

# CLIMATE PROJECTIONS FOR THE SOUTH CENTRAL US

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# ABOUT ME

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Originally from Arkansas, but have resided in Oklahoma since 2009

**Bachelors Degree in Meteorology** from OU

**Masters Degree in Geography** from OU

University Assistant Director of the **USGS South Central Climate Adaptation Science Center**

Hobbies: **Wildlife Photography & Baking**





# WHY USE FUTURE CLIMATE INFO?

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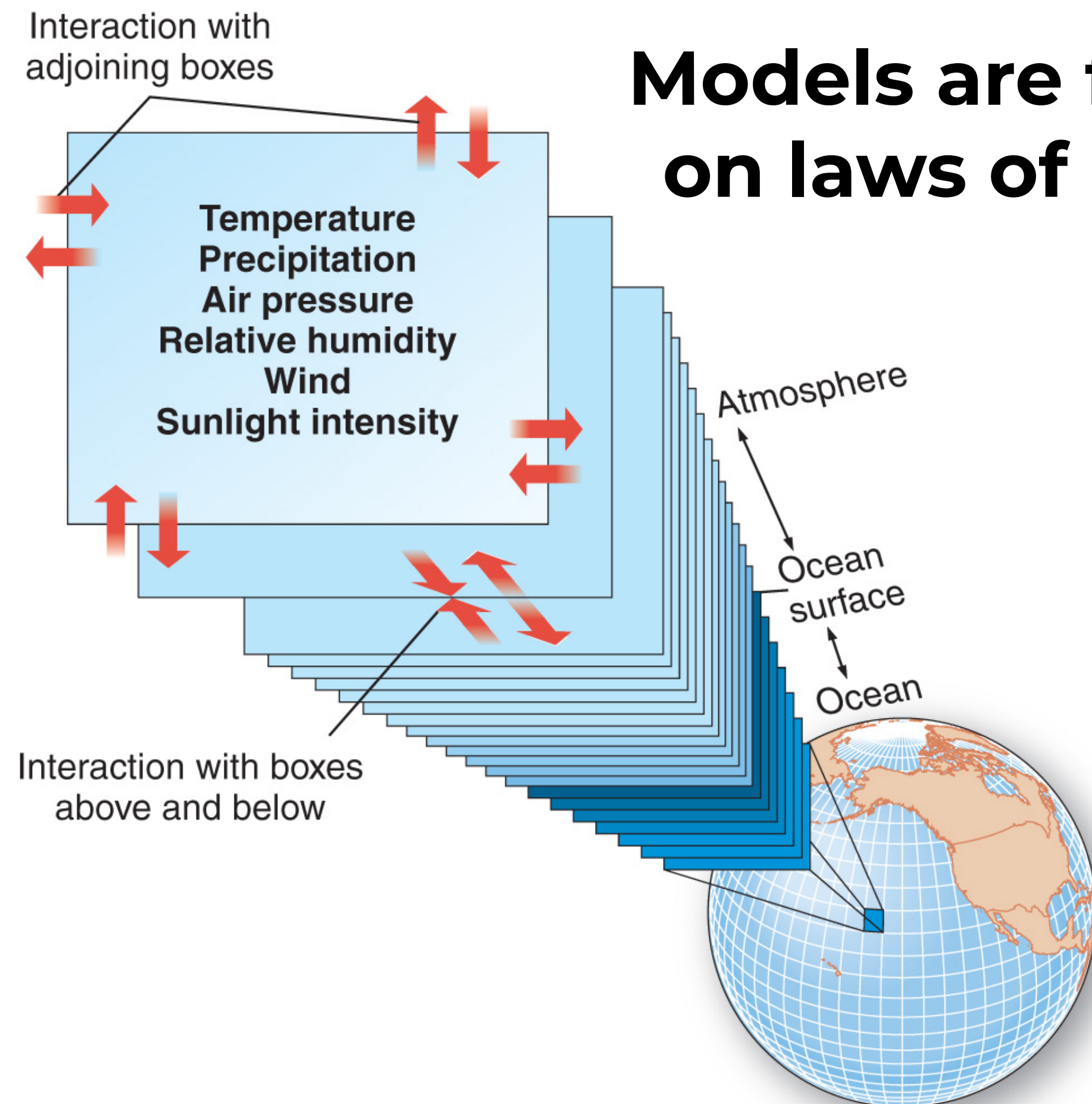
# WHAT DOES THE FUTURE LOOK LIKE? & HOW DO WE KNOW?



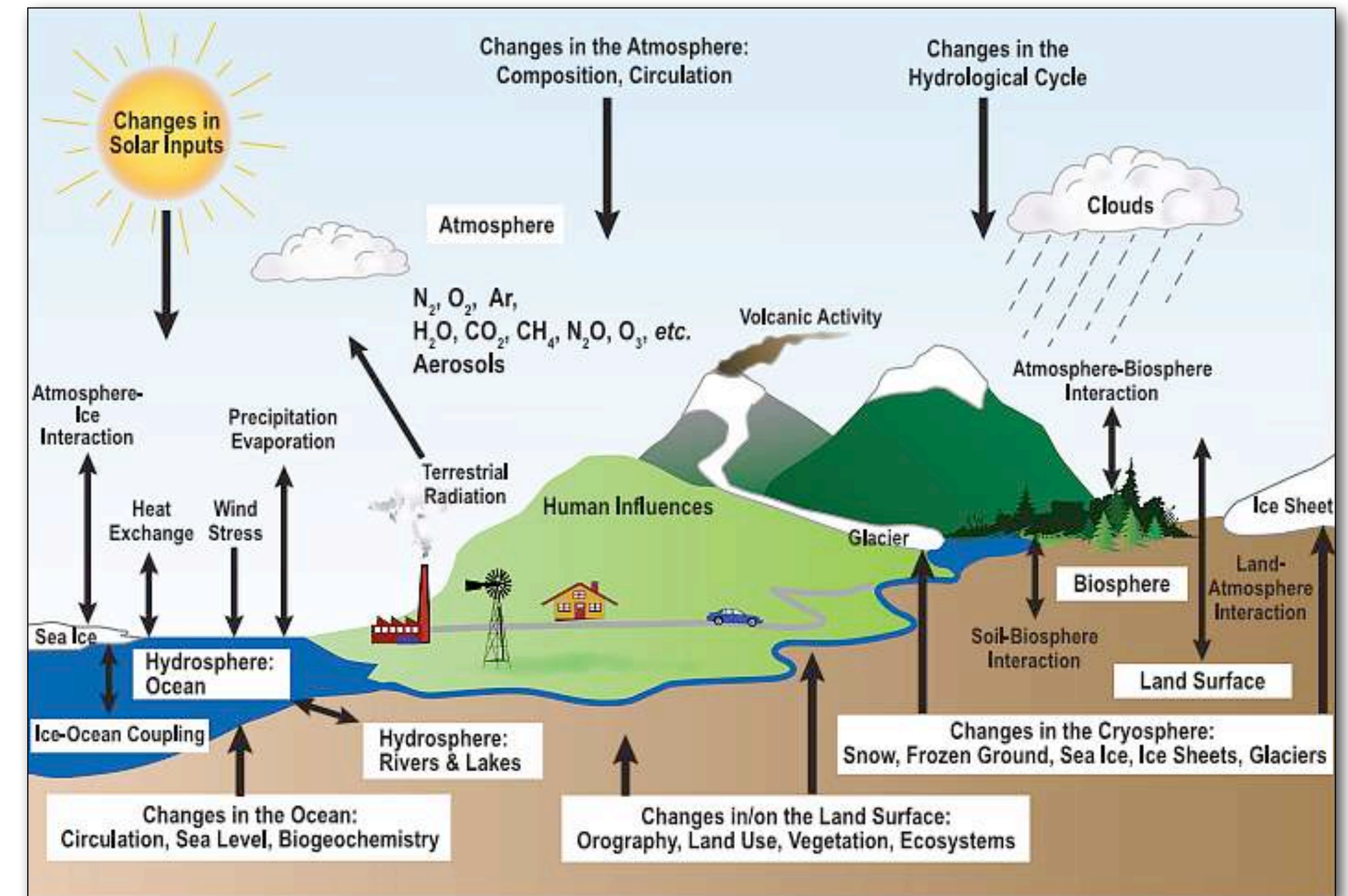
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# GLOBAL CLIMATE MODEL



