

# Everglades National Park

## *South Florida Natural Resources Center*

National Park Service  
U.S. Department of the Interior



## Climate Change:

### Discussion on South Florida Resources at Risk

**Dan Kimball**, Superintendent  
Everglades National Park  
**Erik Stabenau**, Ph.D., Oceanographer  
Everglades National Park

## ***What do we know for sure?***

- Sea level is rising at an increasing rate
- Flooding occurs on an annual basis
- Saltwater intrusion has impacted wellfields and is moving further west
- Coastlines are shifting



# The National Park Service and the Leopold Report

## 1963 Leopold Report

### Key feature:

*“A national park should present a vignette of primitive America...if the goal cannot be fully achieved it can be approached. A reasonable illusion of primitive America could be recreated, using the utmost in skill, judgment, and ecologic sensitivity.”*

- Snapshot, frozen in time
- Illusion is acceptable, if needed

## 2013 Leopold Revisited

### Key feature:

*“The overarching goal of NPS resource management should be to steward NPS resources for continuous change that is not yet fully understood, in order to preserve ecological integrity and cultural and historical authenticity, provide visitors with transformative experiences, and form the core of a national conservation land- and seascape”*

- Provide for continuous change
- Protect ecosystem function

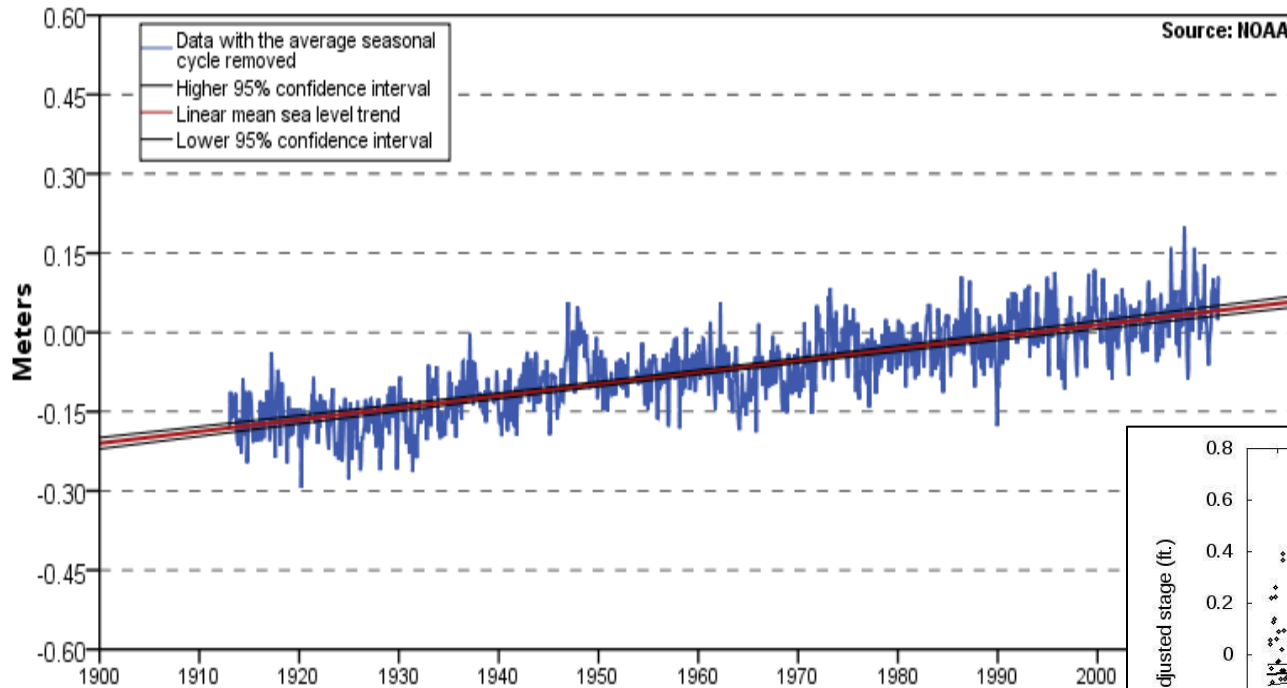


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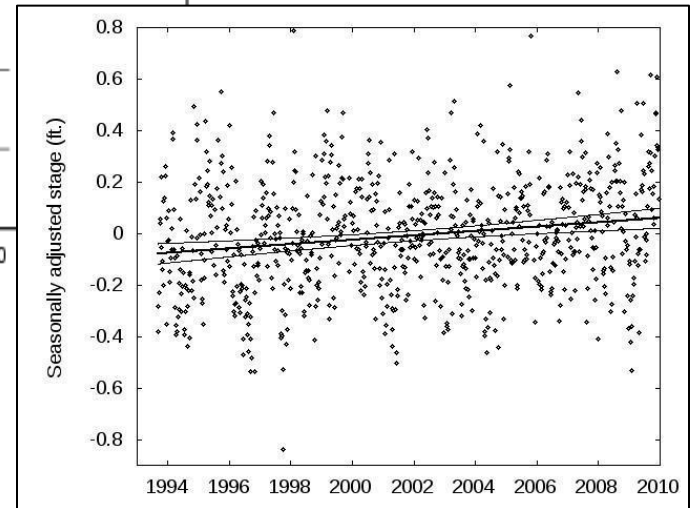
# Sea-level rise

Key West, FL  $2.24 \pm 0.16$  mm/yr



Little Madiera Bay water level shows similar rate of sea level rise as observed in Key West.

Water levels have risen at an average of 2.2 mm/yr over the last 100 years and closer to 2.8 mm/yr for the last decade.



