

The background of the slide features a large, faint, circular seal of Rutgers University. The seal contains the text 'RUTGERS UNIVERSITY' and 'THE STATE UNIVERSITY OF NEW JERSEY' around its perimeter. In the center of the seal is a sunburst design. The seal is rendered in a light red color, matching the overall theme of the slide.

RUTGERS

THE STATE UNIVERSITY
OF NEW JERSEY

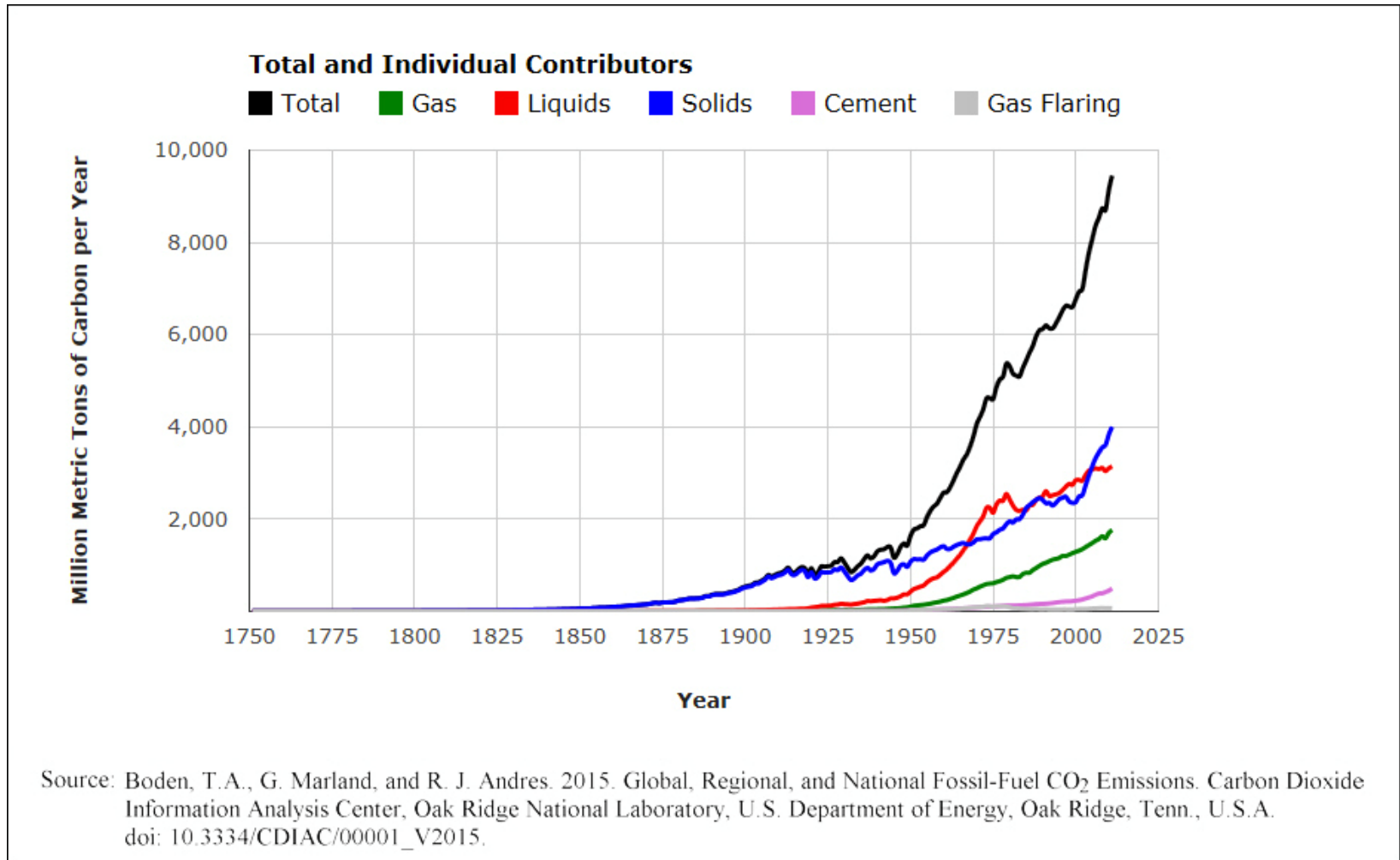
Council of New Jersey Grantmakers

January 15, 2020

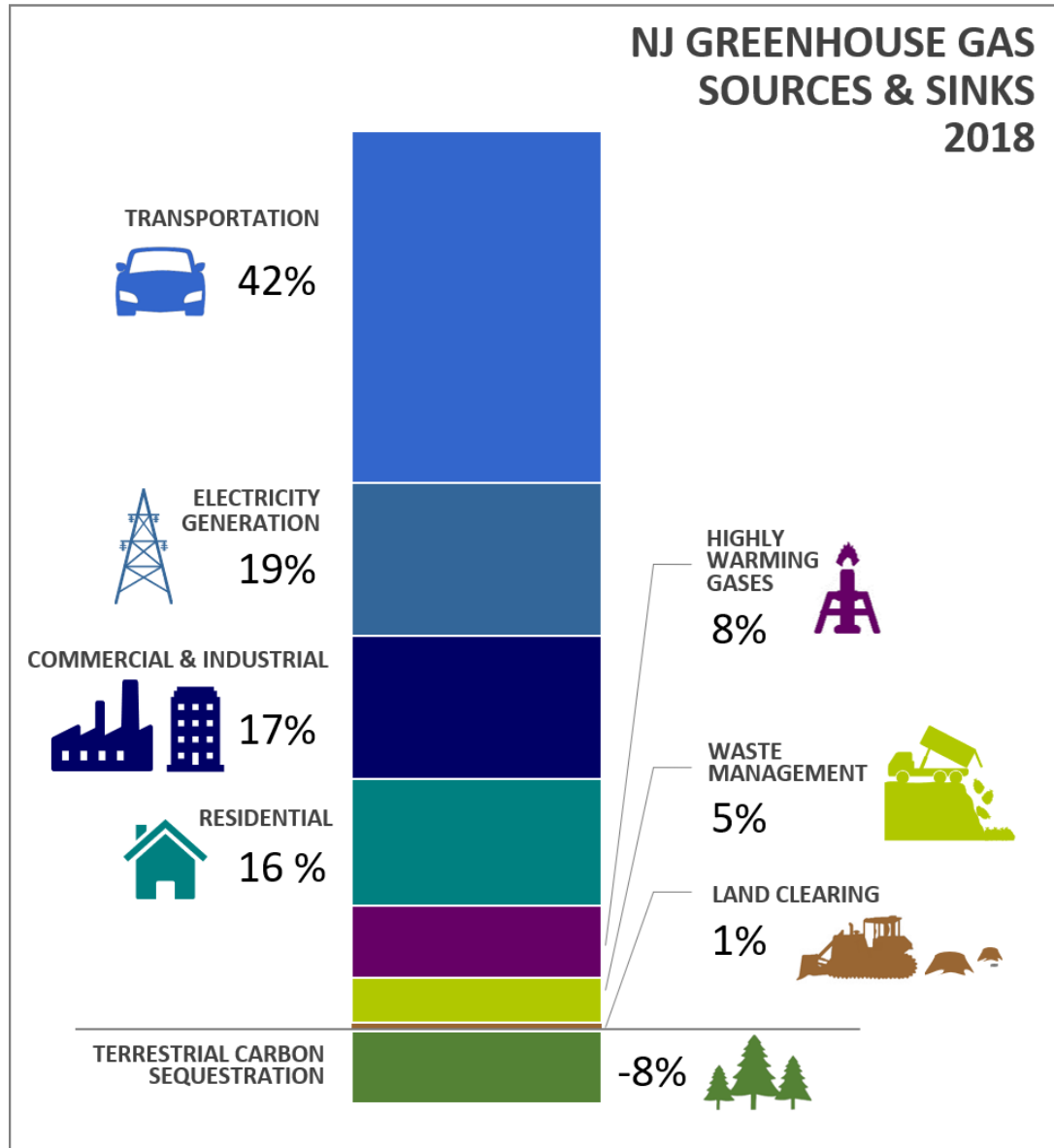
Jeanne Herb

