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THE STATE UNIVERSITY
OF NEW JERSEY

U.S. Climate Change and Health

James B. Shope, PhD

Assistant Extension Specialist in Climate Services,
New Jersey Agricultural Experiment Station and
Department of Environmental Sciences
Rutgers University

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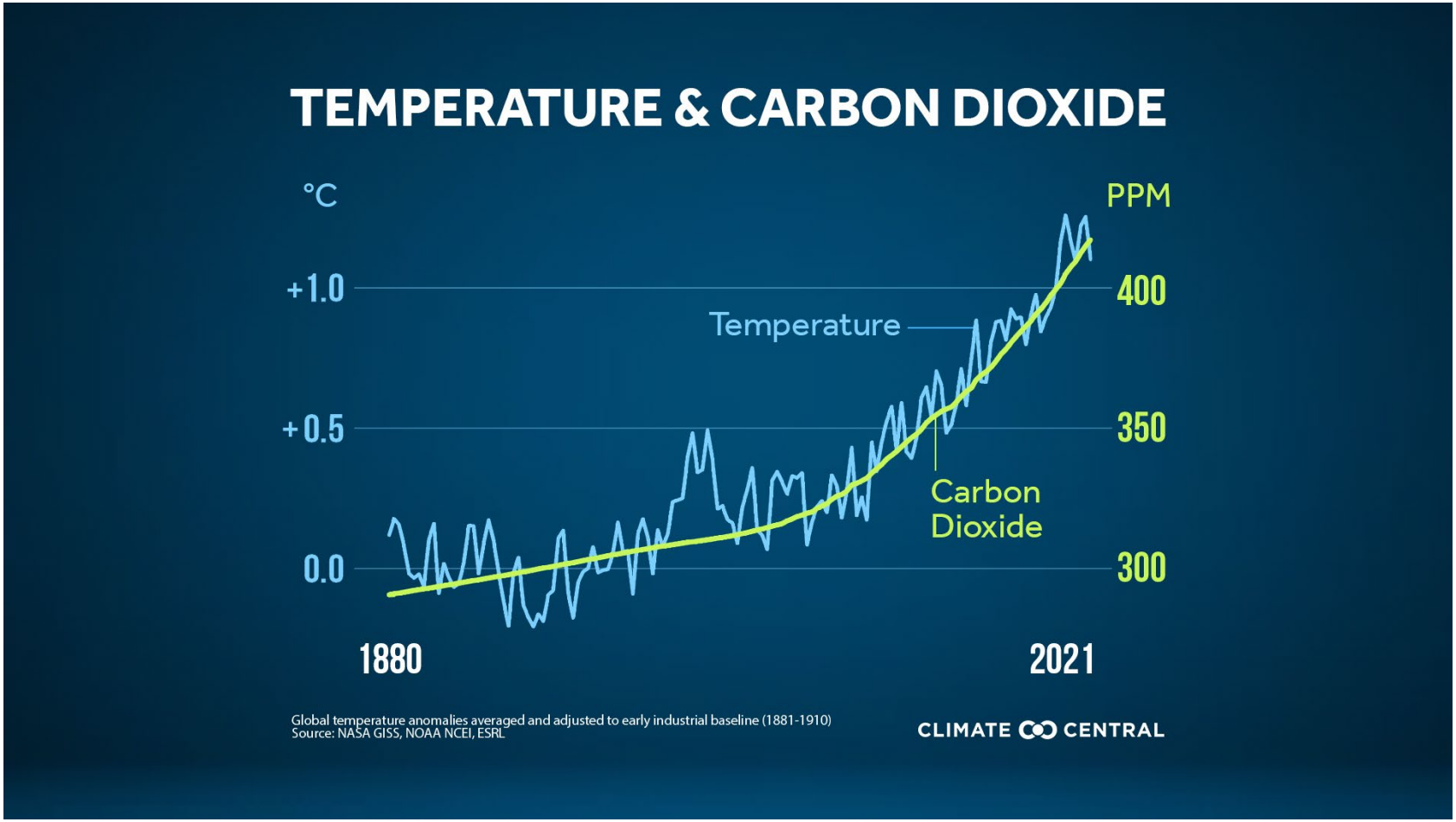
CMS National Training Program Workshop

“Climate change is a public health emergency.”

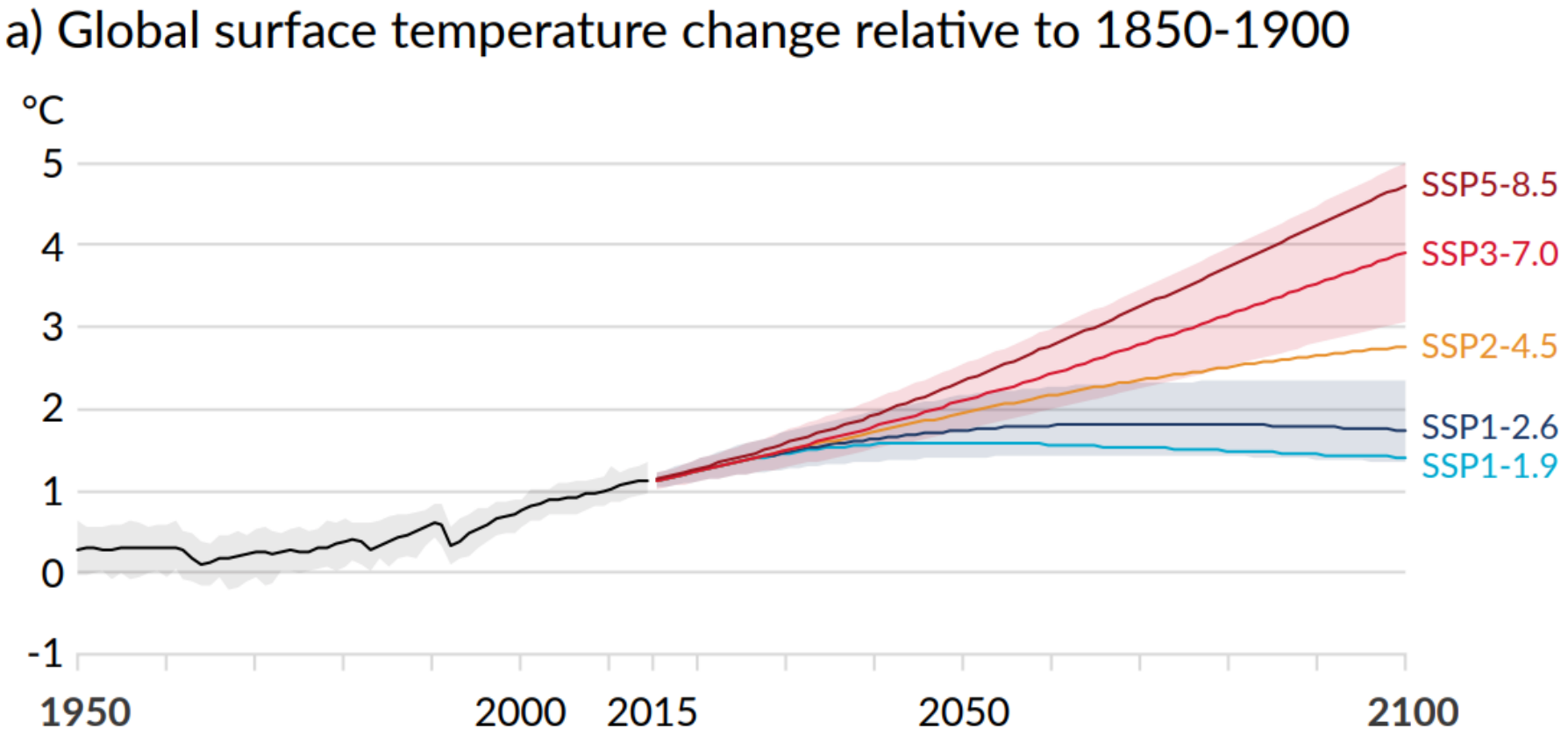
Georges C. Benjamin, MD Executive Director American Public Health Association

