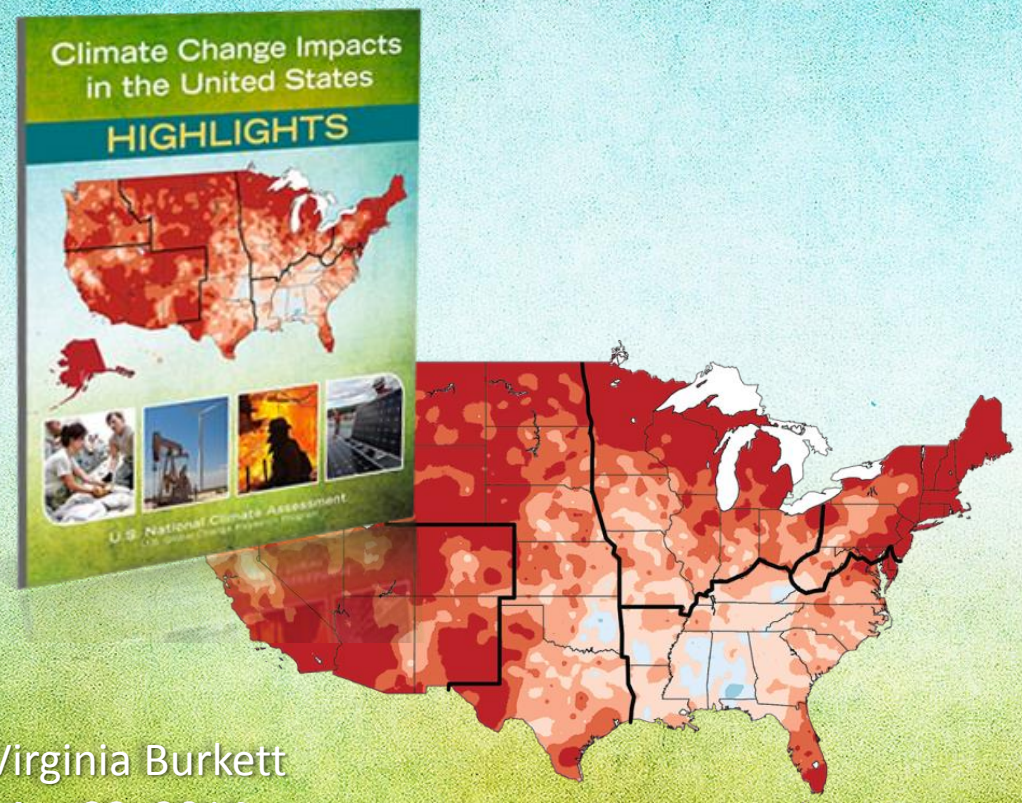
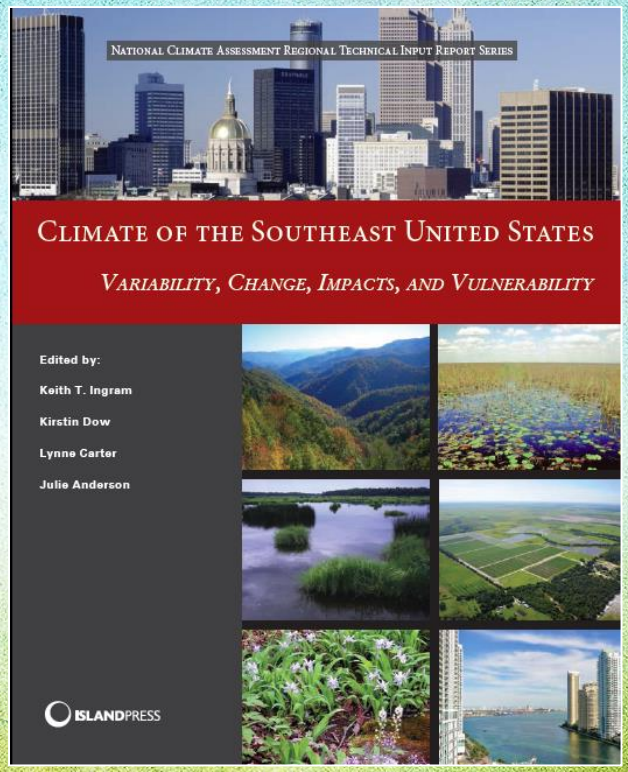
Third National Climate Assessment
Key Findings for the Southeast





Virginia Burkett
May 22, 2014

U.S. Department of the Interior

USGS
science for a changing world

Energy and Environmental Study Institute
Senate Briefing

EESI

NCA3 Southeast and Caribbean Chapter

http://nca2014.globalchange.gov/report/regions/southeast

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Three Key Messages from the SE

- **Sea level rise** poses widespread and continuing threats to both natural and built environments and to the regional economy.

Terrebonne Parish, LA

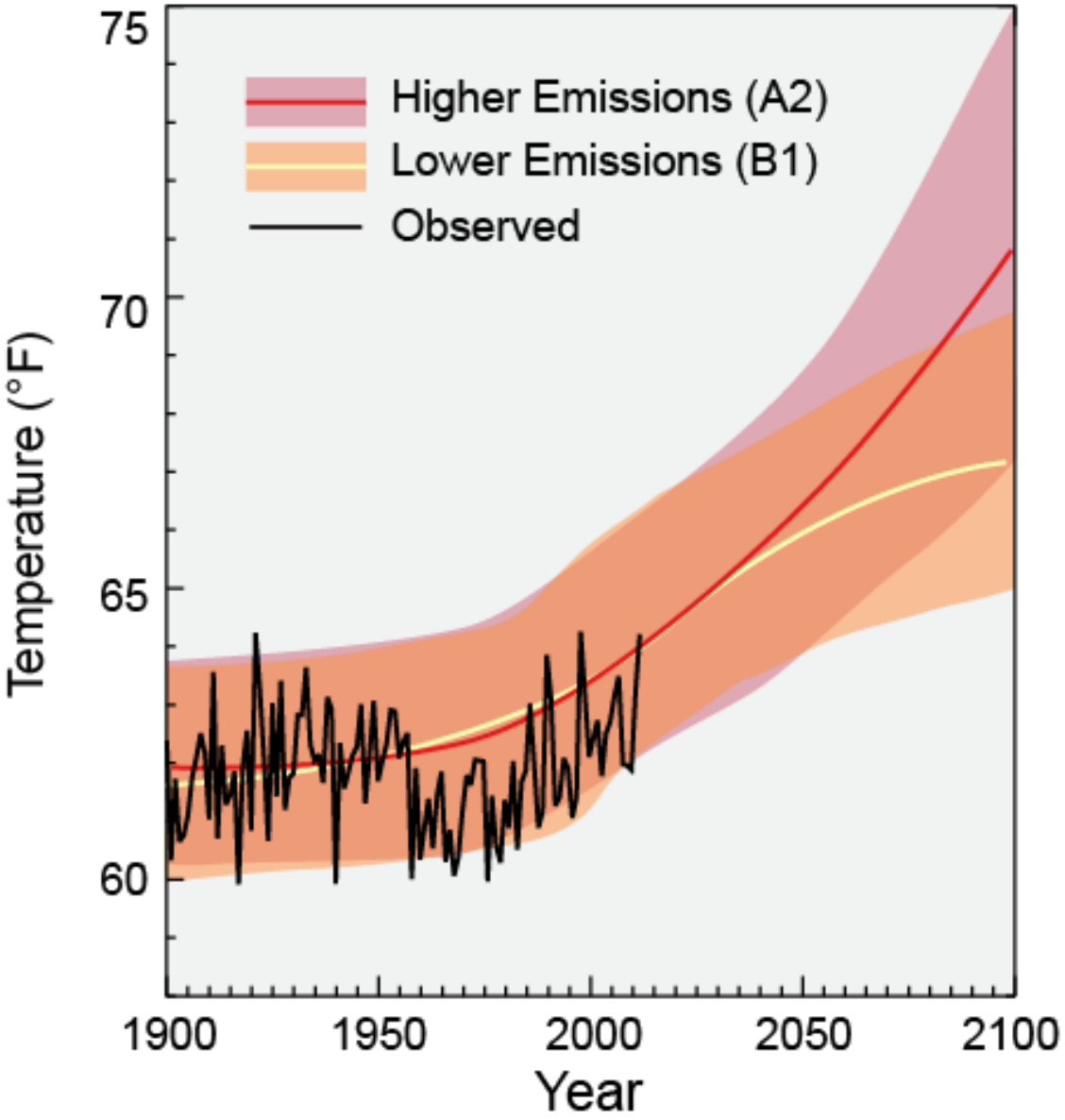
- **Increasing temperatures** and the associated increase in frequency, intensity, and duration of extreme heat events will affect public health, natural and built environments, energy, agriculture, and forestry.