Station LM;  $2.58 \pm 0.47$  mm/yr

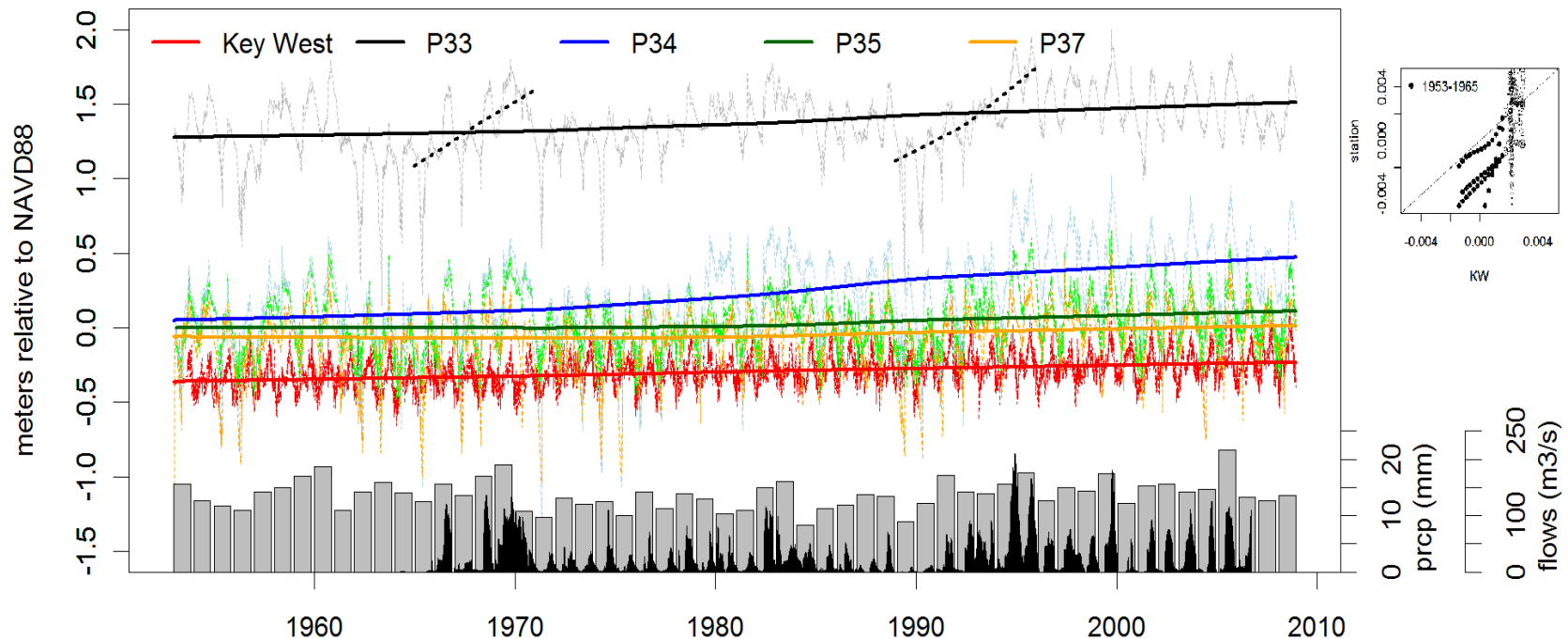


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# Punctuated equilibrium

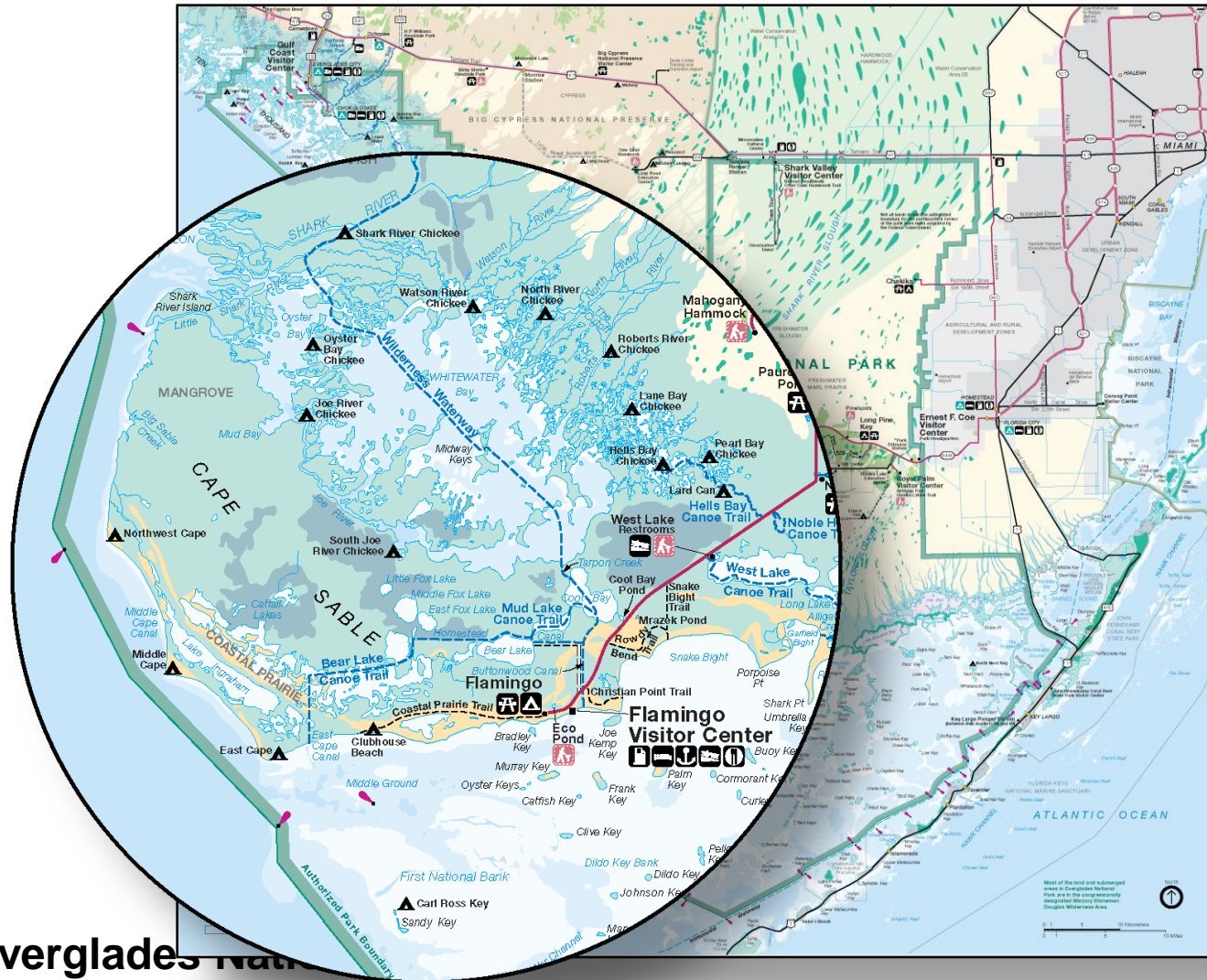
Data reveals two periods in the previous 50 years when water levels have increased **10 times faster** than the long term trend.



