FIU | Sea Level Solutions Center

FLORIDA INTERNATIONAL UNIVERSITY

Understanding risks to realize solutions

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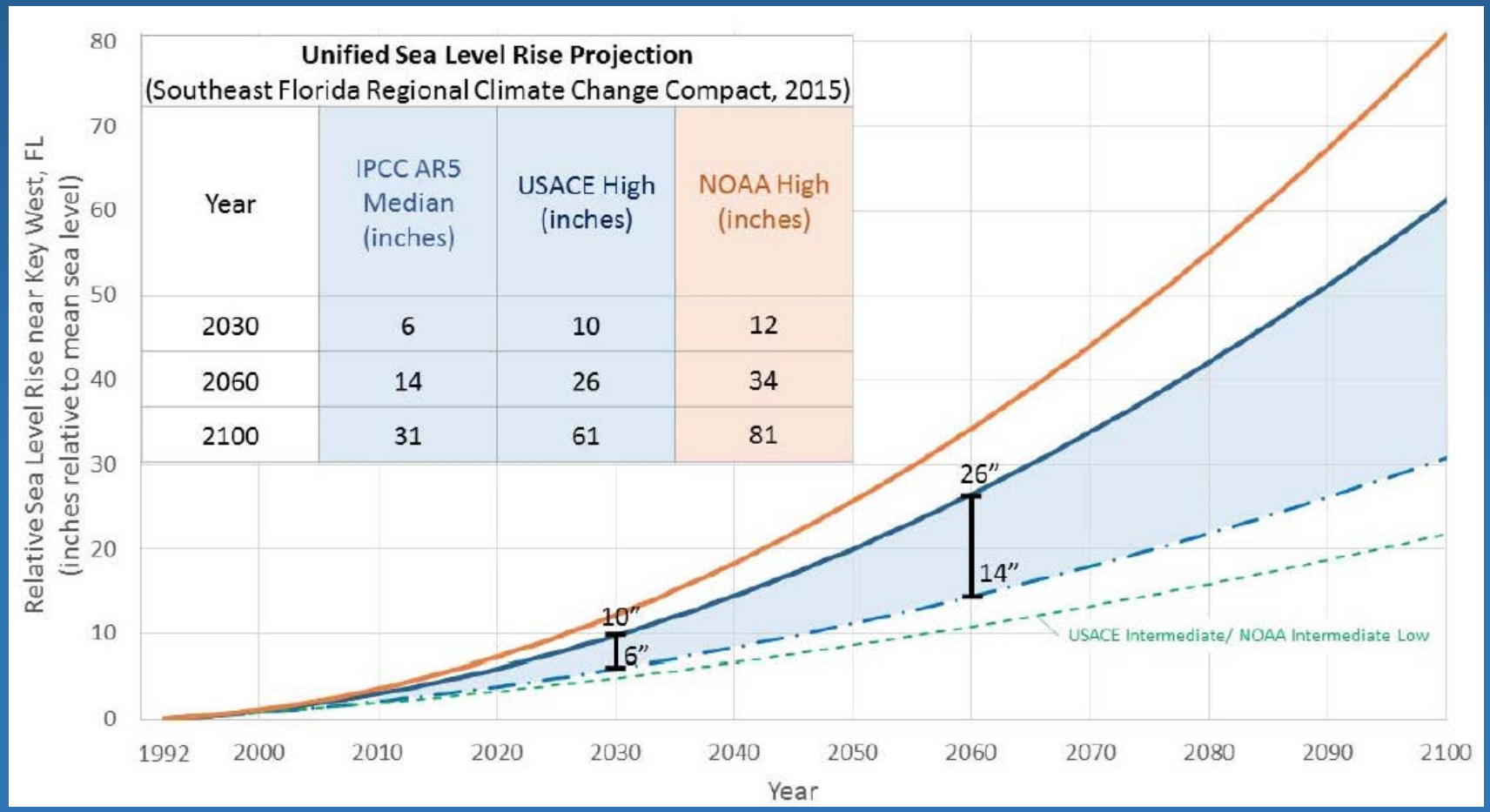
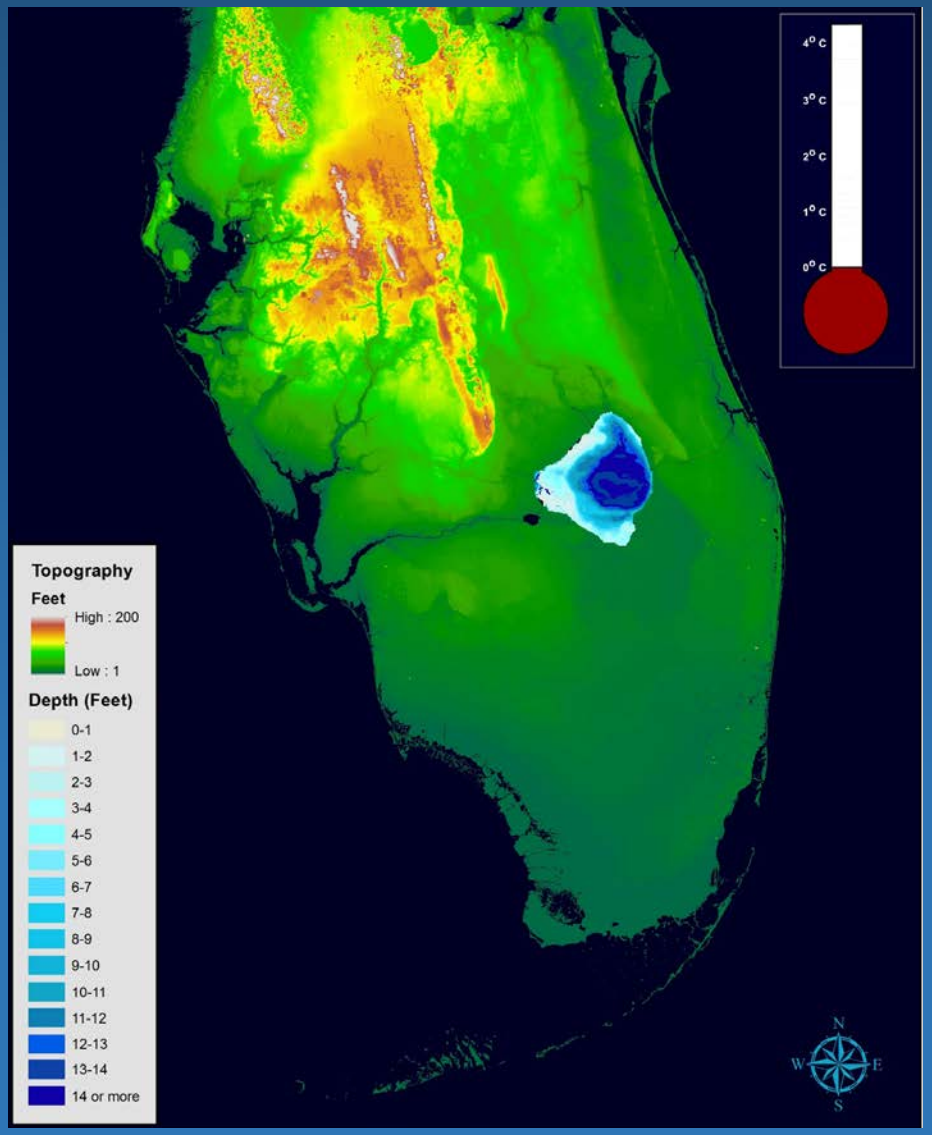
Climate change effects like sea-level rise are no longer just an environmental issue but one that permeates every sector of society with significant implications for economic prosperity and growth, social equity and quality of life.