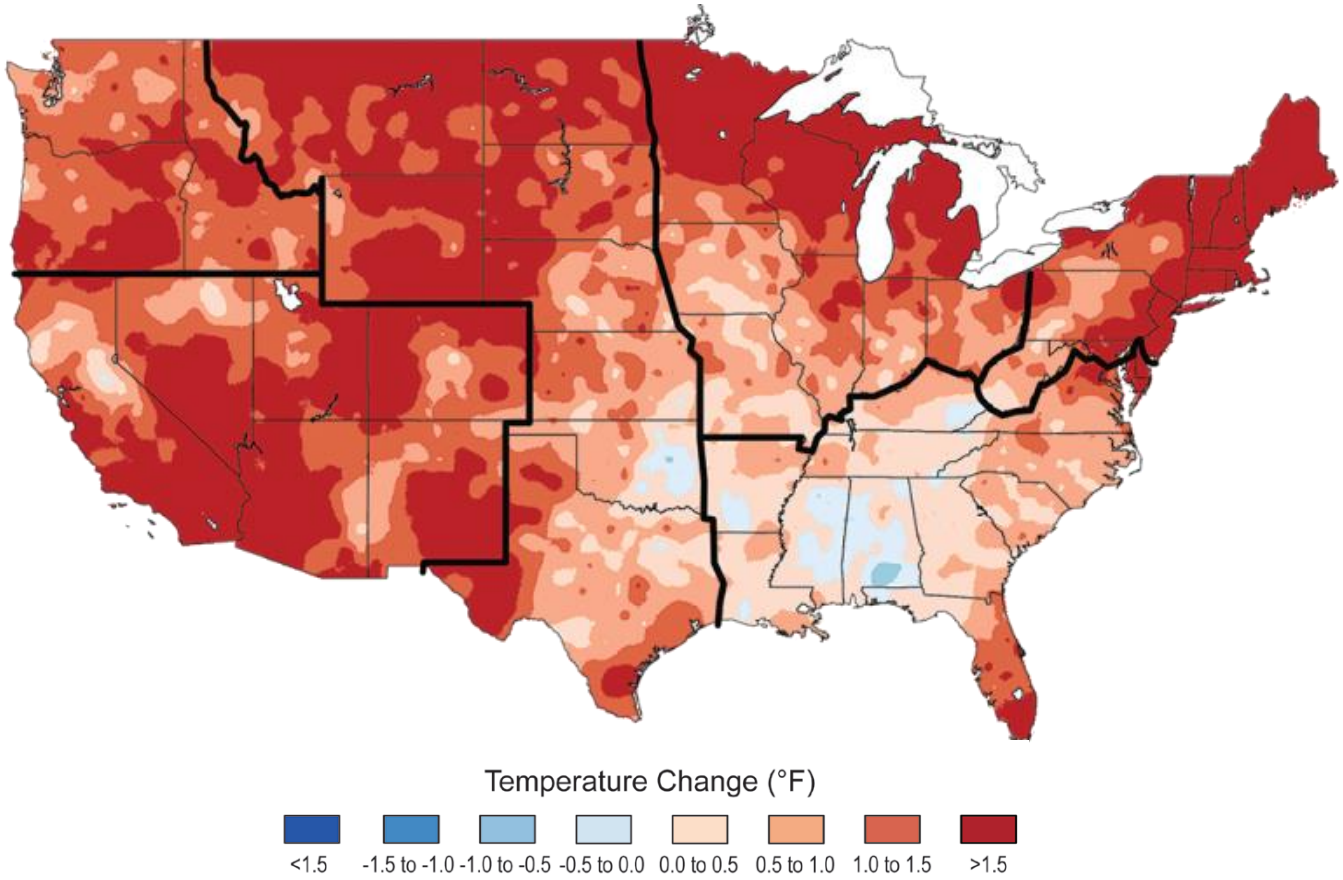
S. Florida

- **Decreased water availability**, exacerbated by population growth and land-use change, will continue to increase competition for water and affect the region's economy and unique ecosystems.

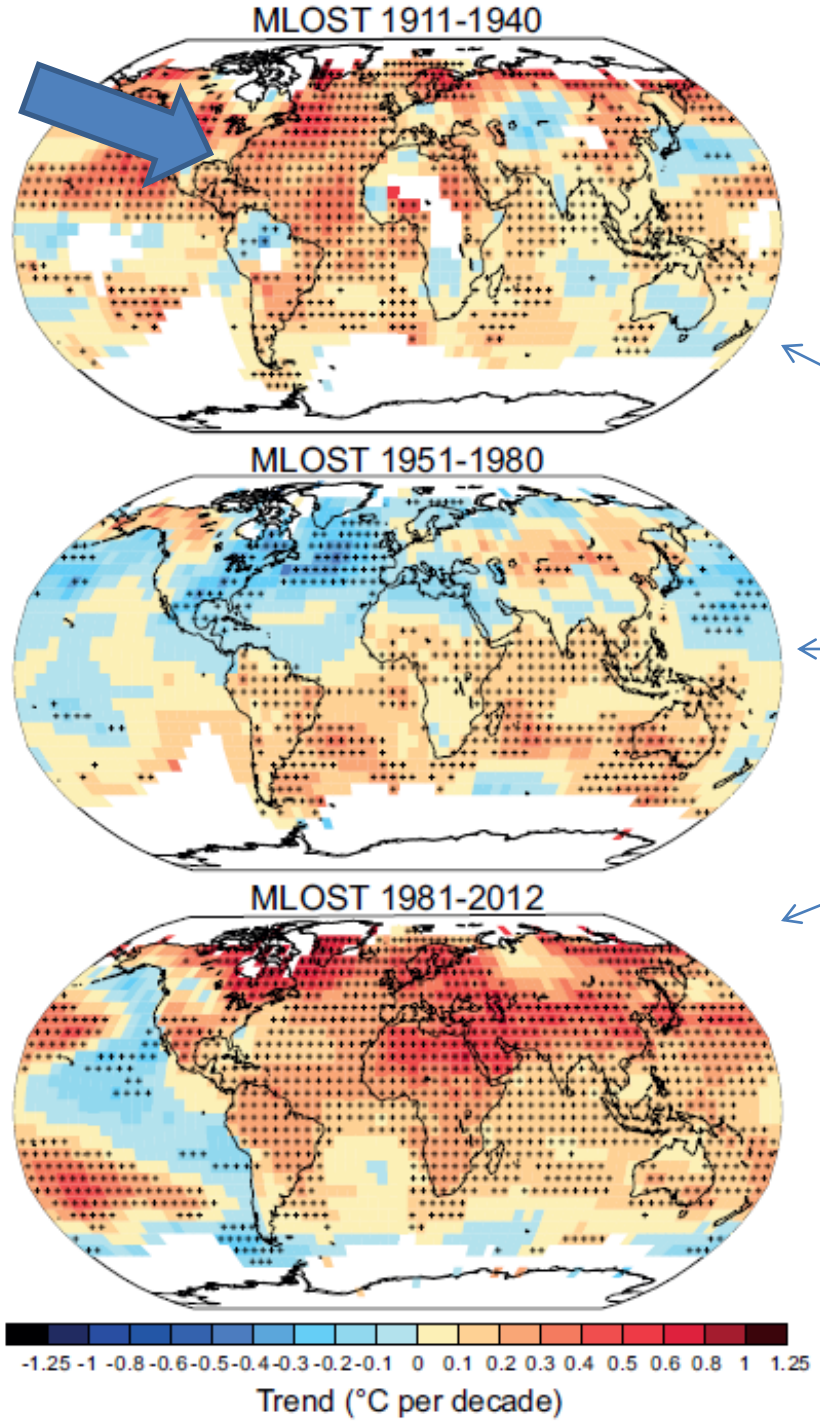
Lake Lanier, Georgia

Southeast Temperature: Observed and Projected





NCA cover figure shows difference in temperature over the past 22 years (1991-2012) compared to the 1901-1960 average. The Southeast warmed during the early part of last century, cooled for a few decades, and is now warming at rates comparable to the global average.