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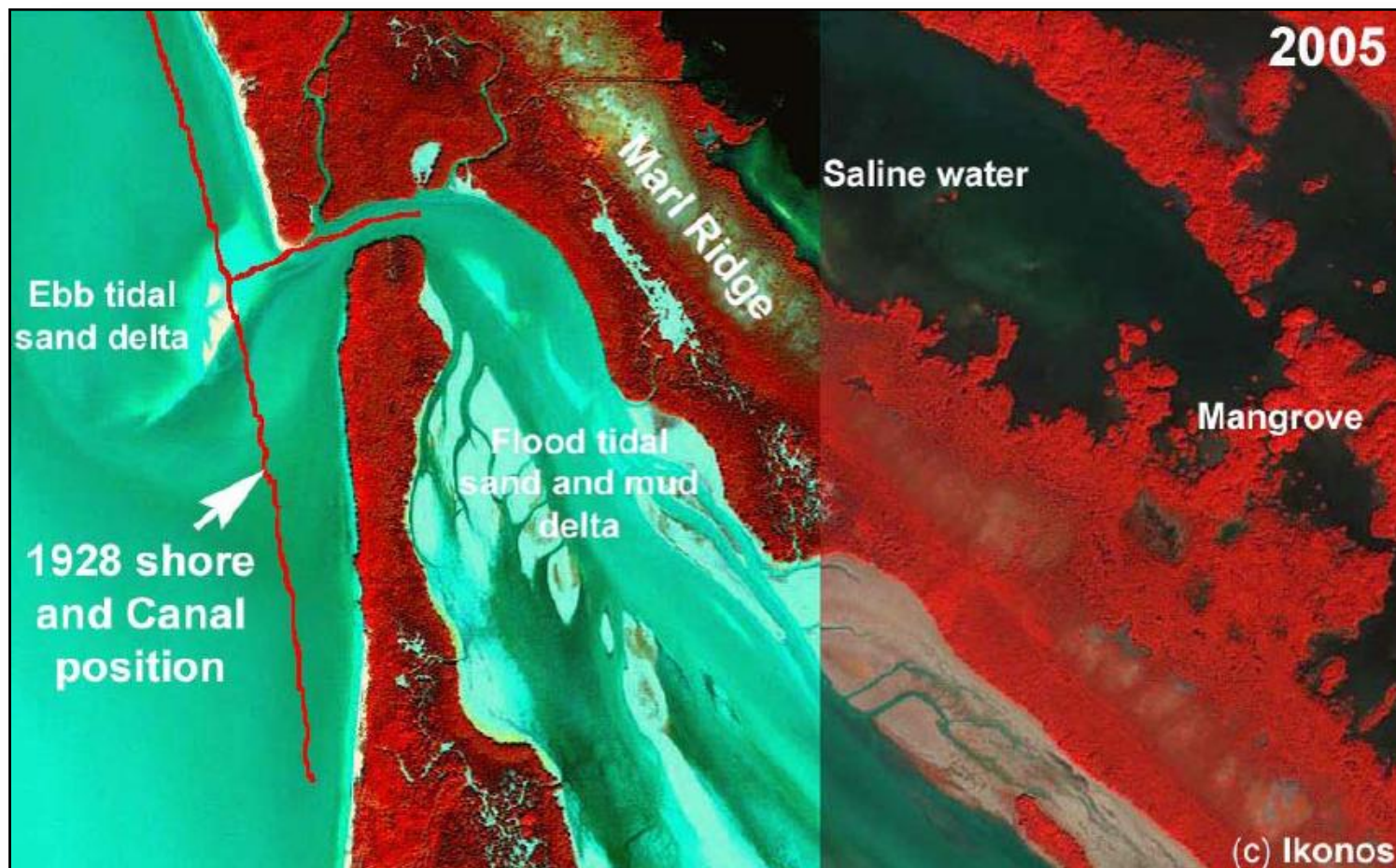
# Coastal Erosion



