

# FUTURE PROJECTIONS OF CLIMATE CHANGE

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UNIVERSITY OF OKLAHOMA



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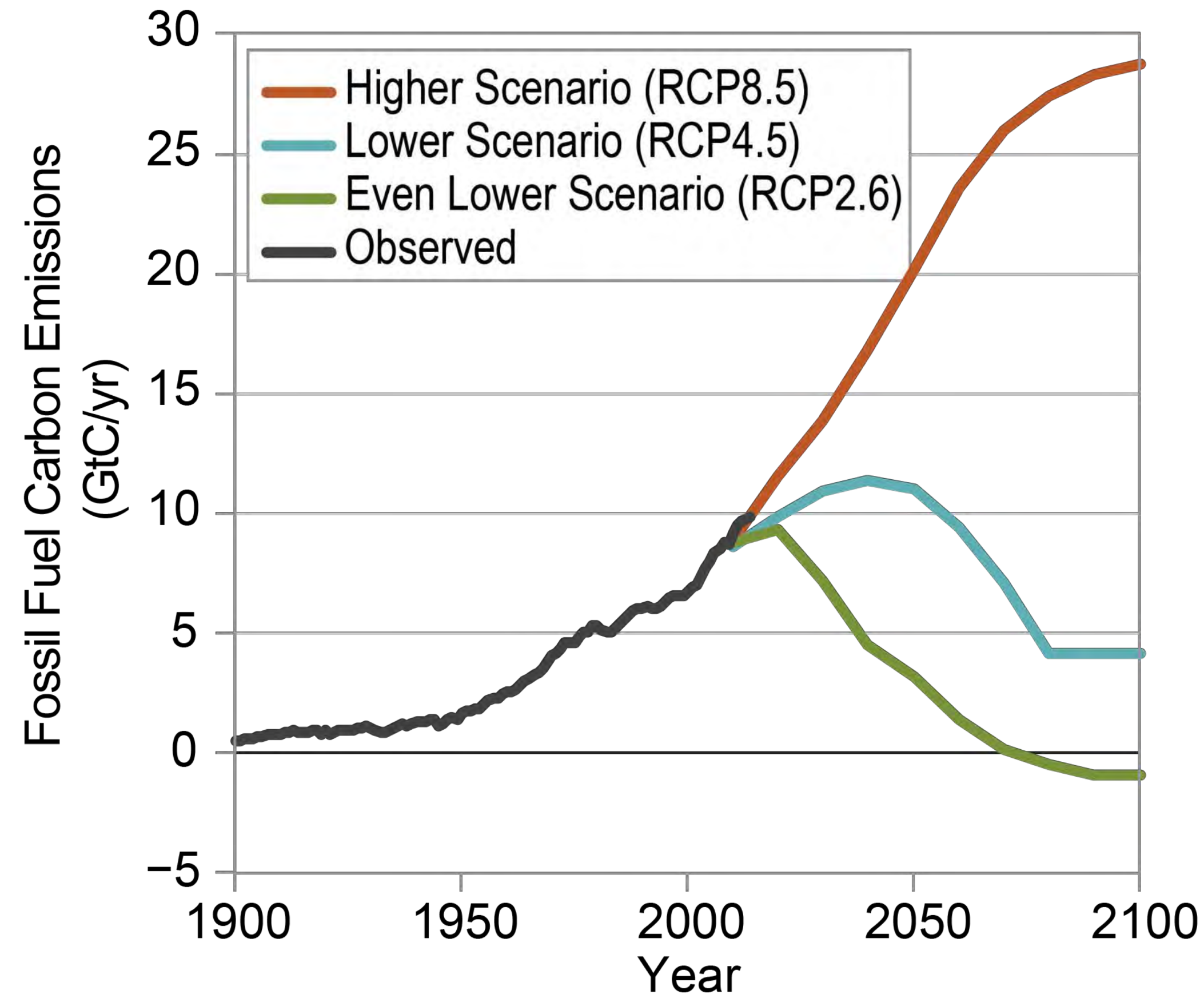
# GLOBAL CLIMATE PROJECTIONS