Climate Change Overview

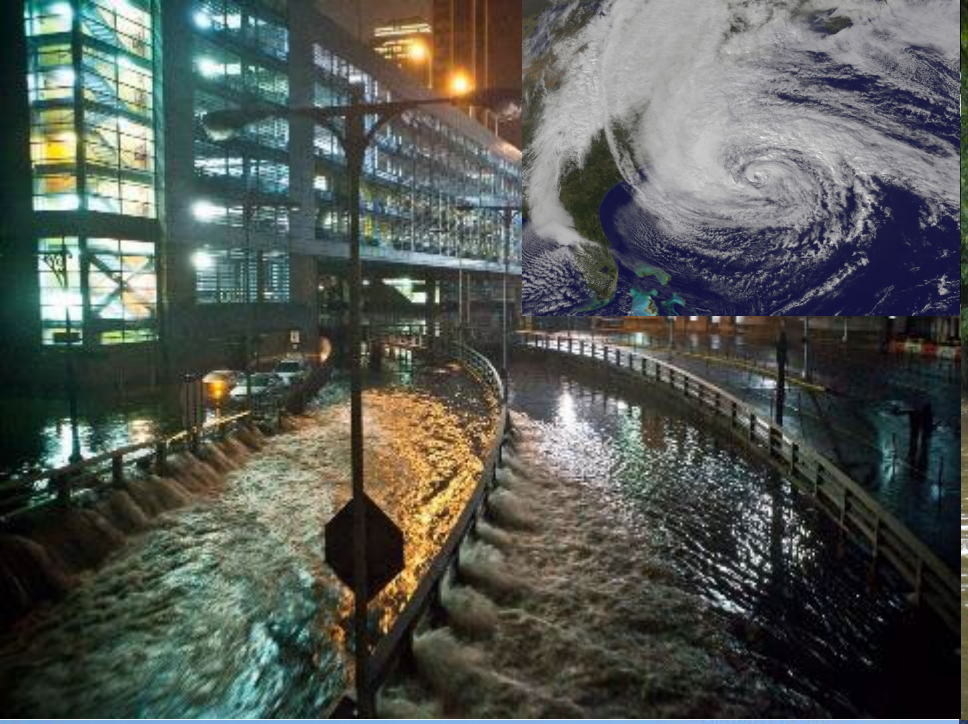
Combustion of fossil fuels (coal, petroleum, natural gas) emits greenhouse gasses into the atmosphere



Warming Scenarios



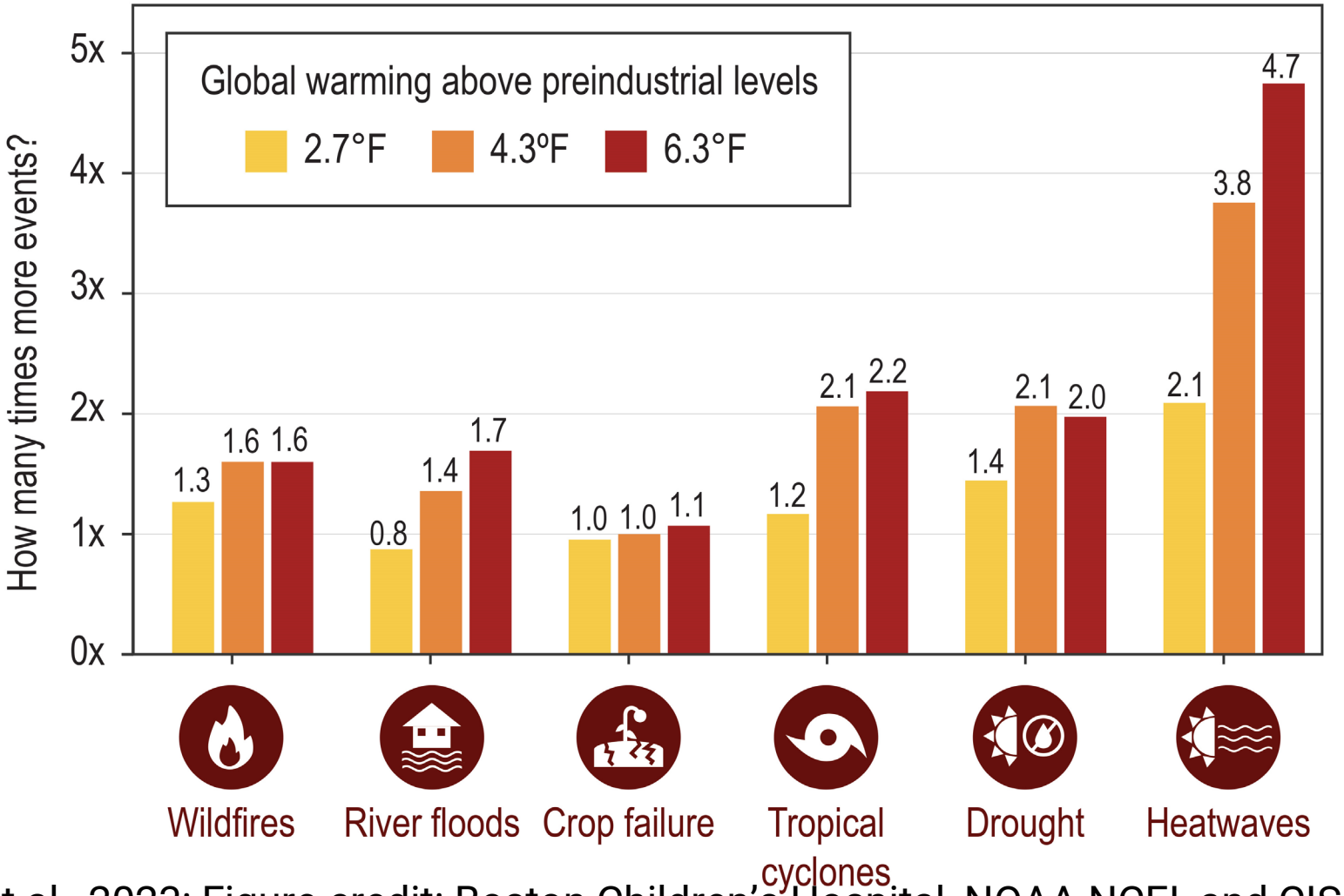
Source: IPCC 2021 Summary for Policymakers



