Making the Transition: Assessment to Action in Broward County, FL

National Academy of Sciences Climate Assessment Workshop

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Dr. Jennifer L. Jurado, CRO and Director
Environmental Planning and Community Resilience Division

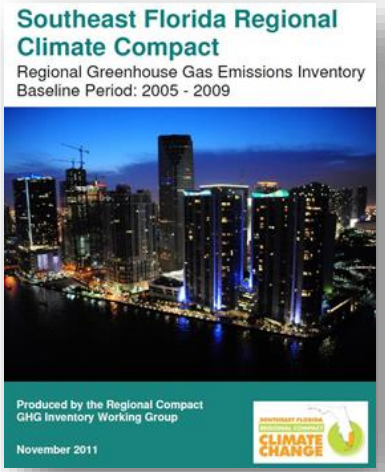
BROWARD COUNTY FLORIDA

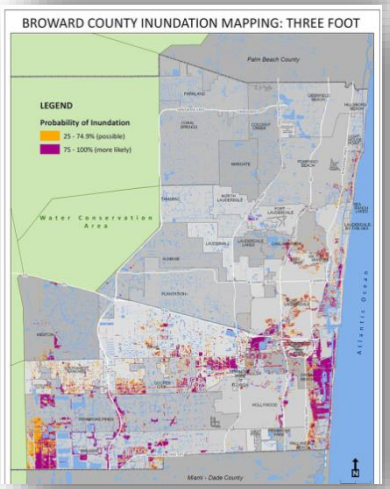
Broward County Characteristics

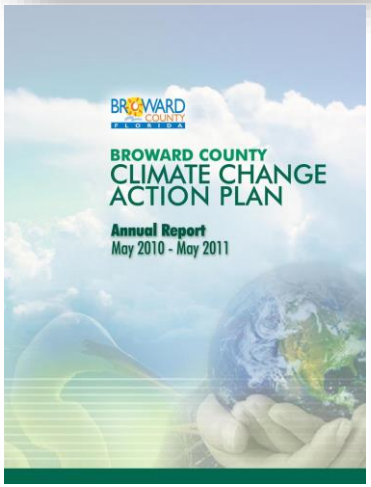
- Nearly 2 million residents
- Dense coastal development
- 24 miles of beaches
- 300 +miles seawalls
- 1800 miles canals
- Porous geology
- Active flood management
- Unique natural resources

Early Initiatives

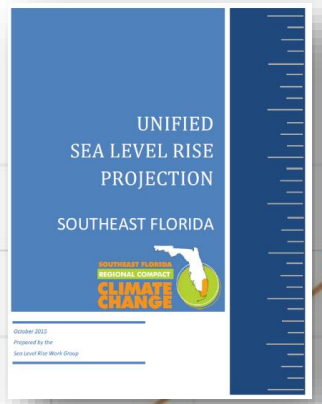
- Tools and Assessment
- Local and Regional
- Policy and Planning
  - Climate Change Element
  - Priority Planning Areas
  - Land use/water/LMS
  - Capital budget planning