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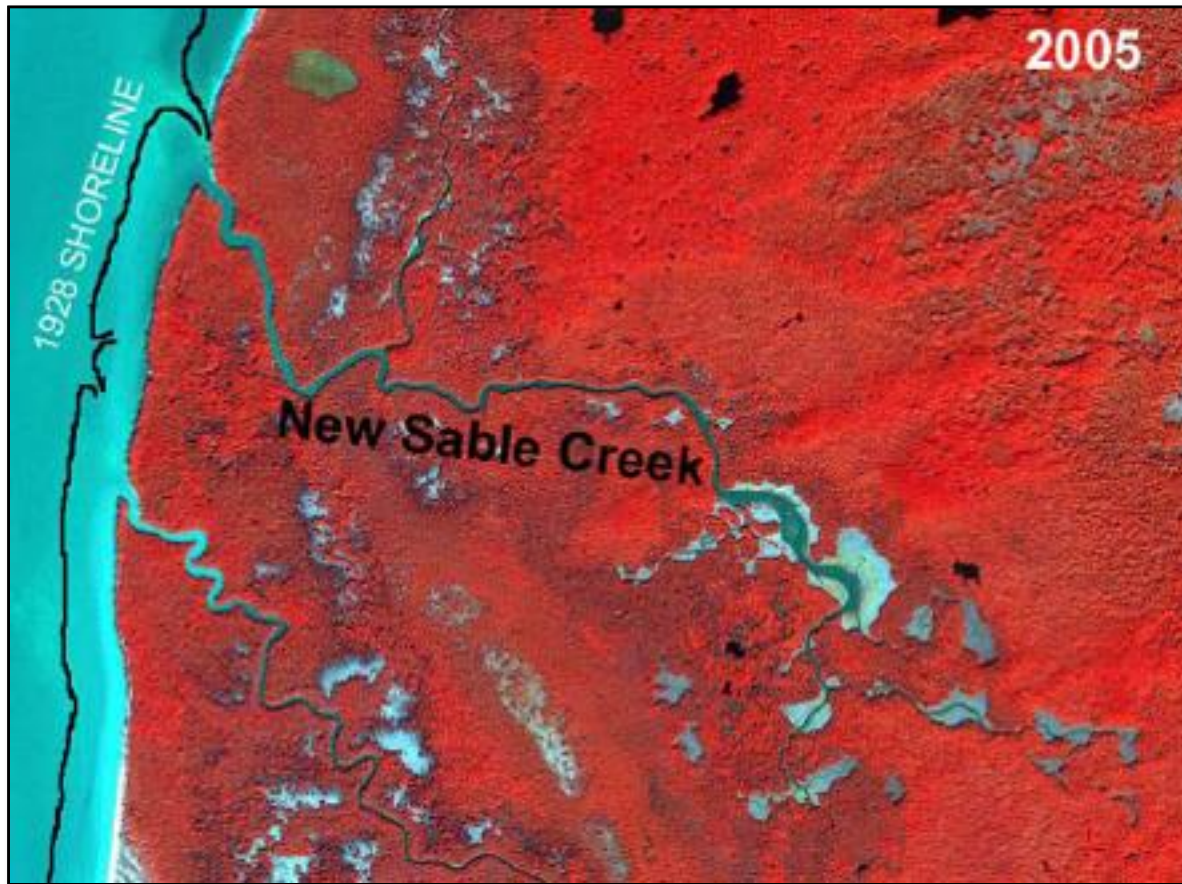
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# What's at risk?

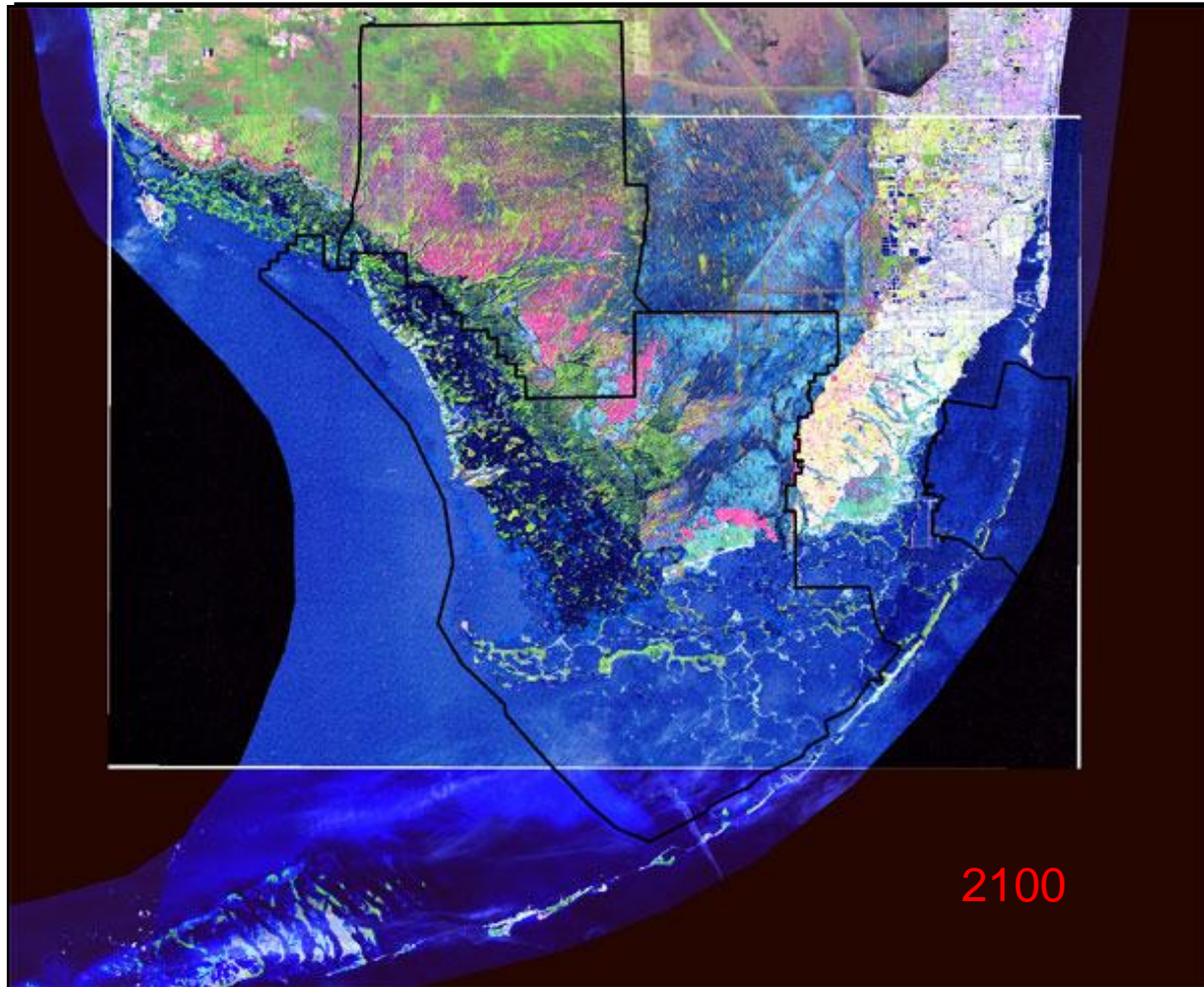


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# Sea Level Rise

Statement of Dan Kimball, Superintendent, Everglades National Park, National Park Service, Department of the Interior, Before the Subcommittee on Interior, Environment, and Related Agencies of the House Appropriations Committee Concerning Climate Change and Lands Administered by the Department of the Interior, April 26, 2007.