**Models are founded on laws of physics**



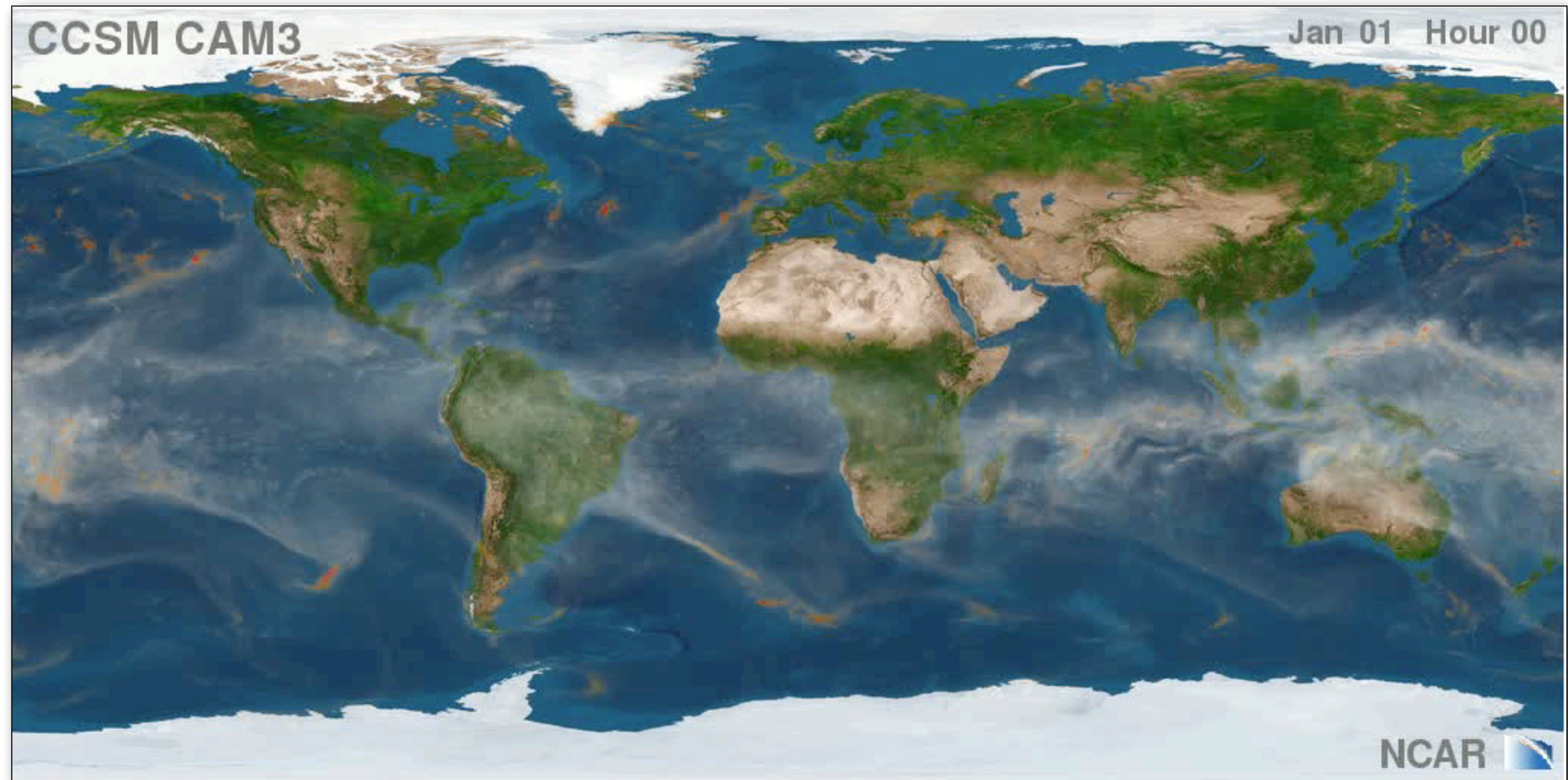
**Provide reasonable projections of physical changes, not detailed predictions**



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# GLOBAL CLIMATE MODEL OUTPUT

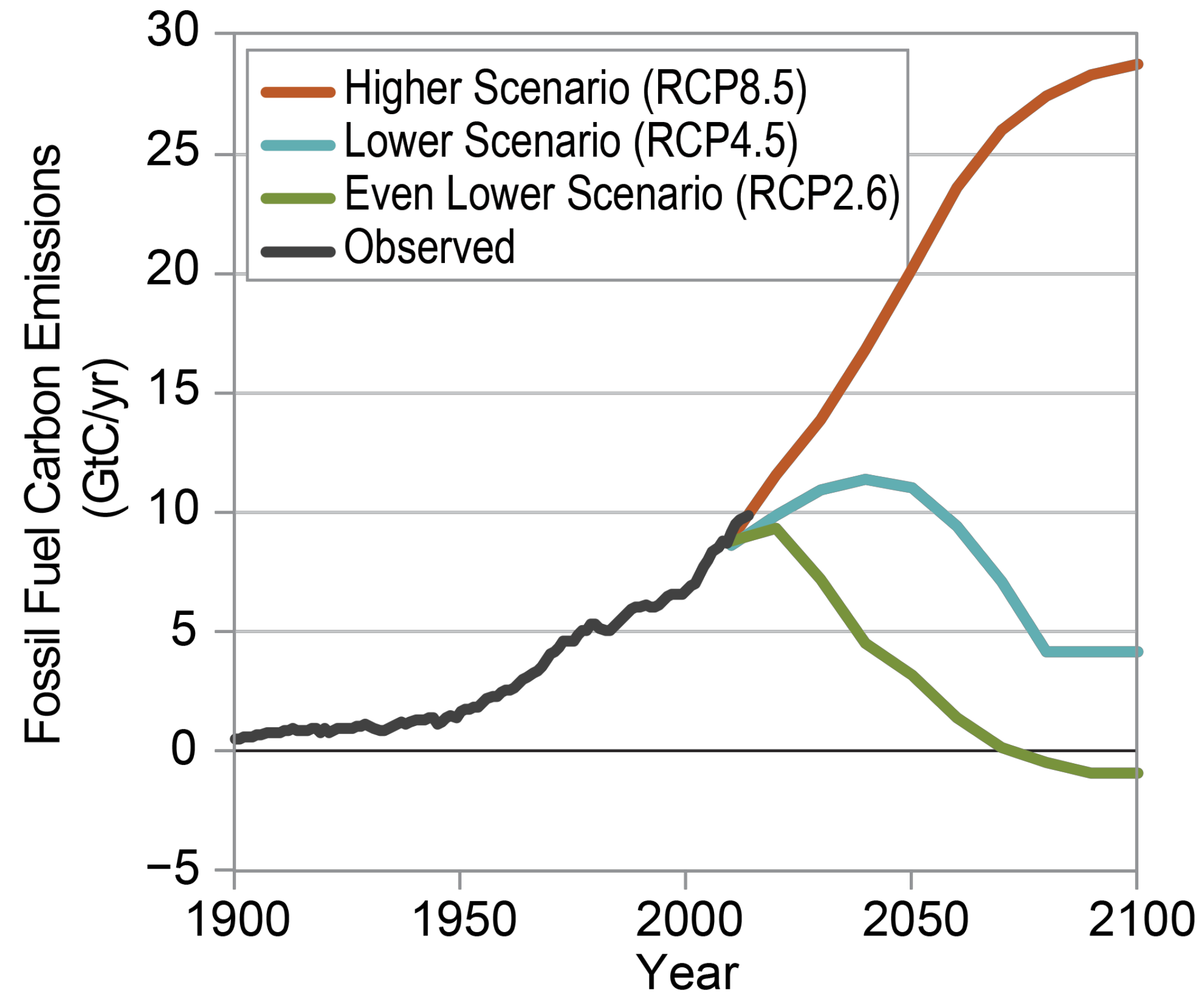


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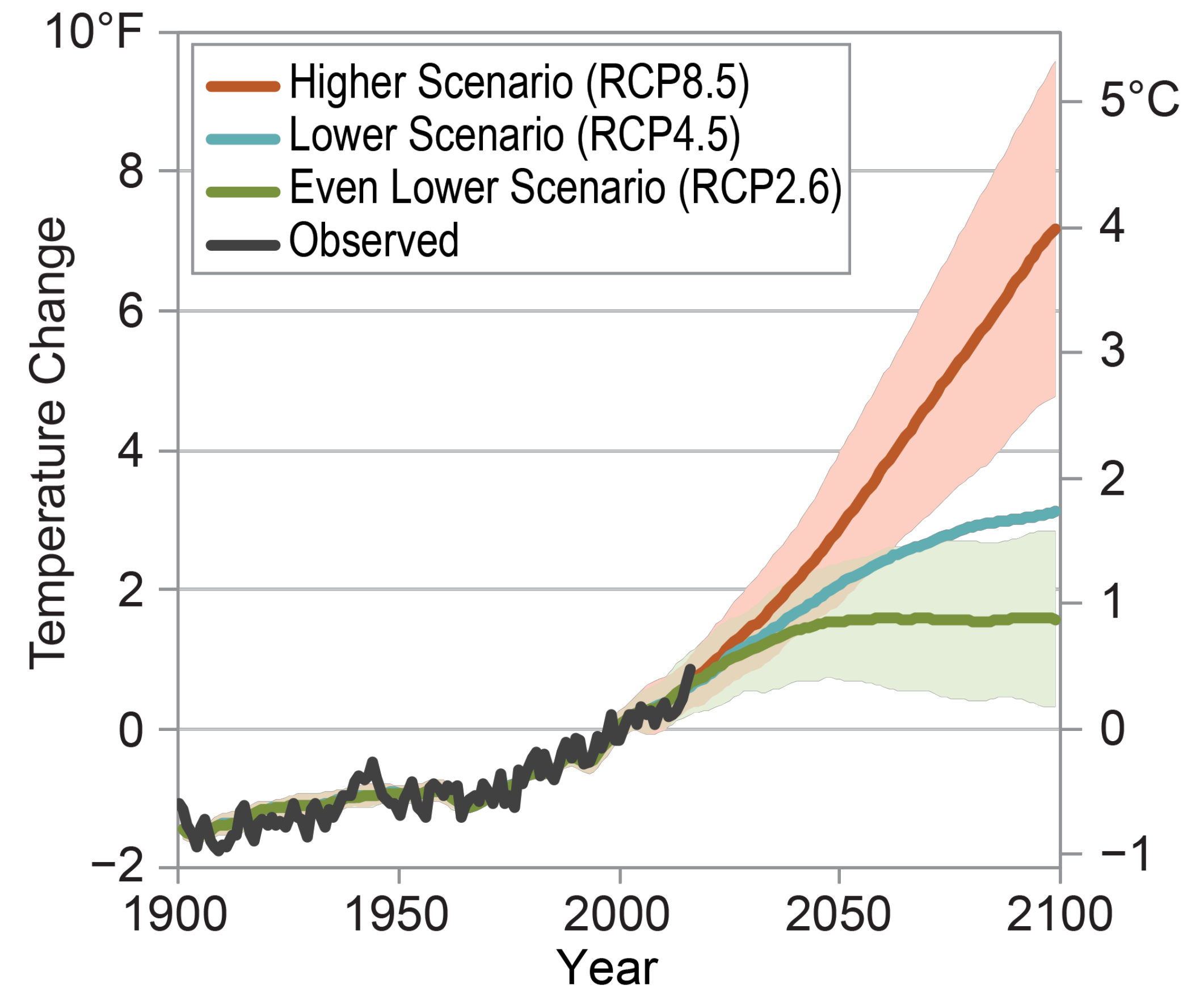


