Climate Change – A Hot Topic Session 2

The Fifth National Climate Assessment

The state of the science of climate change and its potential impact on the American people.

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FIFTH NATIONAL CLIMATE ASSESSMENT

How the United States Is Addressing Climate Change

The effects of human-caused climate change are already far-reaching and worsening across every region of the United States. Rapidly reducing greenhouse gas emissions can limit future warming and associated increases in many risks. Across the country, efforts to adapt to climate change and reduce emissions have expanded since 2018, and US emissions have fallen since peaking in 2007. However, without deeper cuts in global net greenhouse gas emissions and accelerated adaptation efforts, severe climate risks to the United States will continue to grow.

FIFTH NATIONAL CLIMATE ASSESSMENT

How the United States Is Experiencing Climate Change

As extreme events and other climate hazards intensify, harmful impacts on people across the United States are increasing. Climate impacts—combined with other stressors—are leading to ripple effects across sectors and regions that multiply harms, with disproportionate effects on underserved and overburdened communities.

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Current and Future Climate Risks to the United States

Climate changes are making it harder to maintain safe homes and healthy families; reliable public services; a sustainable economy; thriving ecosystems, cultures, and traditions; and strong communities. Many of the extreme events and harmful impacts that people are already experiencing will worsen as warming increases and new risks emerge.

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The Choices That Will Determine the Future

With each additional increment of warming, the consequences of climate change increase. The faster and further the world cuts greenhouse gas emissions, the more future warming will be avoided, increasing the chances of limiting or avoiding harmful impacts to current and future generations.

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How Climate Action Can Create a More Resilient and Just Nation

Large near-term cuts in greenhouse gas emissions are achievable through many currently available and cost-effective mitigation options. However, reaching net-zero emissions by midcentury cannot be achieved without exploring additional mitigation options. Even if the world decarbonizes rapidly, the Nation will continue to face climate impacts and risks. Adequately and equitably addressing these risks involves longer-term inclusive planning, investments in transformative adaptation, and mitigation approaches that consider equity and justice.

Figure 1.1. Climate change presents risks while action to limit warming and reduce risks presents opportunities for the US.

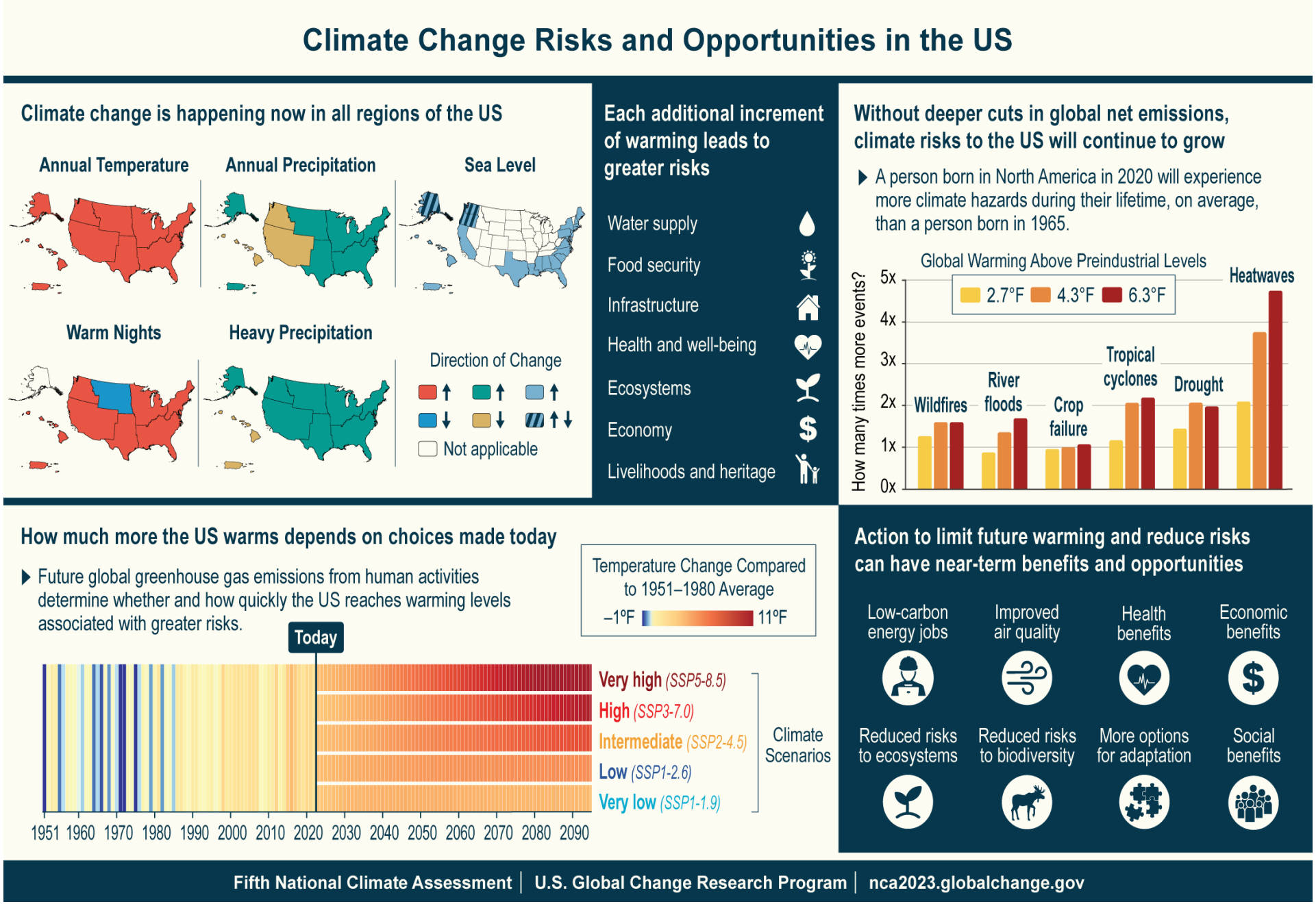


Figure 1.2. Increasing capacities and decreasing costs of low-carbon energy technologies are supporting efforts to further reduce emissions.

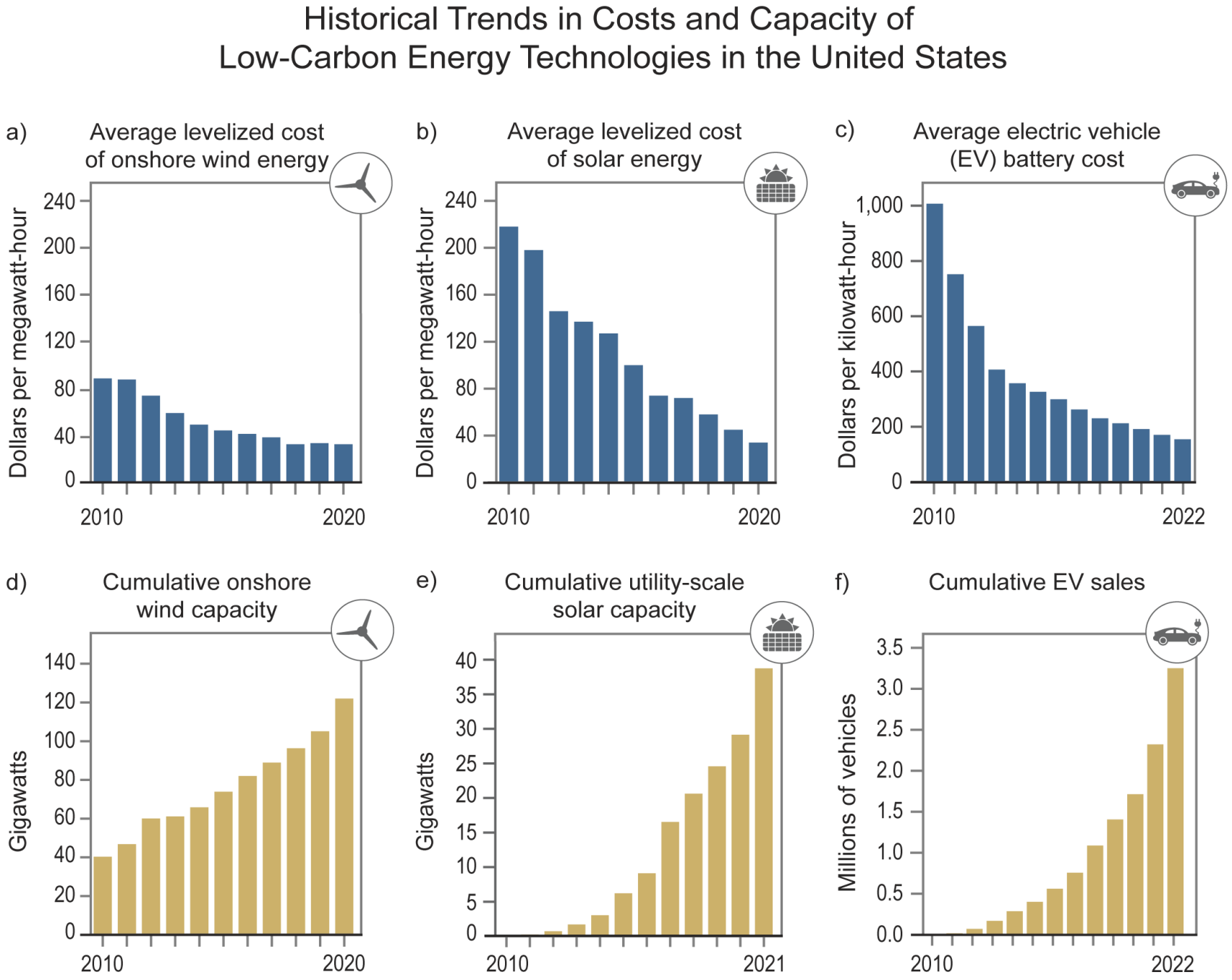


Figure 1.3. Cities and states are acting on climate change, with a substantial increase in new activities underway since 2018.