Trends in global surface temperature for three non-consecutive periods:

1911–1940

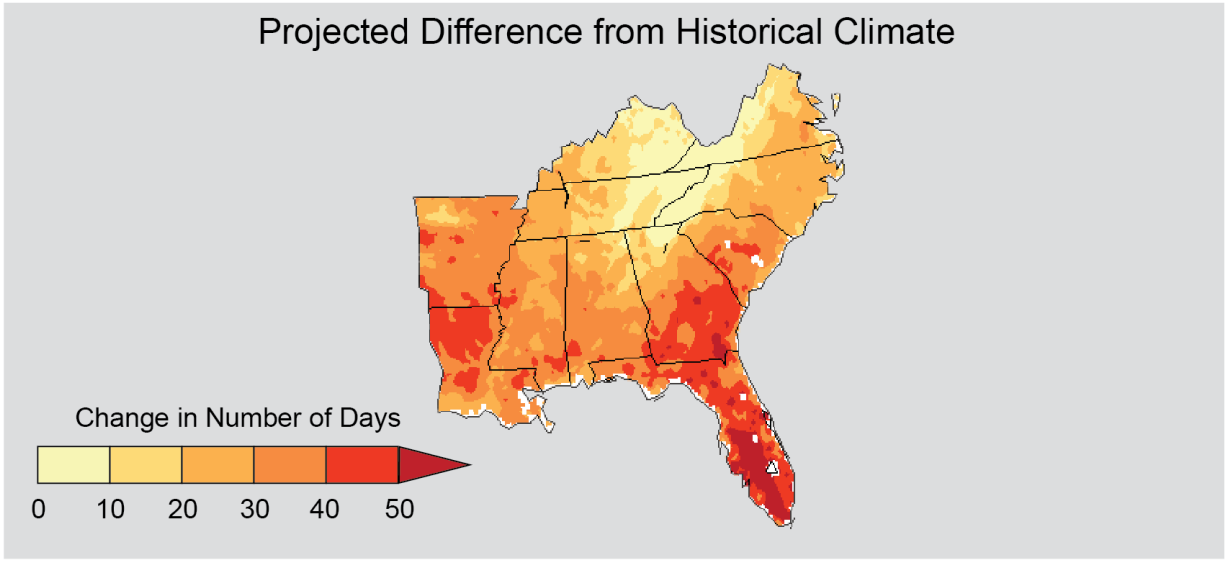
1951–1980

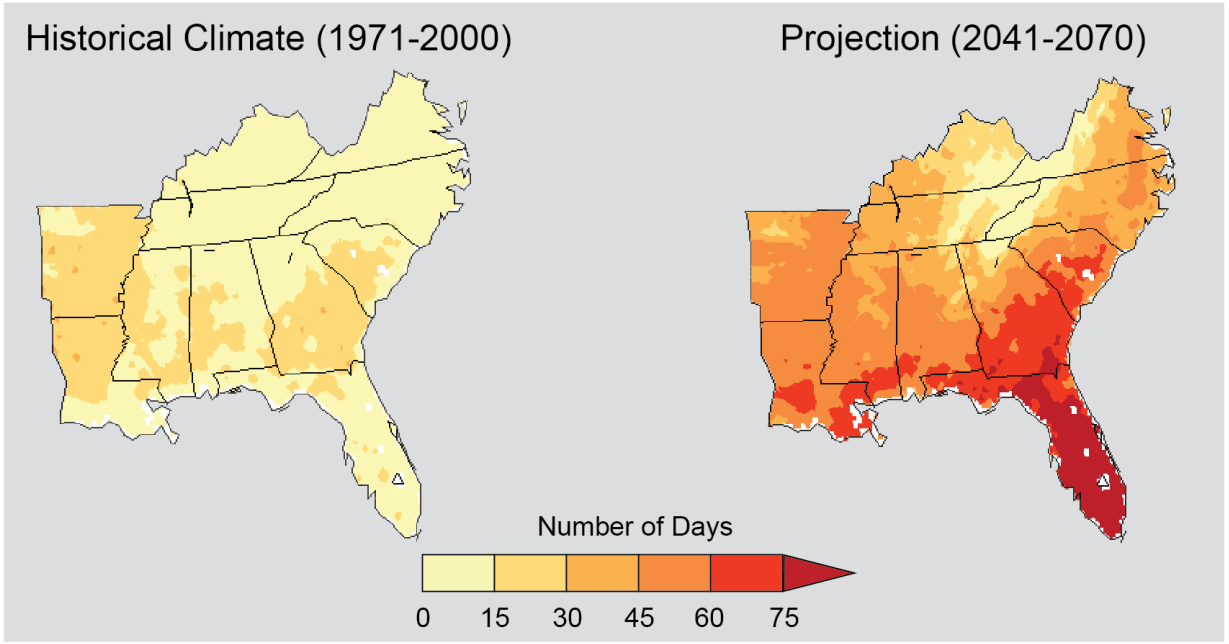
1981–2012

Figure is based on Merged Land-Ocean Surface Temperature (MLOST) Analysis by NOAA's NCDC. White areas indicate incomplete or missing data.

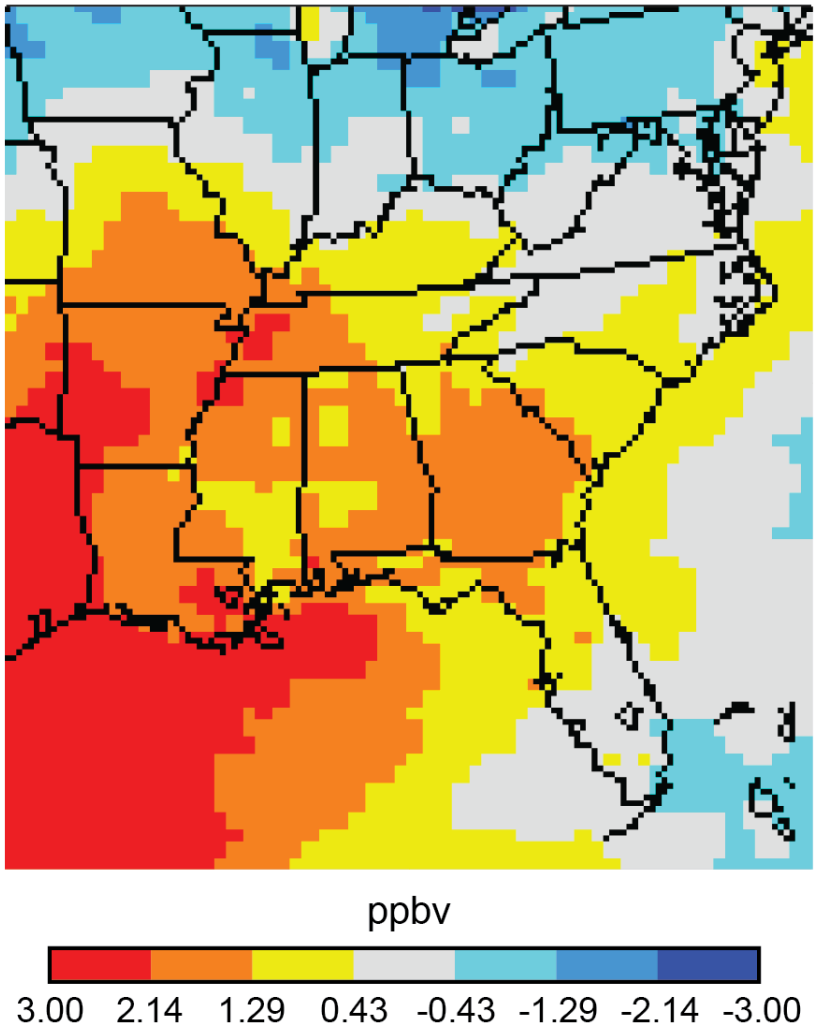
(Source: IPCC Working Group I, 2013, Figure 2-22)