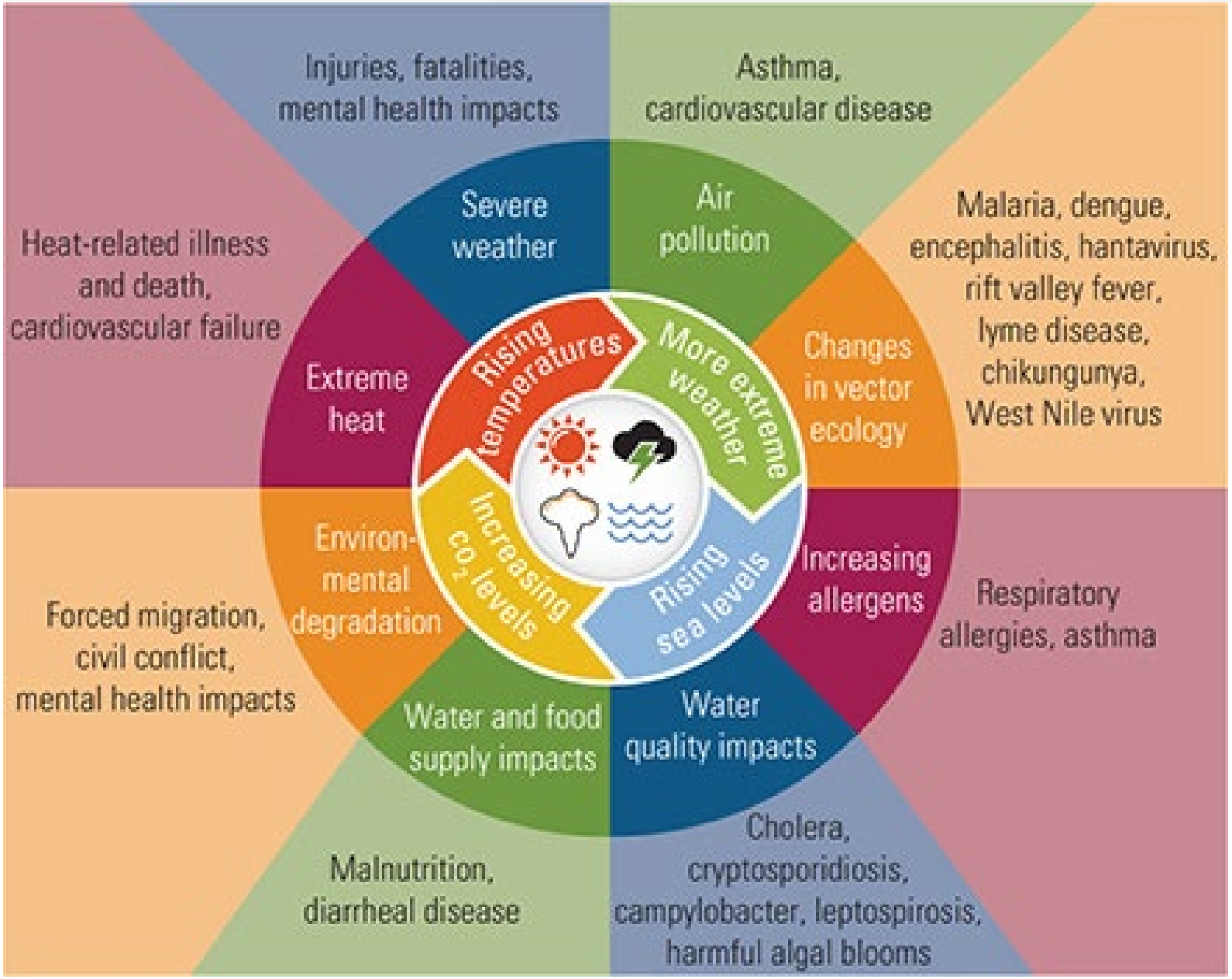

STOP
4-WAY

Intergenerational Inequity

A person born in 2020 will experience more climate hazards during their lifetime, on average, than a person born in 1965.

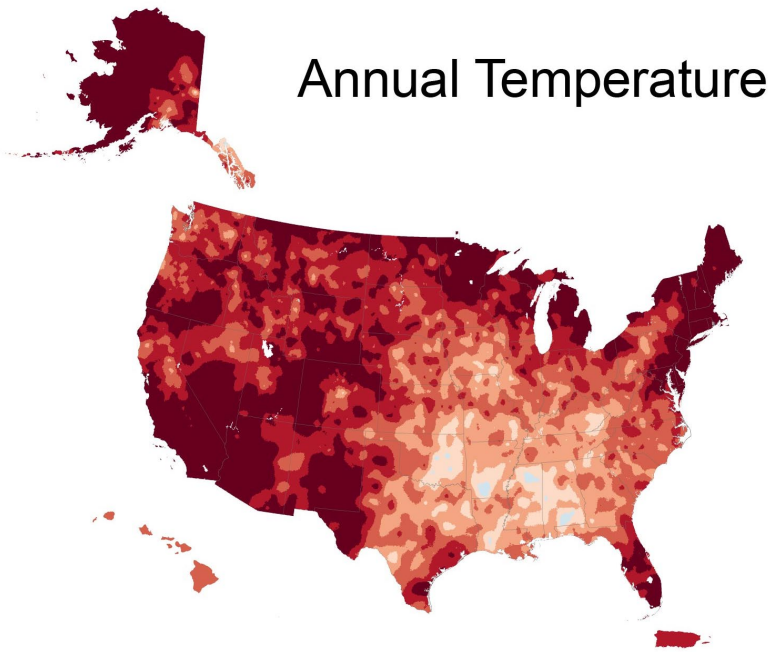


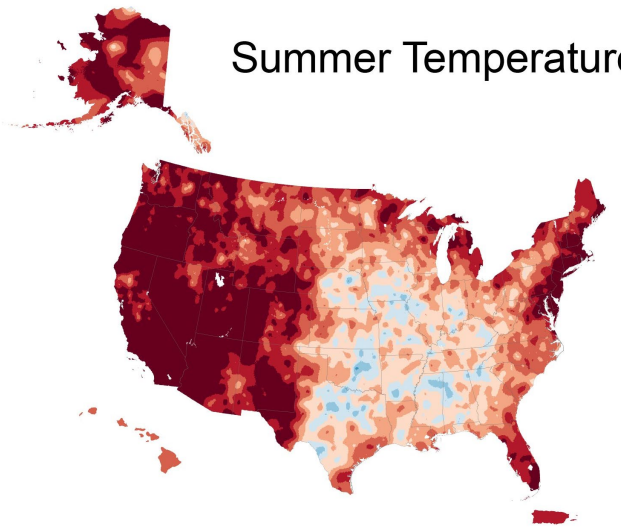
Marvel et al., 2023; Figure credit: Boston Children's Hospital, NOAA NCEI, and CISESS NC

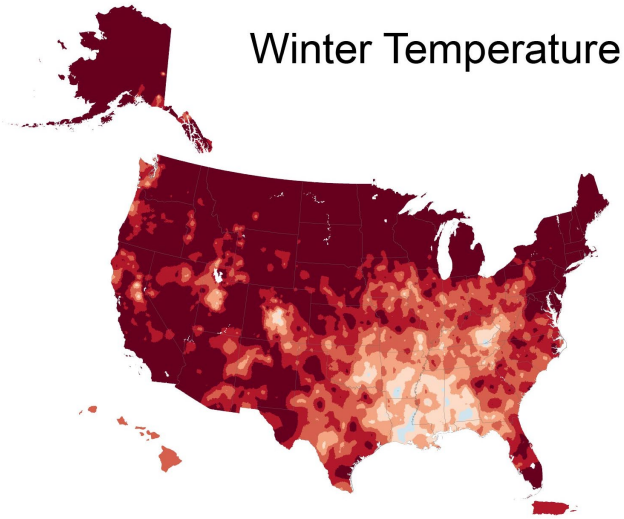

Injuries, fatalities, mental health impacts
Asthma, cardiovascular disease
Heat-related illness and death, cardiovascular failure
Severe weather
Air pollution
Malaria, dengue, encephalitis, hantavirus, rift valley fever, lyme disease, chikungunya, West Nile virus
Extreme heat
Rising temperatures
More extreme weather
Changes in vector ecology
Environ-mental degradation
Increasing CO_2 levels
Rising sea levels
Increasing allergens
Forced migration, civil conflict, mental health impacts
Respiratory allergies, asthma
Water and food supply impacts
Water quality impacts
Malnutrition, diarrheal disease
Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms

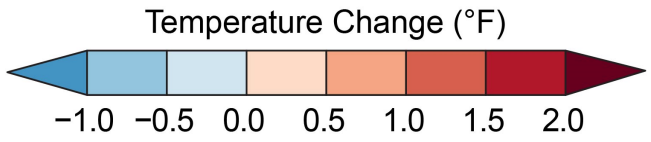
Source: CDC

Present day (2002–2021) compared to early 1900s (1901–1960)









Marvel et al., 2023; Figure credit: NOAA NCEI and CISESS NC.