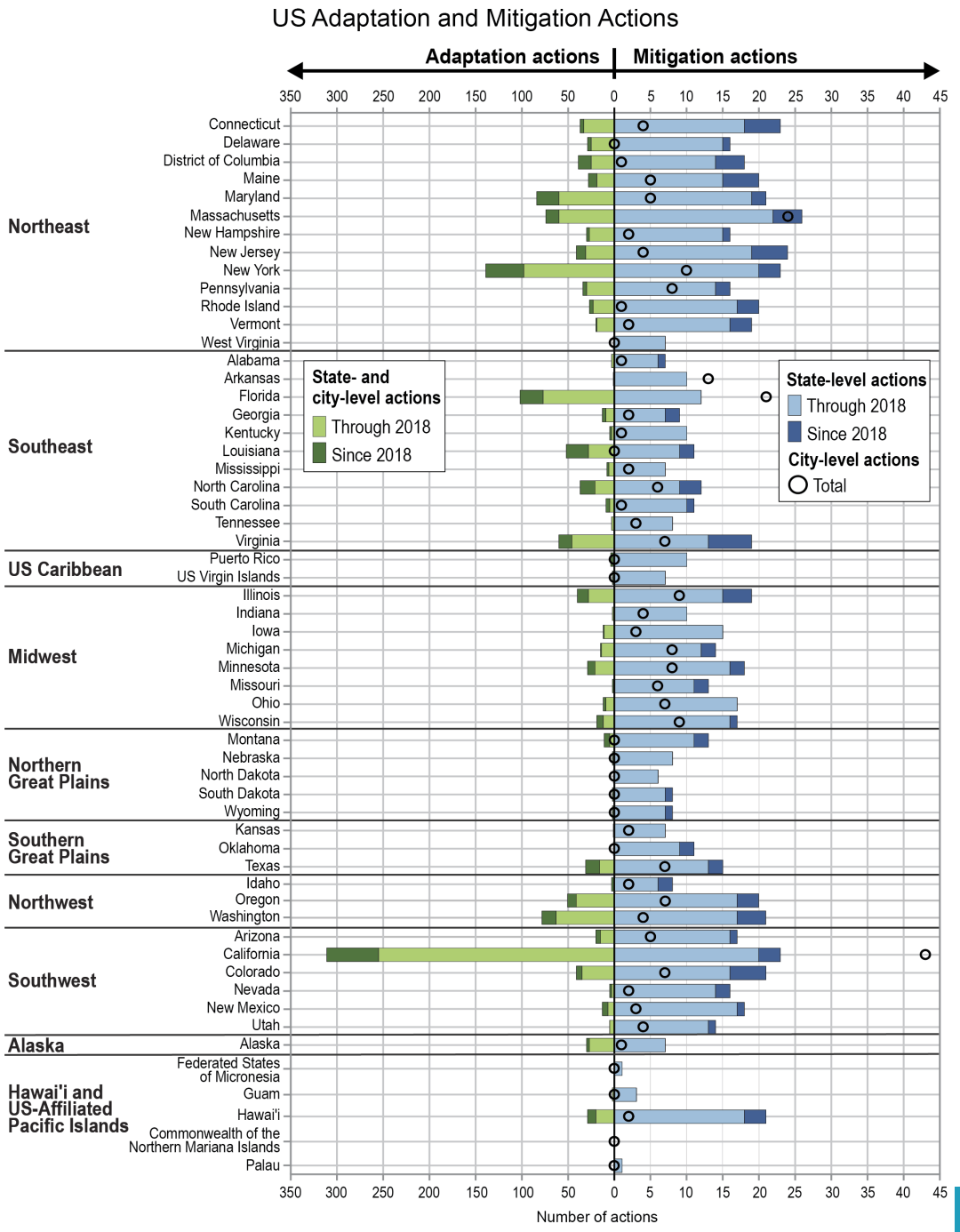
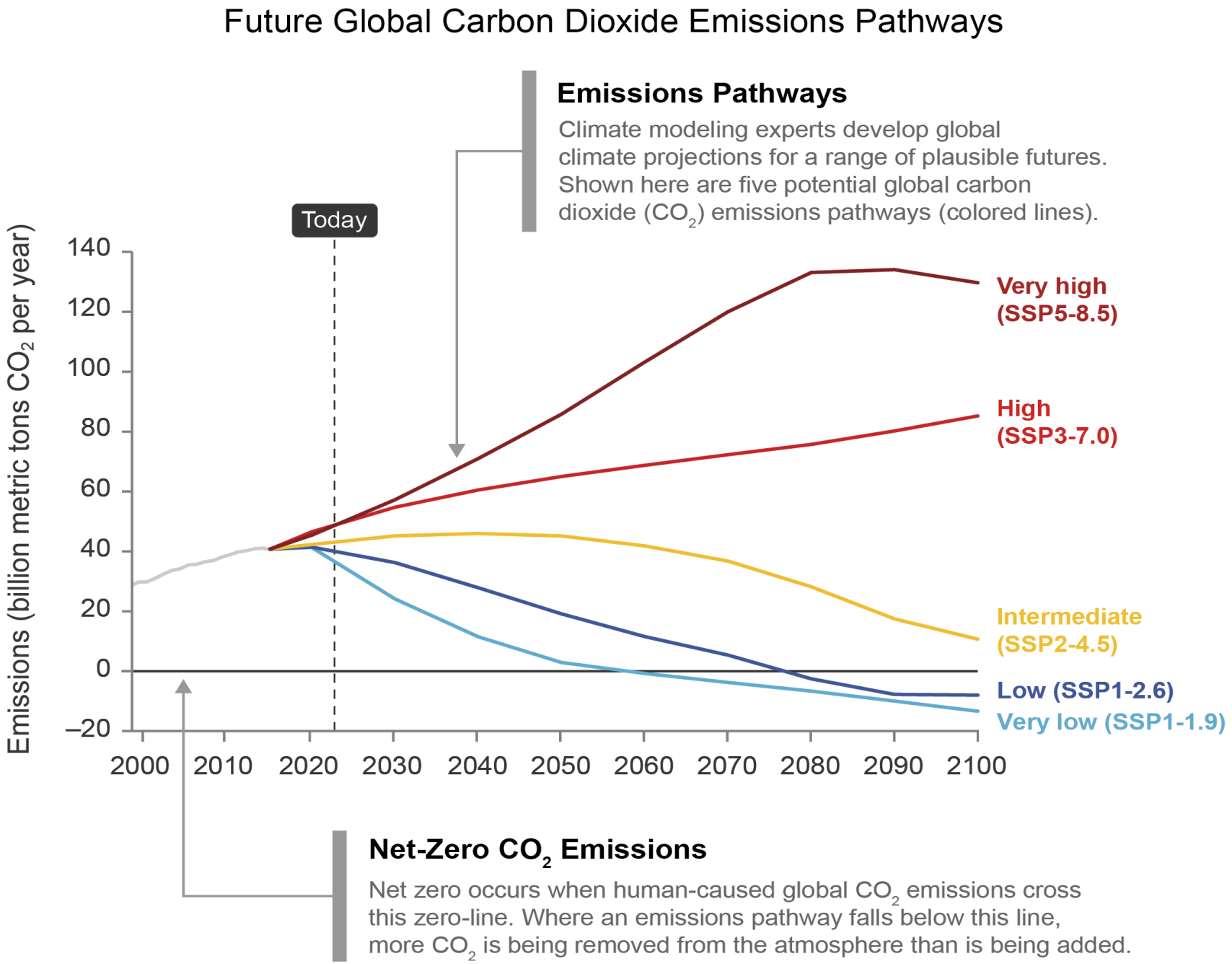


Figure 1.4. Different scenarios of future carbon dioxide emissions are used to explore the range of possible climate futures.



2023 was 2.4 degrees above the average.