Projected Change in Number of Days in SE Over 95° F





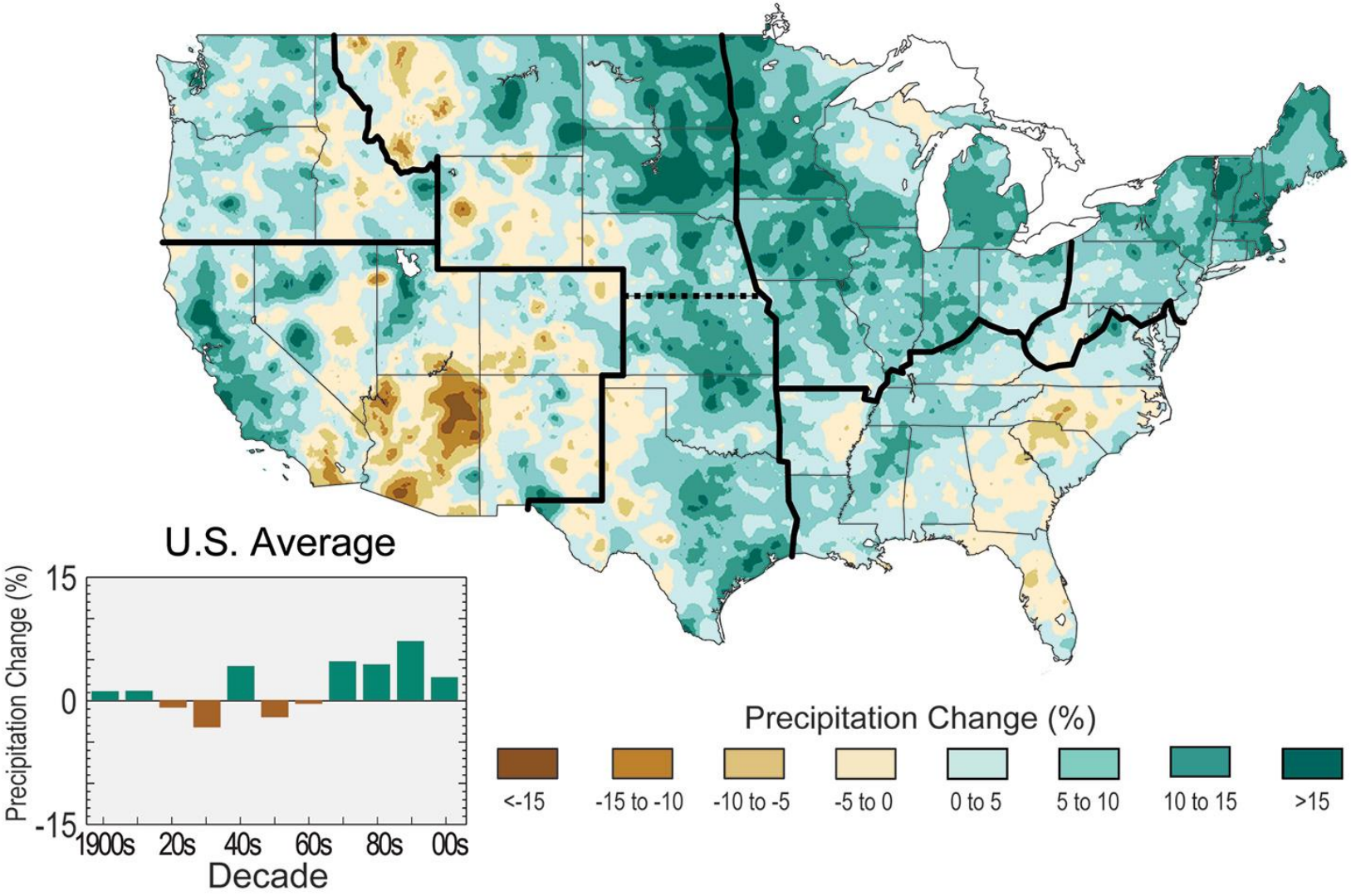
Ground-level Ozone
generally increases with temperature



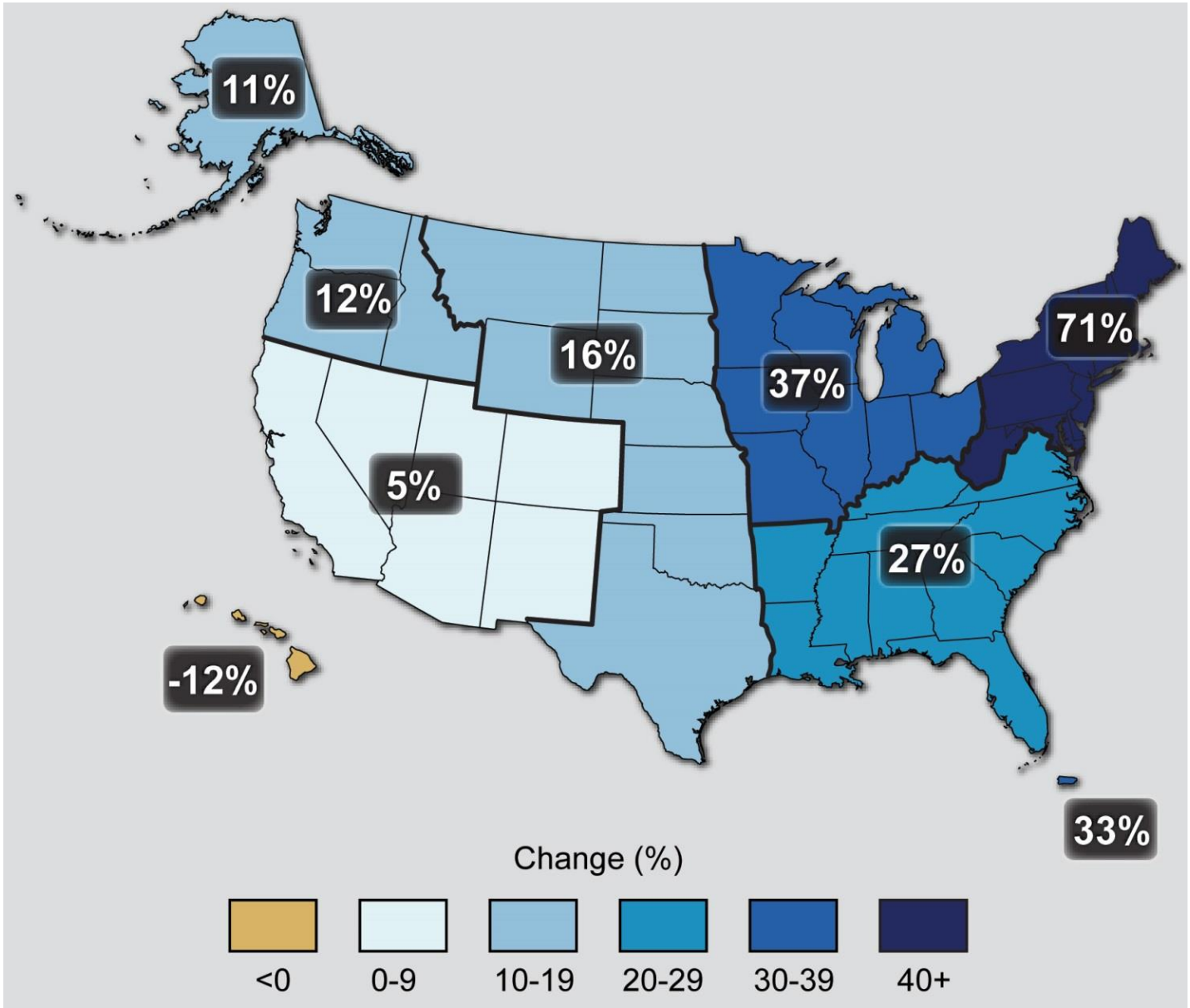
Map shows projected changes in average annual ground ozone in 2050 compared to 2001, using a mid-range emissions scenario (A1B)