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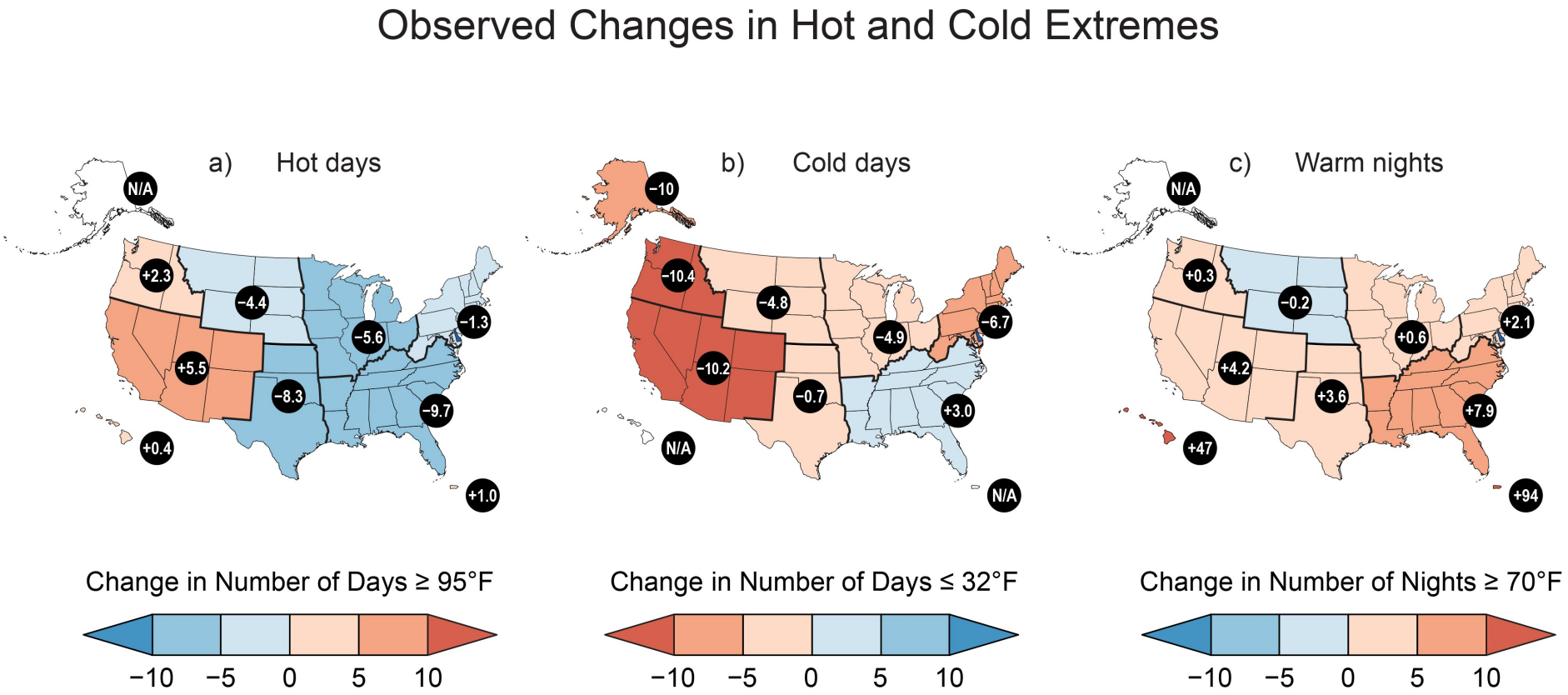
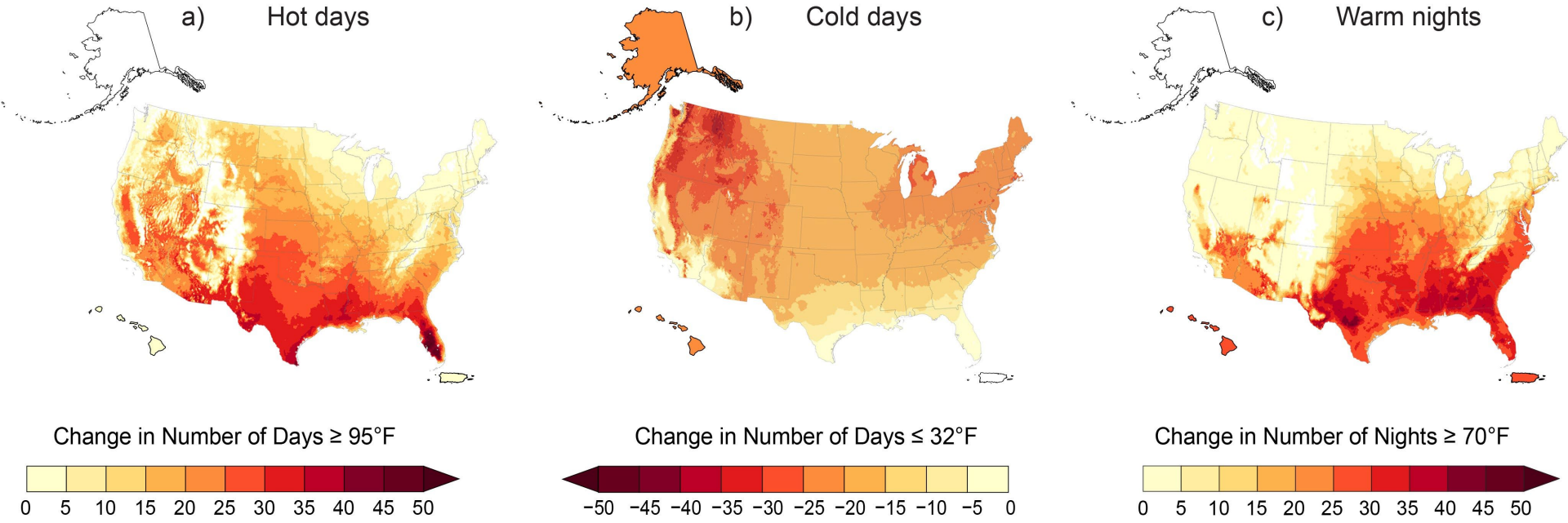


Marvel et al., 2023; Figure credit: Project Drawdown, Washington State University Vancouver, NOAA NCEI, and CISESS NC.

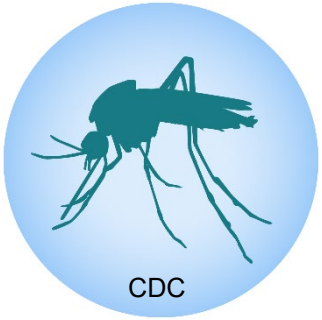
Projected Changes to Hot and Cold Extremes at 2°C of Global Warming