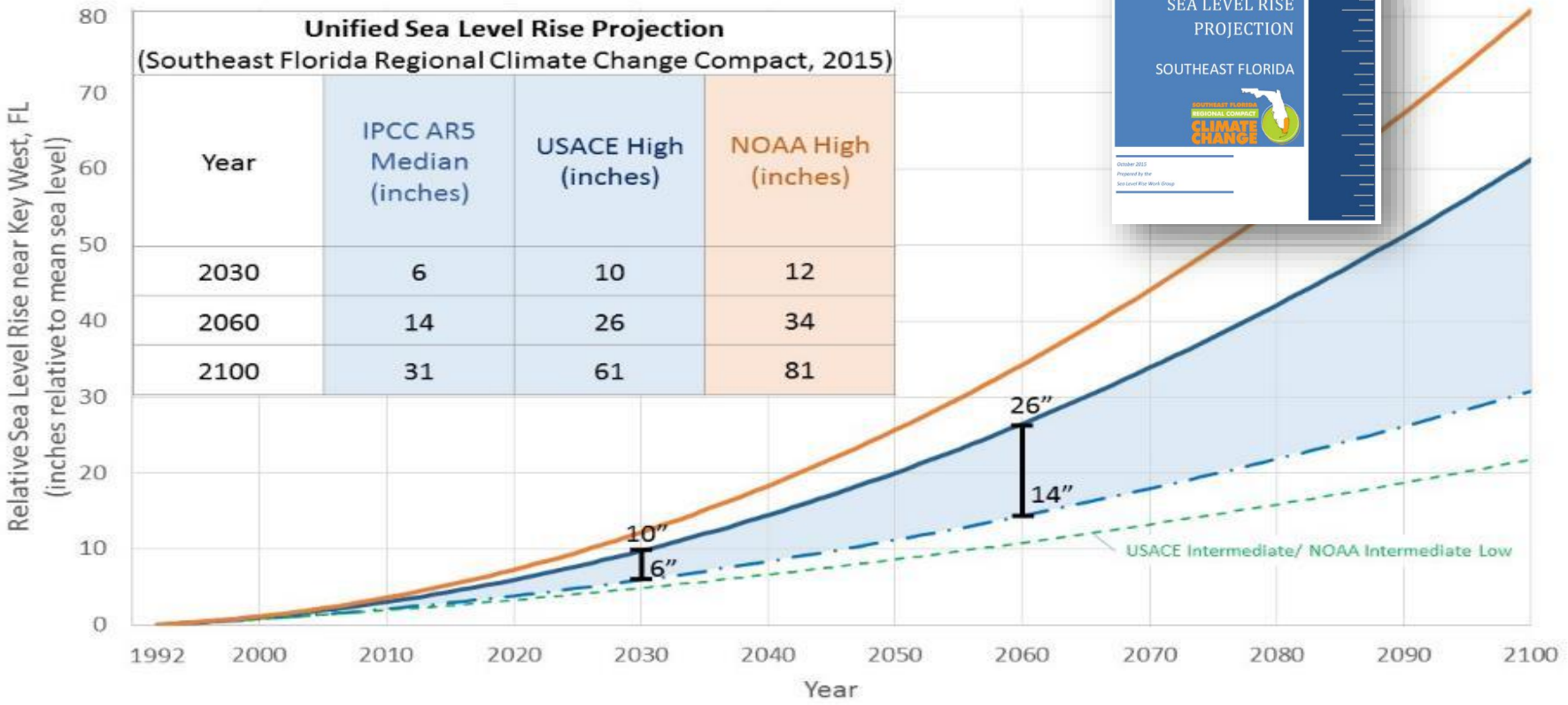


2015 Regional SLR Projection



Unified Sea Level Rise Projection
(Southeast Florida Regional Climate Change Compact, 2015)

Year	IPCC AR5 Median (inches)	USACE High (inches)	NOAA High (inches)
2030	6	10	12
2060	14	26	34
2100	31	61	81

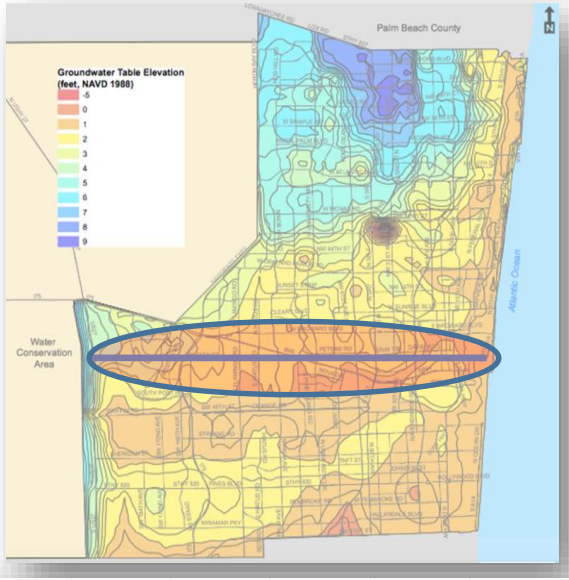


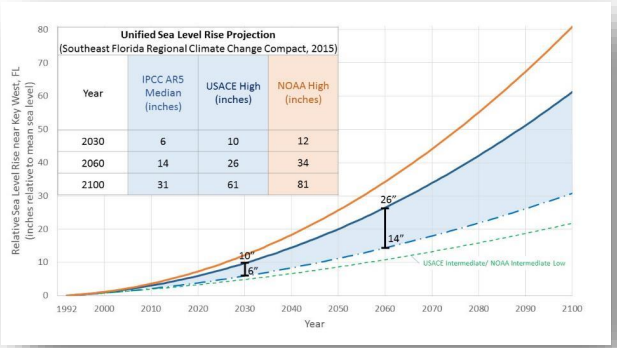
From Planning to Action:

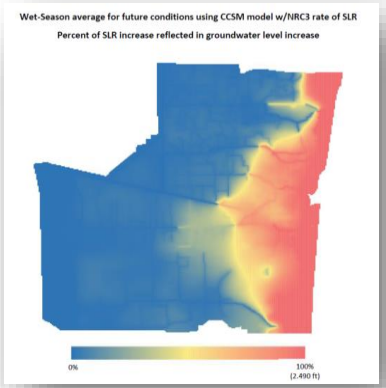
- Maximize use of county authority
- Land use and water regulations
- Future conditions map series – code of ordinances (established May 2017)
- 3-year timeline
  - Drainage infrastructure (2017)
  - Coastal flood barriers (2018)
  - Flood elevations (2019)
- Tools
  - Groundwater Models
  - Coastal Study
  - Updated FEMA Flood Model

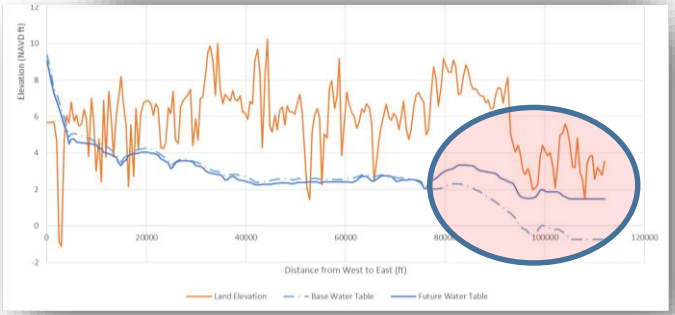
Future Condition Average Wet Season Groundwater Table Map

- 2060-2069 average groundwater conditions
- USACE high = 2 feet SLR
- CCSM model = 9% increase in rainfall
- Extensive stakeholder engagement
- Effective July 1, 2017