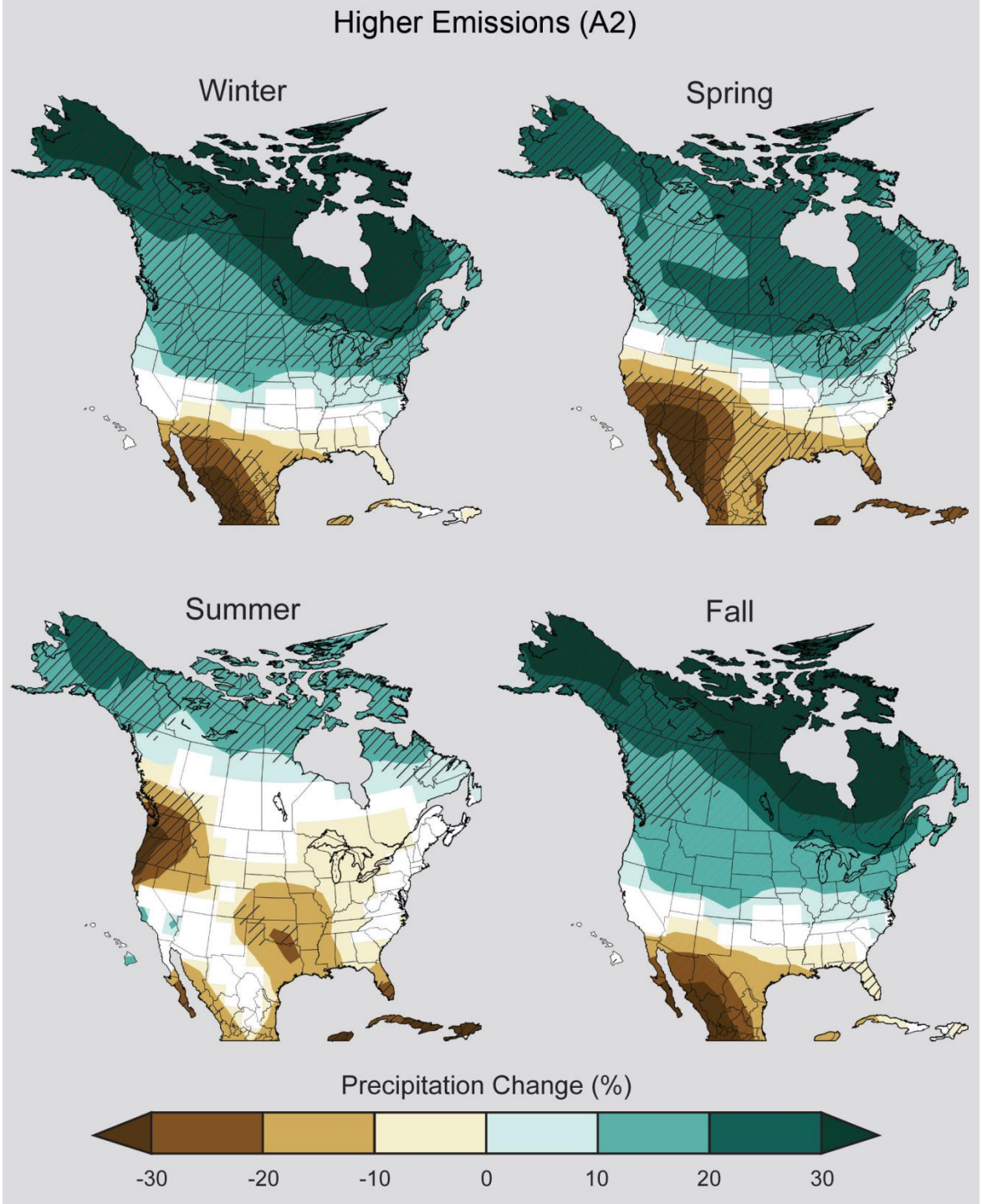
Observed precipitation change

for 1991-2012 compared to the 1901-1960 average



Observed Change in Very Heavy Precipitation from 1958 to 2012

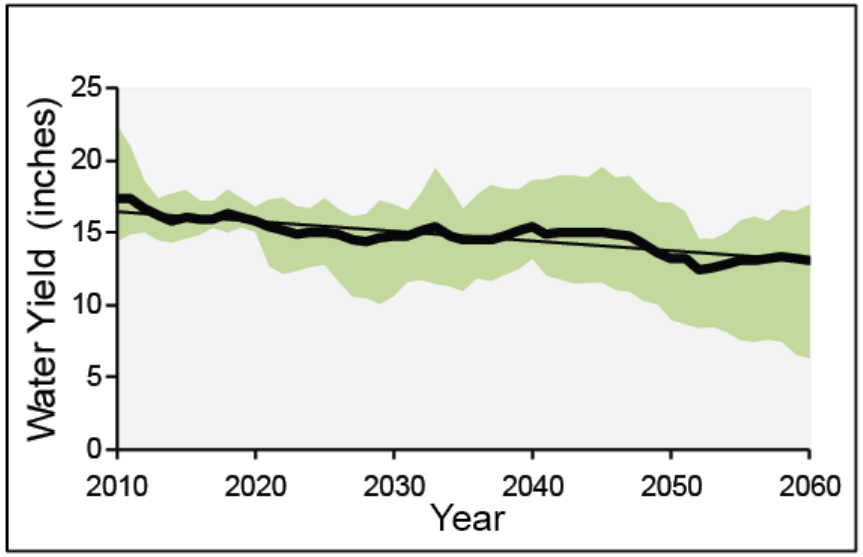


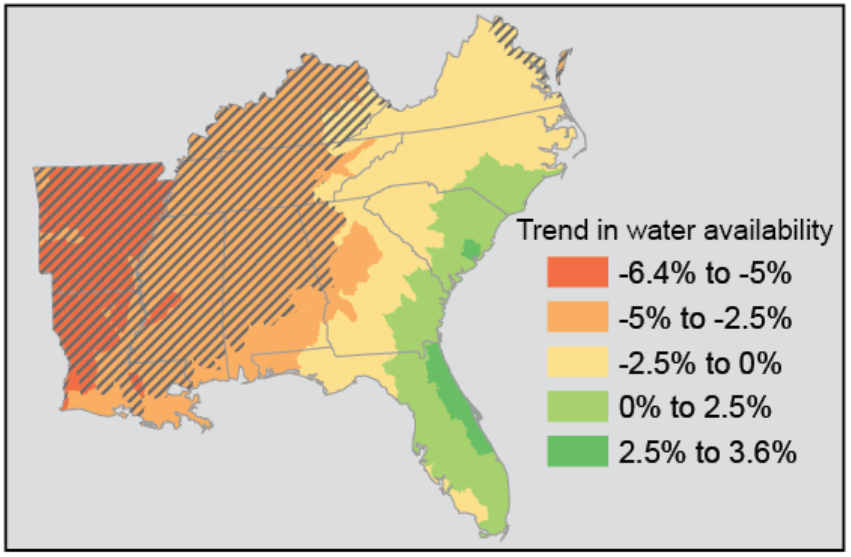


Projected change in seasonal precipitation

for 2071-2099 (compared to the period 1970-1999) under an emissions scenario that assumes continued increases in emissions (A2)

