigation plans, v change plans.

**Policy 3.1.11:**  
Participate in, when appropriate, agencies' proposed application r

**Policy 3.1.12:**  
Collaborate and coordinate with extant possible, toward the impl

**Policy 3.1.13:**  
Based on evolving rising seas dat preserve future strategic adaptat response to new risks and vulner technological opportunities.

**Policy 3.1.14:**  
Continue to foster effective colla and local partners to identify risk the impacts from sea level rise.

#### ADMINISTRATION AND IMPLEM

**Add/Amend Comp Plan Admin**  
Priority Planning Areas f illustrates vulnerable are or exacerbated by, seal l map in partnership with i Oceanographic and Atm

**Protection:** Strategies th impacts of rising seas in c infrastructure to remain renourishment. Protectio location-dependent and areas of historical signific Options for Adaptive Plan 2013)

**Policy 3.1.4:**  
AAAs' adaptation strategy options may inclu  
a. Protection  
b. Accommodation  
c. Managed retreat  
d. Avoidance  
e. Other options

**Policy 3.1.5.:**  
Considerations for AAAs designation may inc  
a. Areas which experience tidal floodin  
b. Areas which have an hydrological co  
c. Locations which are within areas de  
d. Other areas impacted by stormwate

**Policy 3.1.6:**  
As a basis for the designation of AAAs, the C the Unified Sea Level Rise Projection for Sou for Sea Level Rise Map, in order to identify a formulate timely and effective adaptation st

**Policy 3.1.7.:**  
As deemed to be in the best interest of the C designation by means of, but not limited to,  
a. Community Investment Program (Ca  
b. City Commission Resolution or Ord  
c. Comprehensive Plan via location des  
d. Other mechanisms as appropriate

**Policy 3.1.8.:**  
Potential funding sources for the implement are not limited to:  
a. Federal and State grants and techn  
b. Local Stormwater Utility Fees and Co  
c. Public/Private Partnerships  
d. Other sources

**Policy 3.1.9:**  
Integrate AAAs into existing and future City include, but not be limited to:  
a. Community Investment Program  
b. Local Mitigation Strategy  
c. Strategic Plan  
d. Sustainability Action Plan  
e. Stormwater Master Plan  
f. Comprehensive Emergency Manage  
g. Unified Land Development Regulatio  
h. Other related processes, plans and c



CITY OF FORT LAUDERDALE

### CITY OF FORT LAUDERDALE COMPREHENSIVE PLAN PROPOSED GOAL, OBJECTIVE AND POLICIES TEXT ADAPTATION ACTION AREAS

#### COASTAL MANAGEMENT ELEMENT

**GOAL 3:**  
Increase the City's resiliency to the impacts of climate change and rising sea levels by developing and implementing adaptation strategies and measures in order to protect human life, natural systems and resources and adapt public infrastructure, services, and public and private property.

**OBJECTIVE 3.1:**  
Develop and implement adaptation strategies for areas vulnerable to coastal flooding, tidal events, storm surge, flash floods, stormwater runoff, salt water intrusion and other impacts related to climate change or exacerbated by sea level rise, with the intent to increase the community's comprehensive adaptability and resiliency capacities.

**Evaluation Measure:** Collaborating with regional partners, City shall identify public investments, infrastructure and assets at risk from rising sea levels by 2018. Thereafter, this assessment will be performed every five (5) years.

**Policy 3.1.1:**  
Identify public investments and infrastructure at risk to sea level rise and other climate related impacts. Assess the vulnerability to public facilities and services, including but not limited to water and wastewater facilities, stormwater systems, roads, bridges, governmental buildings, hospitals, transit infrastructure and other assets.

**Policy 3.1.2:**  
Adaptation strategies may include, but not be limited to:  
a. Public infrastructure planning, siting, construction, replacement, operation and maintenance  
b. Emergency management  
c. Stormwater management  
d. Land development regulations  
e. Building codes  
f. Comprehensive planning  
g. Other strategies

**Policy 3.1.3:**  
Adaptation strategy options may include the designation of Adaptation Action Areas (AAAs). As per Section 163.3164(1), Florida Statutes, an AAA is an optional designation within the coastal management element of a local government's comprehensive plan which identifies one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure and adaptation planning.

WE ARE READY  
We are a resilient and safe coastal community.



We are first to write Adaptation Action Areas into our Comprehensive Plan.

# AAA Policies

## City of Fort Lauderdale Comprehensive Plan Proposed AAA Goal, Objective and Policies

**Policy 3.1.1 – Identify** public investments and infrastructure

**Policy 3.1.2 –** Adaptation Strategies

**Policy 3.1.3 –** Adaptation Action Areas (AAA)

**Policy 3.1.4 –** AAA adaptation strategy options

**Policy 3.1.5 – Considerations** for AAA designation

**Policy 3.1.6 – Basis** for the designation of AAAs

**Policy 3.1.7 –** City Commission **mechanisms** for designating AAAs

**Policy 3.1.8 – Funding** Sources



# AAA Policies

## City of Fort Lauderdale Comprehensive Plan Proposed AAA Goal, Objective and Policies

- Policy 3.1.9** – **Integration** of AAAs into existing city processes and plans
- Policy 3.1.10** – **Alignment** with national, state, and regional adaptation strategy documents
- Policy 3.1.11** – Participate in other appropriate agencies' proposed application requests for funding adaptation implementation projects
- Policy 3.1.12** – Collaborate and coordinate
- Policy 3.1.13** – Allow for **flexible** adjustments
- Policy 3.1.14** – Foster effective collaborations and coordination to identify risks, vulnerabilities and opportunities associated with coastal hazards and sea level rise