# EMISSIONS & TEMPERATURE CHANGE

Global Carbon Emissions



Global Average Temperature Change



USGCRP CSSR 2017

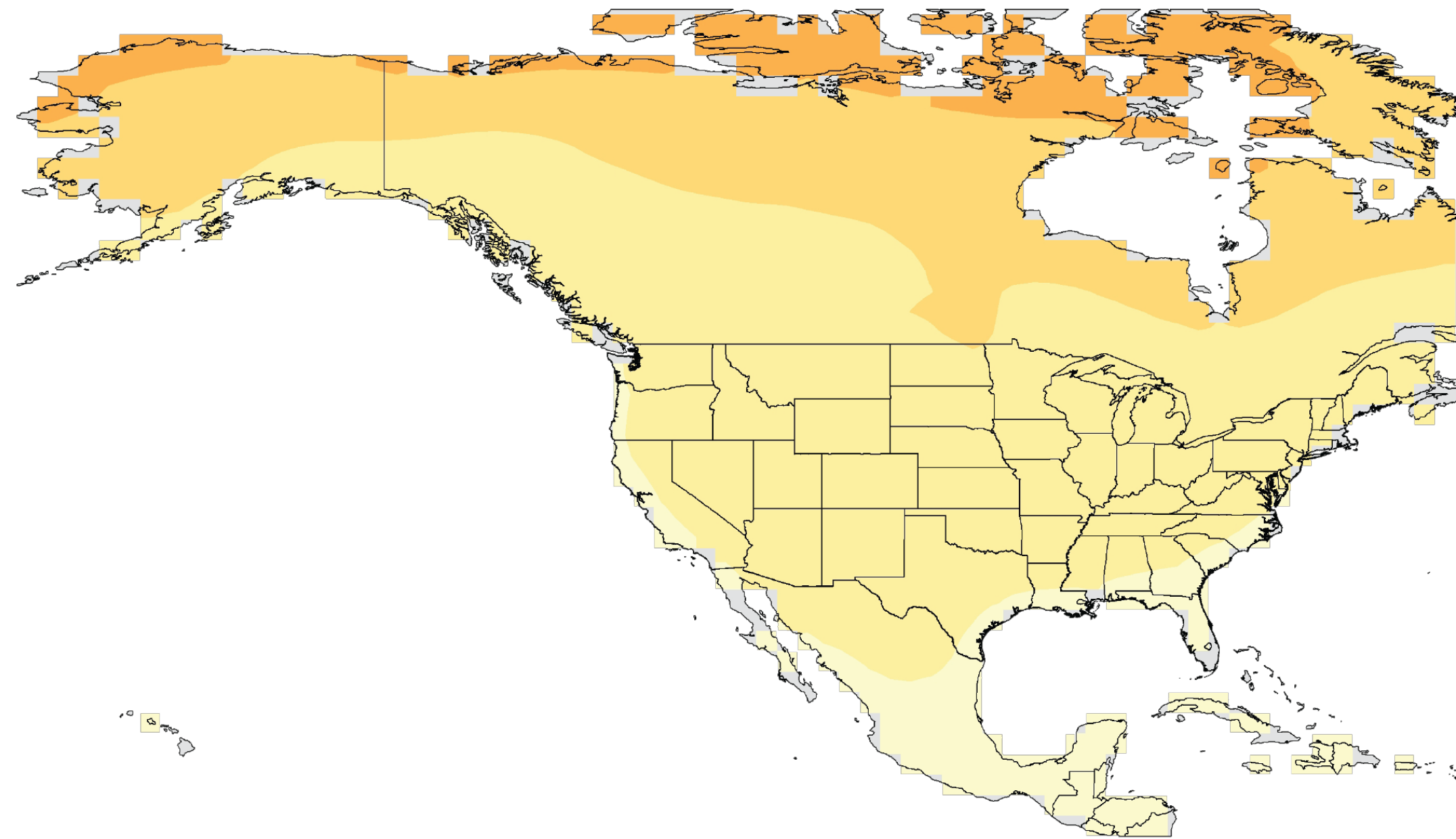


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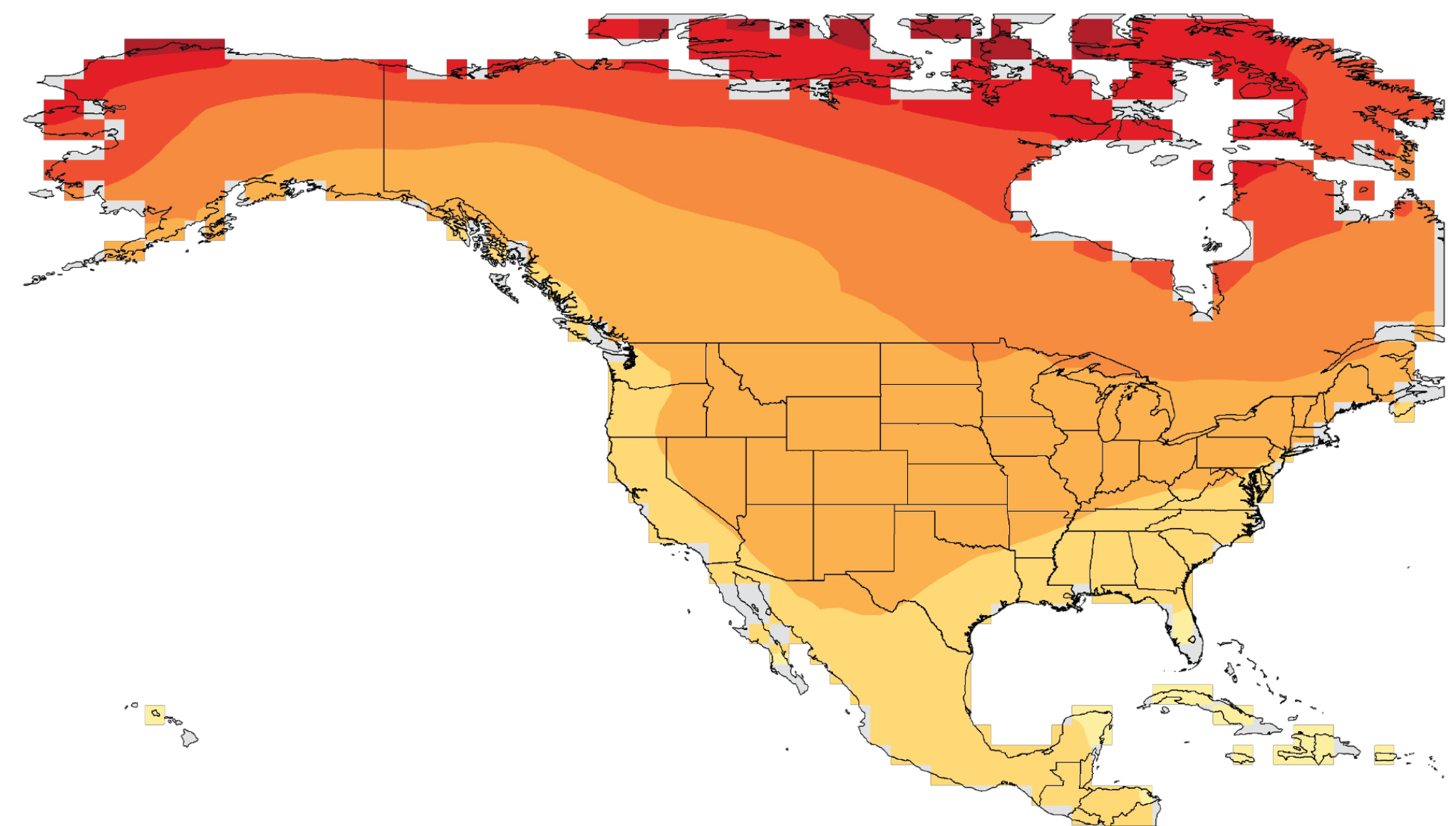