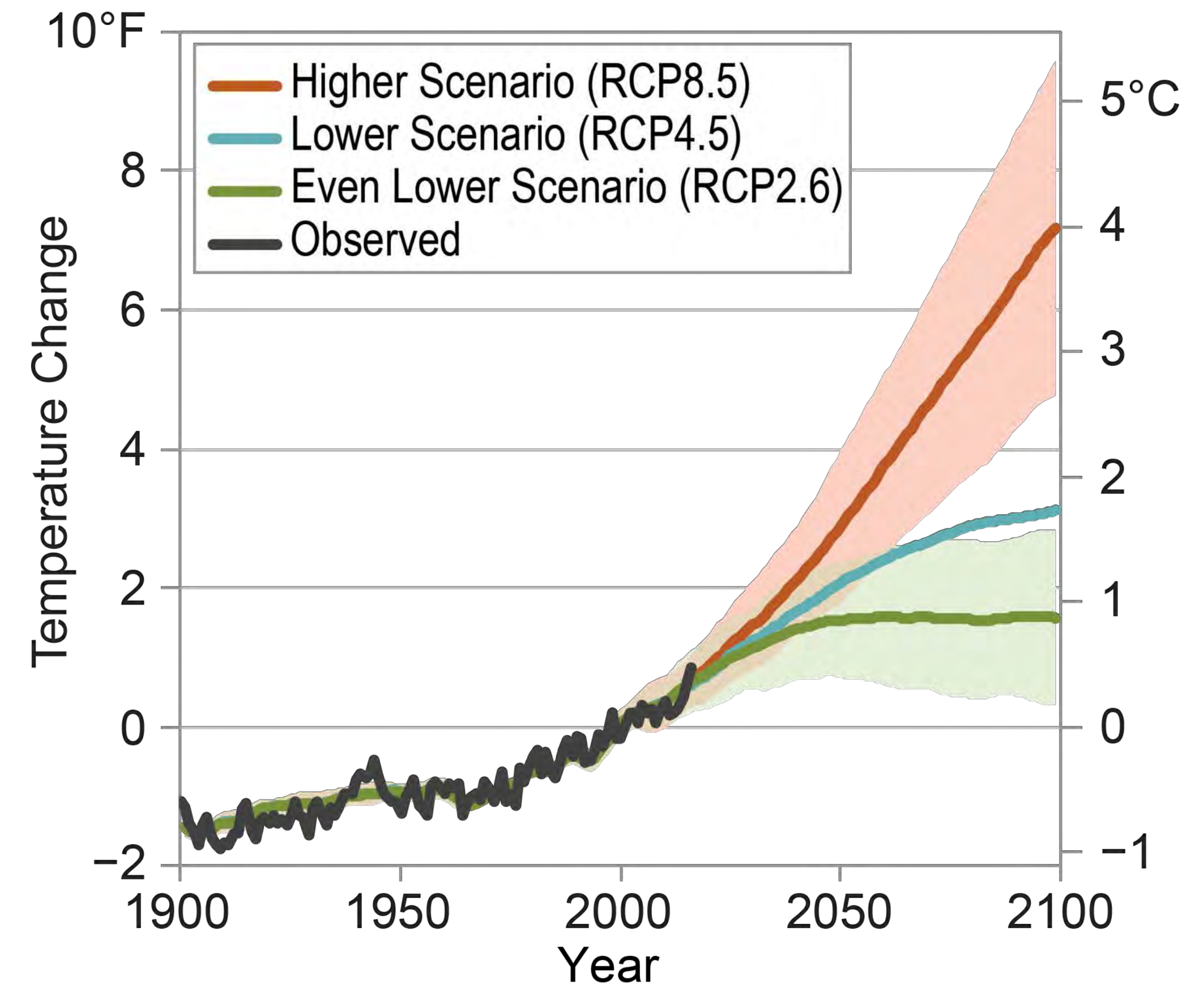
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# EMISSIONS & TEMPERATURE CHANGE