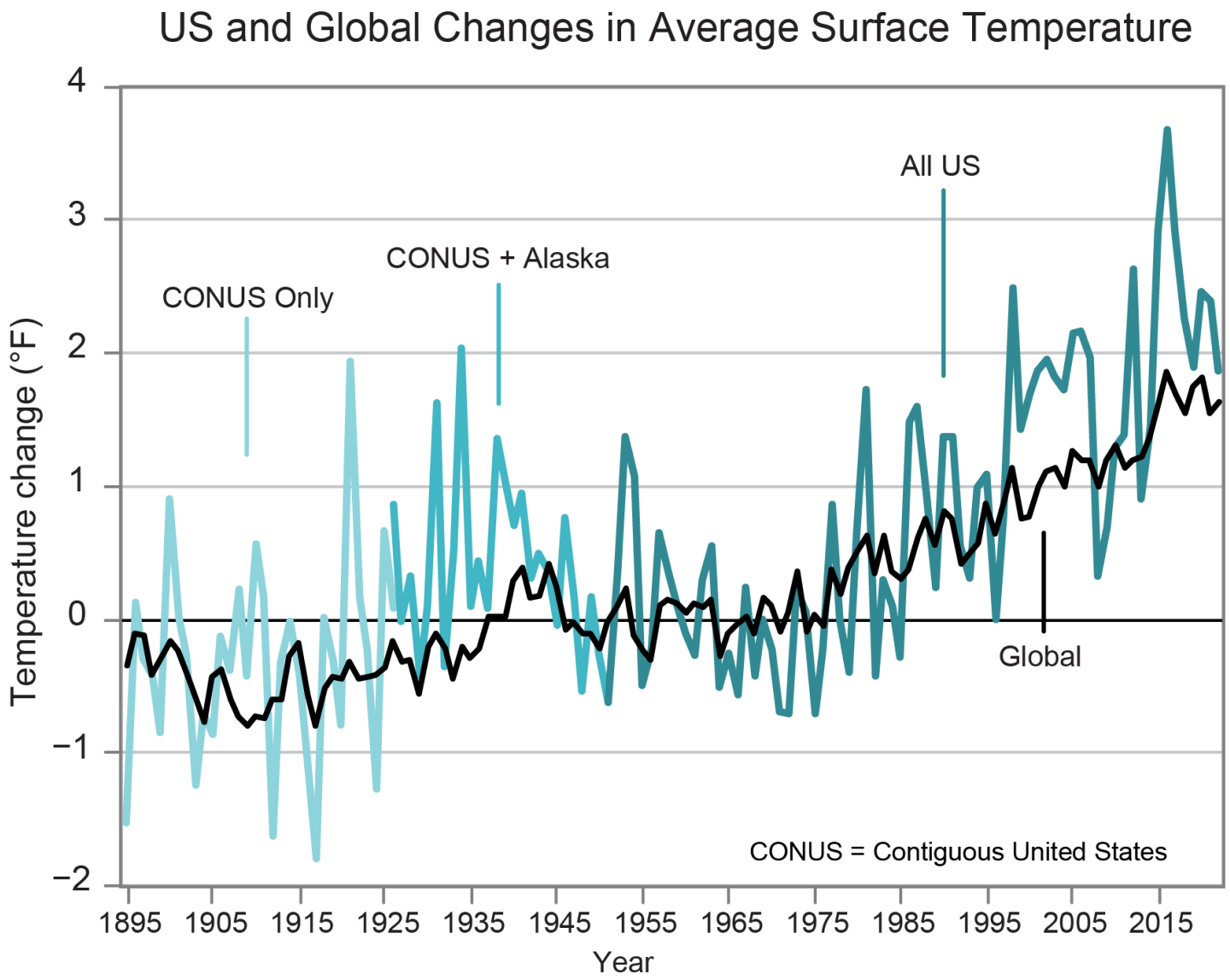


Figure 1.5. The US has warmed rapidly since the 1970s.

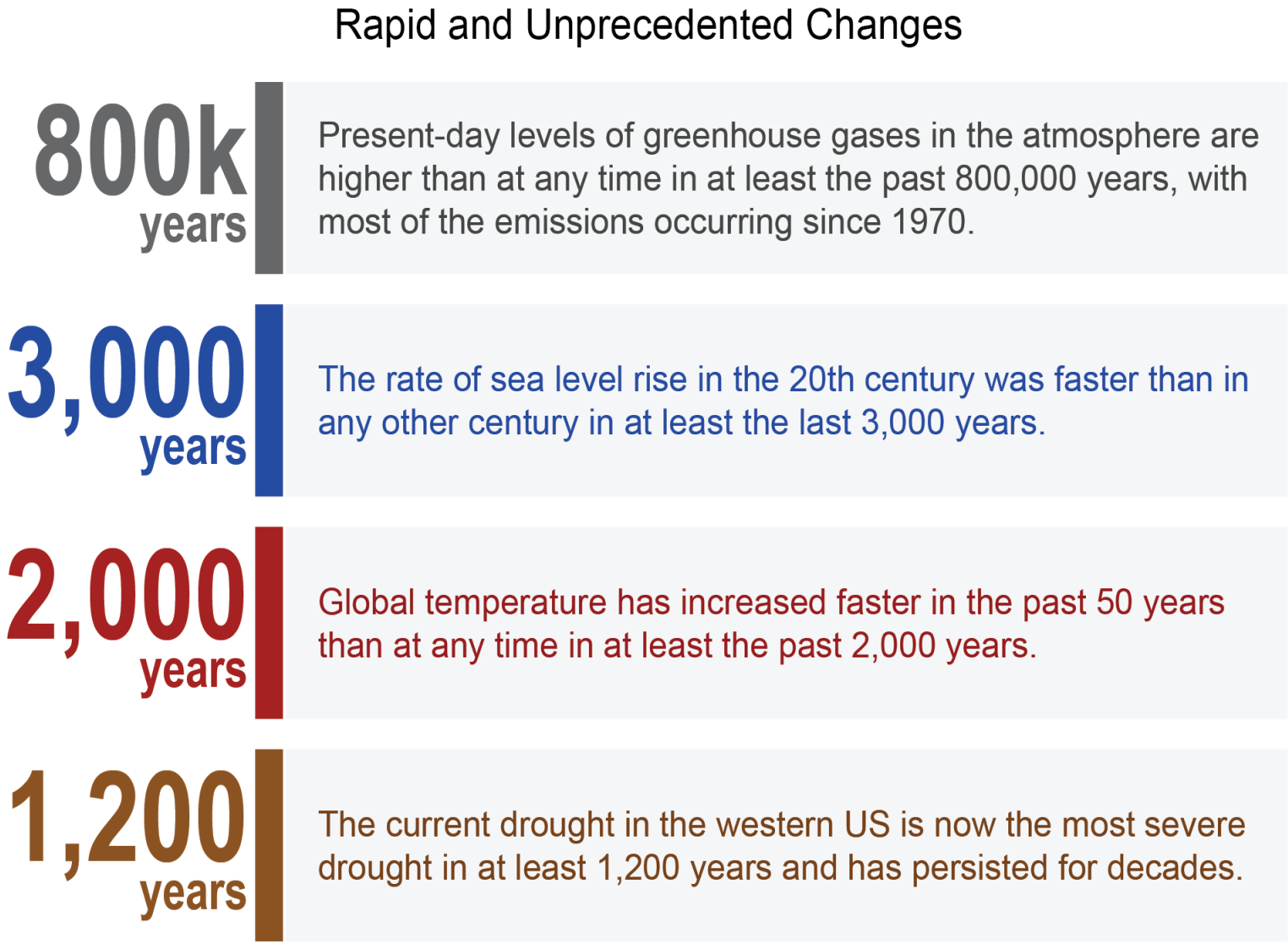
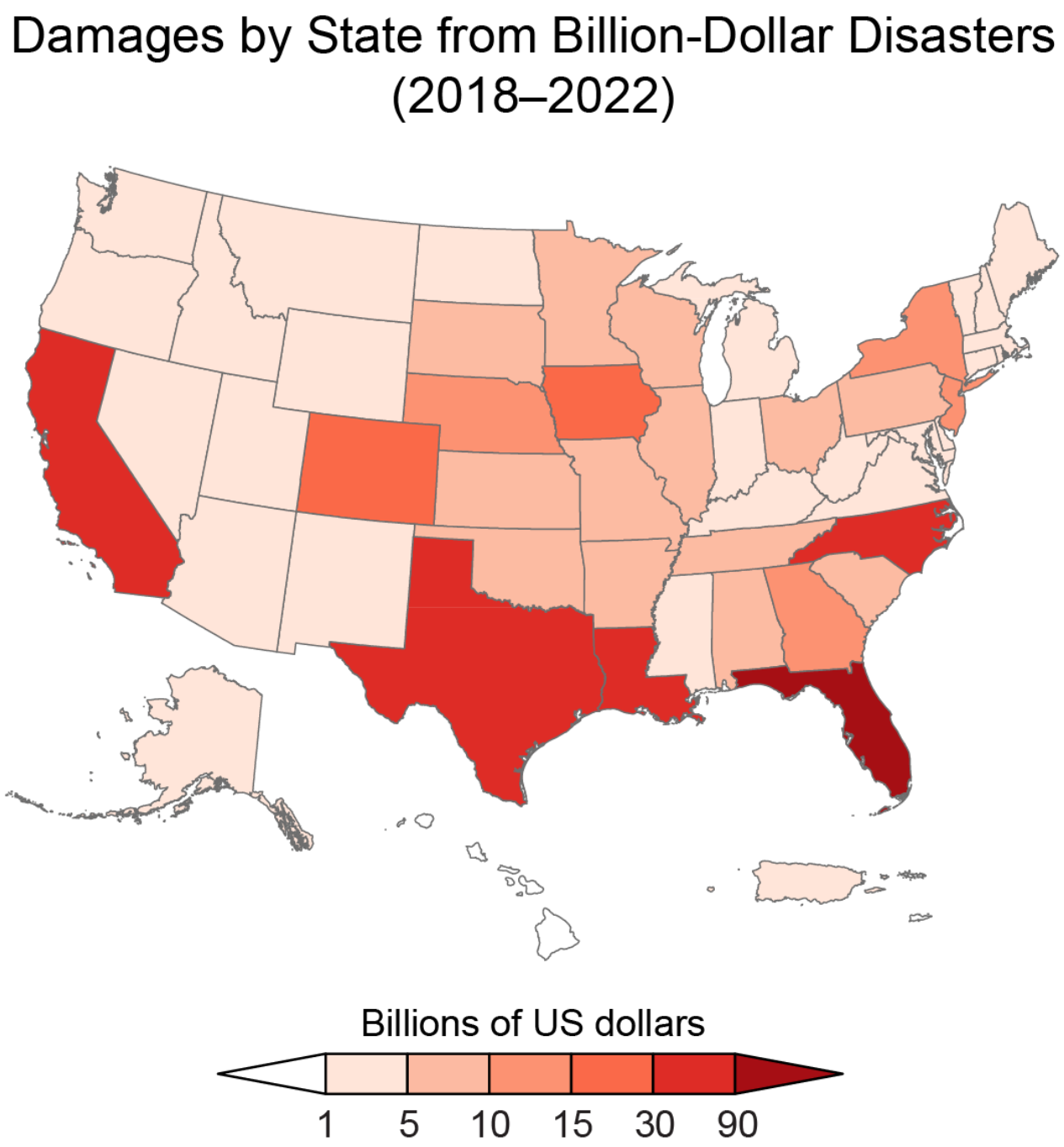
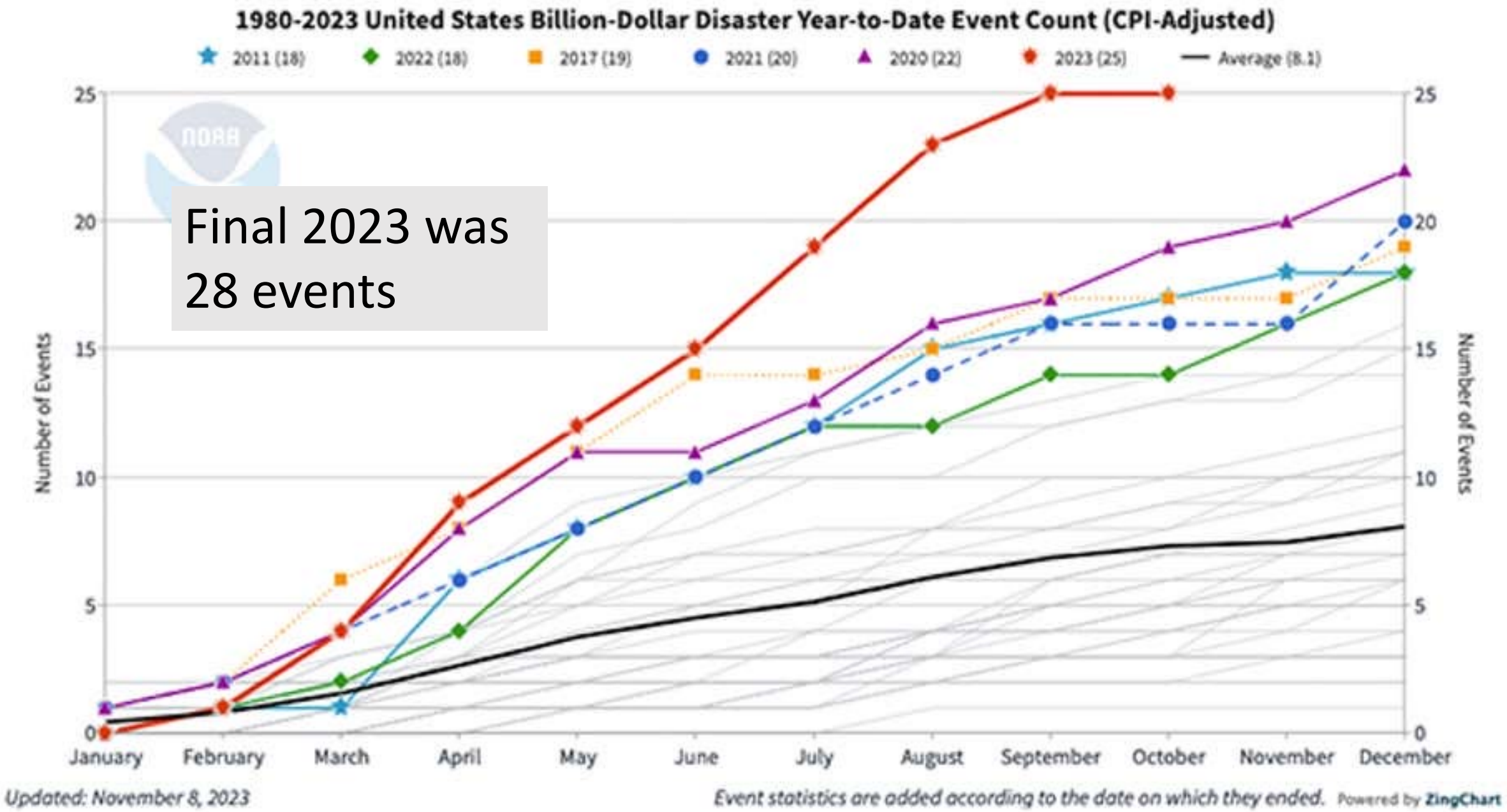