South Florida projections for SLR

Unified Southeast Florida Sea Level Rise Projection for Regional Planning Purposes



Compact 2015



Map by Peter W. Harlem, GIS-RS Center and SLSC, FIU, 2015

South Florida is very vulnerable to SLR

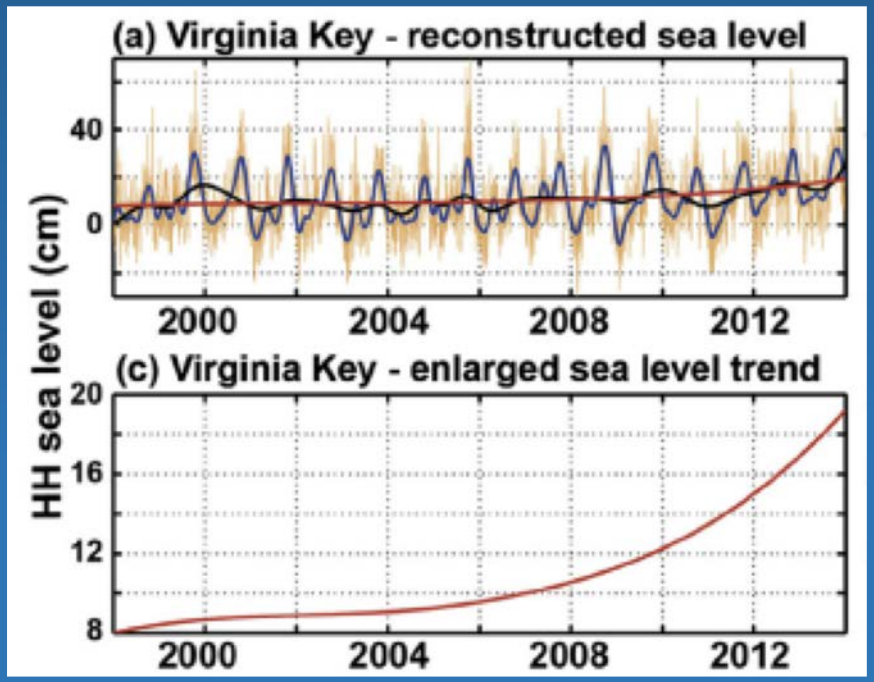
Southern Florida Topography

Shorecrest Neighborhood, October 7, 2017 – King Tide flooding event

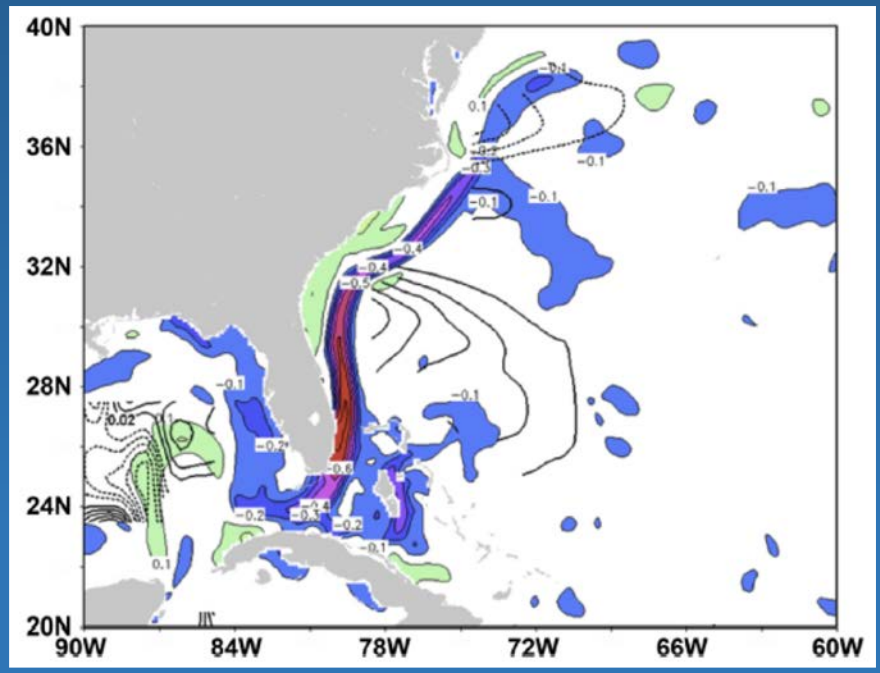
Video was shot by FIU Journalism student Colin Simpson