Global Carbon Emissions



Global Average Temperature Change

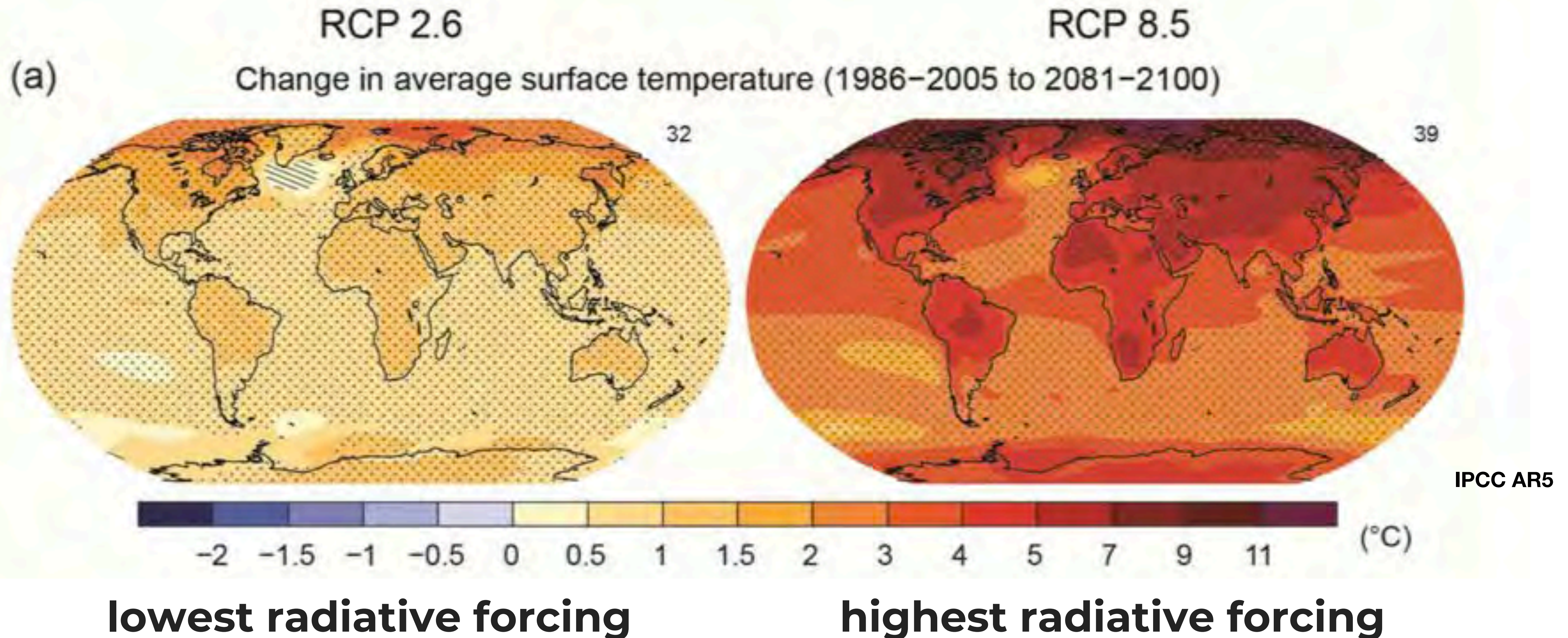


USGCRP CSSR 2017



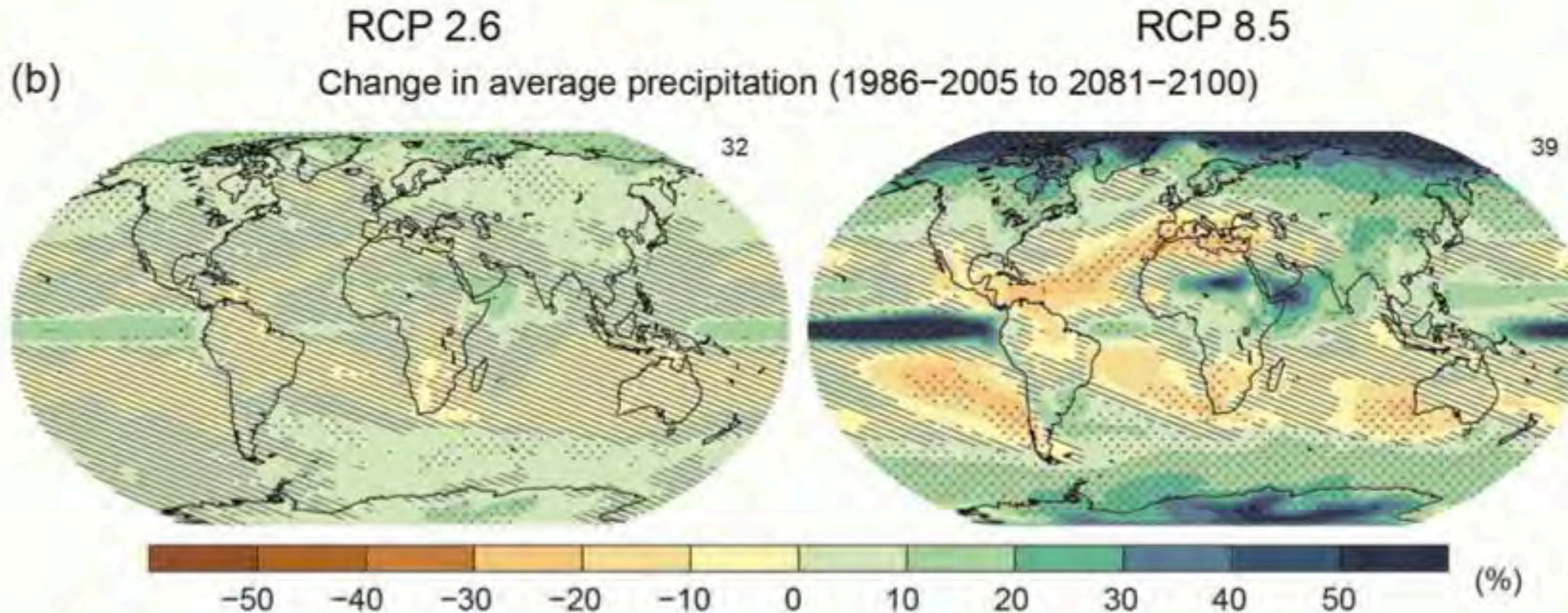
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# PROJECTIONS FOR LATE 21ST CENTURY



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# PROJECTIONS FOR LATE 21ST CENTURY