Figure 1.6. Current climate conditions are unprecedented for thousands of years.

Figure 1.7. The US now experiences, on average, a billion-dollar weather or climate disaster every three weeks.





Final 2023 was 28 events

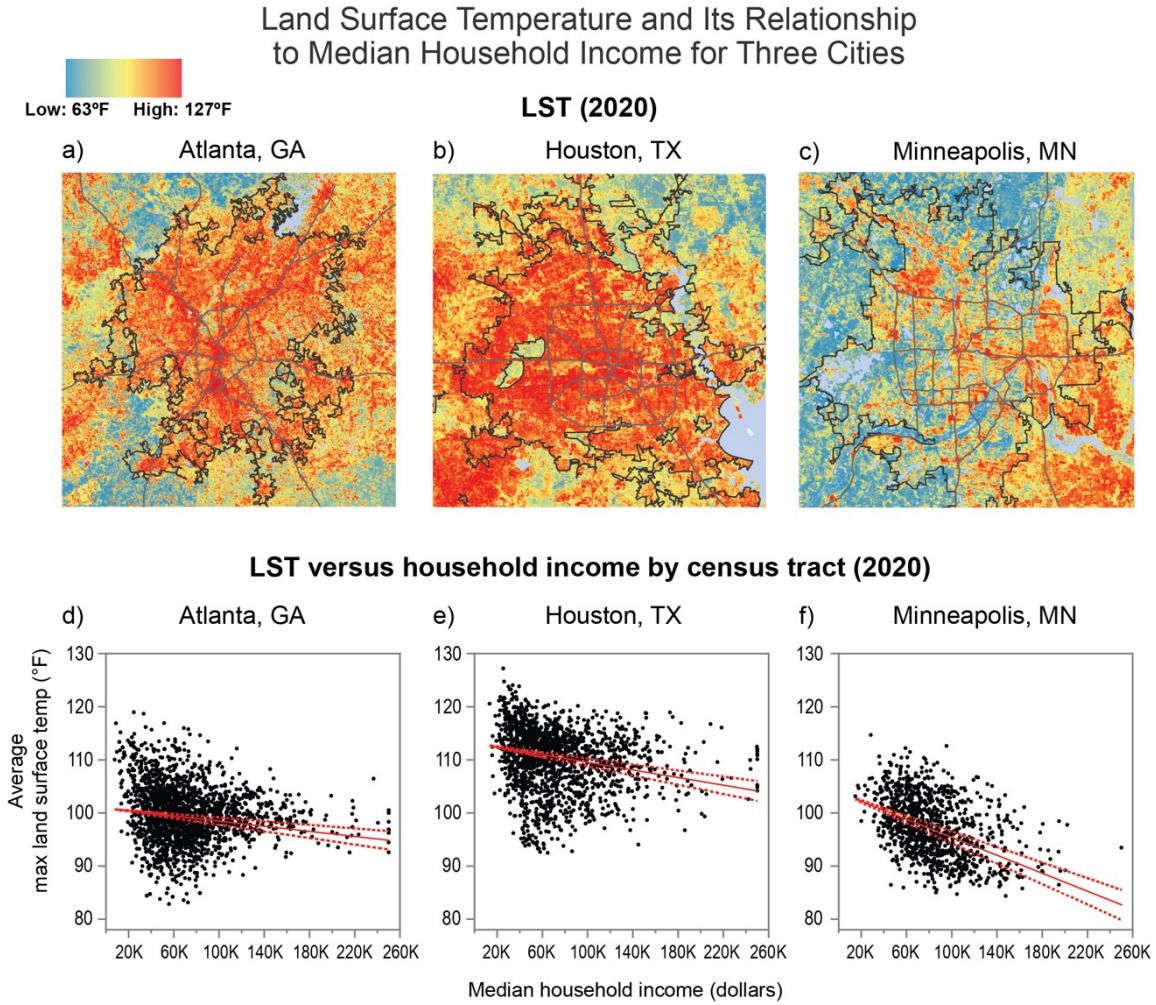


Figure 1.8. Lower-income urban neighborhoods experience higher surface temperatures.

Figure 1.9. Losses due to floods are projected to increase disproportion-nately in US Census tracts with higher percentages of Black residents.