Recent uptick in SLR for SE Florida

The average pre-2006 rate is 3 ± 2 mm/yr, similar to the global long-term rate of SLR, whereas after 2006 the average rate of SLR in Southeast Florida rose to 9 ± 4 mm/yr. (Wdowinski et al. 2016)



Accelerating rate of SLR, which began around 2006



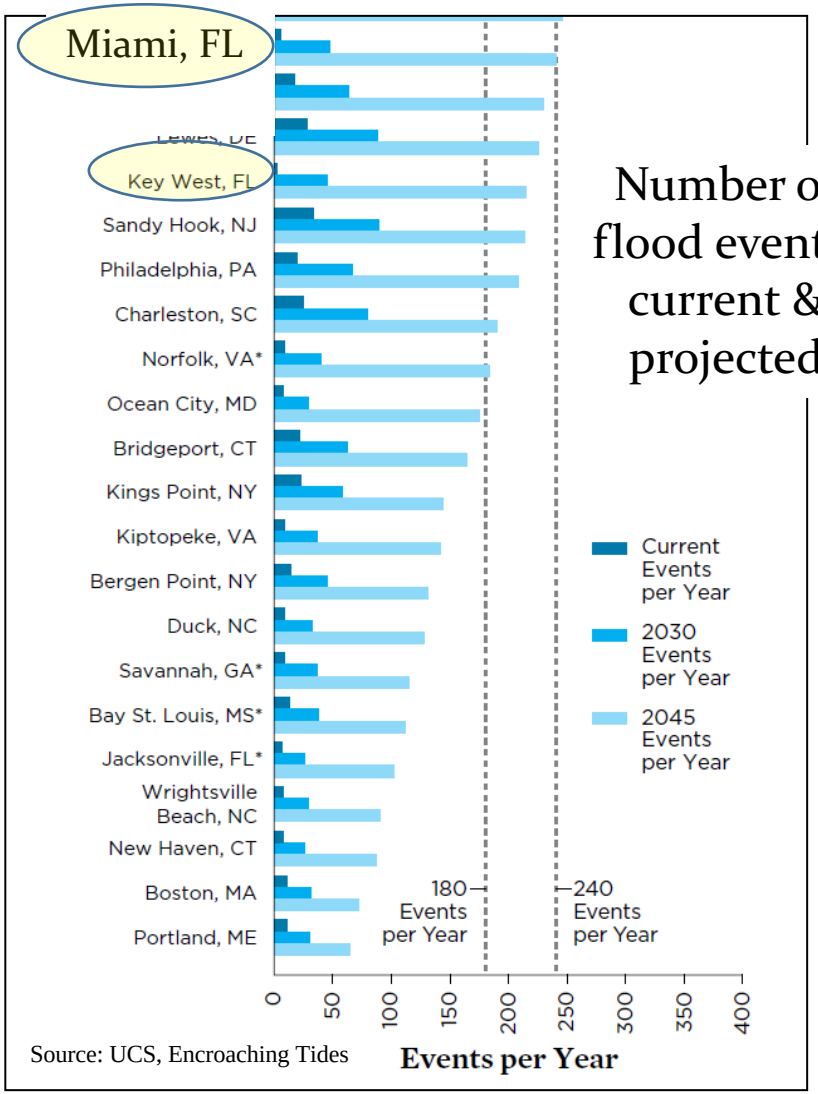
Correlation between sea level variation nearest to Miami Beach and the ocean surface current energy

