

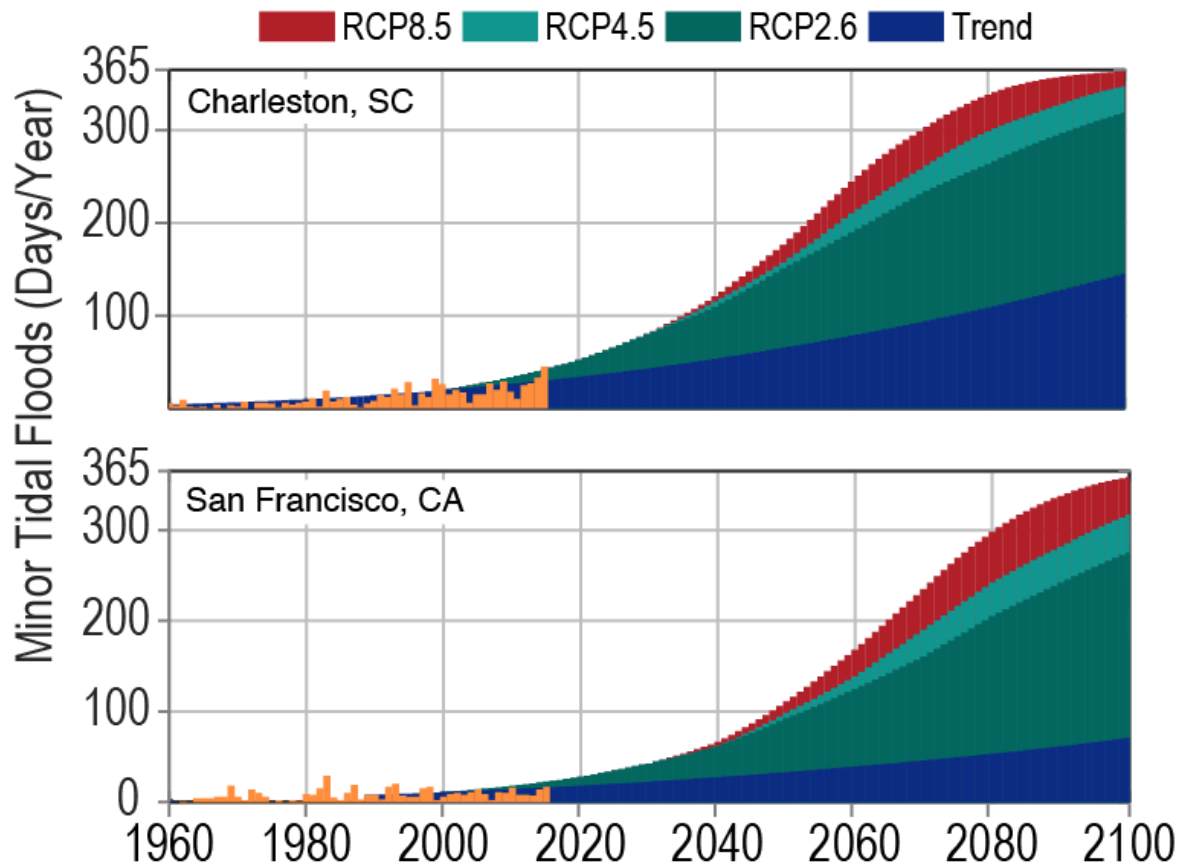
# Surging Seas - Economic and Financial Consequences

Geoffrey Heal May 4<sup>th</sup> 2018

# Sea level is rising

- Could rise anywhere from lower bound of 3 feet to upper bound of 15 feet by 2100
- Estimates based modeling ice sheets and on paleoclimate record
- Even a small rise has huge consequences
- Loss of homes and infrastructure to value of \$100s of billions

# Flooding Risk



Thanks to  
Radley Horton for  
this slide.

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- Agricultural land
- Recreational sites (beaches, parks)
  - Beaches are at sea level and will be the first to go
- Beaches don't appear as assets on any balance sheets but they create value for coastal businesses