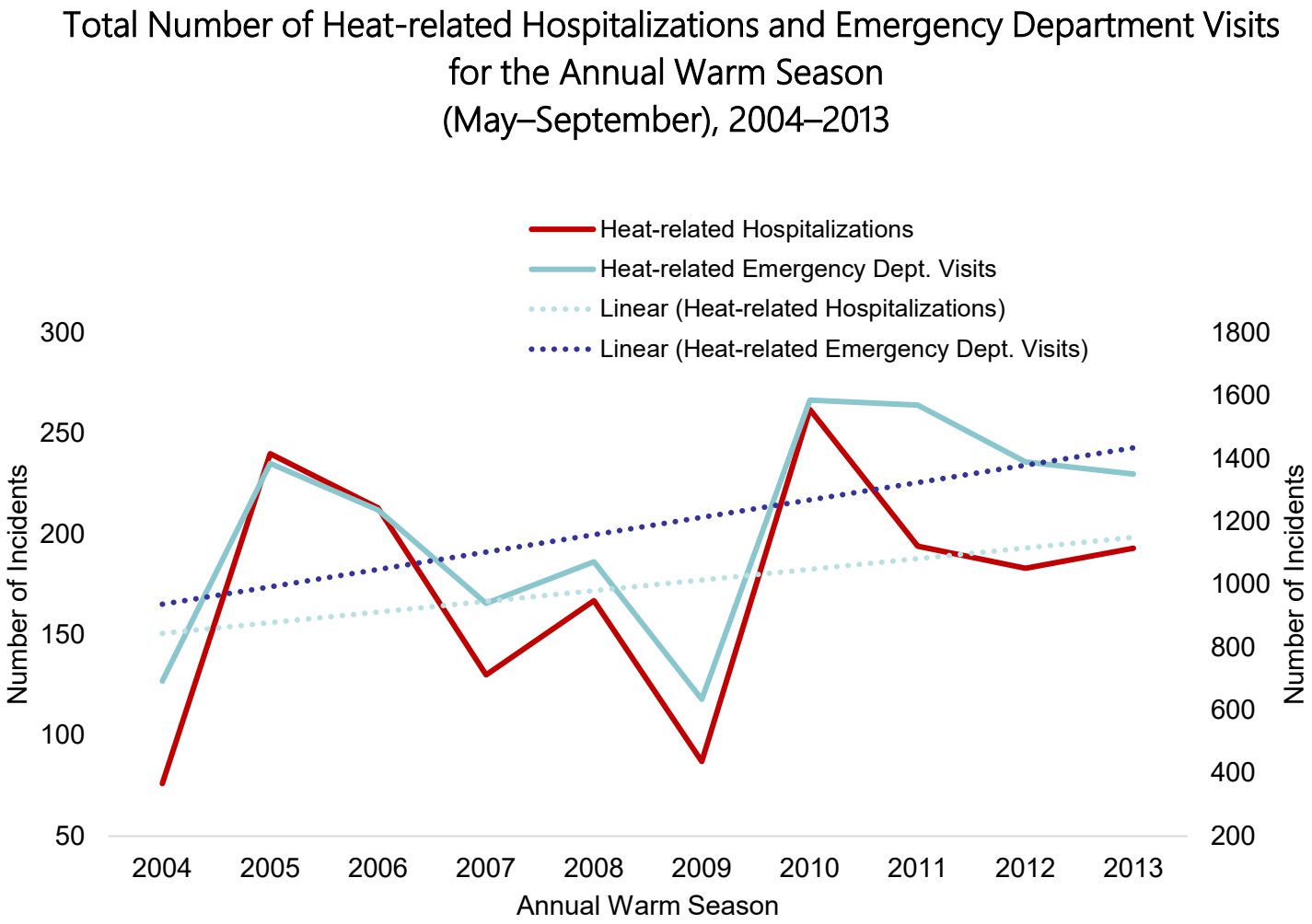
Marvel et al., 2023; Figure credit: NOAA NCEI and CISESS NC.

Increasing Temperatures

- Urban heat island
- Heat and health
- Degrade air quality by increasing pollutants
- Increase prevalence of vector borne diseases



NJ Heat-Related Illnesses Rising



Source: NJDOH 2015

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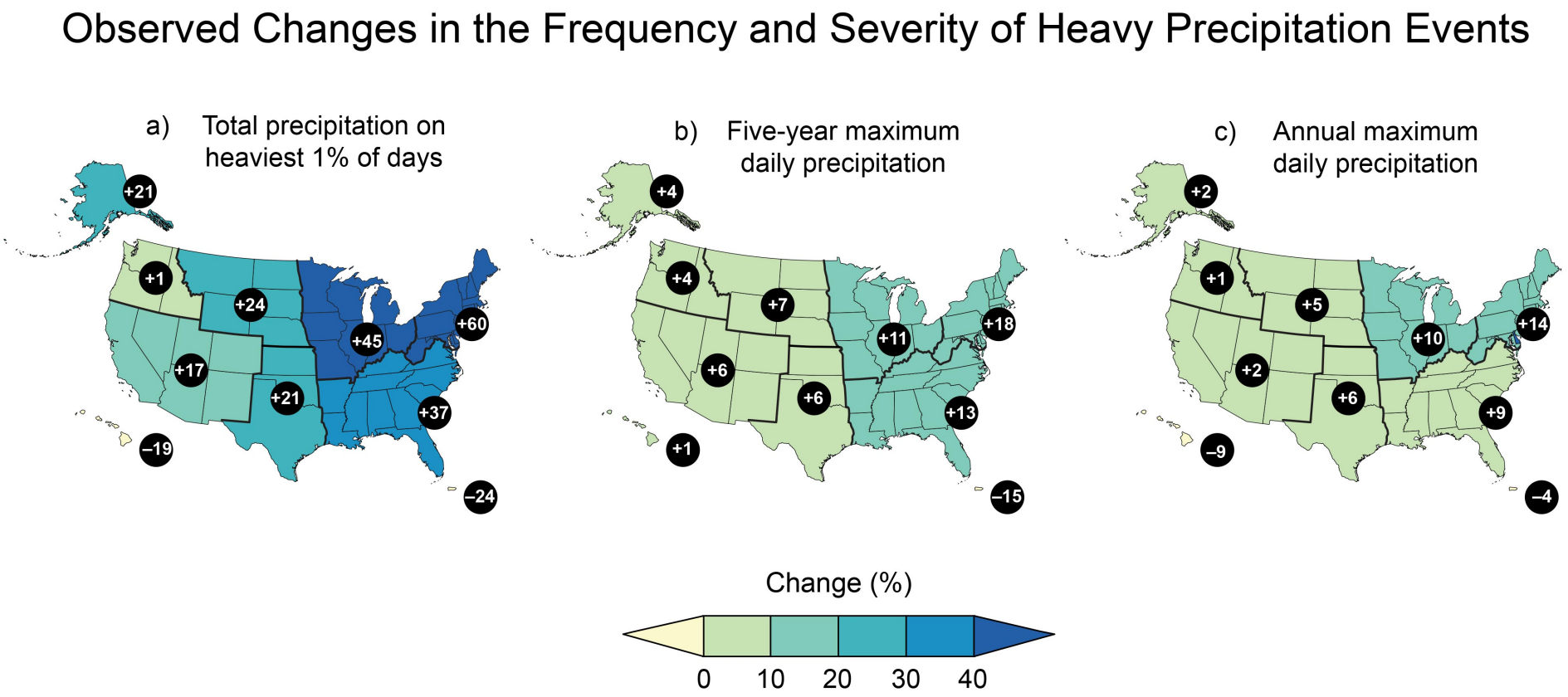
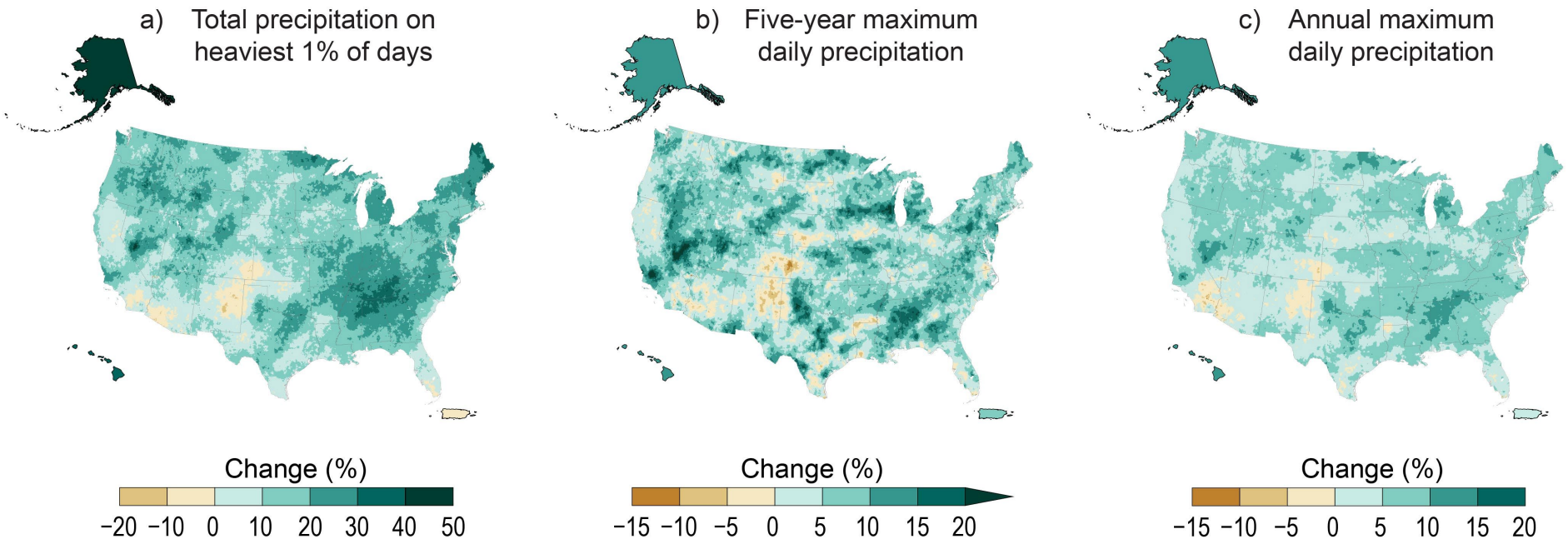