Not just a coastal issue

Extent and frequency of flooding is expected to increase

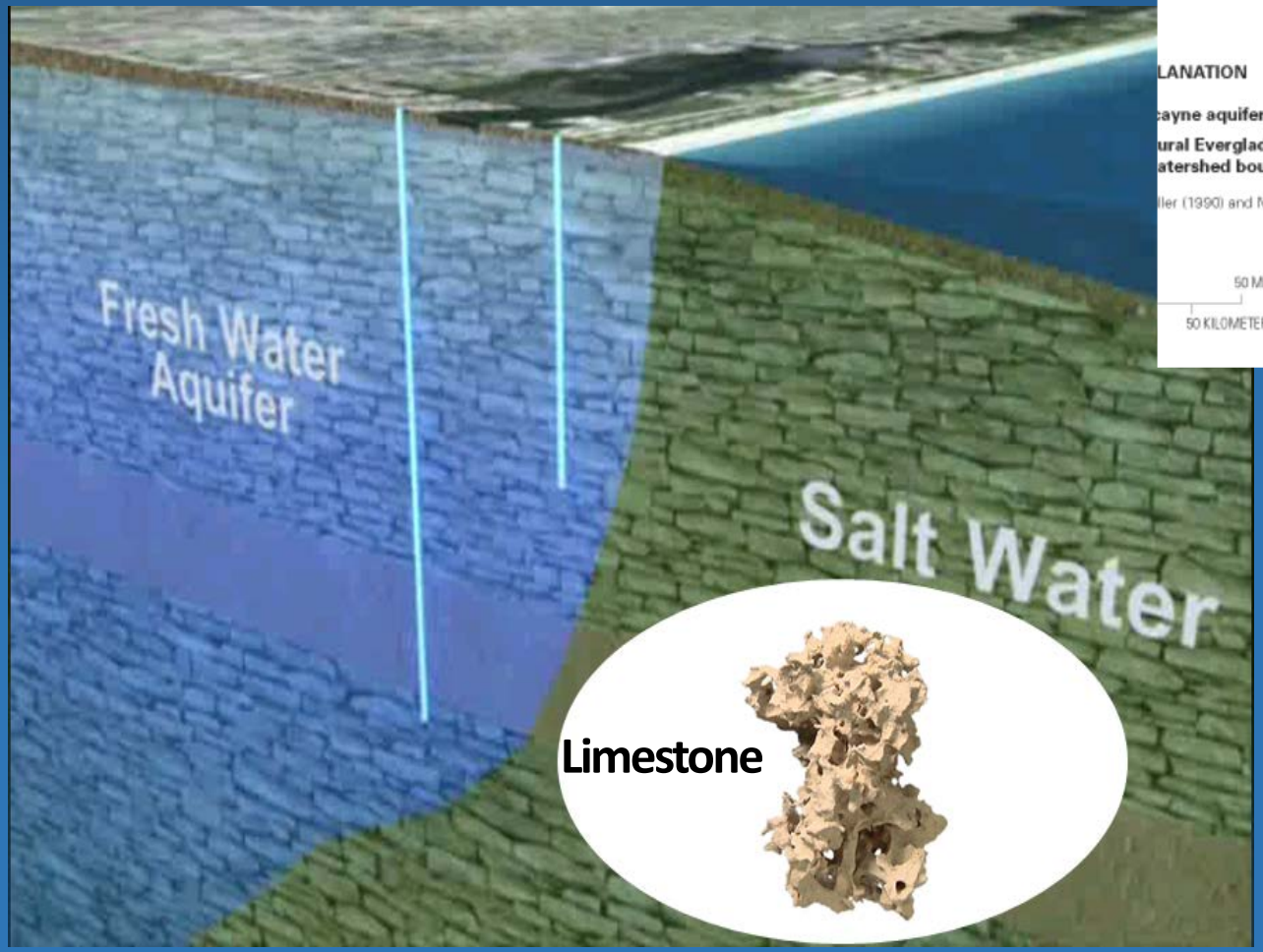
Shorecrest, Miami, Fall 2017

Coconut Grove, Miami, Fall 2016



Implications for drinking water

- Porous limestone is our source



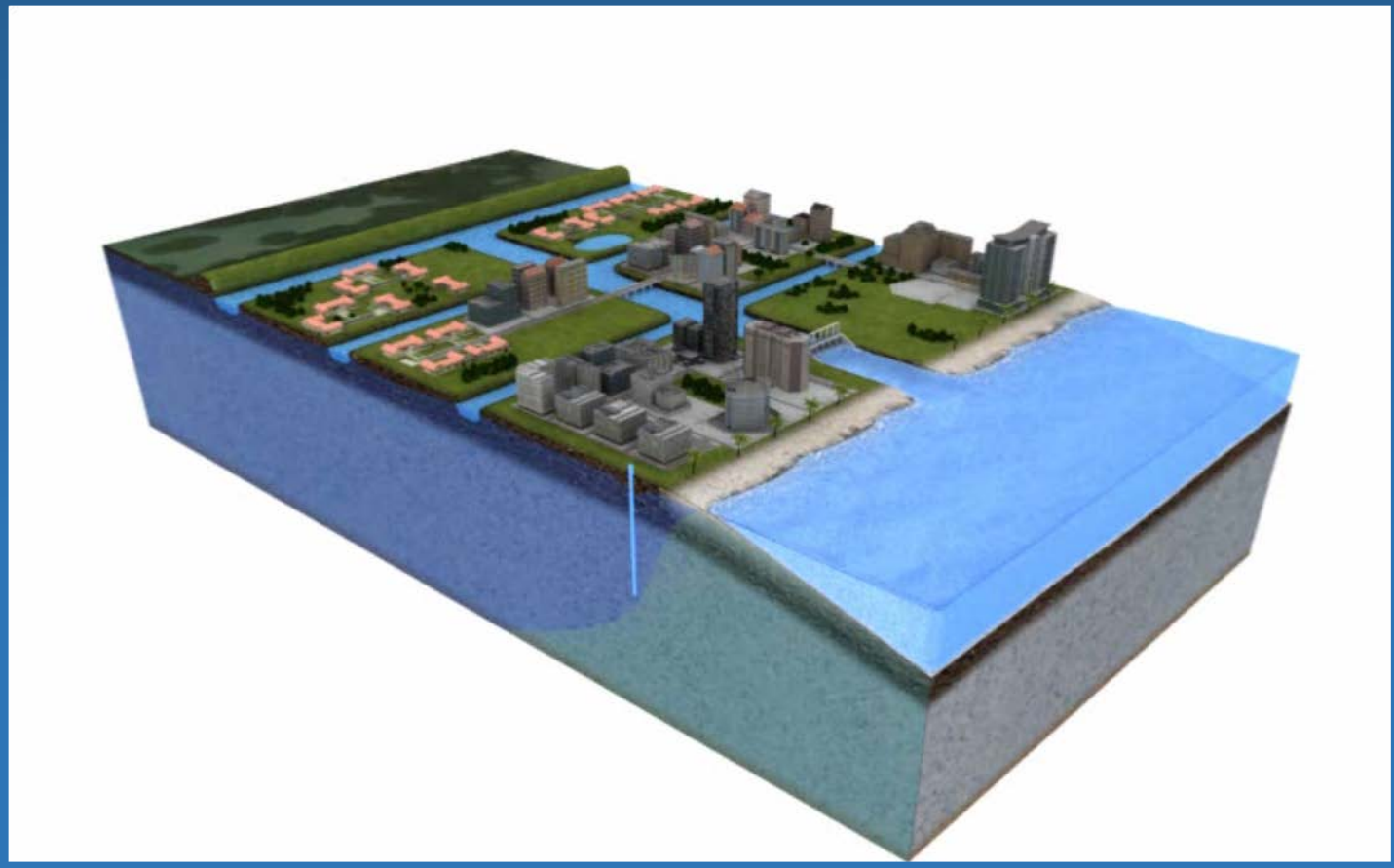
The Biscayne Aquifer is Miami-Dade & Monroe County's primary source of drinking water.