**Bloustein School of Planning & Public Policy
Rutgers, The State University of New Jersey**

Combustion of fossil fuels (coal, petroleum, natural gas) emits carbon dioxide into the atmosphere



NJ GREENHOUSE GAS SOURCES & SINKS 2018



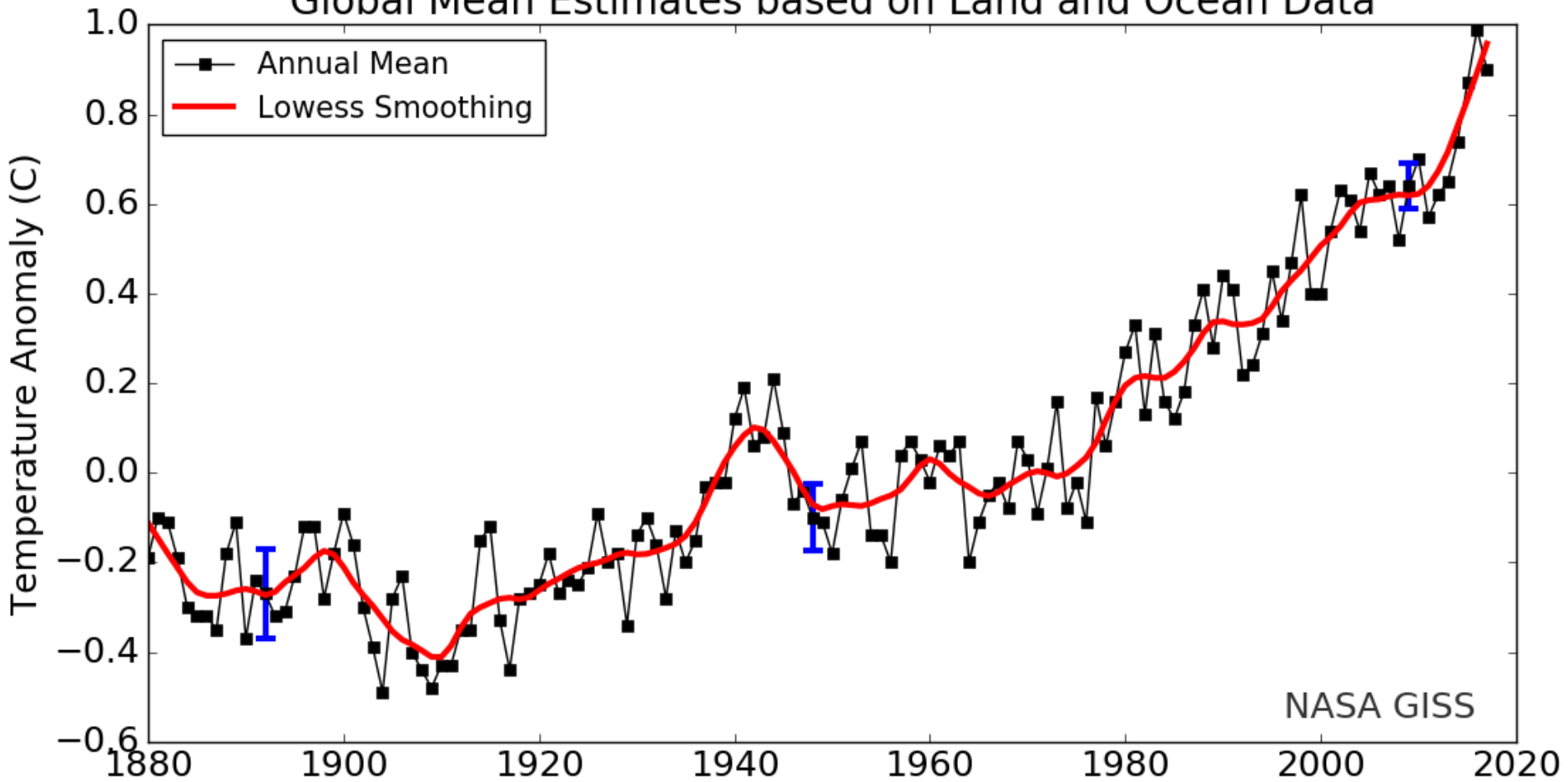
Source: NJDEP

1. More warm extremes with less cooling intervals
2. Heavy rains become more intense with dry spells becoming more frequent.
3. Rising sea levels will increase storm-related and “sunny day” flooding and intensity of coastal storms will increase.