# PROJECTED CHANGES IN AVERAGE ANNUAL TEMPERATURE

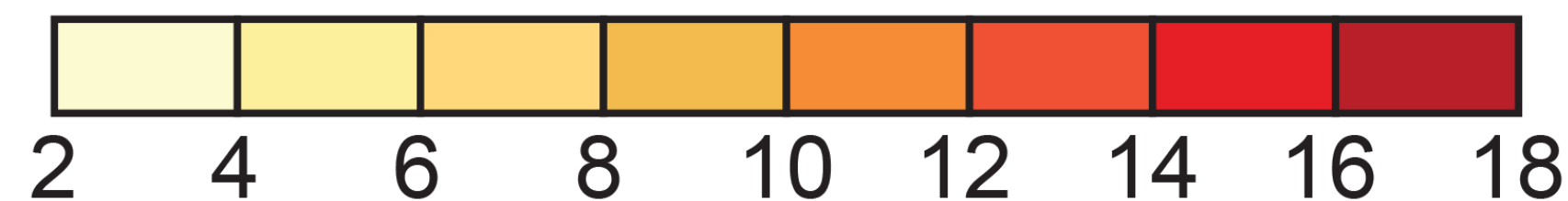
Lower Scenario (RCP4.5)



Higher Scenario (RCP8.5)



Change in Temperature (°F)

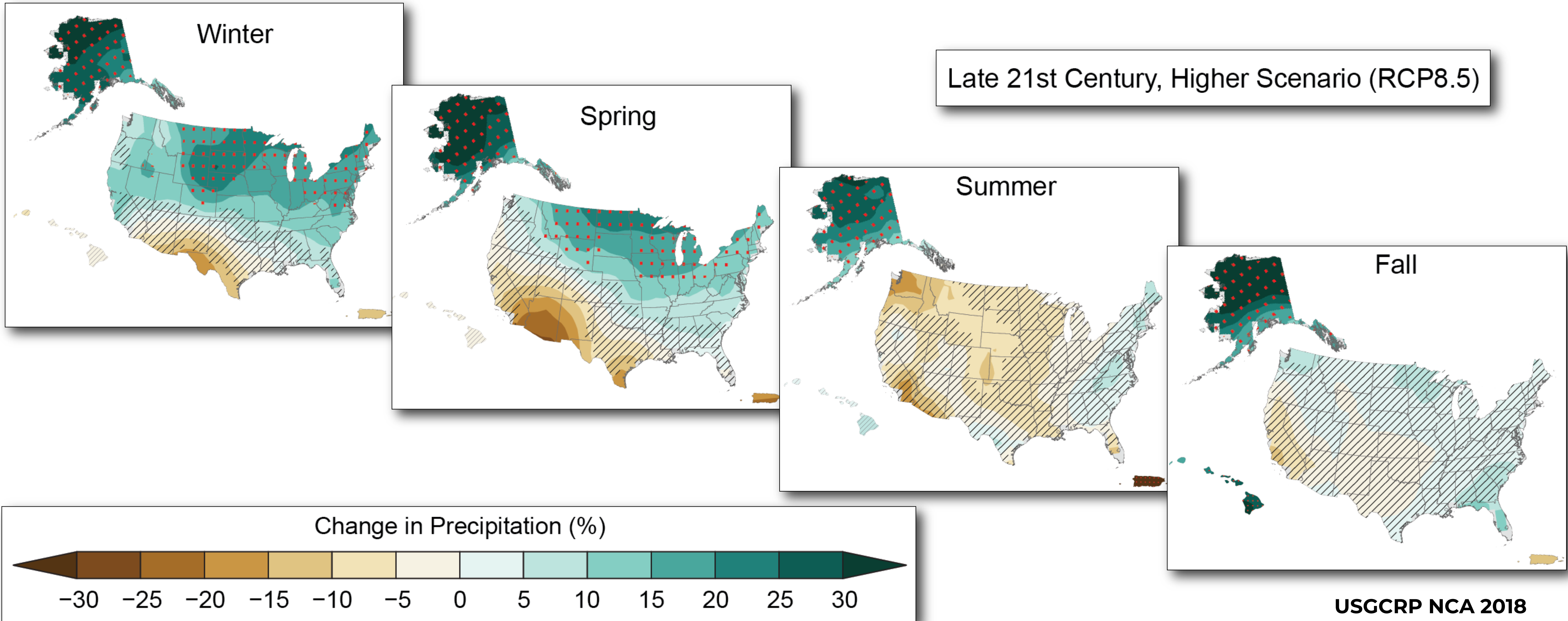


**Projections for the  
late 21<sup>st</sup> century  
relative to 1976–2005**





# PROJECTED CHANGES IN AVERAGE ANNUAL PRECIPITATION

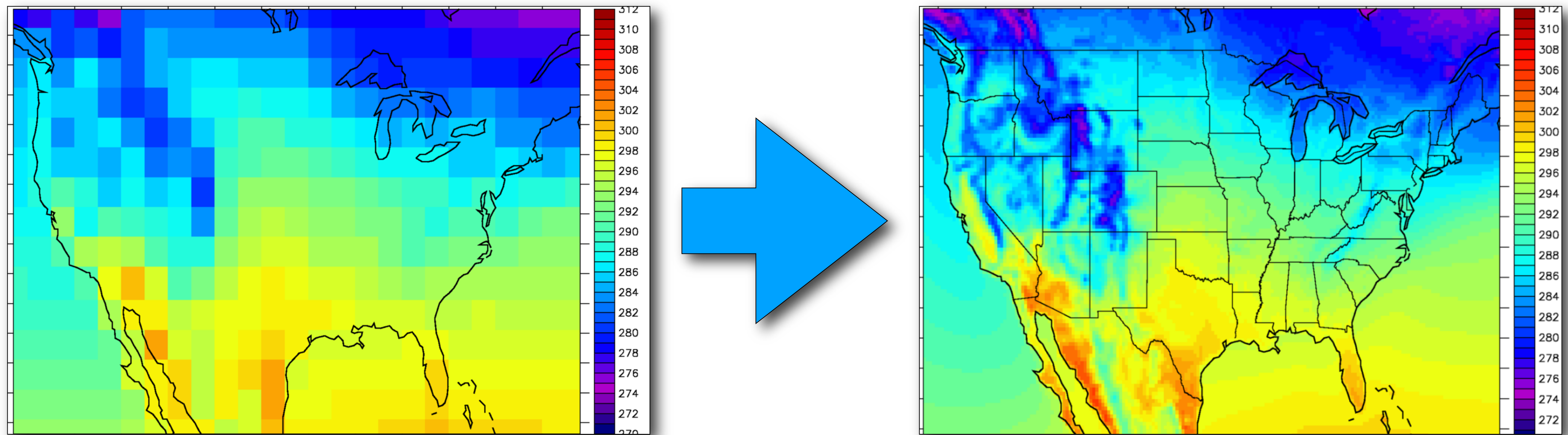


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# DOWNSCALING

- Used to increase the resolution of global climate model
- Helps answer stakeholders' questions about how the climate will change in their location (i.e., impacts assessments) & better represent local climates