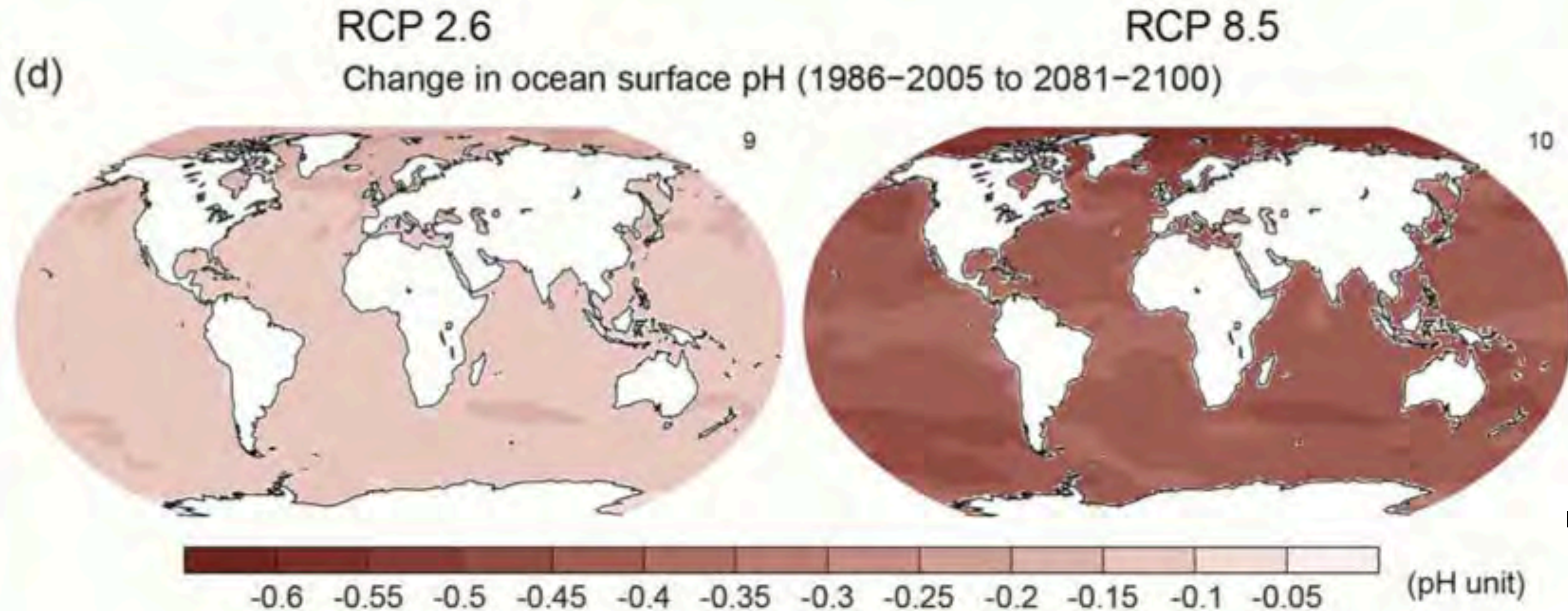
**lowest radiative forcing**

**highest radiative forcing**



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# PROJECTIONS FOR LATE 21ST CENTURY



IPCC AR5

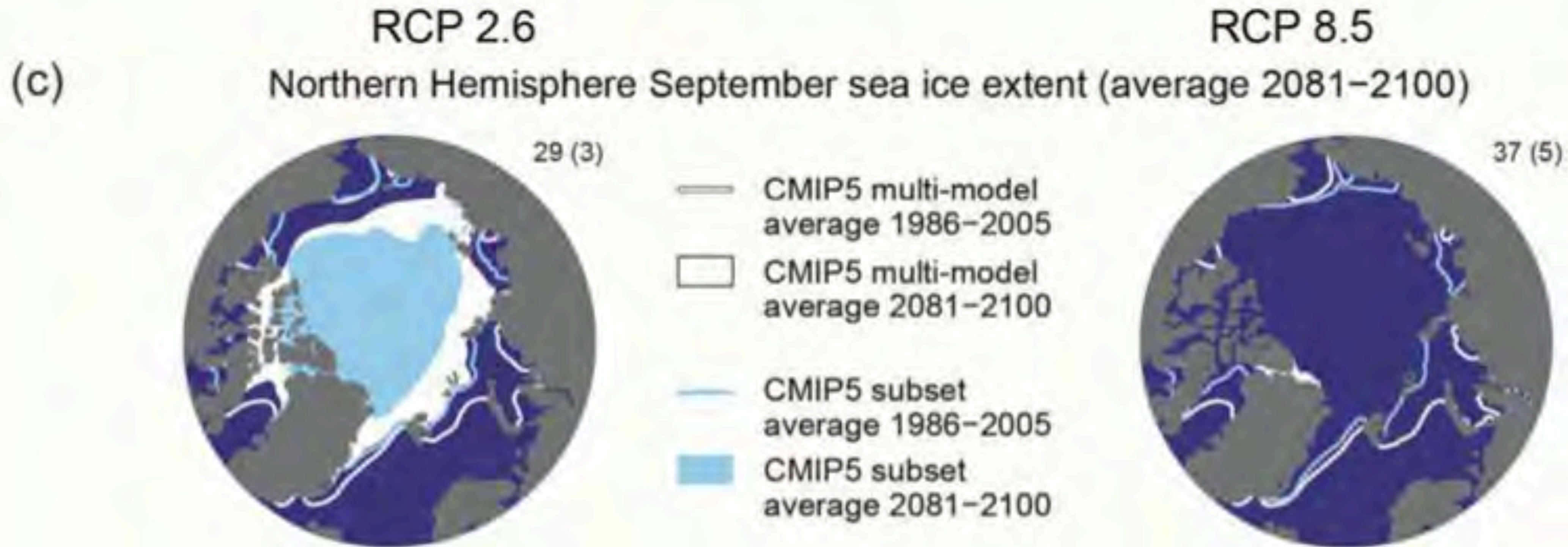
**lowest radiative forcing**

**highest radiative forcing**



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# PROJECTIONS FOR LATE 21ST CENTURY