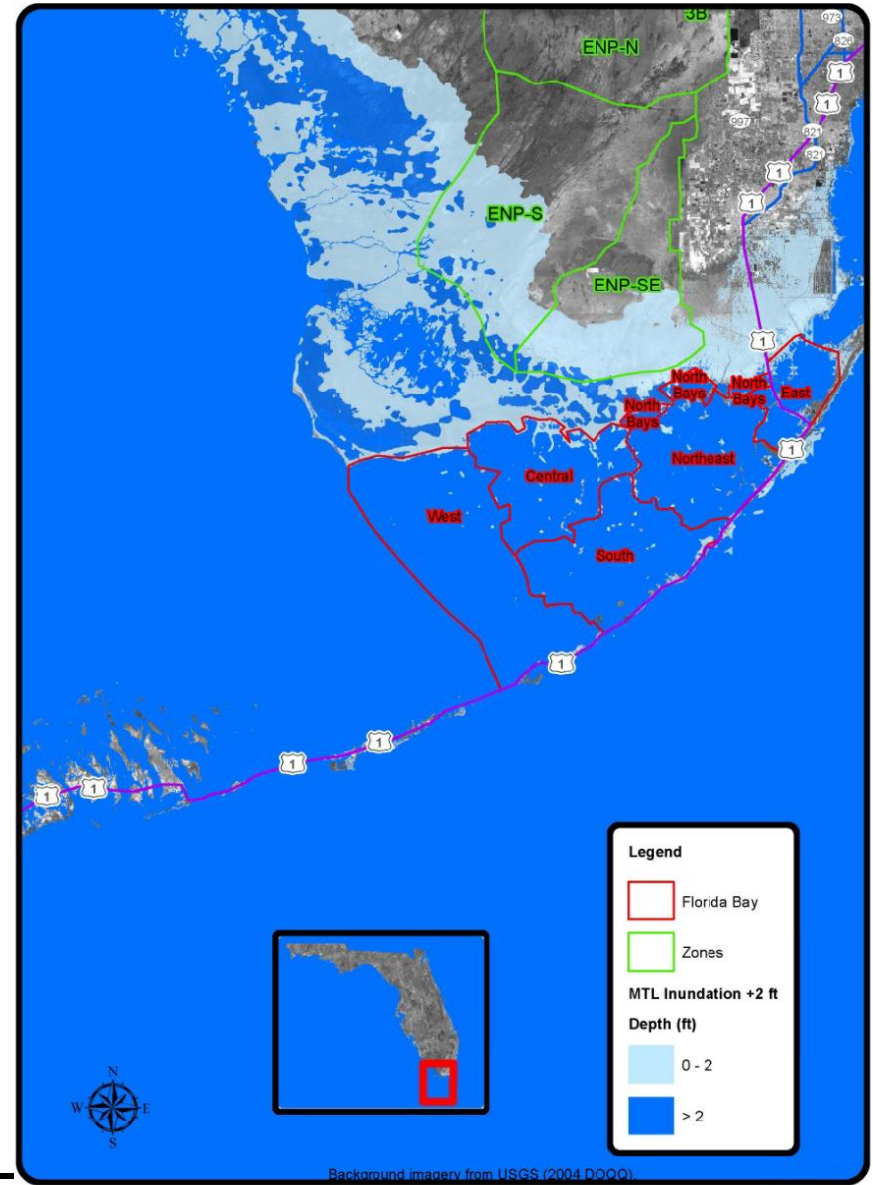
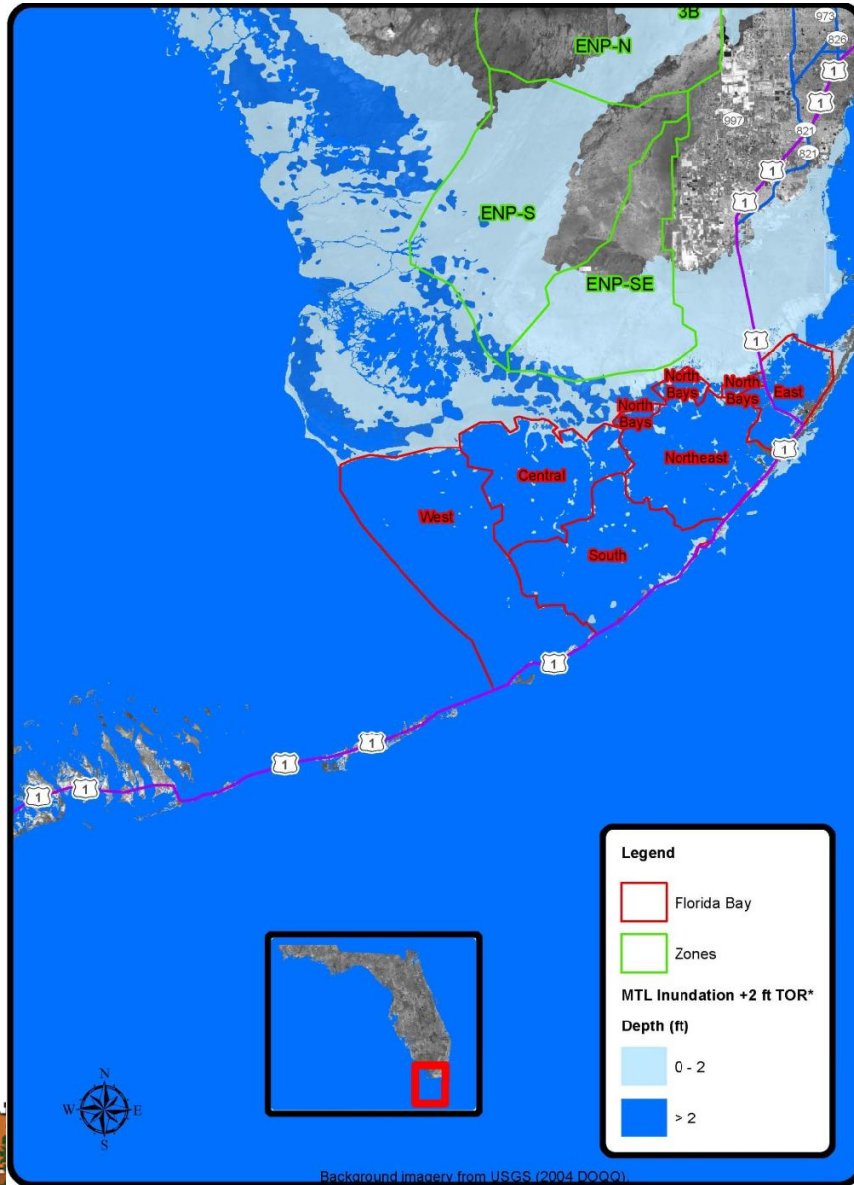
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# Sea Level Rise Projection through 2100