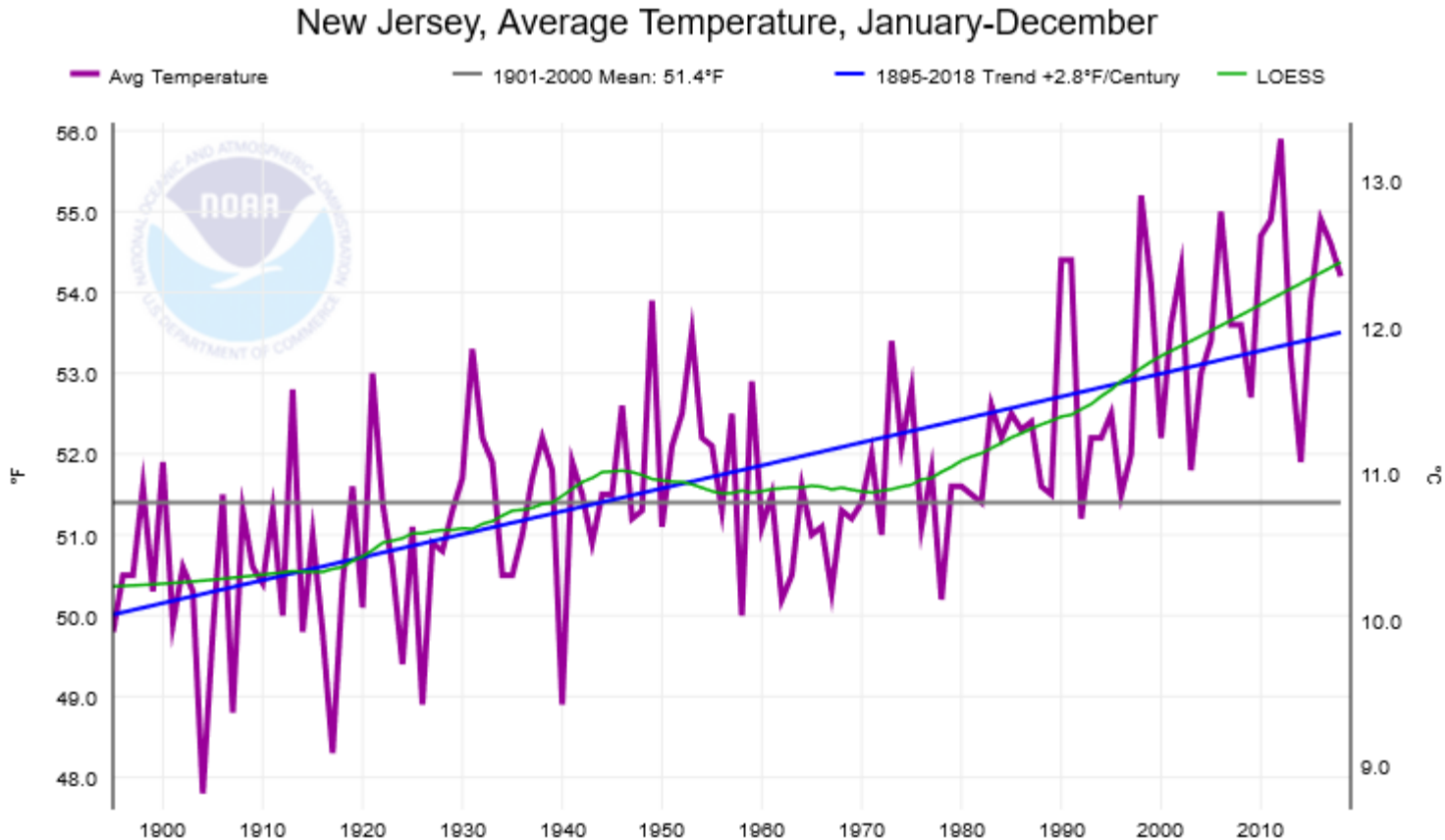
TEMPERATURE: Trends in global average temperature

Global Mean Estimates based on Land and Ocean Data



Source: NASA/Goddard Institute for Space Studies

Trends in annual mean New Jersey temperature



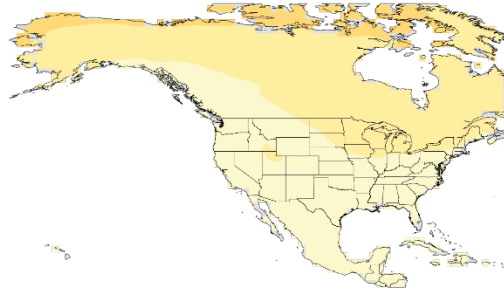
- Long-term upward trend of 2.8°F per 100 years
- More rapid warming since 1970
- The seven warmest years have occurred since 1998
- The 12 warmest years have occurred since 1990.
- 2012 was the warmest year on record

Source: National Centers for Environmental Information

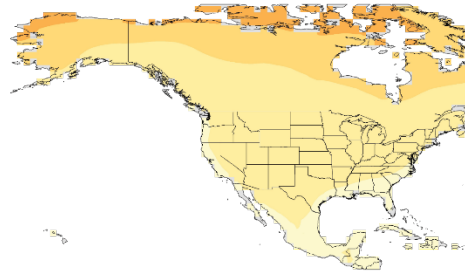
Projected Changes in Annual Average Temperature

Mid 21st Century

Lower Scenario (RCP4.5)

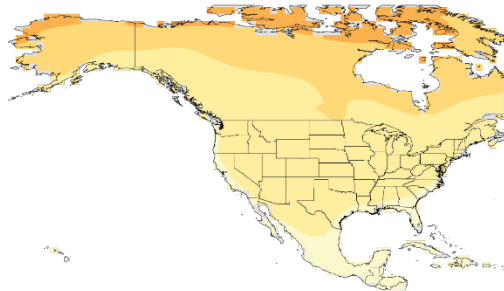


Higher Scenario (RCP8.5)

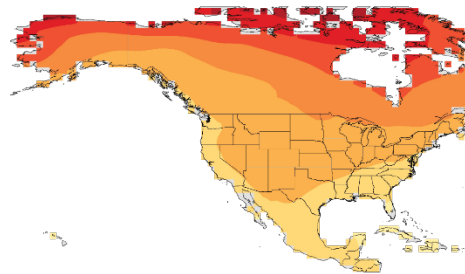


Late 21st Century

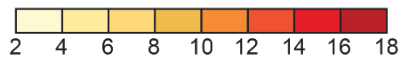
Lower Scenario (RCP4.5)



Higher Scenario (RCP8.5)