IPCC AR5

**lowest radiative forcing**

**highest radiative forcing**



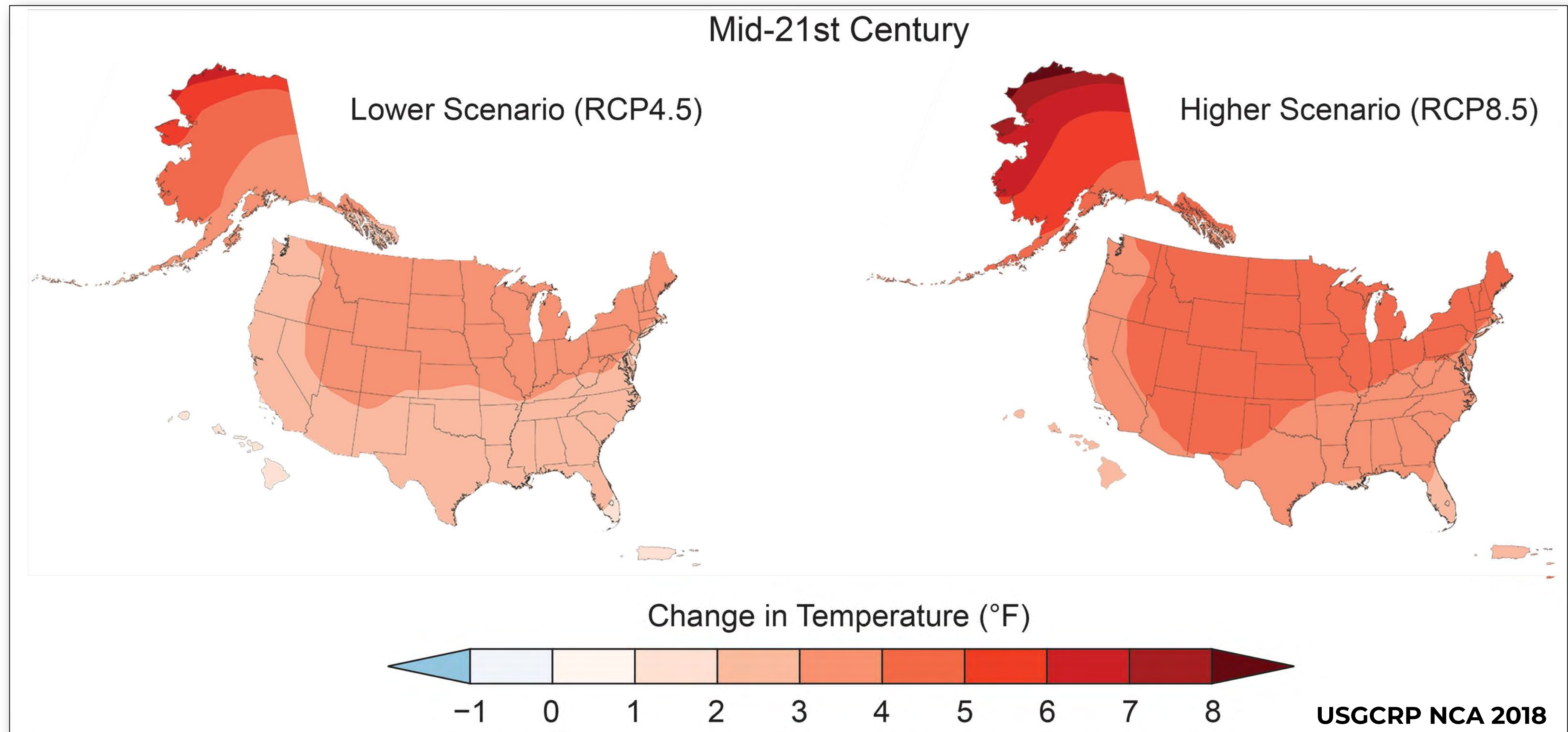
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# NATIONAL CLIMATE PROJECTIONS