# REGIONAL CLIMATE PROJECTIONS

## MID-CENTURY

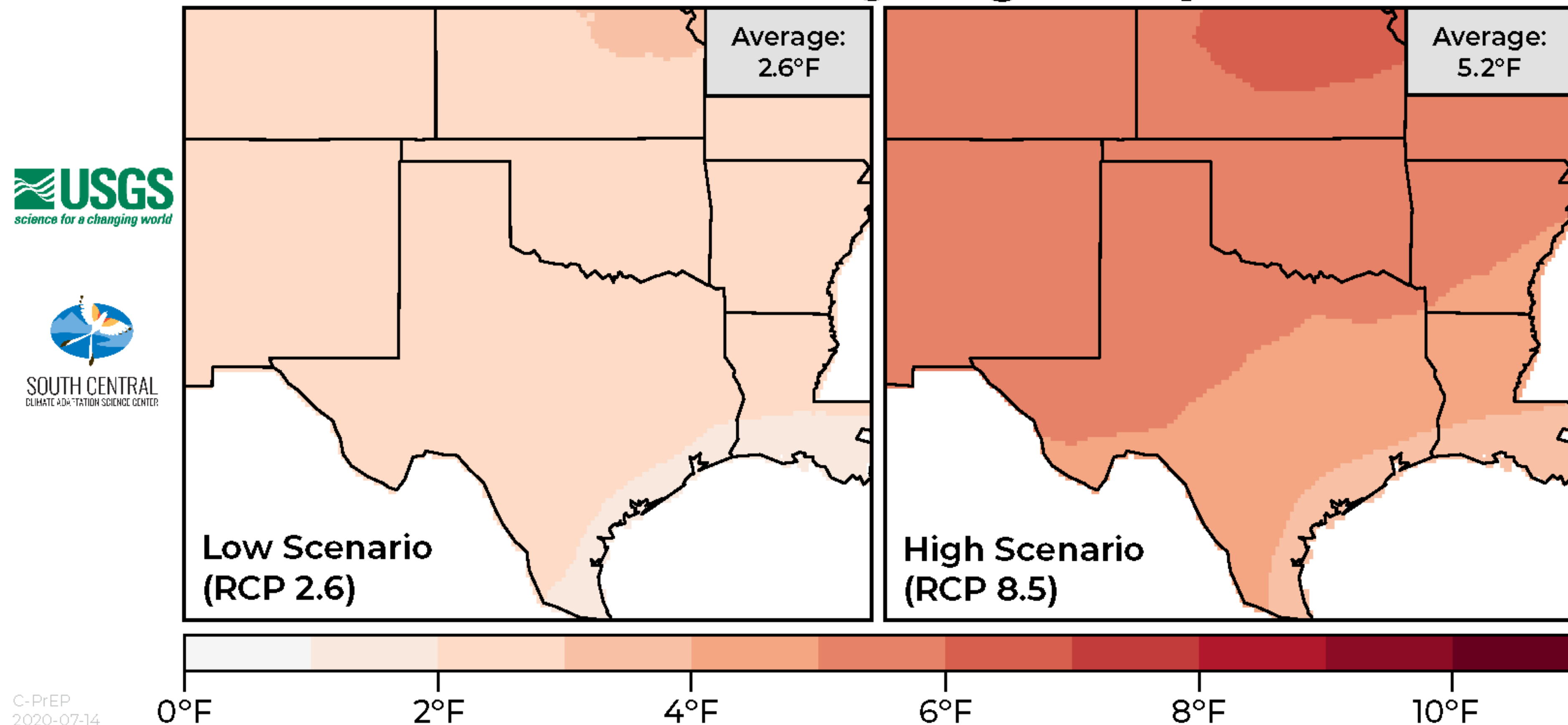
### 2036-2065



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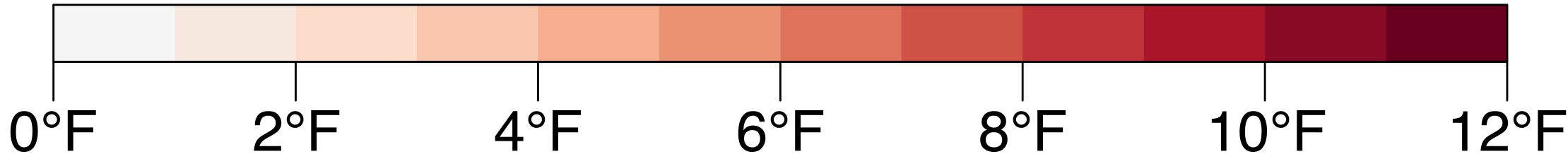
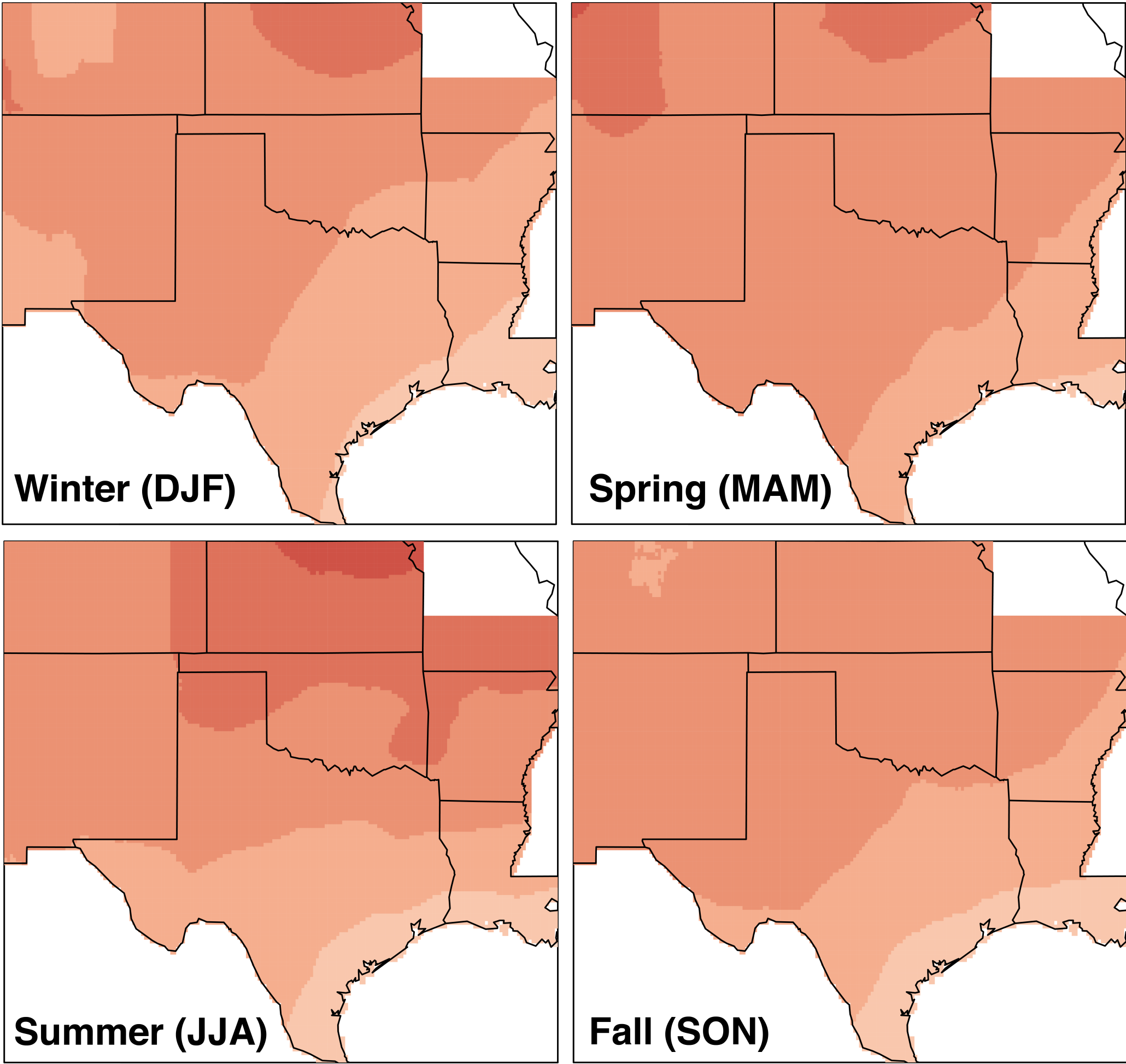
# Mid-Century Projected Change of the Annual Average High Temperature



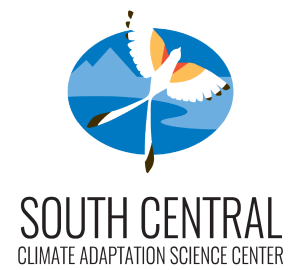
Daily high temperatures averaged for all days during the mid-century are projected to **increase by 2.5°F to 5.5°F** in Oklahoma



Projected Change (2036-2065) of the Seasonal Average  
High Temperature - High Scenario (RCP 8.5)