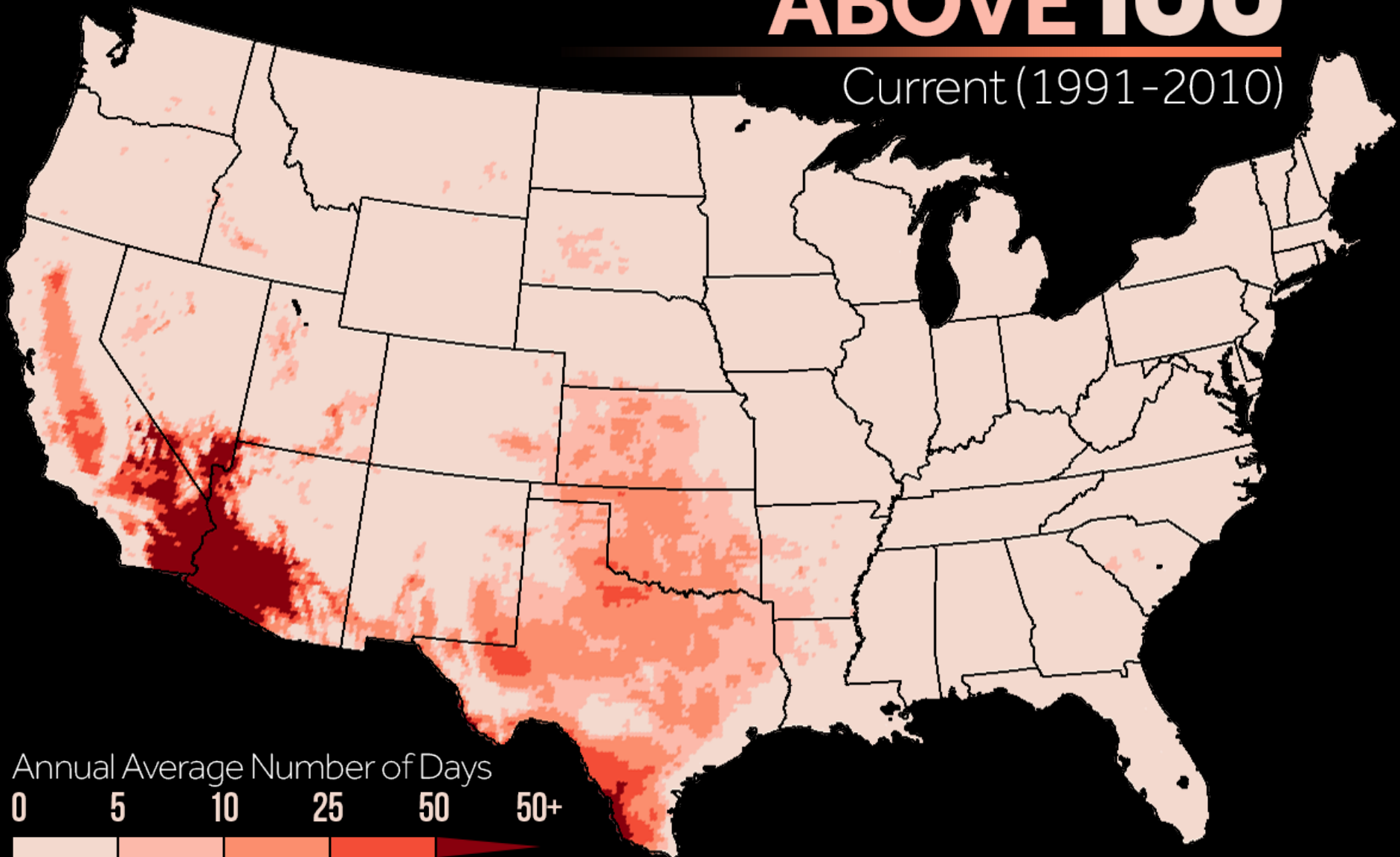
Change in Temperature (°F)



Source: National
Climate
Assessment (2017)

DAYS ABOVE 100°

Current (1991-2010)