Marvel et al., 2023; Figure credits: (a) adapted from Easterling et al. 2017; (b, c) NOAA NCEI and CISESS NC.

Projected Changes to Precipitation Extremes at 2°C of Global Warming



Marvel et al., 2023; Figure credit: NOAA NCEI and CISESS NC.

Extreme Precipitation

Loss of life and property/infrastructure damage, contaminate food/water supplies

Combined sewage overflow/runoff into local waterways

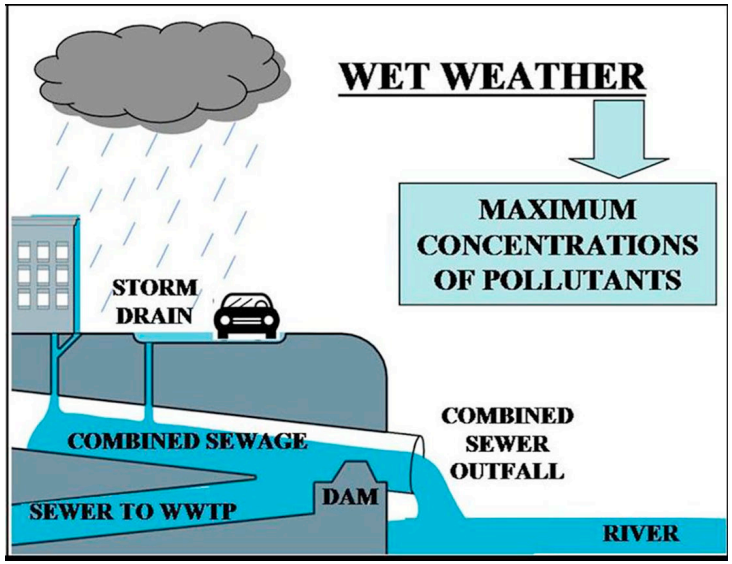
Agriculture Impacts

- Reduced growth, delayed planting, more disease

<u>Water Resources</u>

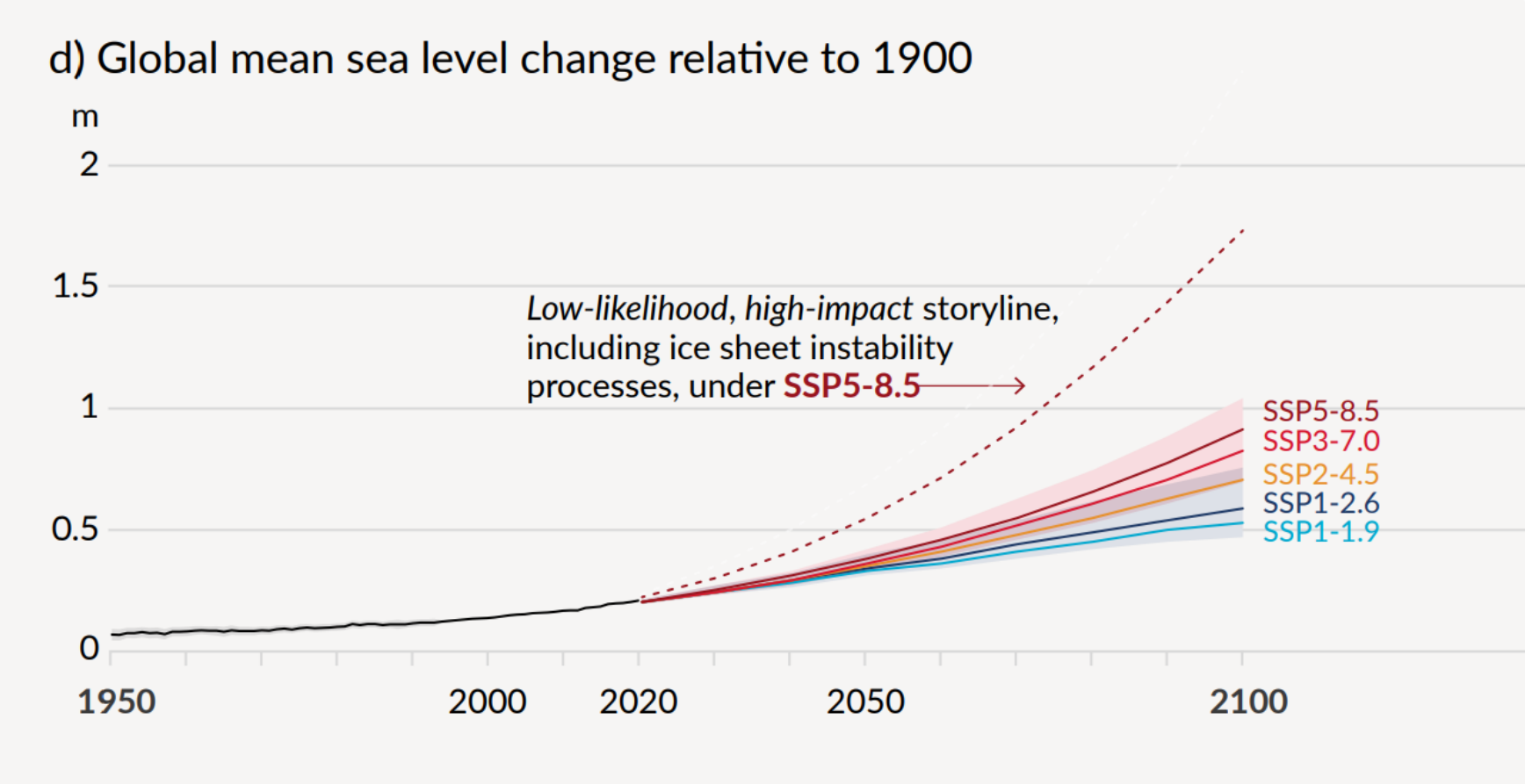
- More rainfall during heavy events, drier to drought conditions in between

Flooded highway in New Brunswick, N.J., after Hurricane Irene, August 2011 (Anthony Adams, CC BY-NC- ND 2.0)