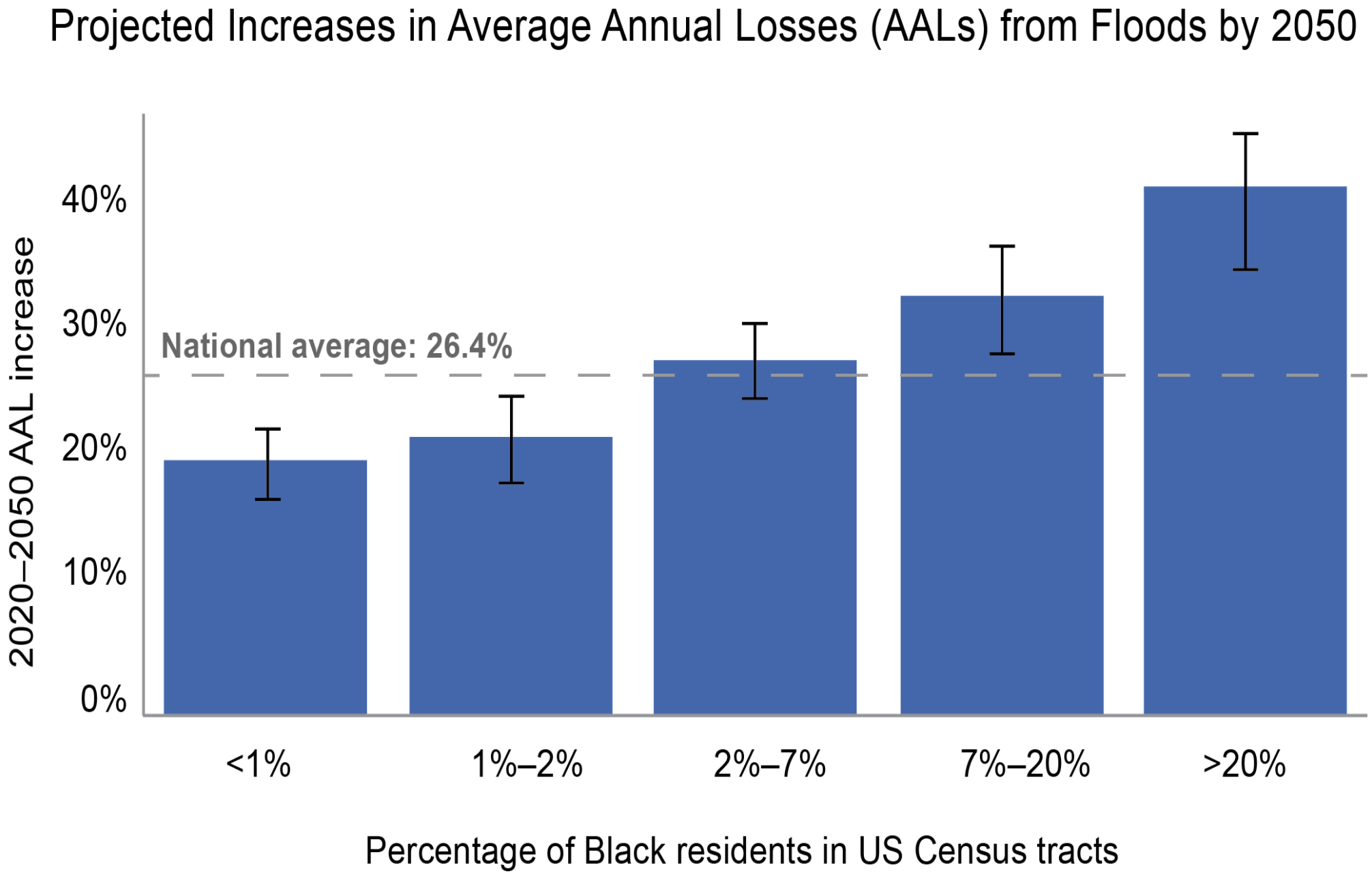
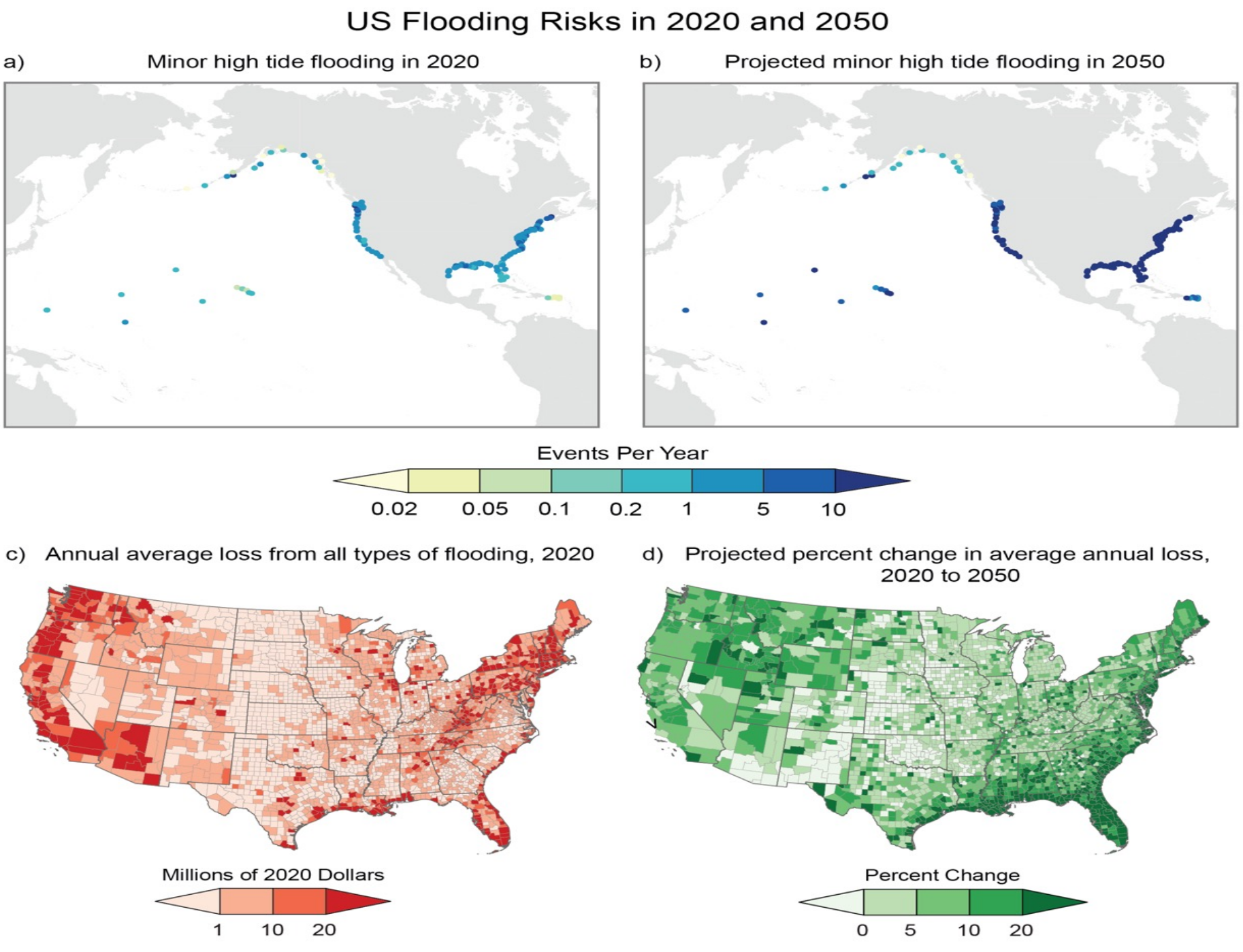


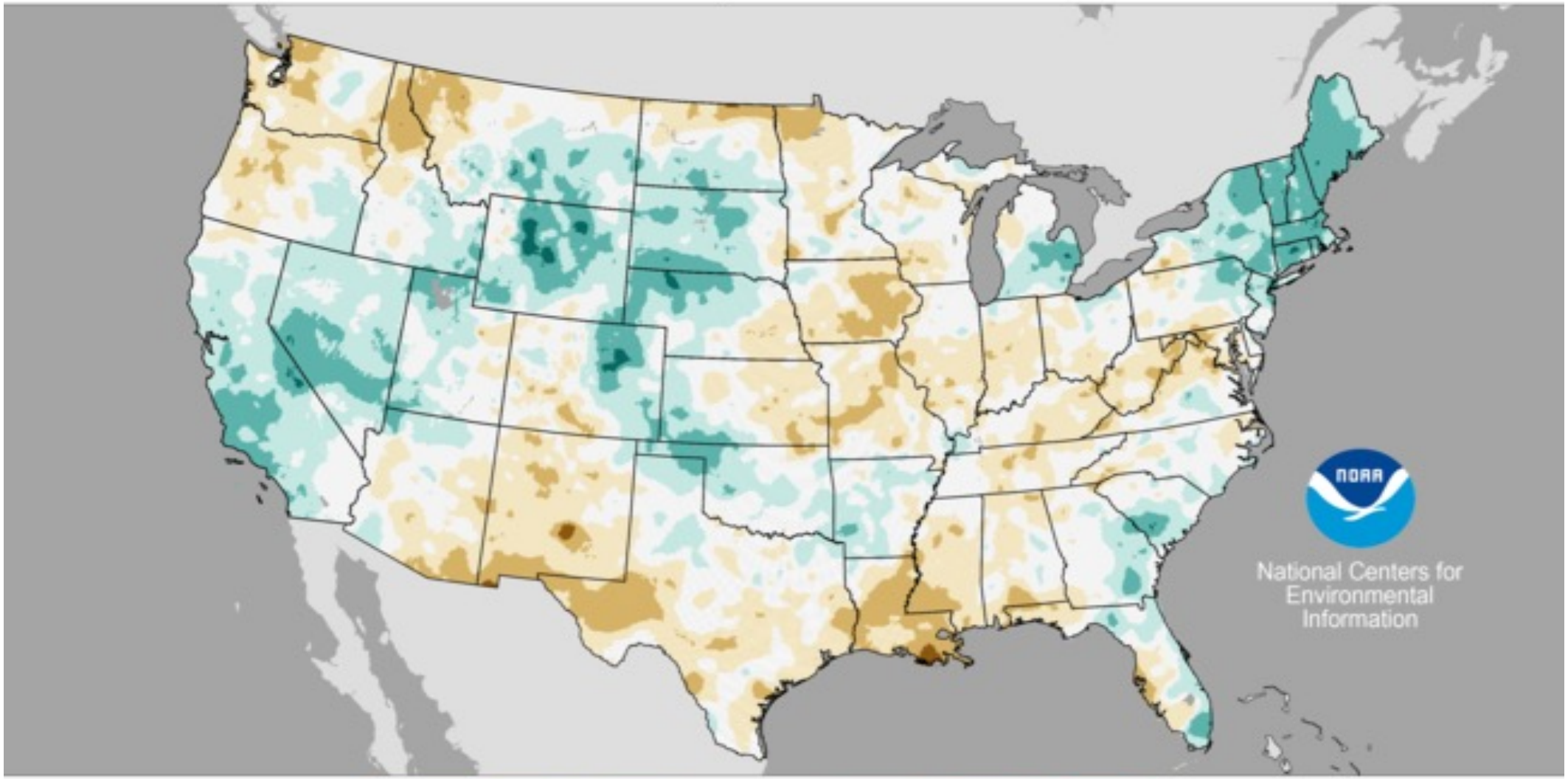
Figure 1.10. Increasing flooding puts more people and assets at risk.