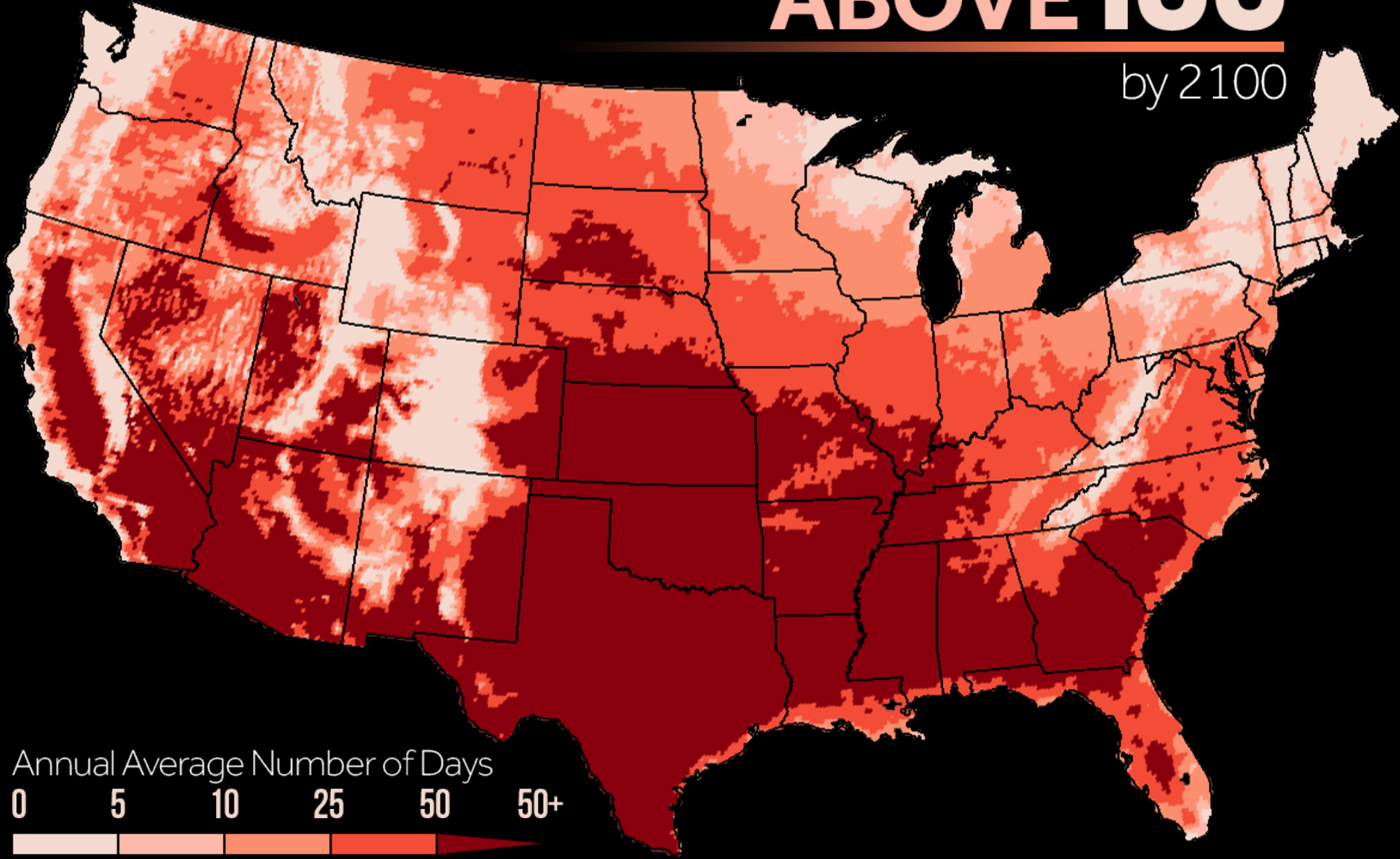


Annual Average Number of Days
0 5 10 25 50 50+

Source: Maurer et al. (2002), Santa Clara University

DAYS ABOVE 100°

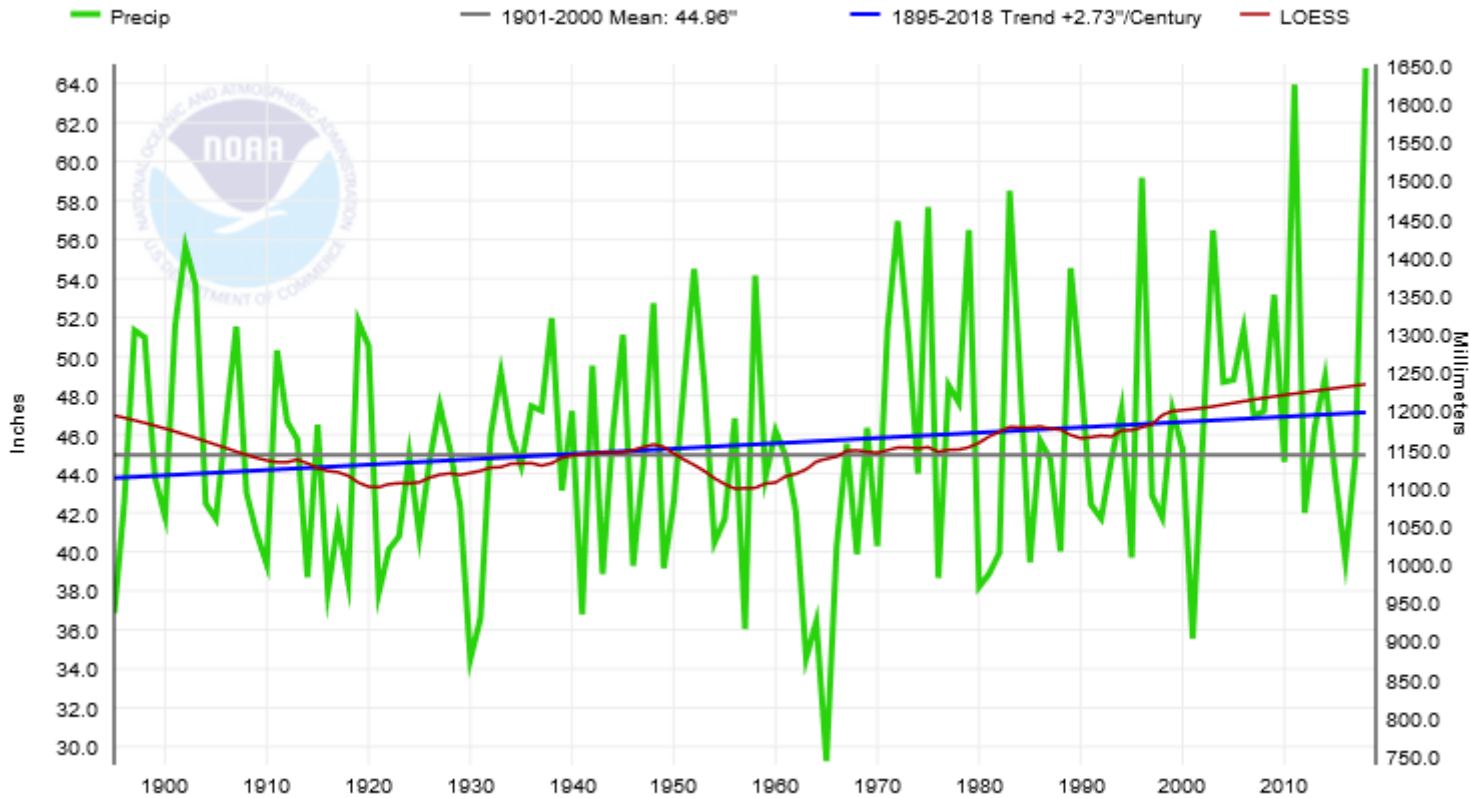
by 2100



Source: CMIP5 model projections of daily maximum temperature averaged over 20 year periods.

Trends in annual mean New Jersey precipitation

New Jersey, Precipitation, January-December

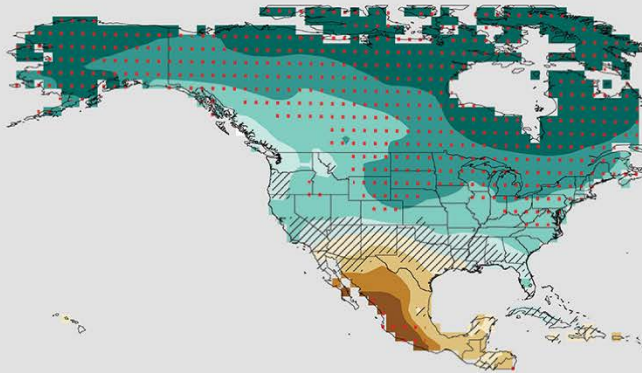


- Long-term upward trend of 2.7" per 100 years
- Large decadal variability (early 1960s drought, wet 1970s, very wet in 2000s)
- Most of the upward trend comes from changes in spring and fall