Projected Trends in SE Water Availability

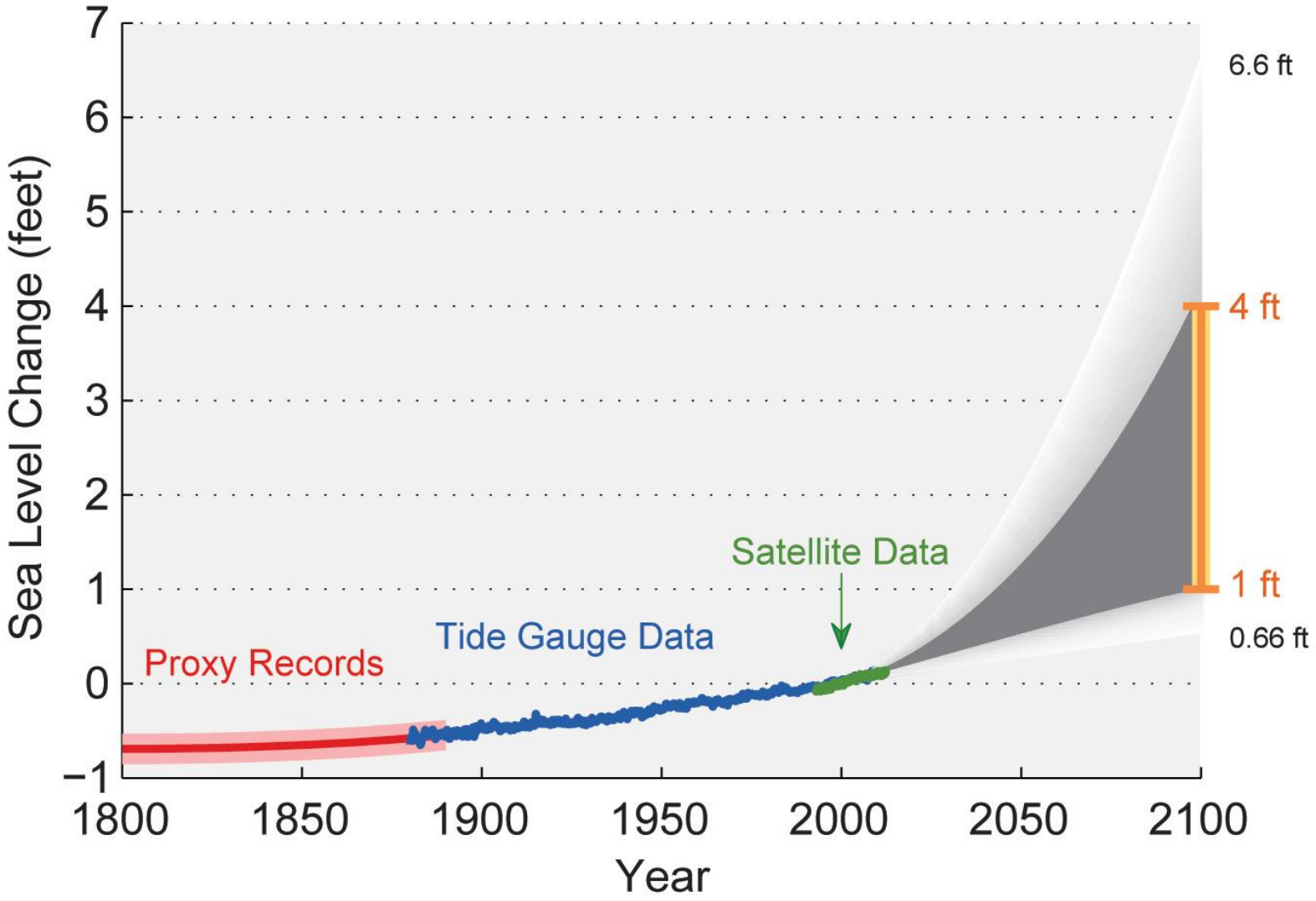




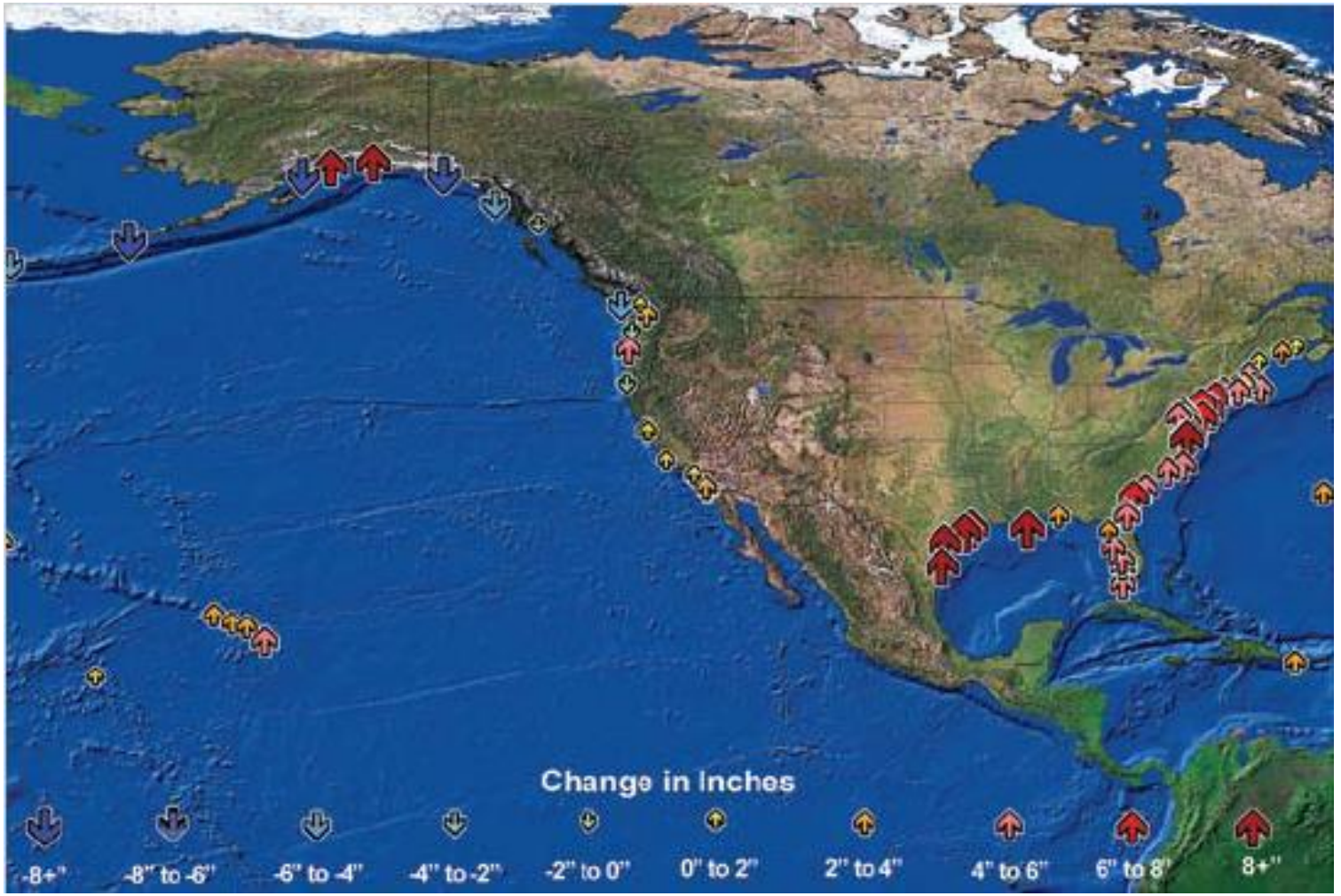
Projected trend in Southeast-wide annual water yield (equivalent to water availability) due to climate change. The green area represents the range in predicted water yield from four climate model projections based on the A1B and B2 emissions scenarios.

Spatial pattern of change in water yield for 2010-2060 (decadal trend relative to 2010). The hatched areas are those where the predicted negative trend in water availability associated with the range of climate scenarios is statistically significant (w/ 95% confidence).

Past and Projected Changes in Global Sea Level

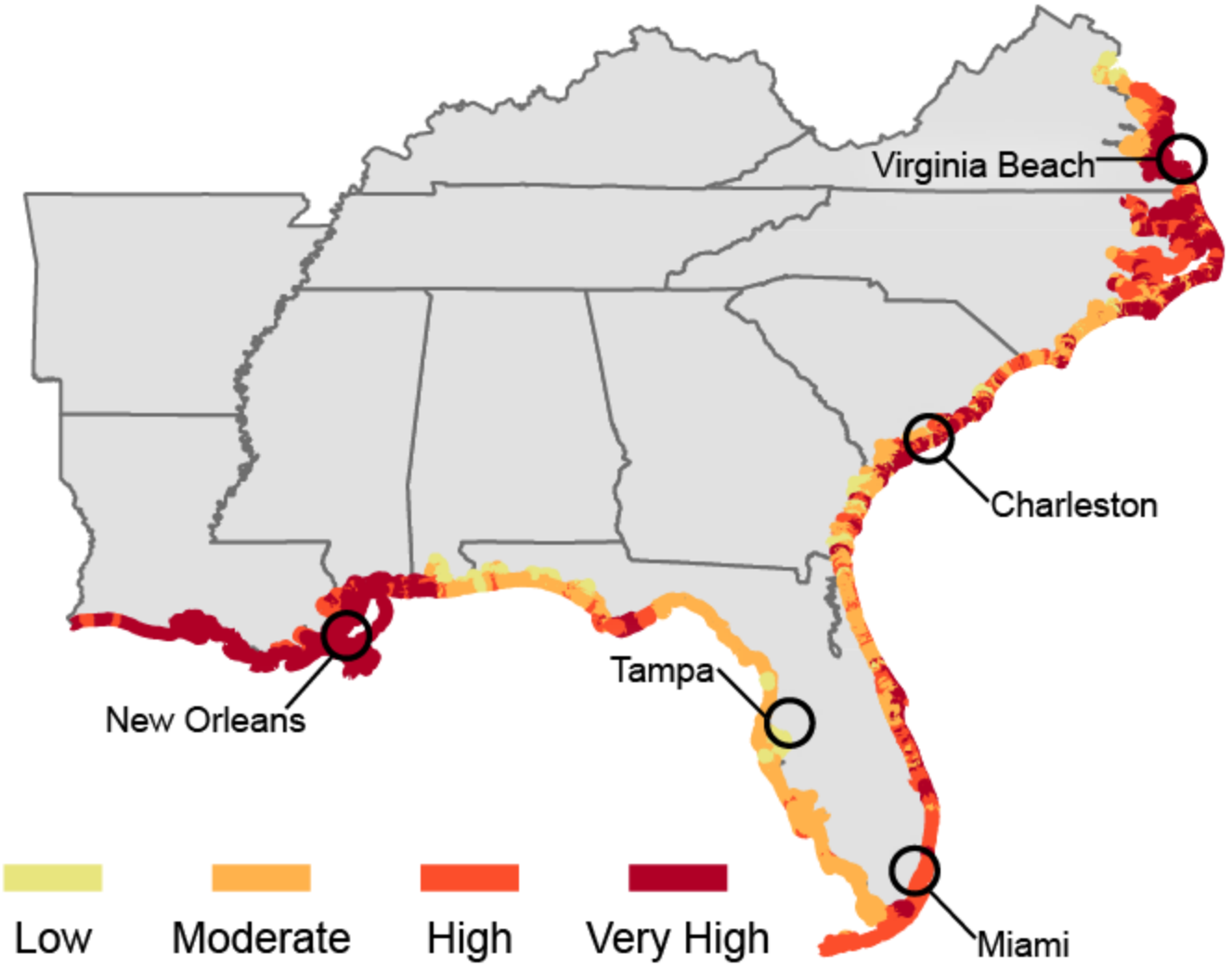


Net effect of “relative” sea level change from 1958 to 2008 for locations on the U.S. coast



(USGCRP, 2009)

Vulnerability to Sea Level Rise



Net Effect of Relative Sea Level Rise in Lafourche Parish, LA


Wendell Curole photo

Shrinking Coastal Lands for Tribal Communities

Source of photos: Isle De Jean Charles band

Thresholds in community sustainability are being crossed in some low-lying coastal regions.