Total Precipitation Percentiles

January–December 2023

Ranking Period: 1895–2023



Record Driest | Much Below Average | Below Average | Near Average | Above Average | Much Above Average | Record Wettest

Created: Fri Jan 05 2024

Data Source: nClimGrid

Figure 1.12. Employment gains in electrification and renewable energy industries are projected to far outpace Job losses in fossil fuel industries.

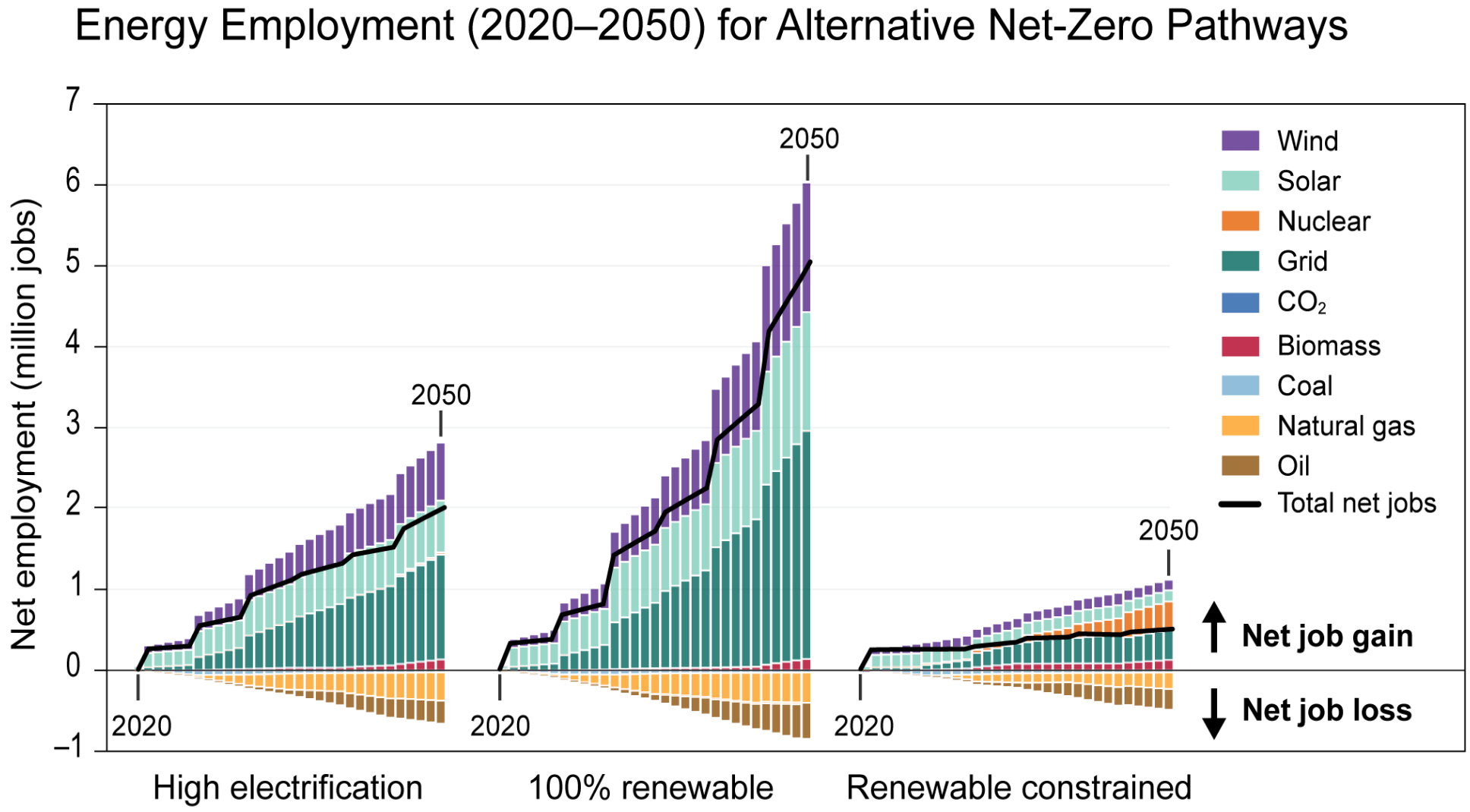


Figure 1.13. When or if the US reaches a particular level of warming depends on global greenhouse gas emissions from human activities.

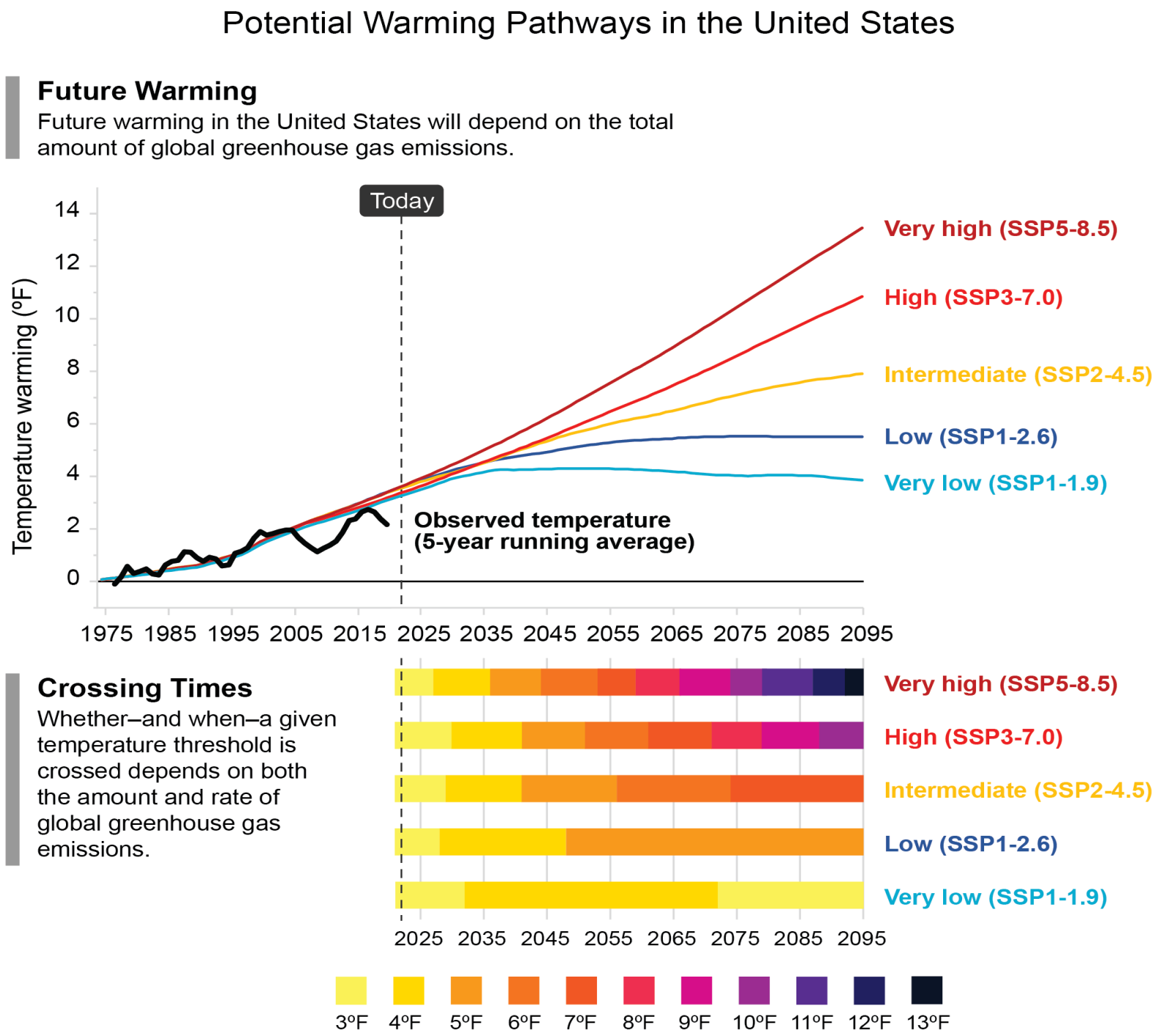


Figure 1.14. What would 3.6°F (2°C) of global warming feel like in the United States?