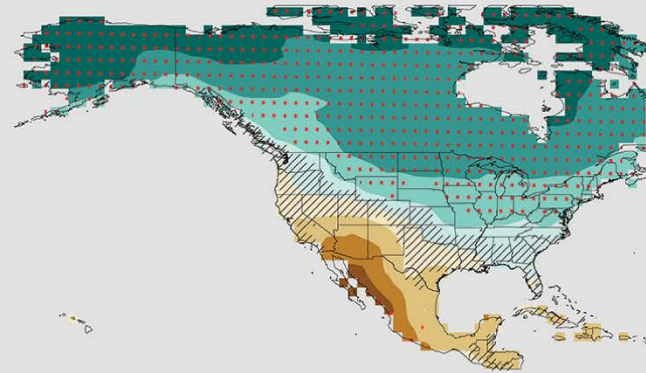
Source: National Centers for Environmental Information

Projected Change (%) in Seasonal Precipitation
(2070-2099 average) – (1976-2005 average)

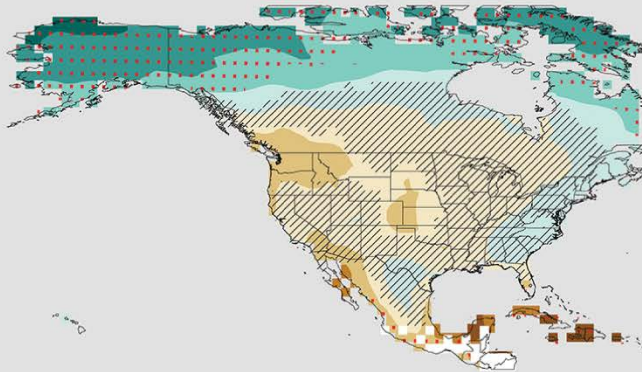
Winter



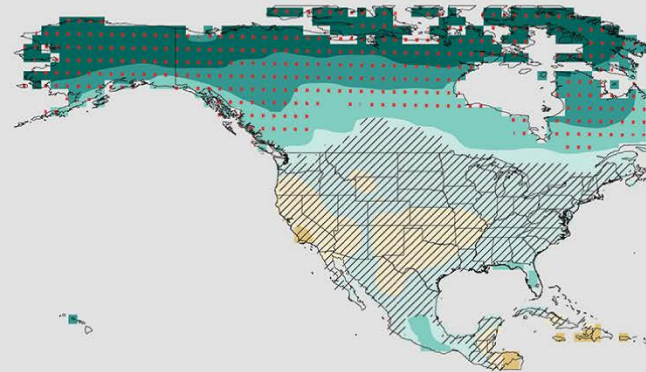
Spring



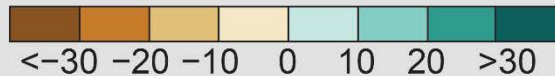
Summer



Fall



Change (%)

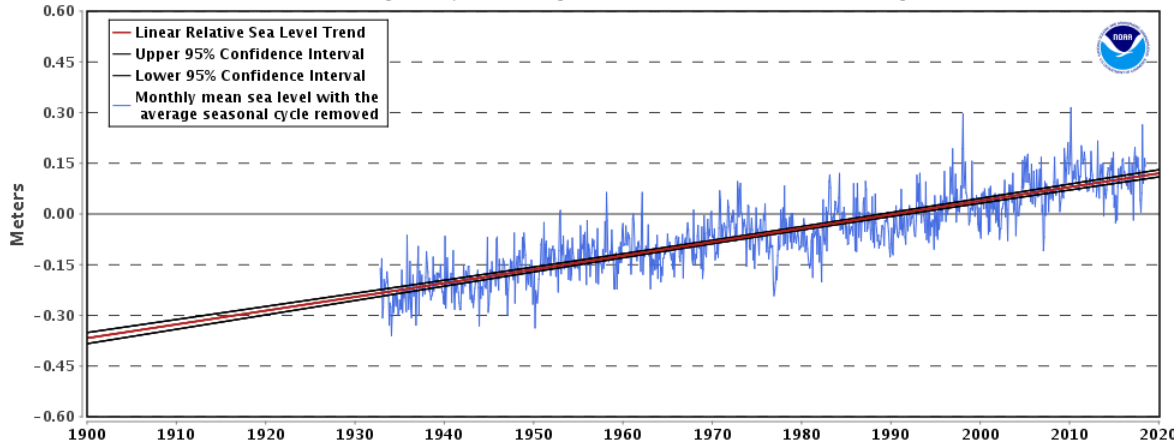


Source: National Climate Assessment (2017)