http://www.fkaa.com

Implications for water management system

- SLR makes water more difficult & costly to manage

- **Primary canals**
  - USACE
  - SFWMD
- **Secondary canals**
  - Local Governments
  - Special Districts
- **Tertiary canals**
  - Home Owners Associations
  - Private Land Owners



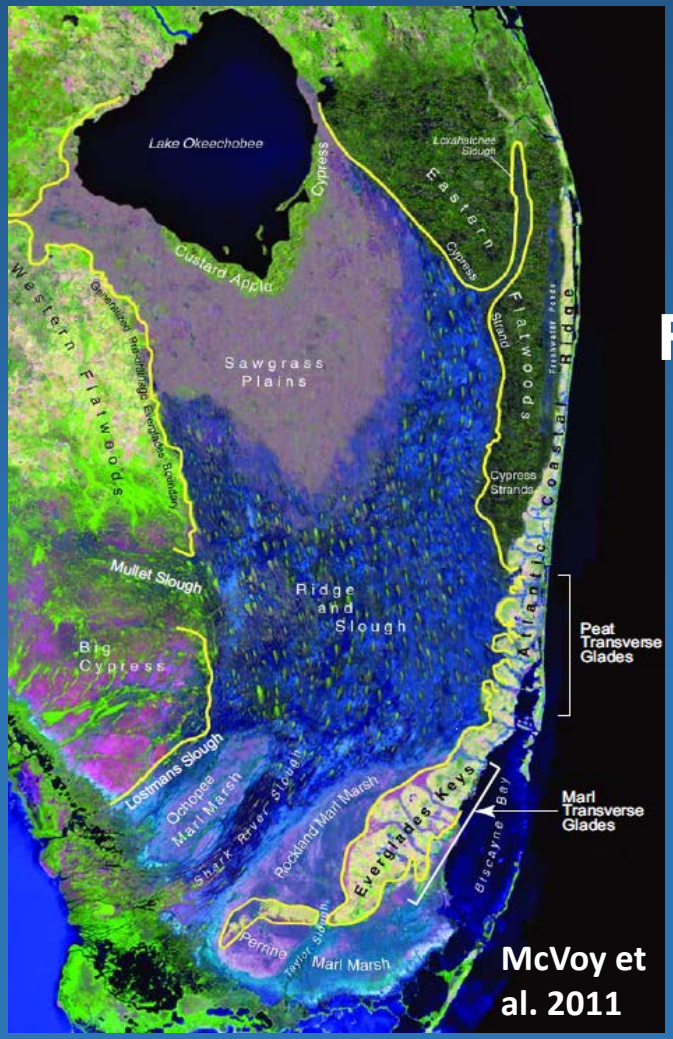
Implications for coastal hazard protection