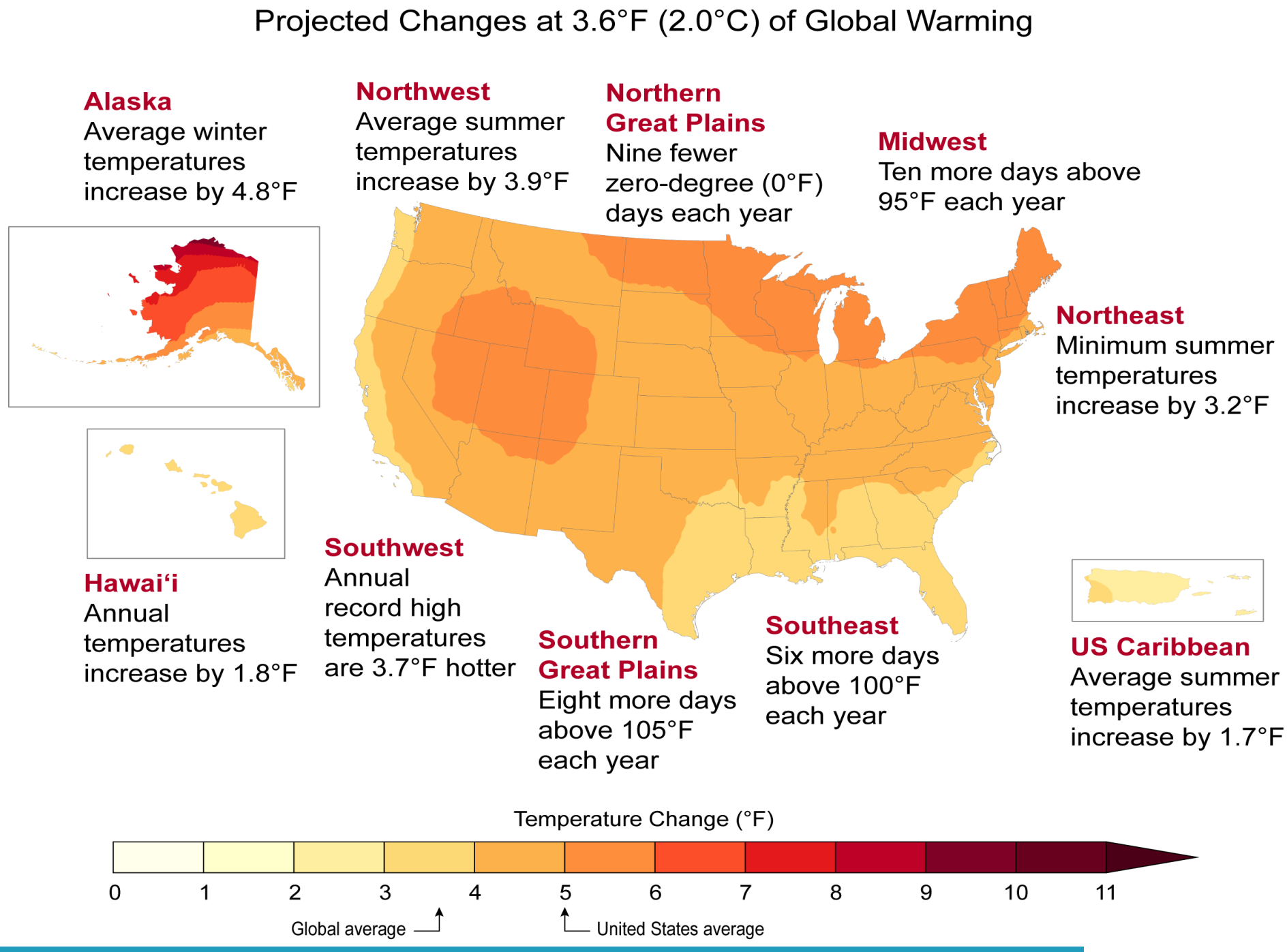
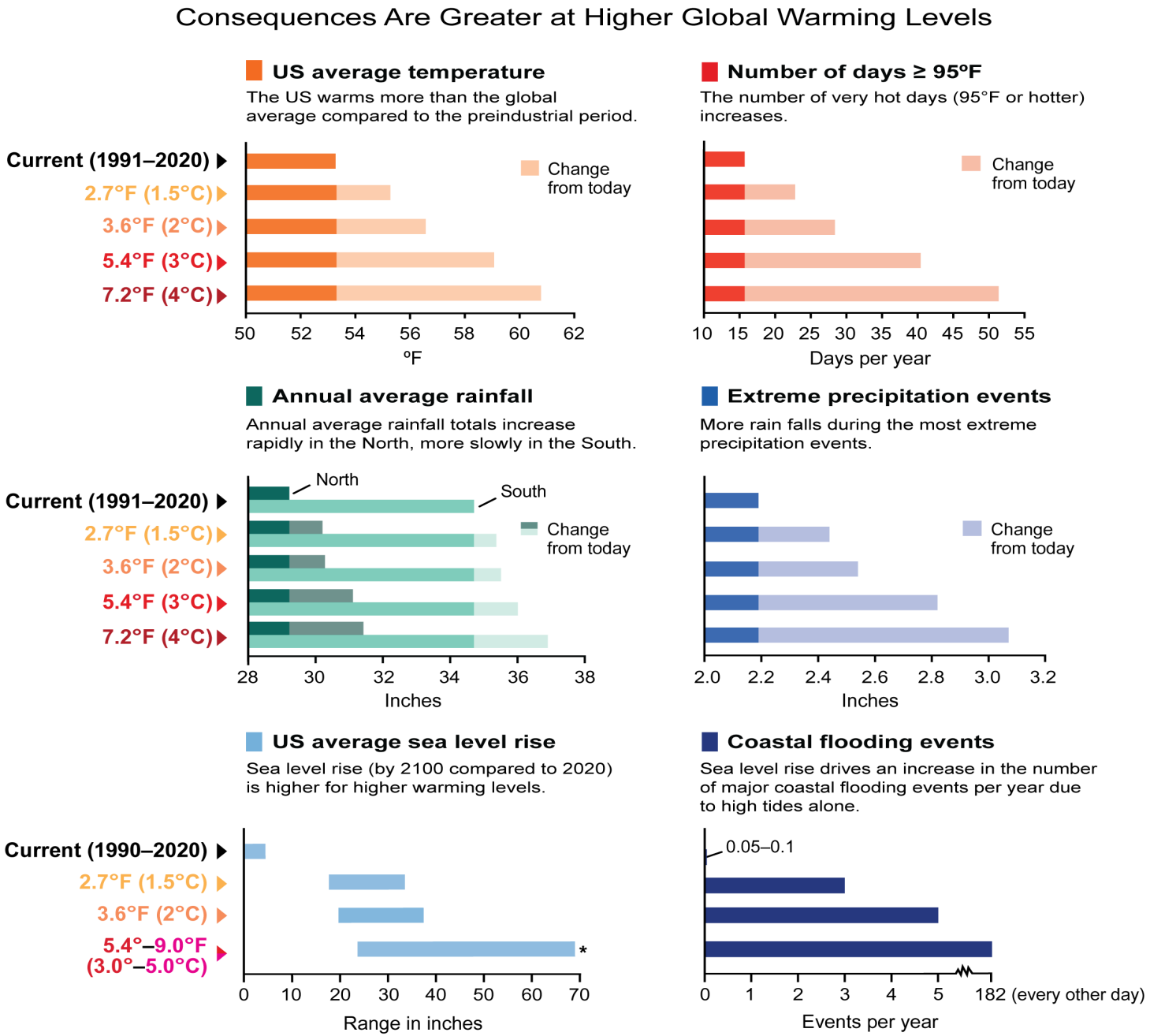
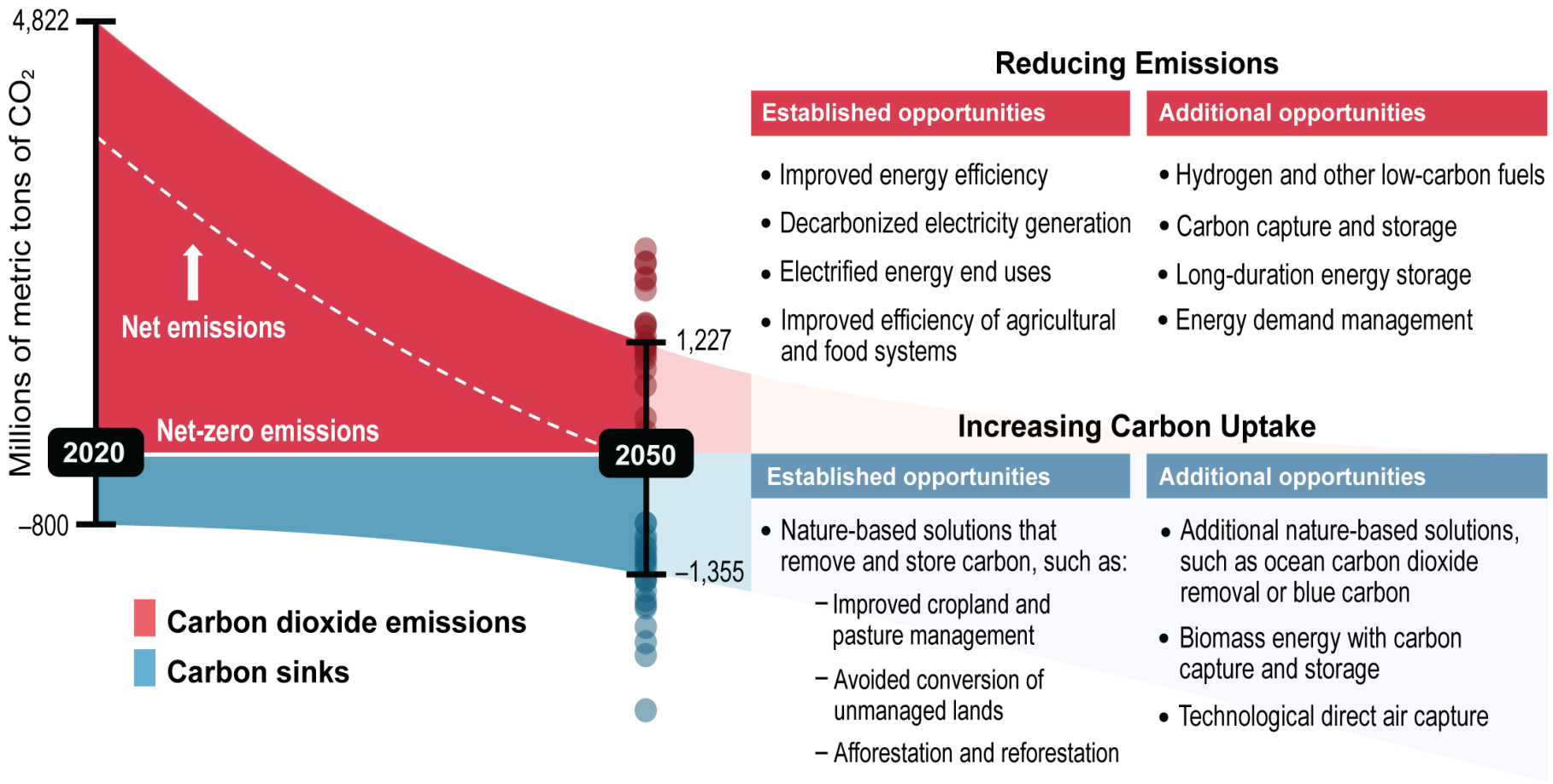