New Jersey sea level trends

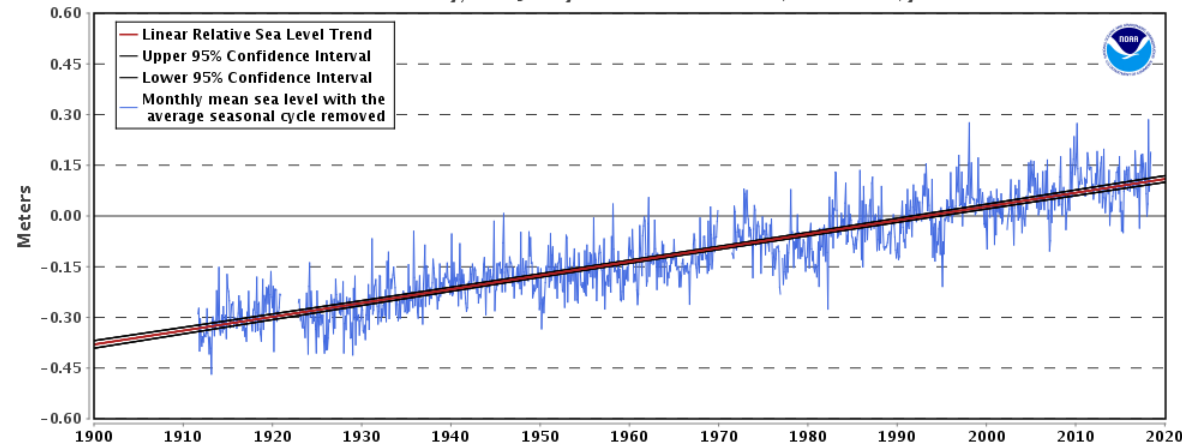
8531680 Sandy Hook, New Jersey

4.06 +/- 0.21 mm/yr



8534720 Atlantic City, New Jersey

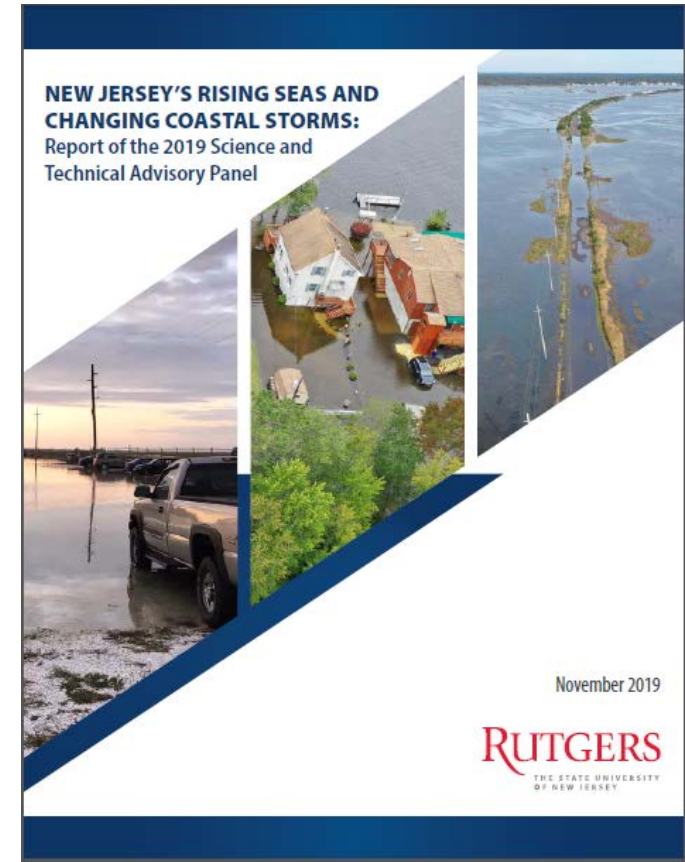
4.08 +/- 0.15 mm/yr



- Century-scale global sea level rise has been 1.7 ± 0.3 mm/yr.
- This rate has nearly doubled in the past two decades.
- Sea level in New Jersey is rising more rapidly than the global average because land is also subsiding.
- Sea level at Atlantic City has risen 17.6 inches since records began in 1911.

New Jersey sea level projections

- Projected changes in ocean currents are also expected to add to the rate of sea level rise on the New Jersey coast.
- A recent analysis by a Rutgers-led team of scientists projects that by 2030, sea level on the NJ coast will likely rise by 0.5-1.1 feet (relative to 2000), with a central estimate of 0.8 feet.
- In 2050, the range is 0.9-2.1 feet with a central estimate of 1.4 feet.
- By 2100, the range is 1.7-3.9 feet (best estimate of 2.8 feet) for a lower emissions scenario and 2.3-6.3 feet (best estimate 3.9 feet) for a higher emission scenario.



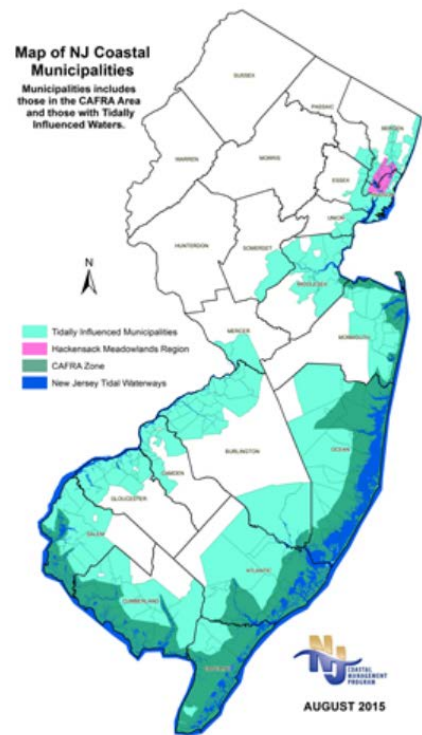
Source: Kopp, R. E. et al., 2019: *New Jersey's Rising Seas and Changing Coastal Storms: Report of the 2019 Science and Technical Advisory Panel.*

A few notes on SLR:

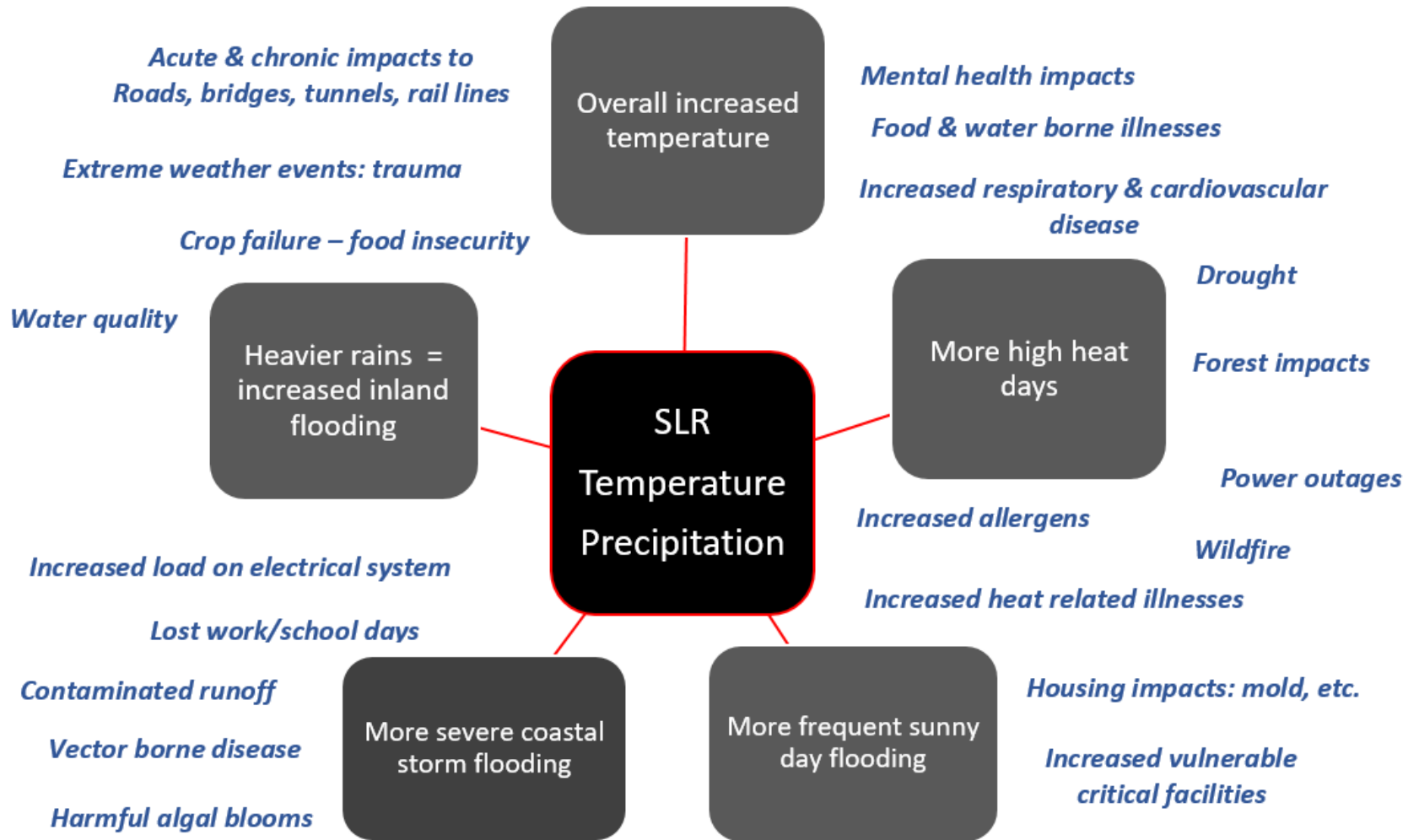
- After 2050 SLR scenarios are emissions dependent
- SLR affects both “sunny day” flooding and flooding from weather events
- New Jersey’s “coast” = 239 municipalities