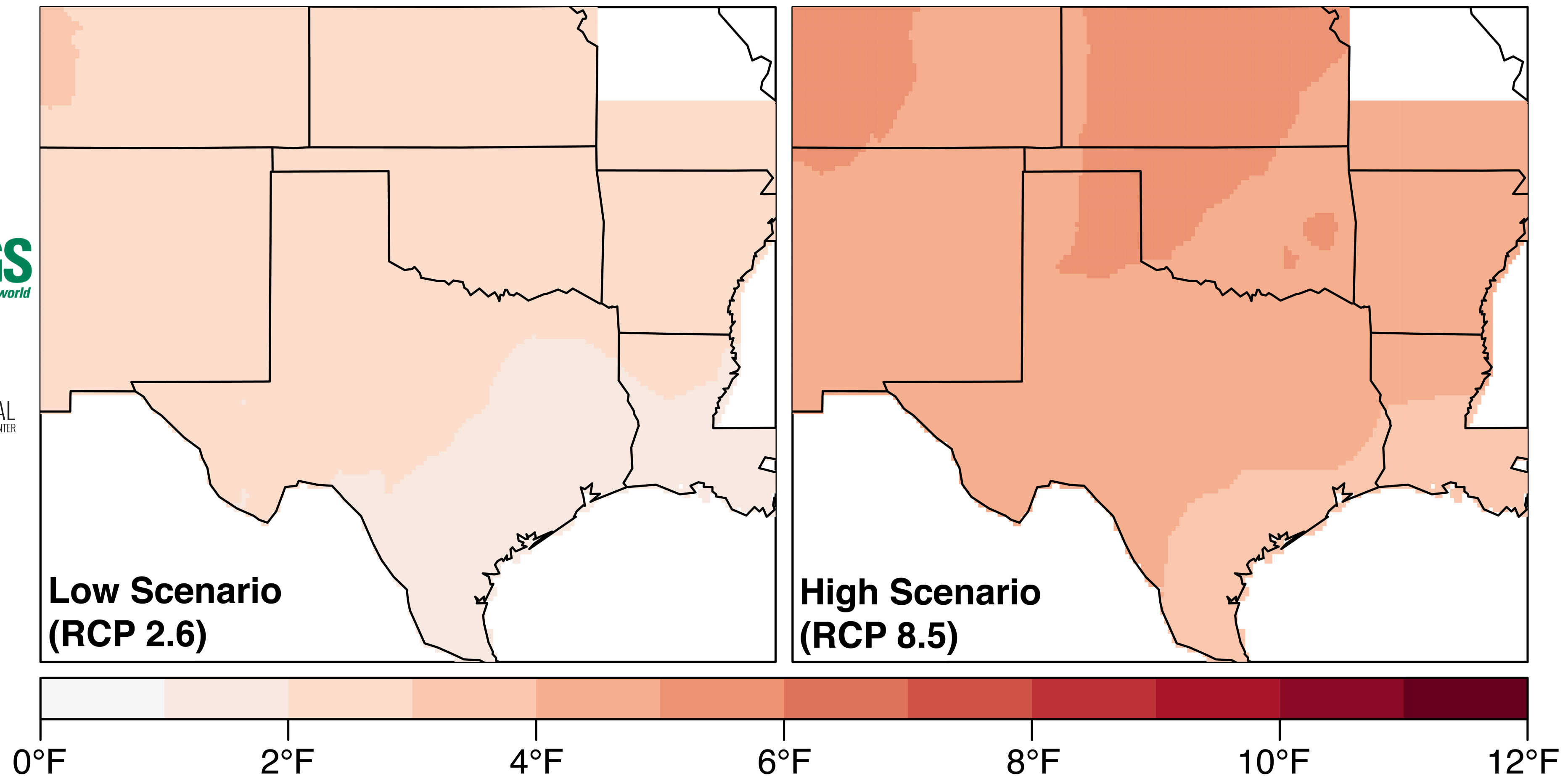
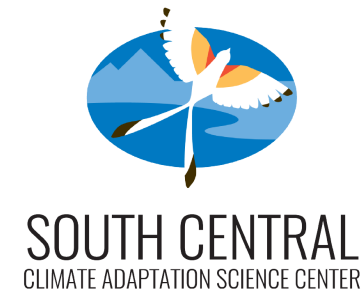


Daily high temperatures  
projected to **increase more  
during summer** than other  
seasons in Oklahoma





# Projected Change (2036-2065) of the Annual Average Low Temperature



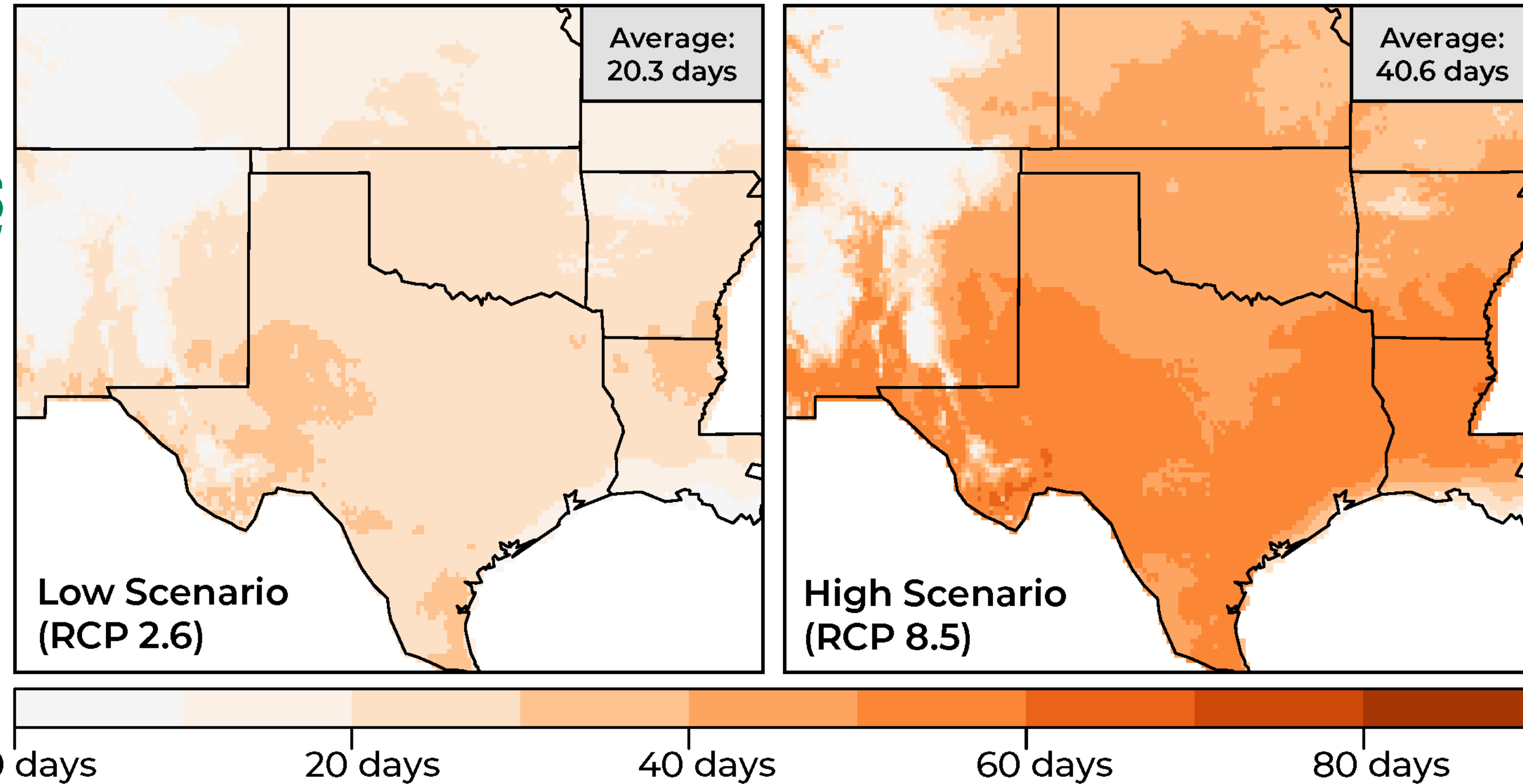
Daily low temperatures averaged for all days during the mid-century are projected to **increase by 2.5°F to 5.5°F** in Oklahoma



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# Mid-Century Projected Change of the Annual Average Number of Days the High Temperature is Greater than 95°F



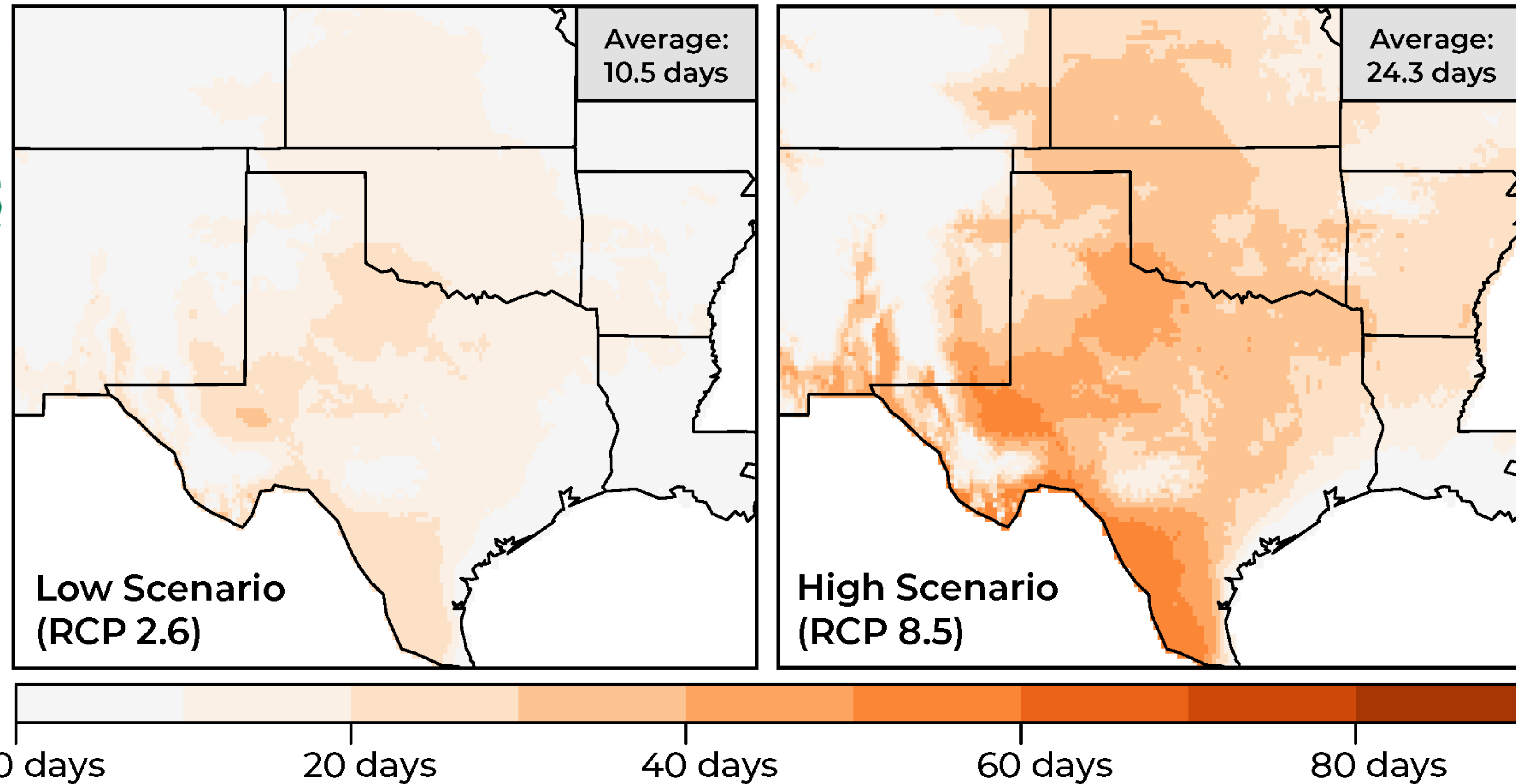
Across Oklahoma, the number of hot days ( $>95^{\circ}\text{F}$ ) are projected to **increase by 20-45 days** on average by the mid-century