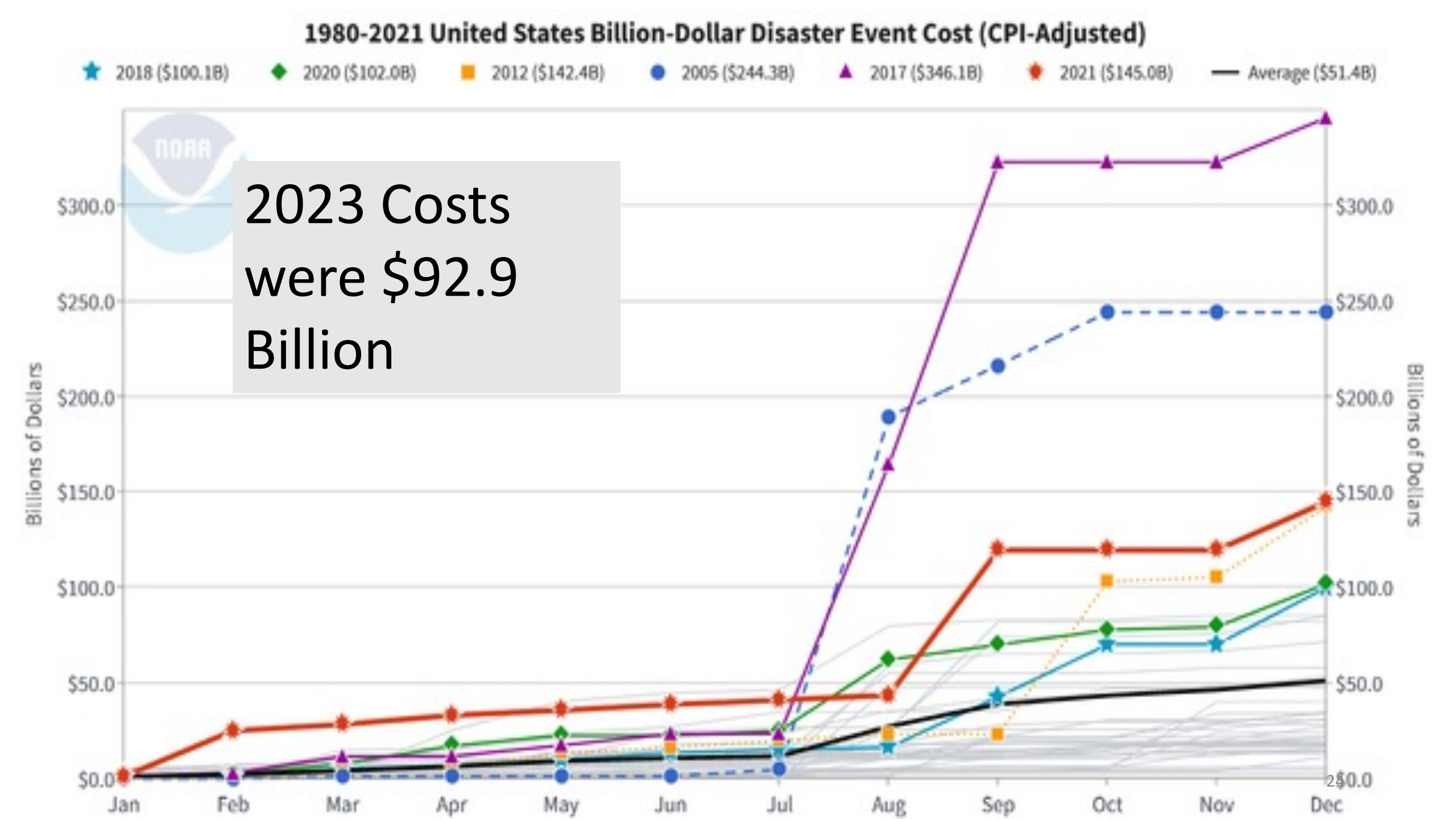
Figure 1.15. At higher global warming levels, the US will experience more severe climate impacts.



*Rise at the upper end of this range cannot be ruled out due to the possibility of rapid ice sheet loss. The amount of warming required to trigger such loss is not currently known but is assessed to be above 3.6°F (2°C).

Figure 1.16. Reaching net zero by 2050 in the US will involve a mix of reductions in greenhouse gas emissions and increases in carbon dioxide removal.




1980-2021 United States Billion-Dollar Disaster Event Cost (CPI-Adjusted)
2018 ($100.1B)
2020 ($102.0B)
2012 ($142.4B)
2005 ($244.3B)
2017 ($346.1B)
2021 ($145.0B)
Average ($51.4B)
2023 Costs were $92.9 Billion
Billions of Dollars
$300.0
$250.0
$200.0
$150.0
$100.0
$50.0
$0.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
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Dec

Global Costs of Climate Change

- The global cost of climate change damage is estimated to be between $1.7 trillion and $3.1 trillion per year by 2050.
- This includes the cost of damage to infrastructure, property, agriculture, and human health.
- This cost is expected to increase over time as the impacts of climate change become more severe.
- The poorest countries in the world are at greatest risk from the economic impacts of climate change.

Data from World Economic Forum

Climate Change is Here

- The changes required to our Built and Natural Environments over the next few decades will be a tremendous undertaking.
- Climate Change has already cost the USA over **$2.5 trillion** and that will continue to increase each year.
- The total cost of U.S. billion-dollar disasters over the last seven years (2017-2023) was **$900 billion.**
- Inaction will exceed the cost of action.
- Much can be done at a profit.

Figure 2 illustrates some representative climate change hazards and potential impacts on DoD missions around the world.

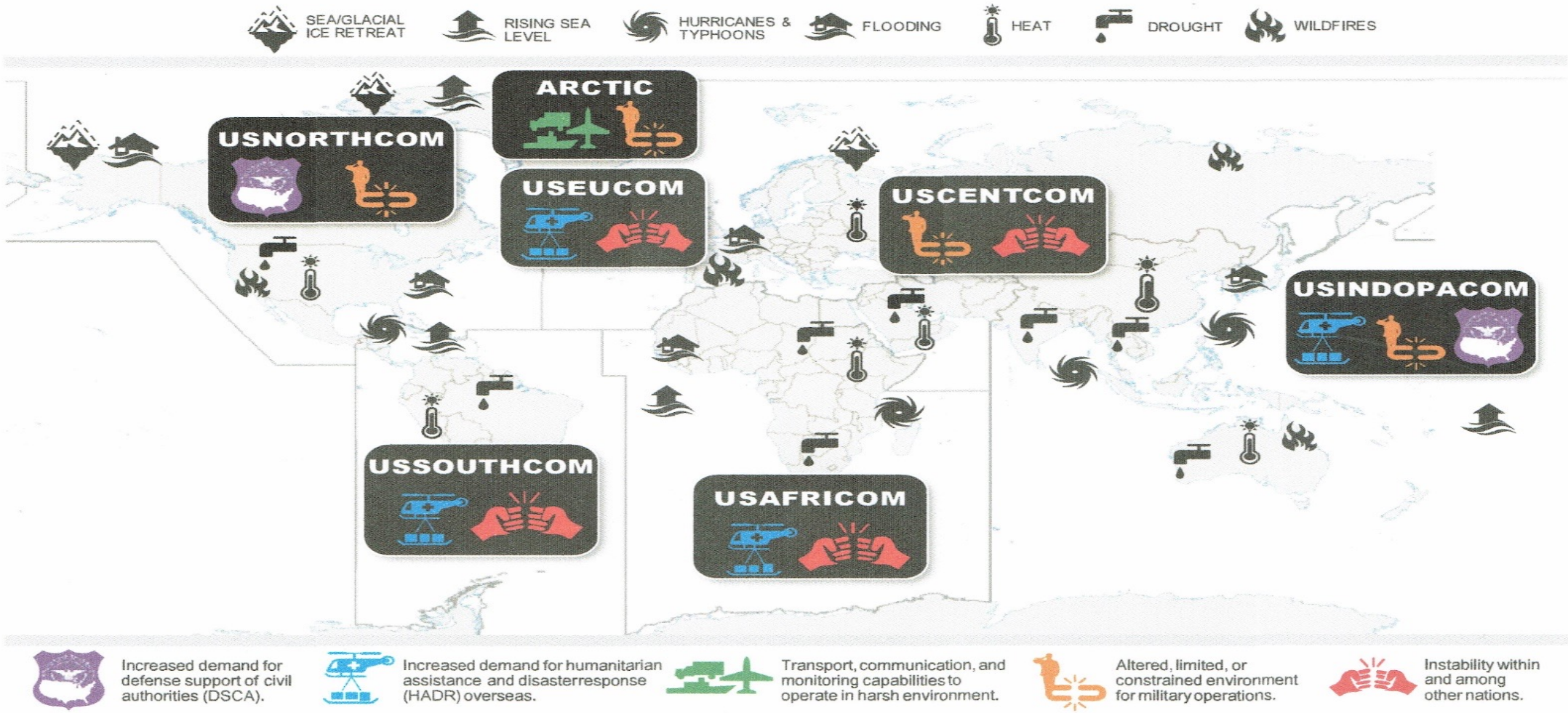

Figure 2. Selected regional hazards worsened by climate change (key to symbols on the top row above map) and identified security implications (key to symbols on the bottom row below the map). This map illustrates some of the key risks by region, but is not comprehensive of all risk.

ADAPTATION VS. MITIGATION