Forward

http://www.indiancountrytoday.com/home/content/61447992.html

INDIAN COUNTRY TODAY

Indian group says it will abandon ancestral home

By Cain Burdeau, Associated Press Writer

Story Published: Sep 28, 2009

Story Updated: Sep 25, 2009

NEW ORLEANS – After 170 years fishing and crabbing in southern Louisiana's swamps and marshes, a group of American Indians repeatedly flooded by hurricanes says it is intent on moving from its ancestral island home.

The band's chief said Sept. 22 that the group is seeking to start a new life as a community behind levees on higher ground.

A migration inland would symbolize one of the most obvious defeats in south Louisiana's losing battle with land loss and hurricanes. The Mississippi River Delta, on which south Louisiana sits, has lost about 2,000 square miles of marsh and swamp since the 1930s.

But relocation was inevitable, said Albert Naquin, the chief of the Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw. He said the marsh community had been flooded five times in the past six years. About 25 families still call it home.

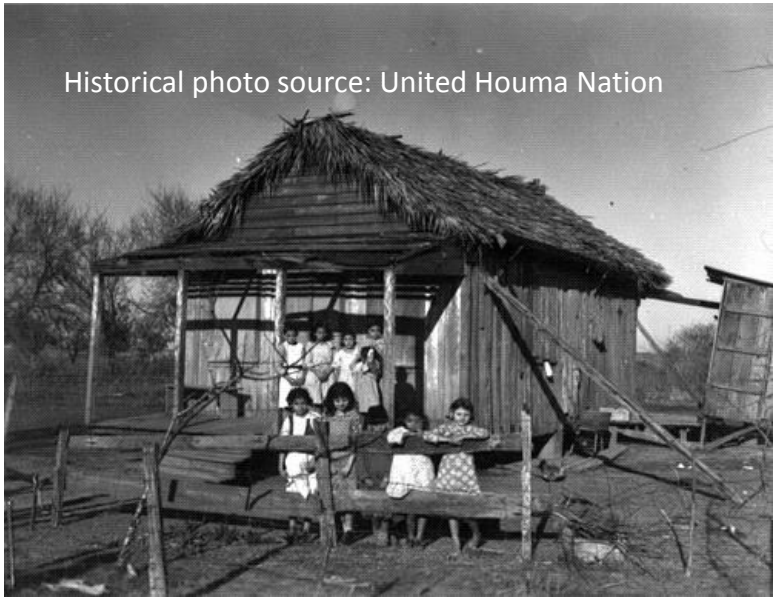
Naquin said the tribe hoped to use about $12 million in federal aid to build 60 homes on 50 acres in Bourg, which is about 10 miles inland.

But many details had to be worked out and the plan was not a done deal.

Naquin said Terrebonne Parish and state officials would have to sign off on it.

State Sen. Butch Gautreaux, D-Morgan City, said he was working with the tribe and Louisiana congressional members to get the relocation plan executed.

Christina Stephens, a spokeswoman for the Louisiana Recovery Authority, said she was unfamiliar with the



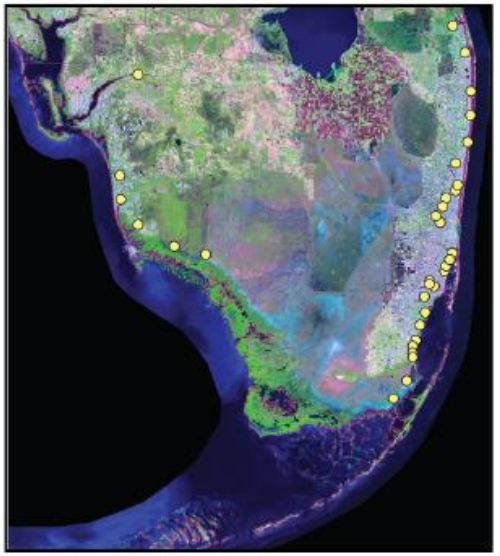
Isle de Jean Charles tribe pursues relocating from island (Houma Courier, Sept. 22, 2009)

HOUMA — Members of a local American Indian tribe are making a new push for government help moving away from their ancestral home on a remote Terrebonne Parish island.

Related Links:

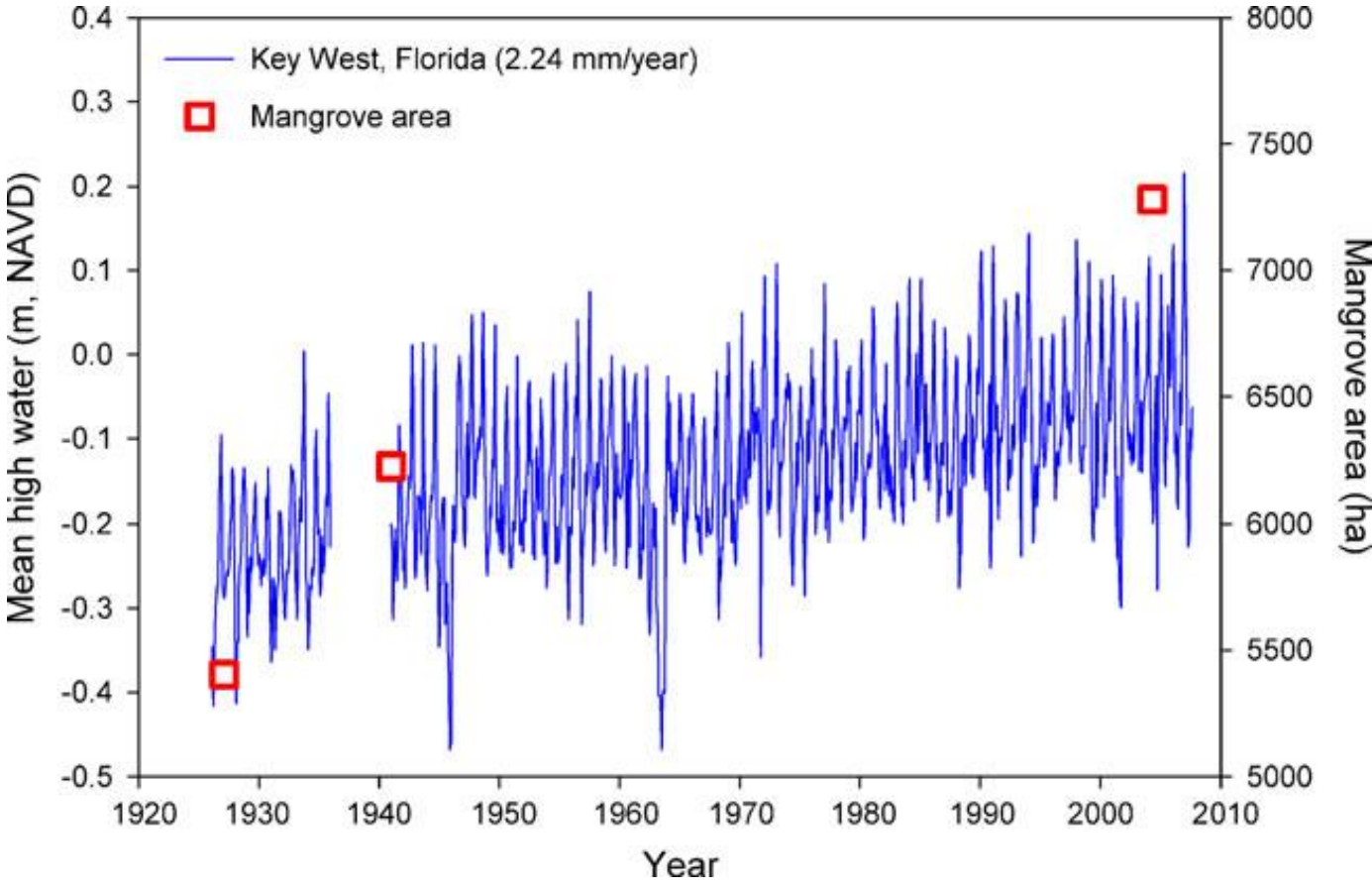
Council to take up potential relocation of islanders
In search of higher ground
Island Road repairs will cost millions
Island residents insist on staying put

South Florida:
Uniquely Vulnerable to Sea Level Rise



In south FL, as sea level rises mangroves are encroaching into marsh.