- SLR exacerbates impacts of storm surge

water is ~5” higher than when Hurricane Andrew hit (‘92)

Implications for the Everglades

- SLR exacerbates saltwater intrusion



FW

FW

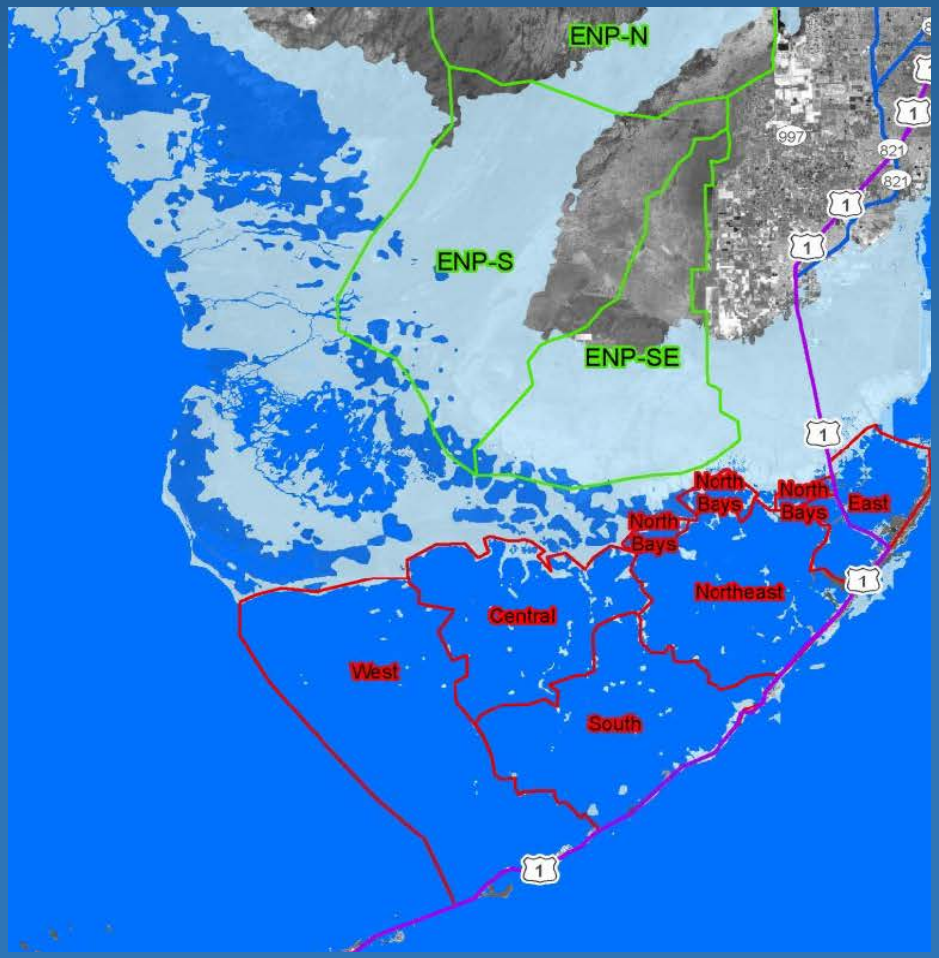
SW

Pre-Drainage

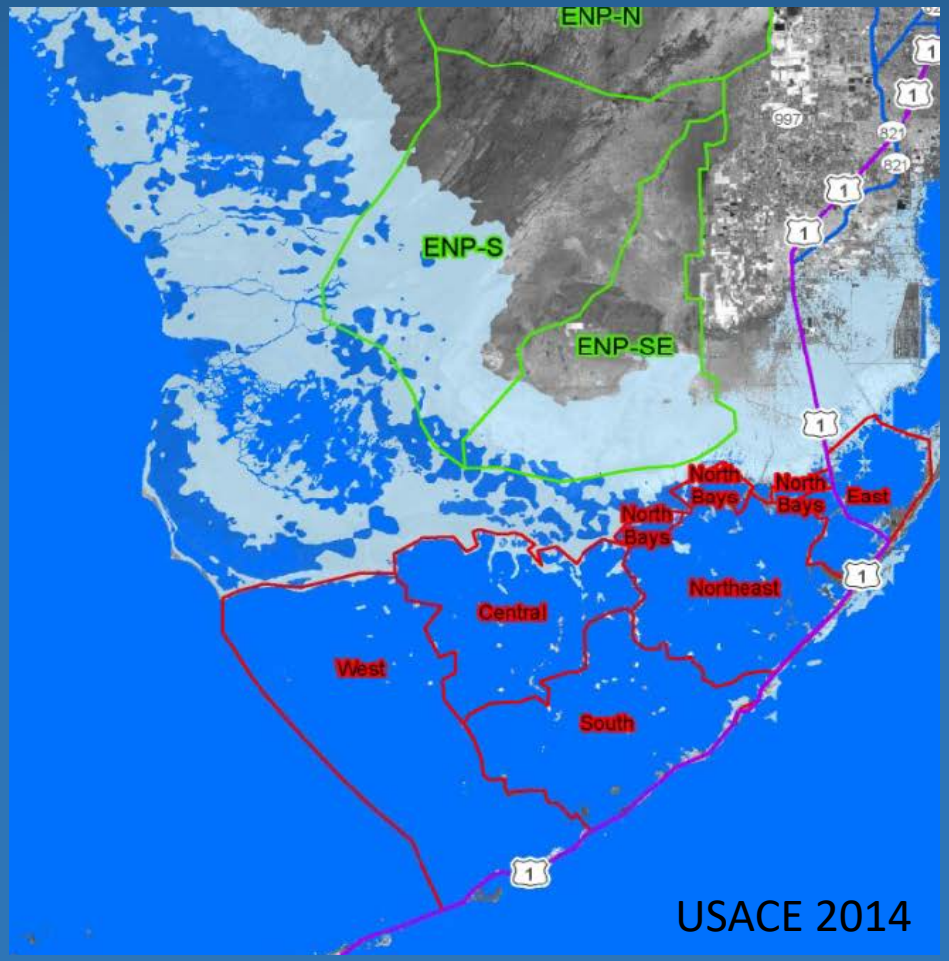
Post-Drainage