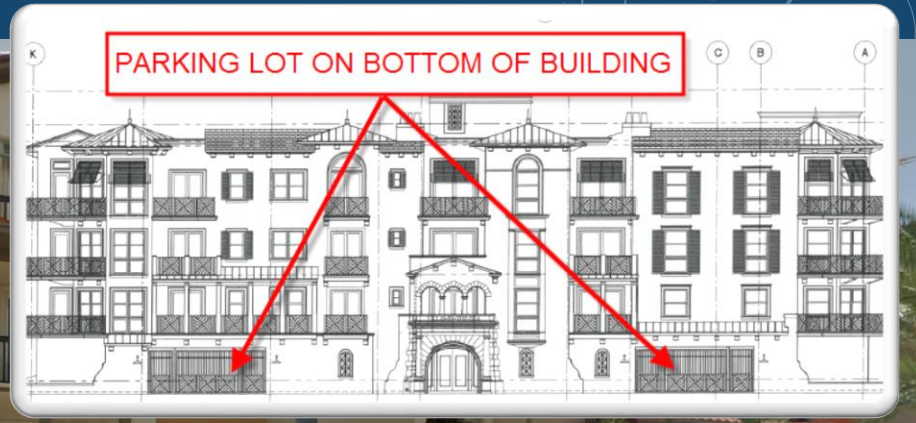






SURFACE WATER MANAGEMENT

DESIGN EXAMPLE 1



SURFACE WATER MANAGEMENT

DESIGN EXAMPLE 1

Permitted Conditions

WSWT: **1.5' NAVD**

WATER QUALITY VOLUME

Required: 0.08 acre-feet

Provided
0.08 acre-feet
By 70 LF exfiltration trench

$15,225*

100-YR, 3-DAY PRE-POST MAX

Required: 9.38' NAVD

Provided
9.38' NAVD
By 1 gravity drainage well

$72,500**

SLR Scenario

WSWT: **3.5' NAVD**

WATER QUALITY VOLUME

Required: 0.08 acre-feet

Provided
0.05 acre-feet
By 70 LF exfiltration trench

100-YR, 3-DAY PRE-POST MAX

Required: 9.38' NAVD

Provided
9.65' NAVD
By 1 gravity drainage well

SLR Adjusted Design

Provided
0.08 acre-feet
By 110 LF exfiltration trench

$23,925*

40 LF additional exfiltration trench

Provided
9.38' NAVD
By 1 pumped drainage well

$290,000**

Added pump to drainage well

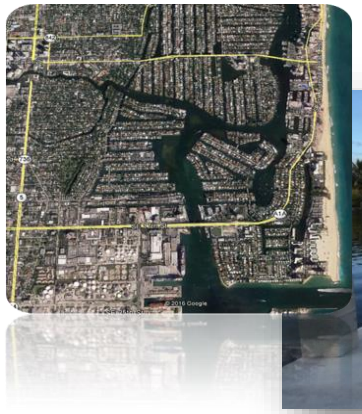
1.6%
Increase in Total Construction Costs

* Costs estimate assuming 18" French Drain. ** Cost estimate assuming dep well, casing 24", up to 100' drilling. Cost estimate varies based on project location, complexity, bid quantity and contractors availability

USACE-Broward Resiliency Study

US Army Corps of Engineers®

- Resilient Sea Wall Top Elevations
- Calibrated hydrodynamic model
  - 2 feet sea level rise
  - High tides
  - 25-yr storm surge
- Economic study
  - Damage loss reduction
  - Analysis by sector

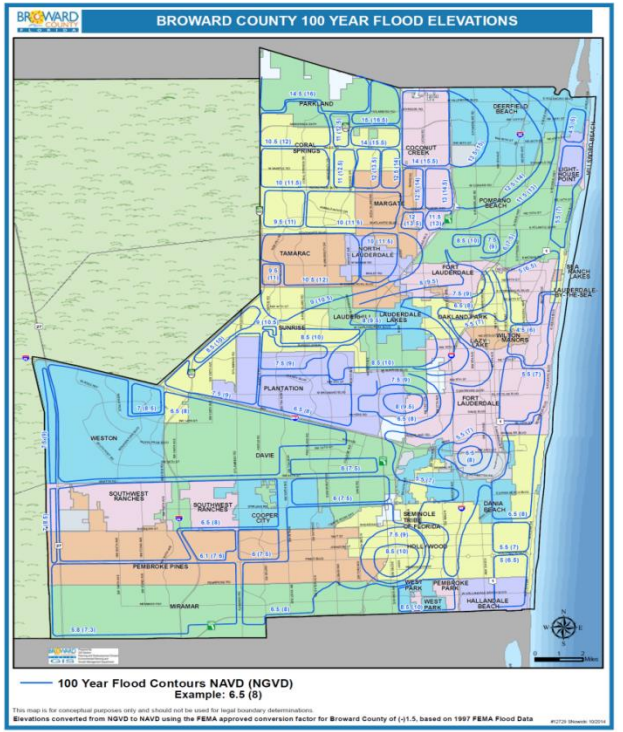


CITY OF FORT LAUDERDALE

CITY OF HOLLYWOOD, FLORIDA
DIAMOND OF THE GOLD COAST
INCORPORATED 1925

Broward 100-Year Community Flood Map

- One of 3 tools used to set finished floor elevations
- Amended map will:
  - Integrate sea level rise
  - Capture changes in groundwater
  - Provide flood elevation with rainfall (non-stationarity analysis)
  - Address CRS creditable criteria
  - NOT be used for the FEMA FIRM
- Developed with partner cost share



Summary

- Resiliency planning in Broward has relied heavily on informed use of science to guide policy recommendations and planning decisions
- Scenario-based assessments offer options and foster community-based decision-making
- Multiagency collaborations and robust partnerships have been vital to building support
- Economic analyses were a necessary condition but did not alter outcome
- Priority next steps include sustained engagement and development of a resilient infrastructure improvement plan

Questions?

Dr. Jennifer L. Jurado
Chief Resilience Officer, Director
Environmental Planning and Community Resilience Division
Broward County
jjurado@broward.org
954-519-1464