Sea-level rise trends (mean high water, mhw) from the Key West, Florida, USA National Oceanic and Atmospheric Administration gauge in relation to mangrove area in Ten Thousand Islands NWR from 1927, 1940, and 2005



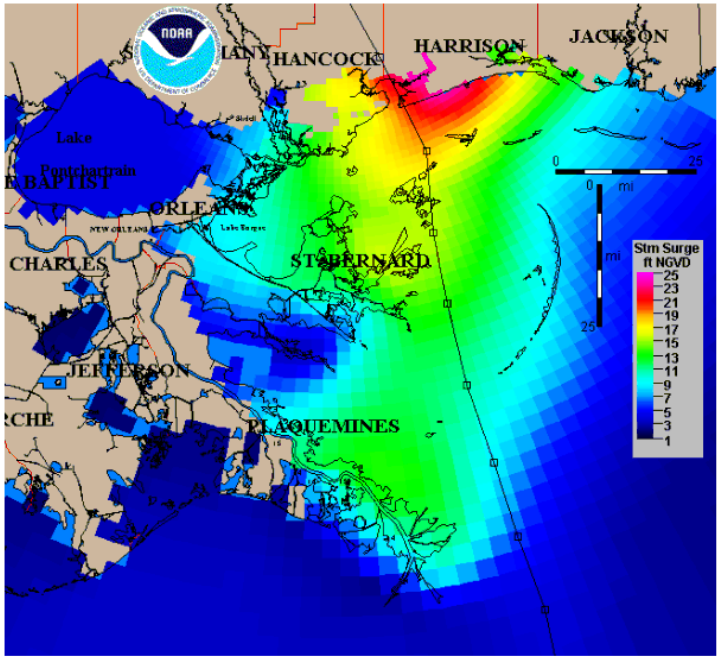
(Figure source: Kraus et al., 2011)

NCA3 key findings regarding Atlantic hurricanes:

Past:

- substantial increase in intensity, frequency, and duration as well as the number of strongest (Category 4 and 5) storms since the early 1980s
- increases in hurricane intensity are linked, in part, to higher sea surface temperatures

(Wilson Shaffer, National Weather Service/NOAA)

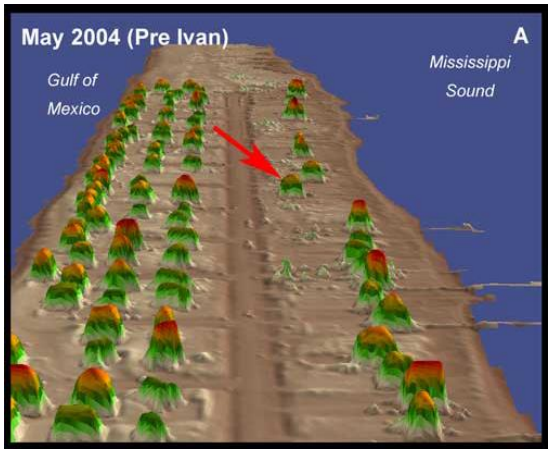


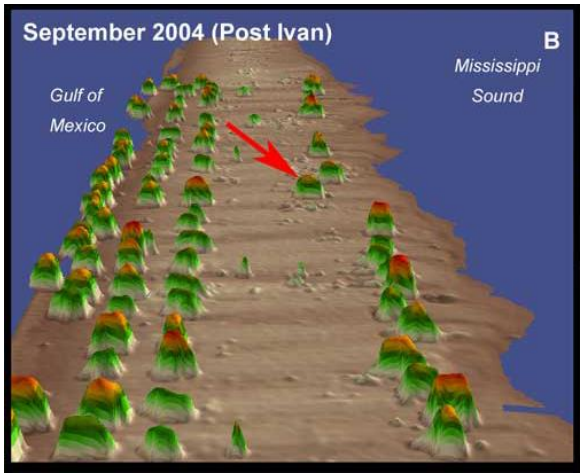
Camille's Envelope of High Water From SLOSH Model

Future:

- by late this century, models, on average, project an increase in the number of the strongest (Category 4 and 5) hurricanes
- greater rainfall rates in hurricanes in a warmer climate, with increases of about 20% averaged near the center of hurricanes

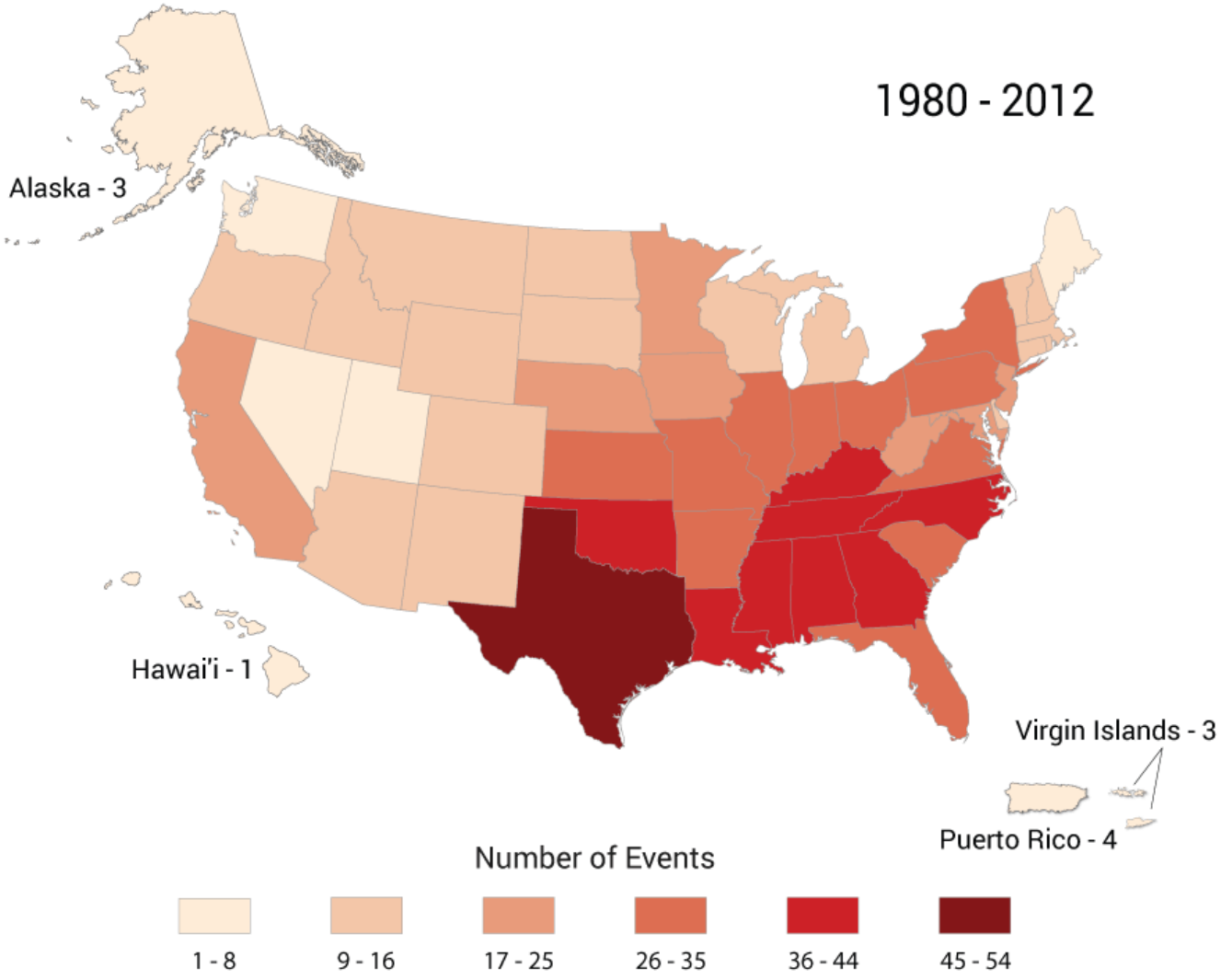
Low-lying Gulf and Atlantic coastal ecosystems will erode more rapidly if hurricanes continue to increase in intensity.





Dauphin Island, Alabama

Billion Dollar Weather / Climate Disasters



Many SE communities are developing climate change adaptation strategies.

Third National Climate Assessment

Climate Change Impacts in the United States

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