Map of NJ Coastal Municipalities

Municipalities includes those in the CAFRA Area and those with Tidally Influenced Waters.



Cascading Effect of Climate Change in New Jersey



Climate Change: An Exacerbator of Root Causes of Health Inequities

NATION & WORLD | Posted September 13 | Updated September 14

Deaths of 8 nursing home patients raise concerns about Florida's elderly

The home had no air conditioning because of Hurricane Irma, but it is across the street from an air-conditioned hospital.

BY TIM REYNOLDS AND TERRY SPENCER ASSOCIATED PRESS

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Key Message 2: Most Vulnerable at Most Risk

Climate change will, absent other changes, amplify some of the existing health threats the nation now faces. Certain people and communities are especially vulnerable, including children, the elderly, the sick, the poor, and some communities of color.



In a world of rising inequality, risks and opportunities are not equally shared*

Solutions



What we've heard

1.



2.



3.



4.



5.



6.



7.



8.



*Bounce Forward, Island Press/Kresge

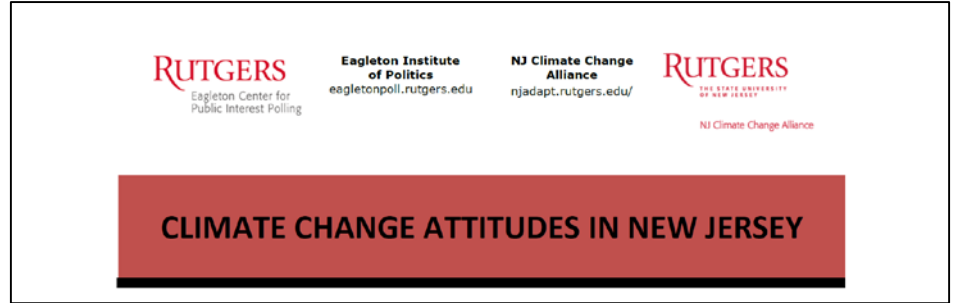


Intersecting climate change and health equity goals generates synergistic outcomes that create a society that is not only *healthier*, more *resilient* and environmentally *sustainable*, but a society that is *just*, in which opportunity is available to all, and risks are equitably shared.



New Jersey Perspectives:

http://eac.rutgers.edu/wp-content/uploads/Eagleton-NJCCA-NJ-Climate-Poll-report_04-25-19.pdf



- 2/3 of New Jerseyans are either “very” or “somewhat” concerned about the effects of climate change on their life, their family members, or people around them.
- Less than ¼ know “a lot” about what to do to prepare for climate change.
- Government should give people resources to rebuild or relocate:
 - Upper income – 49%
 - Lower & middle income – 63%
- How to reduce greenhouse gases:
 - Government should impose limits on the sources of greenhouse gasses (limiting emissions from cars, trucks, and industries – 27%)
 - Government should try to reduce greenhouse gases voluntarily by offering incentives to those who reduce emissions (residents, businesses, industries – 45%)
 - Both or neither – 20%
- Who should pay added cost to make NJ more resilient to climate change?
 - Fuel producers and responsible users – 62%
 - State government from current taxes – 43%
 - Residents – 6%

- New Jersey Climate Change Alliance

<https://njadapt.rutgers.edu/>



NJ Climate Change Alliance

- Rutgers Climate Institute

<https://climatechange.rutgers.edu/>



- NJADAPT

<http://www.njadapt.org/>



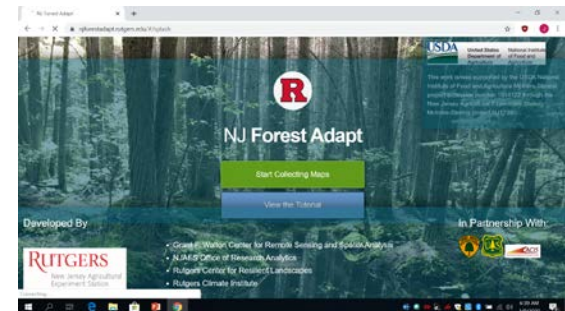
- New Jersey Floodmapper

<https://www.njfloodmapper.org/>



- New Jersey Forest Adapt

<https://njforestadapt.rutgers.edu/#/splash>



Equity and State/city climate policy (13 states, 2 cities)

<https://www.rggiprojectseries.org/reports>

Rapid Health Impact Assessment of draft New Jersey Energy Master Plan w/
focus on equity

<http://eac.rutgers.edu/eac-team-conducts-rapid-hia-on-new-jerseys-draft-energy-master-plan/>

New Rutgers report on sea level rise and coastal storm projections for NJ

<https://climatechange.rutgers.edu/resources/climate-change-and-new-jersey/nj-sea-level-rise-reports>

A seat at the table: insights from engagement with populations vulnerable to
climate change

<http://eac.rutgers.edu/social-vulnerability-and-climate-change/>

Summary: June 24 convening of NJ leaders on climate change/health equity

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Sea level rise and resilience policies in 15 states outside NJ

<http://eac.rutgers.edu/rutgers-researchers-study-state-sea-level-rise-policies/>

Overlay of race, income and environmental burden in New Jersey

<http://eac.rutgers.edu/eac-staff-develops-indicators-of-health-inequities-in-new-jersey/>



Thank you

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