2 Foot SLR Marsh Losses Without Flow Restoration    2 Foot SLR Marsh Losses With Flow Restoration



# Flooding & Storm related impacts

Ft. Lauderdale



Miami Beach

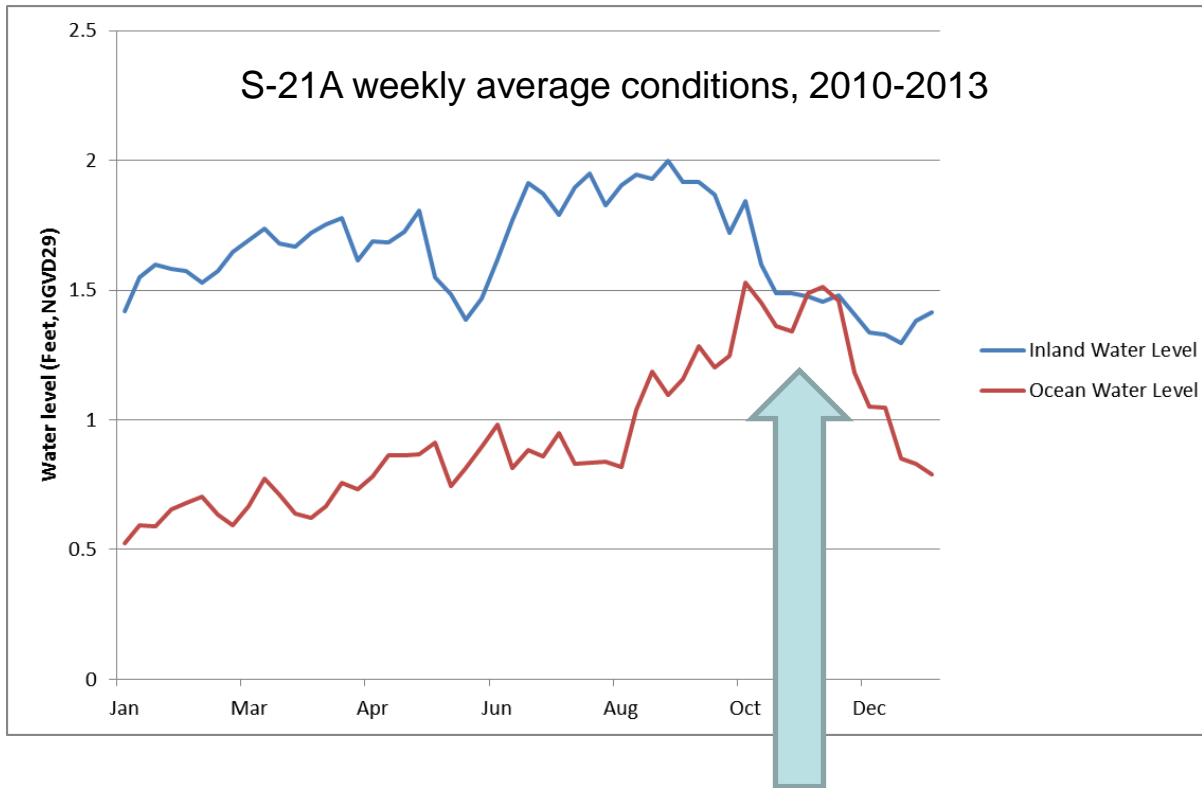


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# Flood control



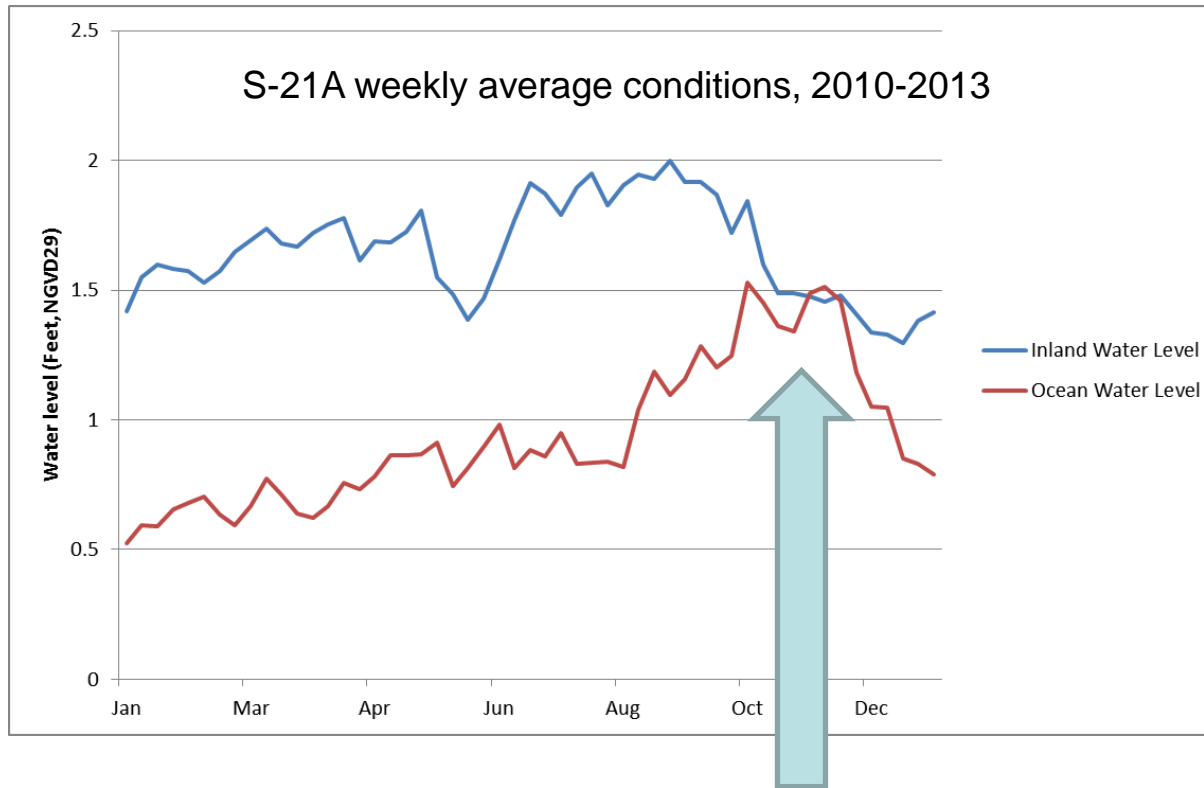
Coastal ocean water level is higher than inland water level each Fall.