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# Mid-Century Projected Change of the Annual Average Number of Days the High Temperature is Greater than 100°F



C-PrEP  
2020-07-06

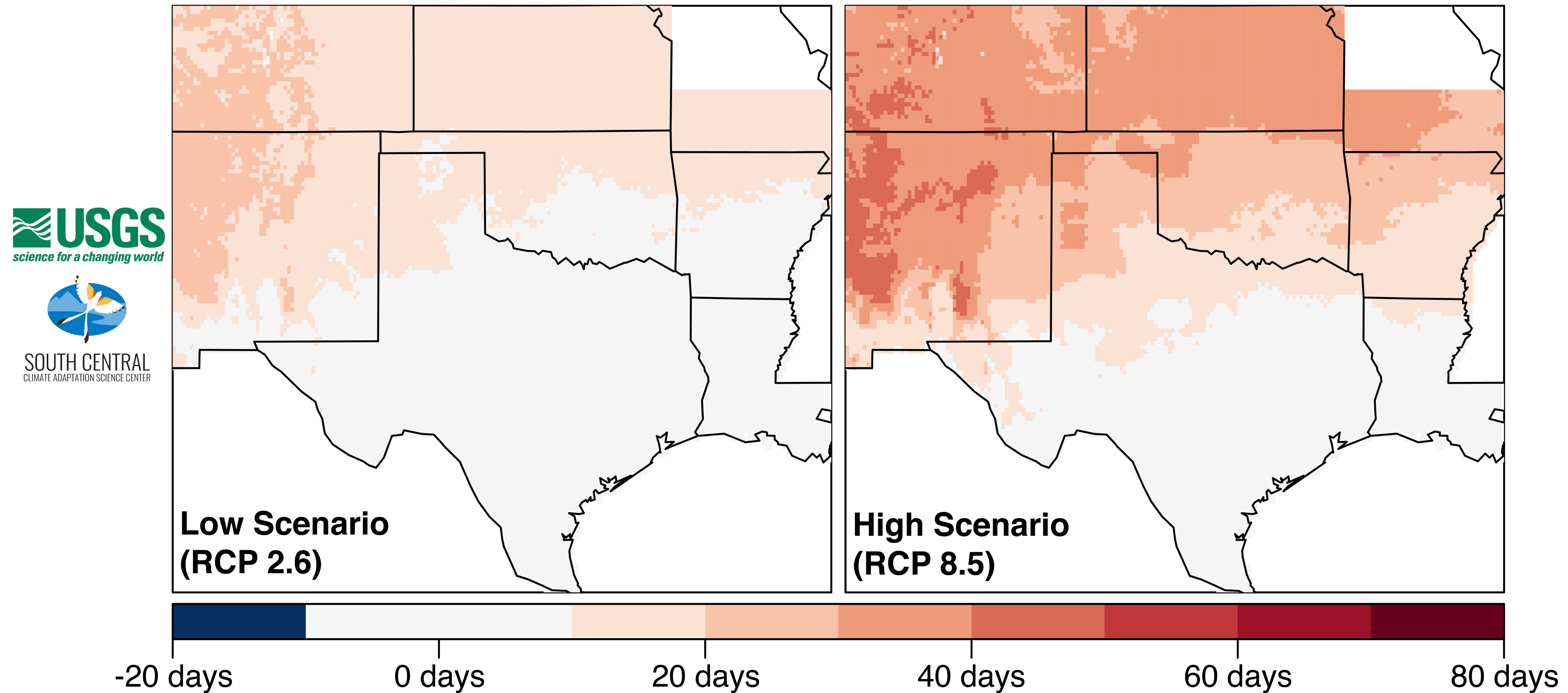
Across Oklahoma, the number of very hot days ( $>100^{\circ}\text{F}$ ) are projected to **increase by 10-40 days** on average by the mid-century



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# Projected Change (2036-2065) of the Annual Average Growing Season Length



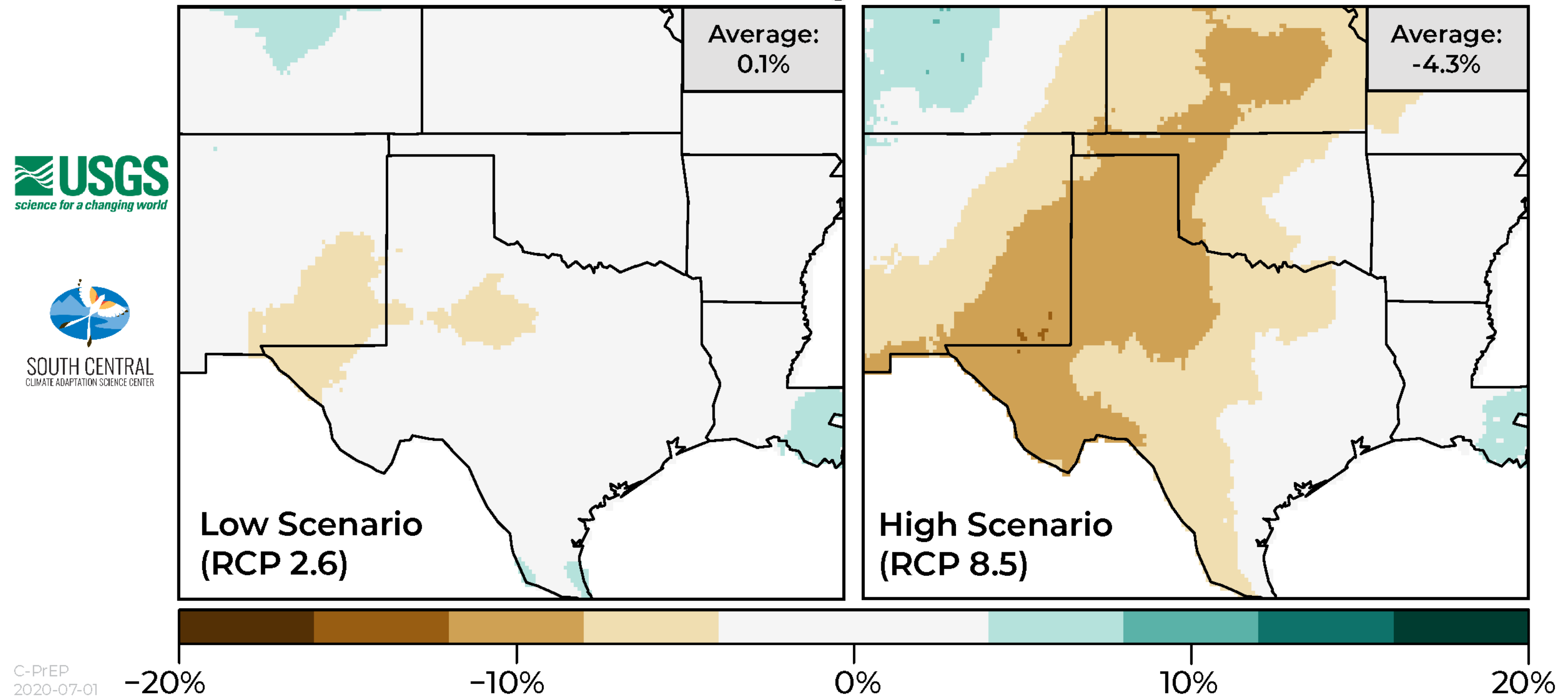
The growing season length (based on temperature) is projected to **increase by 10 to 30 days** on average across Oklahoma by mid-century