Sea level rise with and without freshwater restoration

2 Foot SLR & total soil loss



2 Foot SLR & no soil loss



USACE 2014

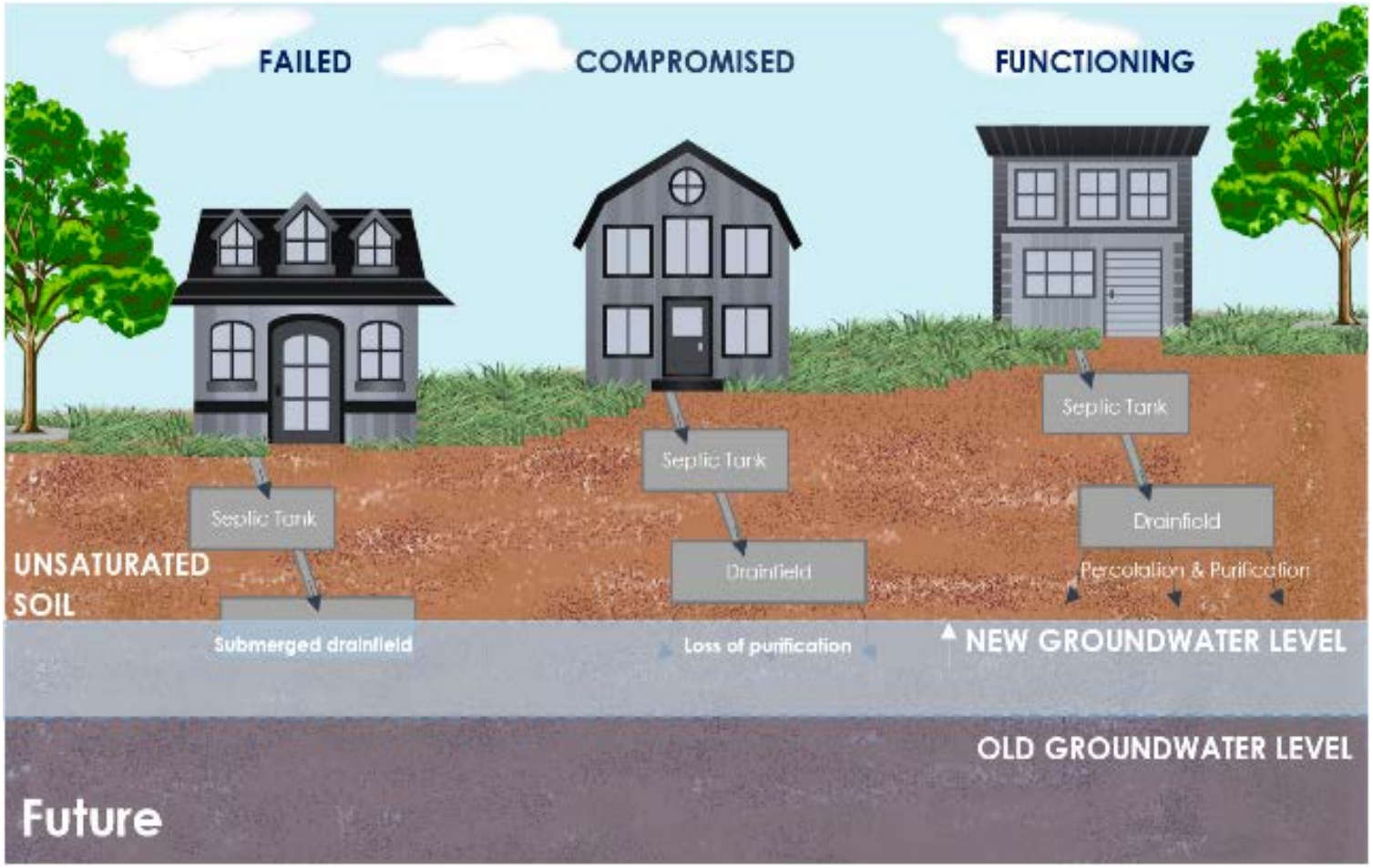
Direct impacts of increased flooding over time: Projected land, people and property in Miami-Dade (*without adaptation*)