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# Flood control



“Unusually low Florida Current transports were observed in May and June (2009) and were linked to high sea level and coastal flooding along the east coast of the United States in the summer”

*Arndt, et al., State of the Climate, 2009*

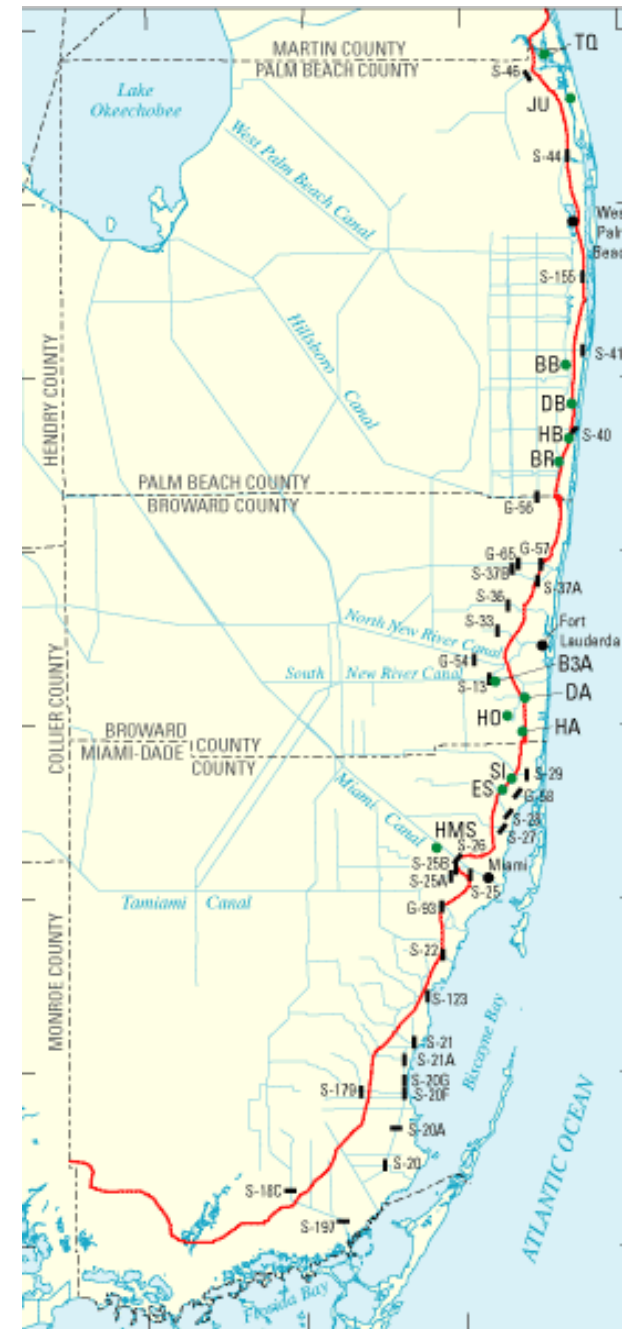
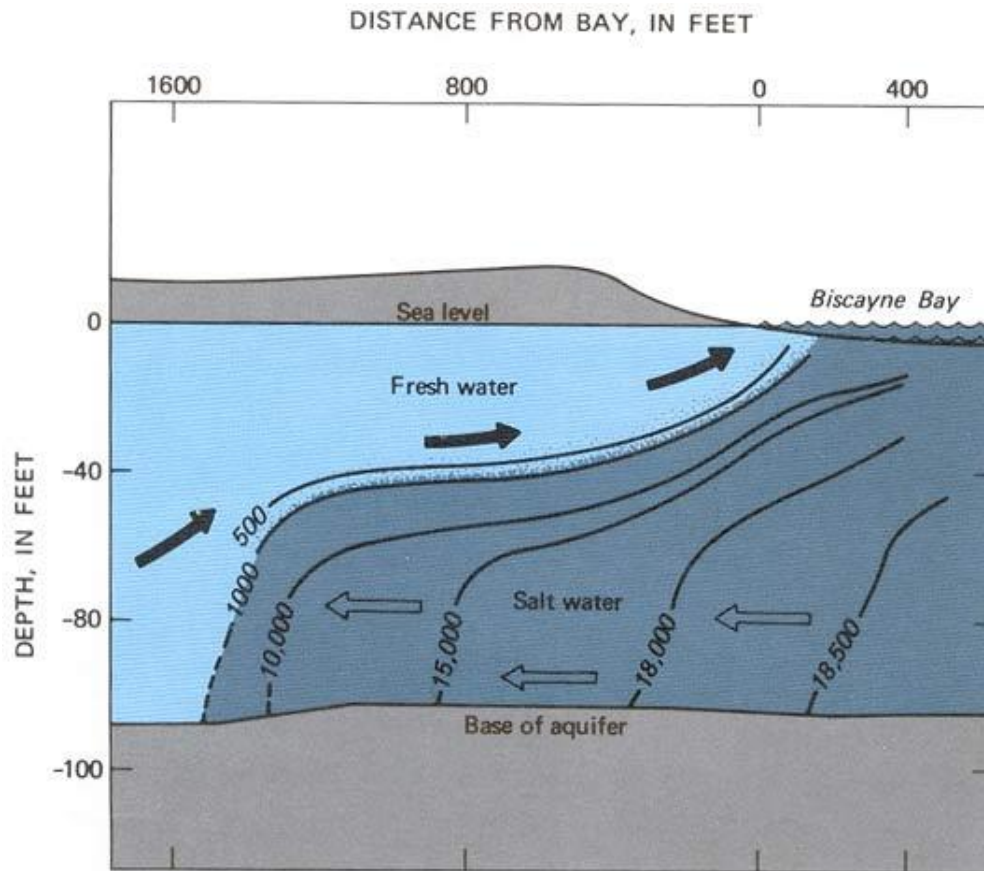
*Bulletin of the American Meteorological Society*