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# Mid-Century Projected Change of the Annual Average Total Rain or Snow

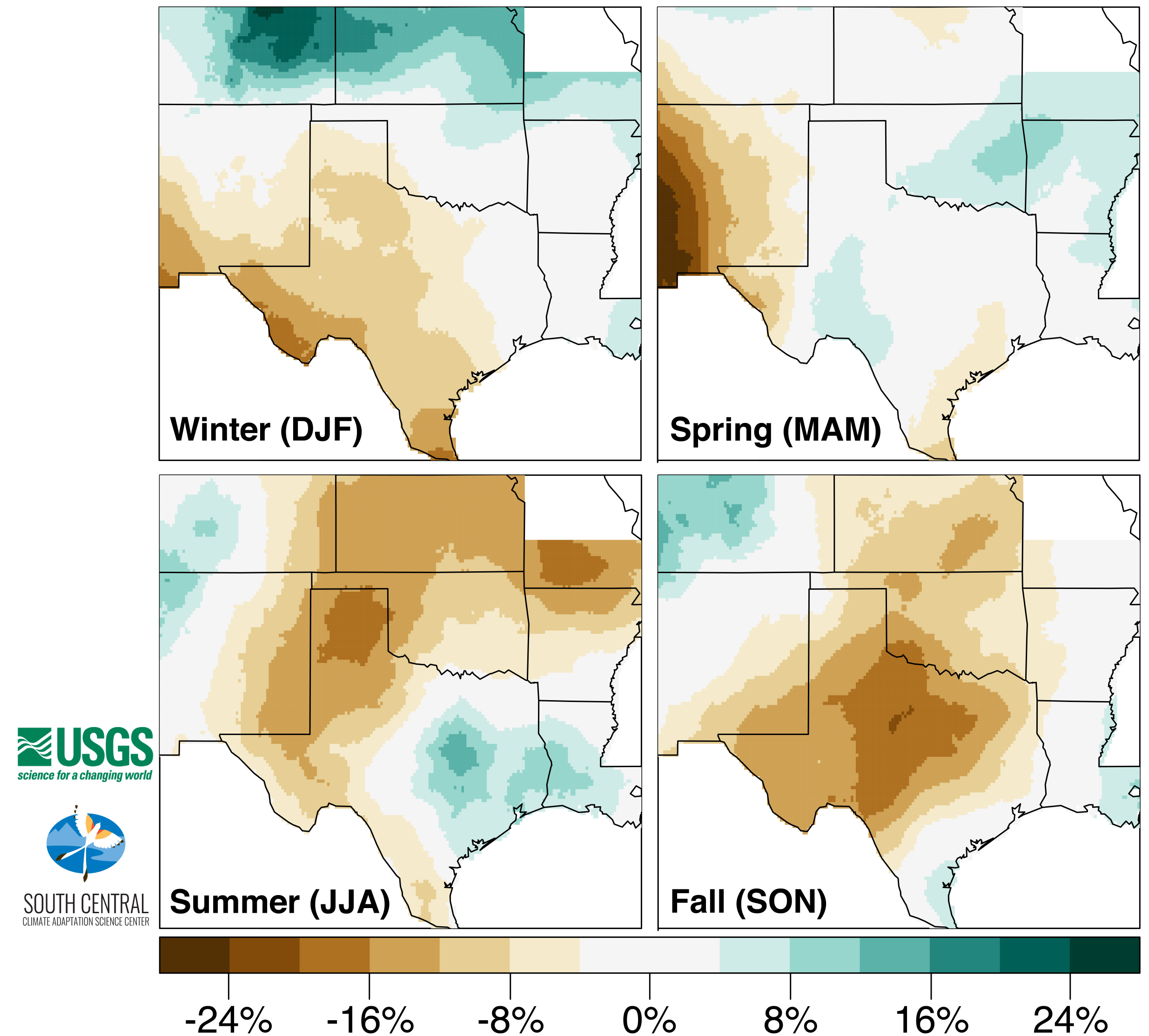


Annual average total precipitation are projected to **decrease by 2% to 10%** across Oklahoma for the high-end scenario



## Projected Change (2036-2065) of the Seasonal Average Total Precipitation - High Scenario (RCP 8.5)

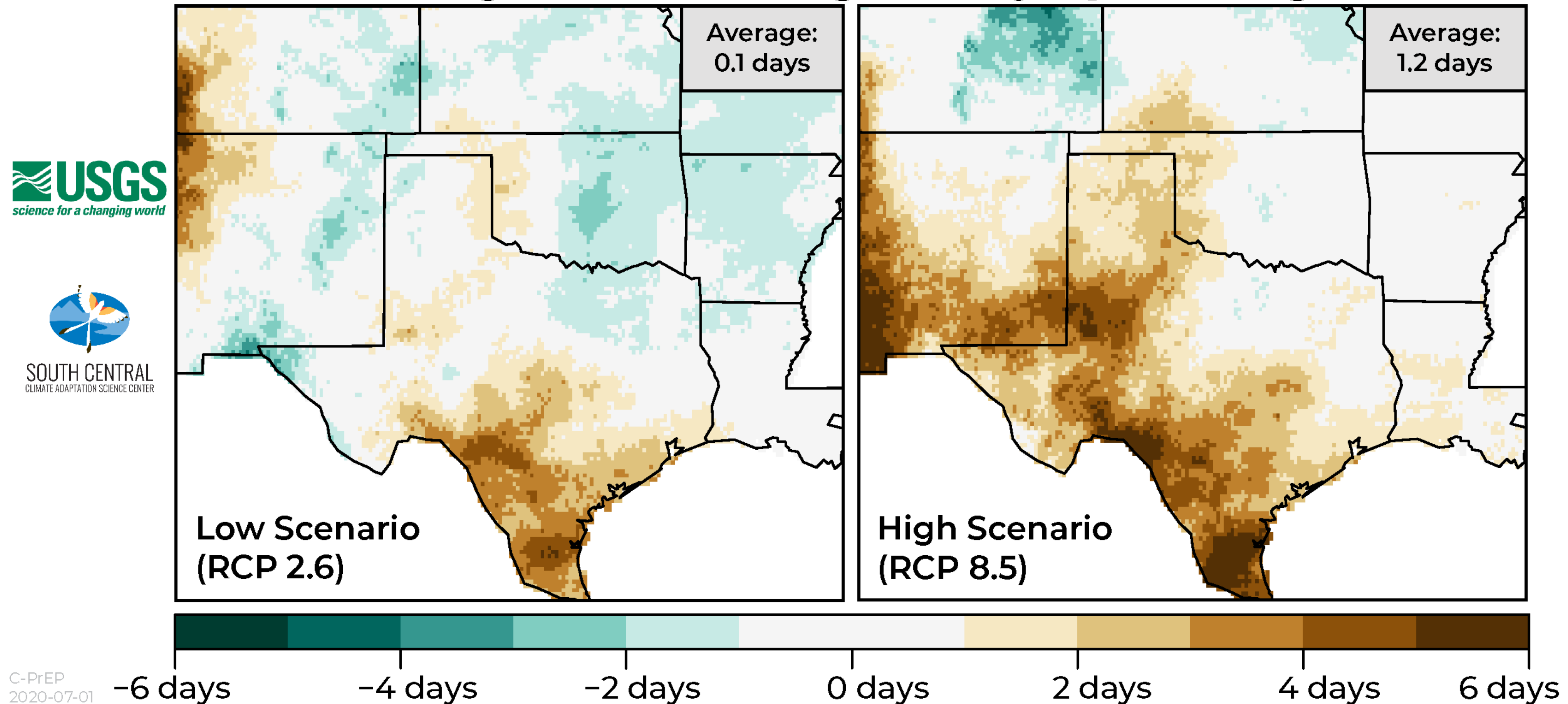
Seasonal average total precipitation projected to **decrease more during summer and fall** than other seasons in Oklahoma



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# Mid-Century Projected Change in the Average Annual **Longest Dry Spell Length**



Average annual longest dry spell is projected to **increase by 1-2 days**  
across Western Oklahoma by the mid-century



# THE FINE PRINT

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- Projections are **NOT** forecasts or predictions
- Interest in other maps or graphics should be sent to **[info@southcentralclimate.org](mailto:info@southcentralclimate.org)** or schedule a virtual visit with us to discuss specific needs
- We have **end-of-century graphics too (2070-2099)!**
- Our ensemble projections are developed using **three downscaling techniques, three historical observation datasets, and three global climate models**





# FIND MORE INFO AT...

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- Follow us on Facebook or Twitter & sign up for our monthly newsletter to stay up-to-date!
- Our website: [www.southcentralclimate.org](http://www.southcentralclimate.org)
- National Climate Assessment: [www.globalchange.gov/nca4](http://www.globalchange.gov/nca4)
- Our Partners:
  - [www.southernclimate.org](http://www.southernclimate.org) (SCIPP)
  - [climate.ok.gov](http://climate.ok.gov) (OK Climate Survey)
  - [www.climate.gov](http://www.climate.gov) (NOAA)



# ACKNOWLEDGEMENTS

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# QUESTIONS?

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