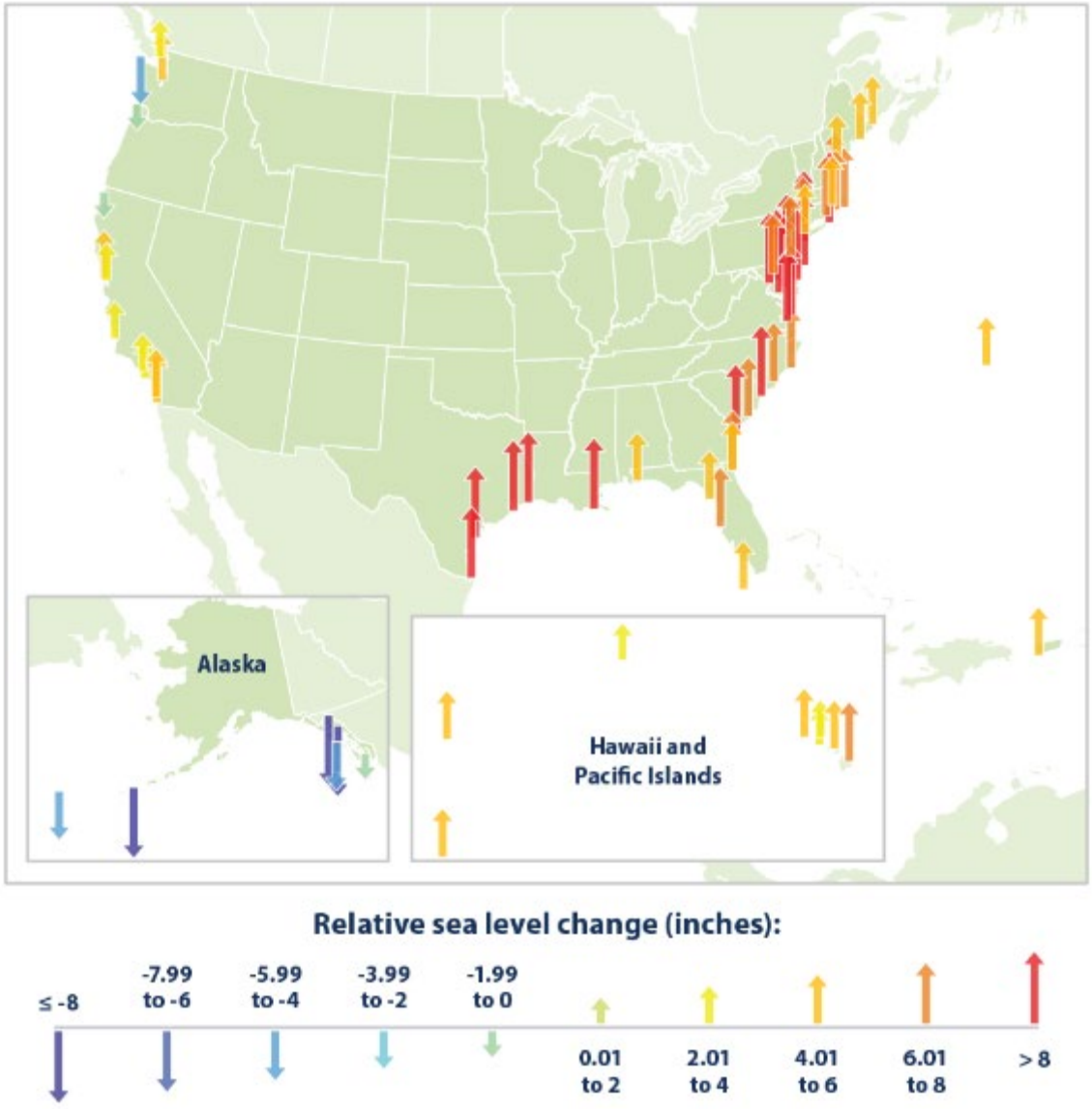


Source: Corada-Fernández et al. (2017)