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# VALUE AT RISK

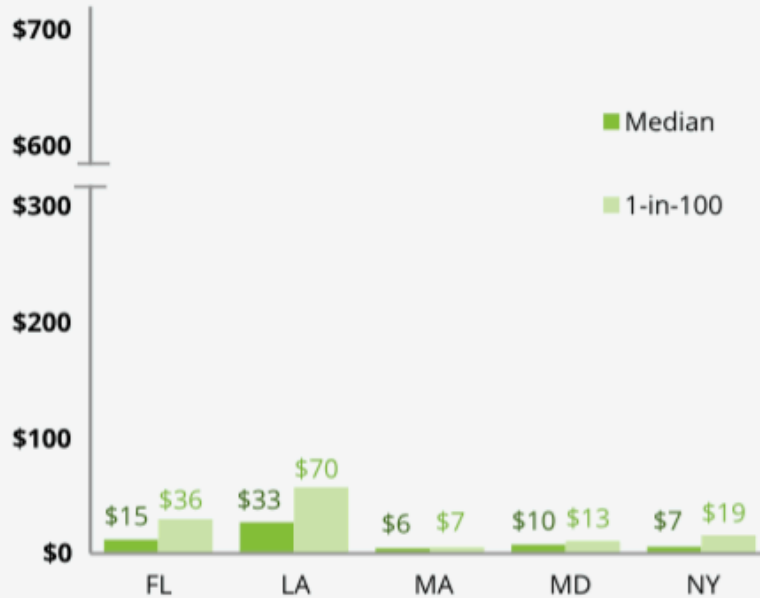
# Housing in NYC & Miami

	New York City	Miami
6 foot rise	100,000/\$39 billion	54,000/\$14 billion
10 foot rise	300,000/\$100 billion	130,000/\$32 billion

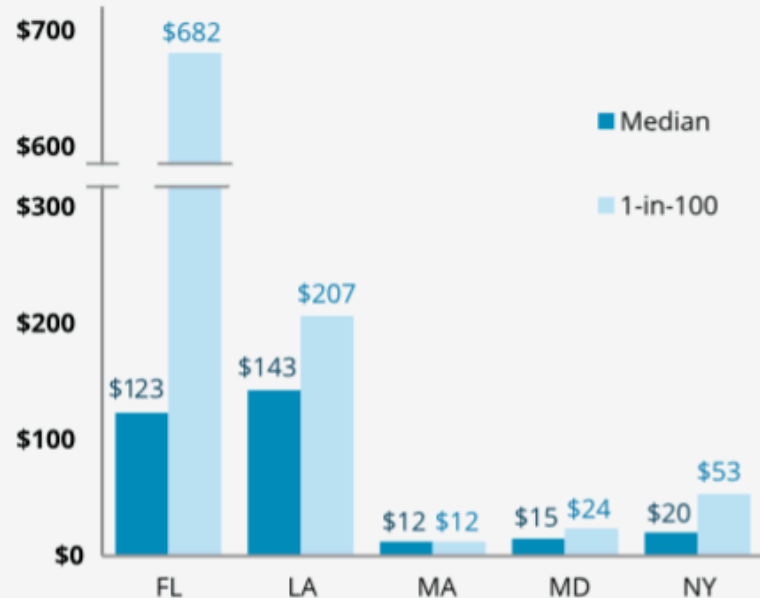
Table 1: homes and property values at risk from flooding in NYC and Miami under 6 and 10 foot rises in sea level.

# Housing in Coastal States

Current Property Value Below Mean Sea Level by 2050, billion USD



Current Property Value Below Mean Sea Level by 2100, billion USD



# Cities at risk worldwide

Rank	City
1	Guangzhou
2	Miami
3	New York-Newark
4	New Orleans
5	Mumbai
6	Nagoya
7	Tampa-St Petersburg
8	Boston
9	Shenzen
10	Osaka-Kobe

# US Airports at risk

Airport Name/Location	Height above Sea Level
Louis Armstrong/New Orleans	-1.7
Fort Lauderdale	5.2
San Francisco	5.4
Oakland	5.6
La Guardia	6.7
Isla Grande/San Juan Puerto Rico	6.8
Miami	7.4
Honolulu	7.7
Philadelphia	8.3
Newark	8.6
Ronald Reagan National/Washington DC	10.3
Tampa	10.6
JFK/New York	11.3



# Roads at Risk

State	Miles of road within 10 feet of sea level
Florida	10630
Texas	6136
North Carolina	3267
California	2634
New Jersey	2144
South Carolina	1872

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- *Or will the trigger be one or two homeowners who decide to sell defensively?”*



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- In South Florida some markets are responding: Florida Sun-Sentinel -
  - *“Florida is at greatest risk of property loss not just because it has the longest sea coast in the continental U.S. and the most expensive coastal real estate, but because of the state's low elevation and high water table. Inland flooding will become common during high tides from water rising up through the ground, overflowing canals and drainage systems in low-lying inland communities.”*

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- .. *there are indications that investors are already looking to higher ground elsewhere in the city, such as the traditionally poor, black neighborhoods of Little Haiti and Liberty City. “The older urban core was settled on the coastal ridge and anything below that was flooded. The coastal ridge we’re talking about is clearly gentrifying,”\**

\* The Guardian Aug 29 2017

\*\* Scientific American May 1 2017

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- *High Ground Is Becoming Hot Property as Sea Level Rises - Climate change may now be a part of the gentrification story in Miami real estate \*\**

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- Could the anticipation of this cause a crisis?