Sea Level		Area	Pop (2000)	Prop Val (2006)
m	in	km^2	#	$m
0.5	20	1,287	6,734	1,950
1.0	39	1,670	79,459	20,968
1.5	59	2,955	323,492	68,235

Zhang 2011 Climatic Change

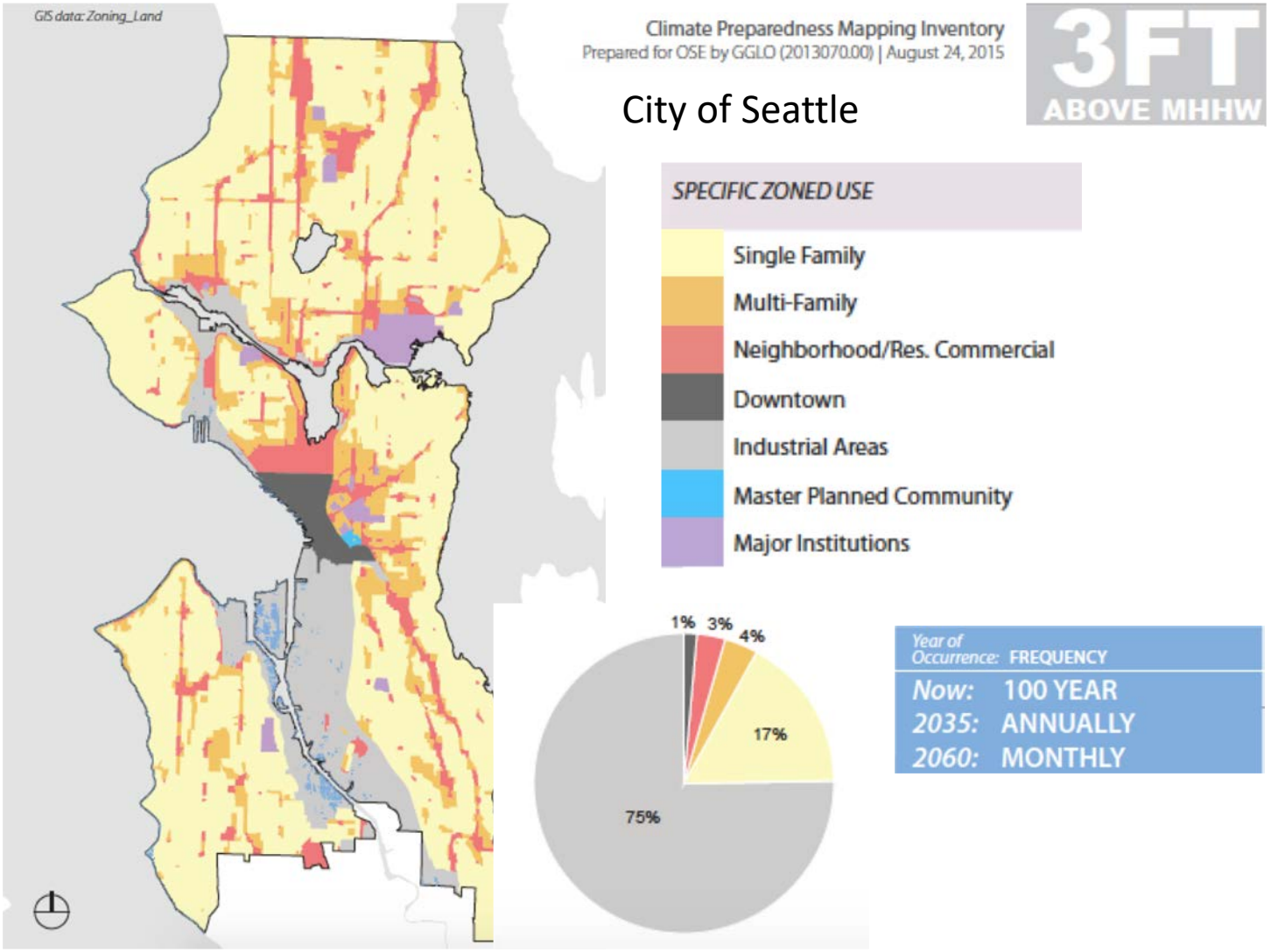
We can learn from our past, but need to innovate for a **no analogue** state and future.

Example: SEPTIC SYSTEMS



Miami-Dade County, draft report

We are not alone, and our rate of adaptation can either put us ahead of the curve or at an economic disadvantage with impacts on quality of life



What can we do now to address sea-level rise?

BUILD RESILIENCE

- ***Produce innovative, interdisciplinary knowledge*** that puts society ahead of the curve
- ***Train and develop*** a new, interdisciplinary workforce
- ***Educate, engage and partner*** with our community to develop solutions
- ***Discover innovative mechanisms*** to comprehensively plan, finance and sustain a resilient and sustainable natural-built environment

MISSION

The Sea Level Solutions Center applies information to build and integrate knowledge, design and evaluate mitigation and adaptation strategies, and create resilient, prosperous coastal urban communities

Foster solutions that are:

- ❖Innovative
- ❖Holistic
- ❖Cross-cutting
- ❖Healthy
- ❖Equitable
- ❖Sustainable