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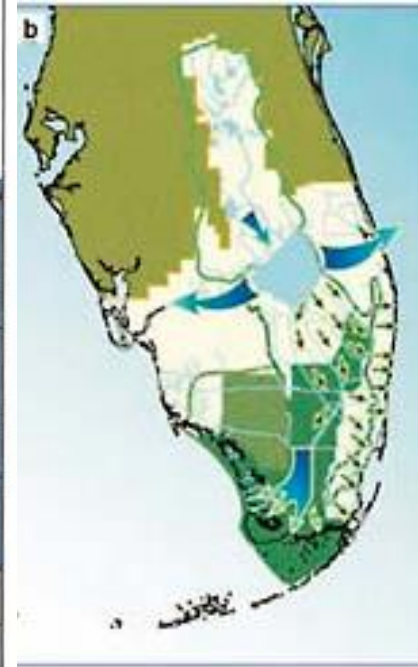
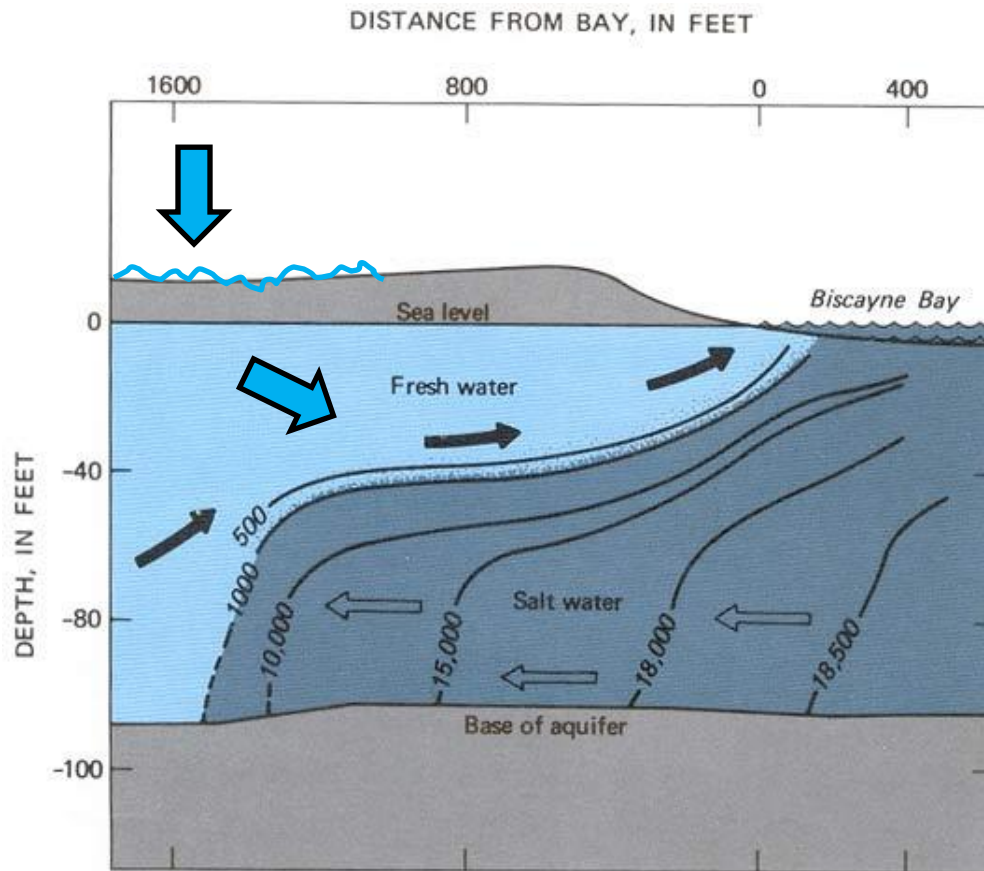
# Saltwater Intrusion



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# Everglades Restoration is a climate change adaptation tool



Current Flow



Restored Flow



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# Discussion

- Everglades Restoration as a climate change adaptation tool
- Physical science behind sea level variability
- Saltwater intrusion
- Hurricanes and other episodic events
- Pumps and canals



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