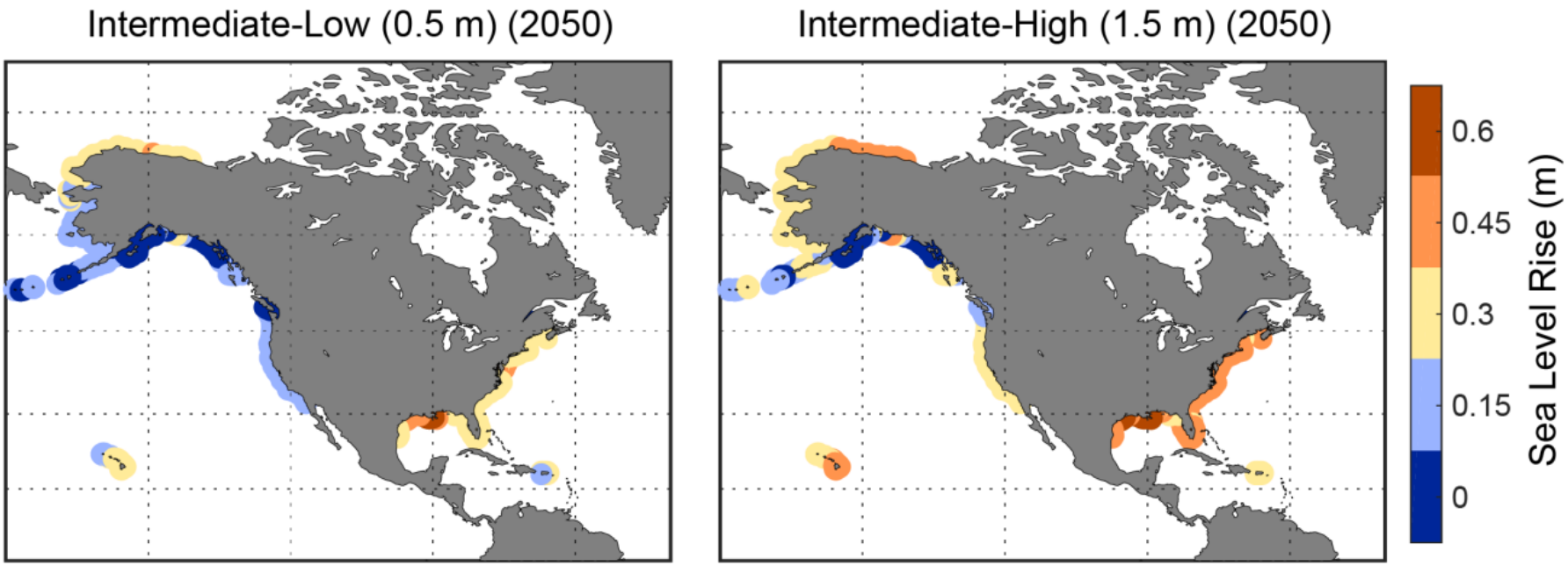
Projected Global Sea Level Trends



Source: IPCC 2021 Summary for Policymakers

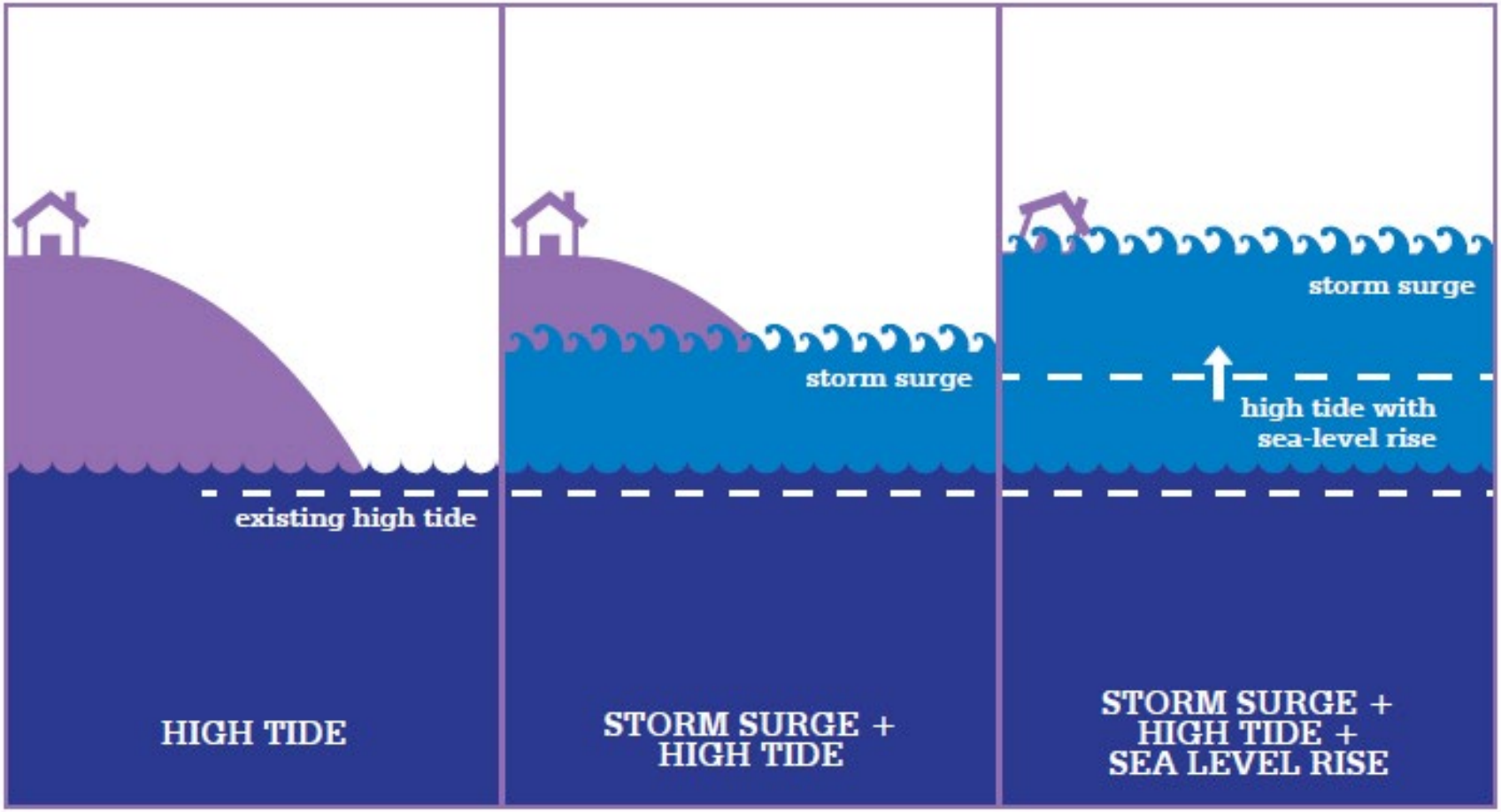


Source: EPA; NOAA



Source: Sweet et al., 2022

Storm Surge Flooding



Source: Southern Slopes Climate Change Adaptation Research Partnership

Hurricane Sandy and Coastal Storms

Estimated 12.8% of Hurricane Sandy property damage in New Jersey attributed to human-caused sea-level rise

- $3.7 billion

Source: Strauss et al. (2021); Tebaldi, Strauss, & Zervas (2012)

Future Storms

Future Atlantic topical cyclones

- Warmer waters fuel more intense hurricanes
- More energetic, intensify more rapidly, more rainfall

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James Shope, Assistant Extension Specialist in Climate Services, Rutgers University

James.Shope@rutgers.edu

Resources:

NJ Climate Change Alliance - https://njadapt.rutgers.edu/

NJ Climate Change Resource Center - https://njclimateresourcecenter.rutgers.edu/

Rutgers Climate and Energy Institute - https://rcei.rutgers.edu/

NJ ADAPT Tools - https://njclimateresourcecenter.rutgers.edu/nj-adapt/

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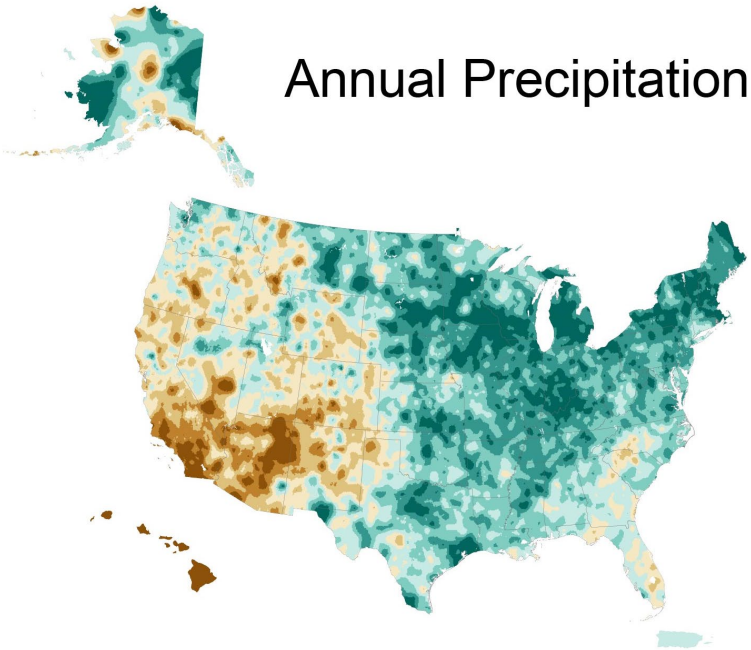

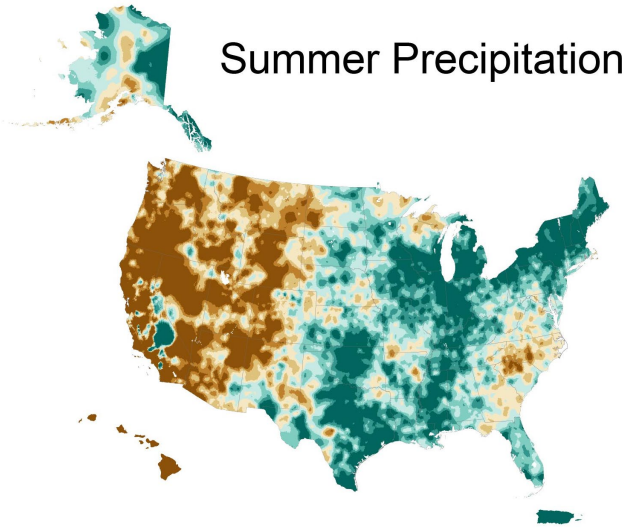

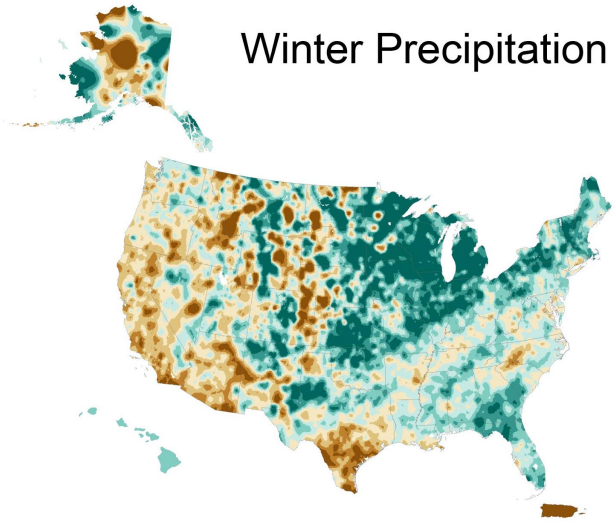

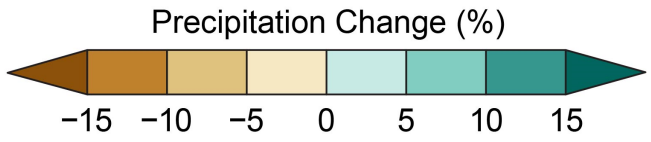

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