# Next Steps

- 🌊 Final City Commission approval – Oct-Nov
- 🌊 Stay tuned for
  - 🌊 AAA Designation
  - 🌊 Prioritized Funding



# Conclusion

- 📡 Talk and listen to ALL audiences
- 📡 Build staff capacity
- 📡 Integrate early and often
- 📡 Leverage different projects with common goals





**T h a n k   y o u .**

**SUSANNE M. TORRIENTE**  
**storiente@fortlauderdale.gov**

**JIM KOETH**  
**jkoeth@fortlauderdale.gov**



Please Support 1000 Friends of Florida:

Please support us at

[www.1000friendsofflorida.org/donate-now/](http://www.1000friendsofflorida.org/donate-now/)







Receive Email Alerts

Search

Gallery



Member Login

Contact Us

Join Us



About Us

Building Better Communities

Saving Special Places

Planning Tools

Outreach



Donate  
Now



Current Foresight

## Our Vision for Florida's Future...

Picture a Florida with vibrant cities and towns, thriving and livable neighborhoods, and an outstanding quality of life. Imagine communities where kids can ride their bikes to school or the park, and parents can walk to the store or take a bus to work if they wish. [Read More >](#)

### 1000 Friends Honors Lee Constantine

Constantine honored for his "leadership on critical conservation and water resource protection in Florida."

[Read More >](#)



Register Now for  
Fall Webinars



## What's New

### Planning for Sea Level Rise in Broward County Webinar on October 8

The PowerPoint is now available

[Read More >](#)

### Scale Back Minto West

Massive development planned for western Palm Beach County

[Read More >](#)

### Survey on Climate Change/Sea Level Rise

Take a few minutes to share what your community is doing

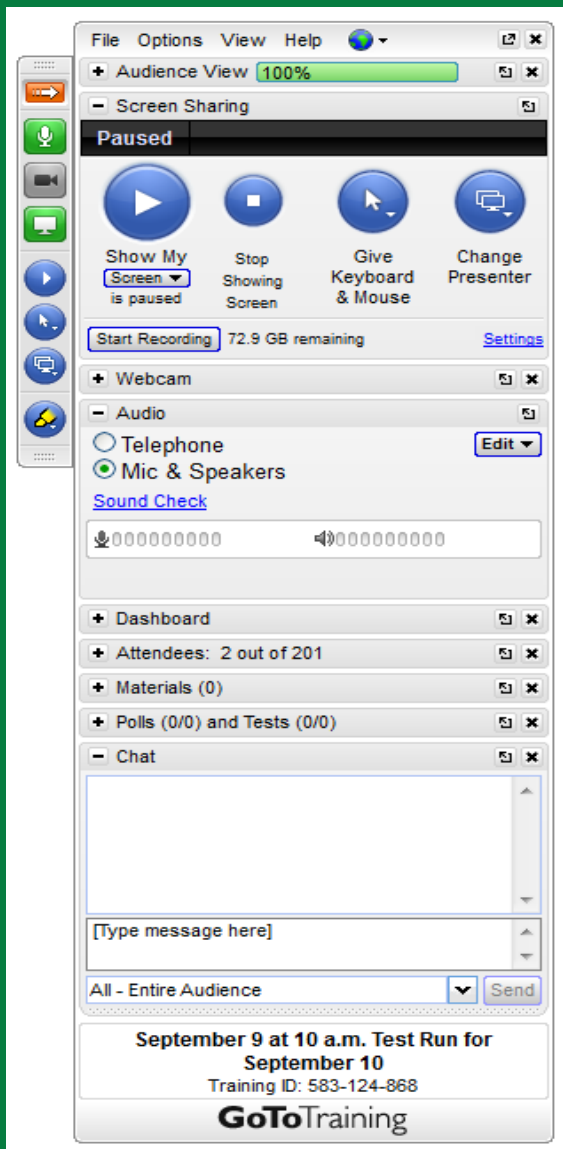
[Read More >](#)

Please Vote Yes on





# QUESTIONS



- Your webinar control panel includes a “Chat” box
- Please click on “+” sign and type any questions in this box
- Please refer to the slide number and/or speaker when you post your question
- Please keep your questions succinct!
- Staff will ask the presenters questions, as time permits
- Please complete the survey in the post-webinar email

## **This Webinar Has Been Approved For:**

- **2.0 AICP CM ([#e.27939](#)) for Planners**
- **2 contact hours for Certified Environmental Health Professionals**
- **1 CEC for Certified Floodplain Managers**
- **CLE ([#1405924N](#)) for Florida attorneys**



## Upcoming DeGrove Webinars:

- **Registration Open: November 12, 2014, Noon to 1:30 p.m.**  
**Planning for Complete Streets in Florida**
- **Wednesday, December 10, Noon to 1:30**  
**Planning for Greenways: Florida's Expanding System of Regional Connectors**
- **January 14, 2015, Noon to 1:30 p.m.**  
**Planning for Sea Level Rise: Legal Issues Facing Florida**
- **February 11, 2015, Noon to 1:30 p.m.**  
**Victor Dover on Street Design: The Secret to Great Cities and Towns**
- **March 11, 2015, Noon to 1:30 p.m.**  
**2015 Florida Legislative Update**