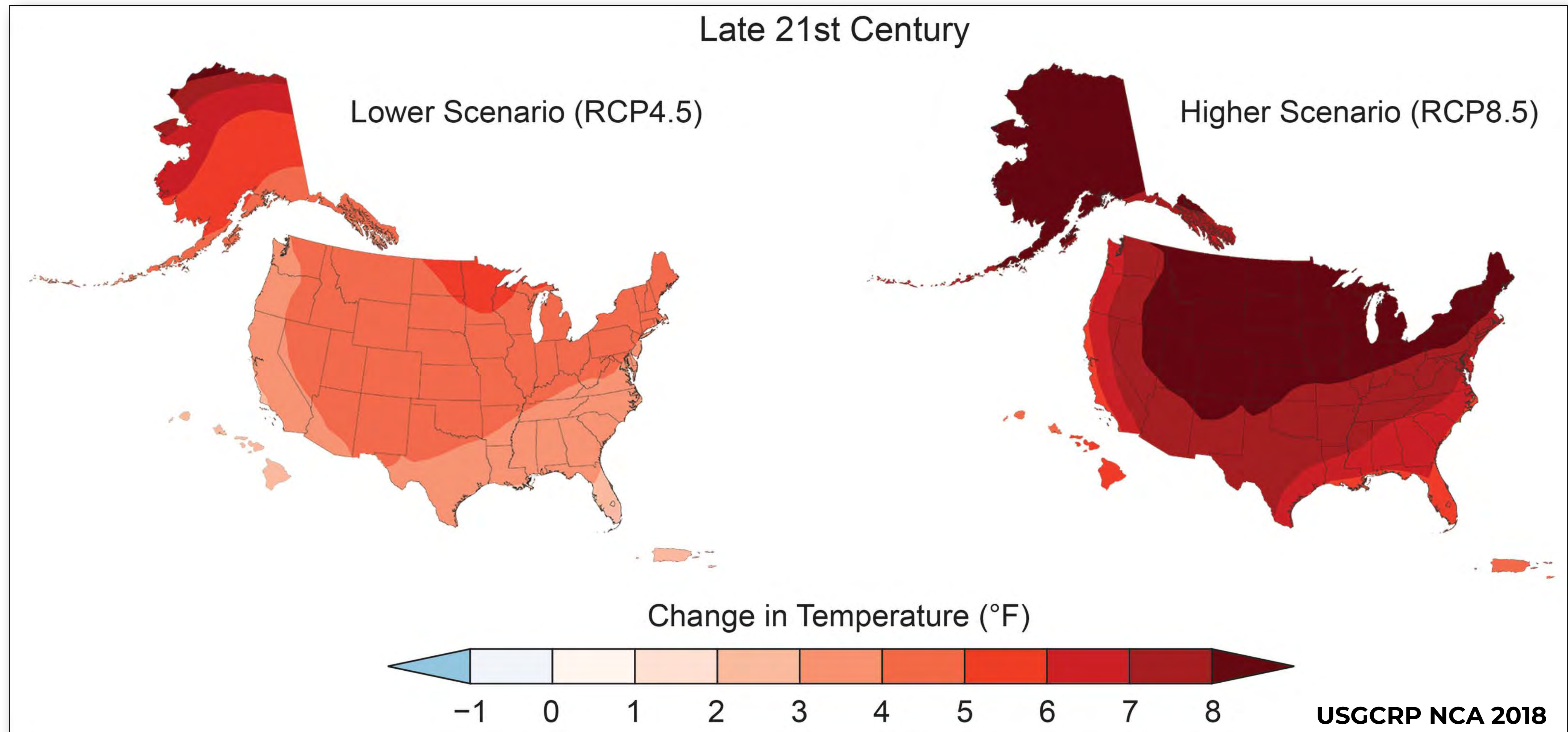
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# PROJECTED TEMPERATURE CHANGE



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# PROJECTED TEMPERATURE CHANGE



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# PROJECTED PRECIPITATION CHANGE

Winter

Spring

Late 21st Century, Higher Scenario (RCP8.5)

Summer

Fall

Change in Precipitation (%)

-30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30

USGCRP NCA 2018



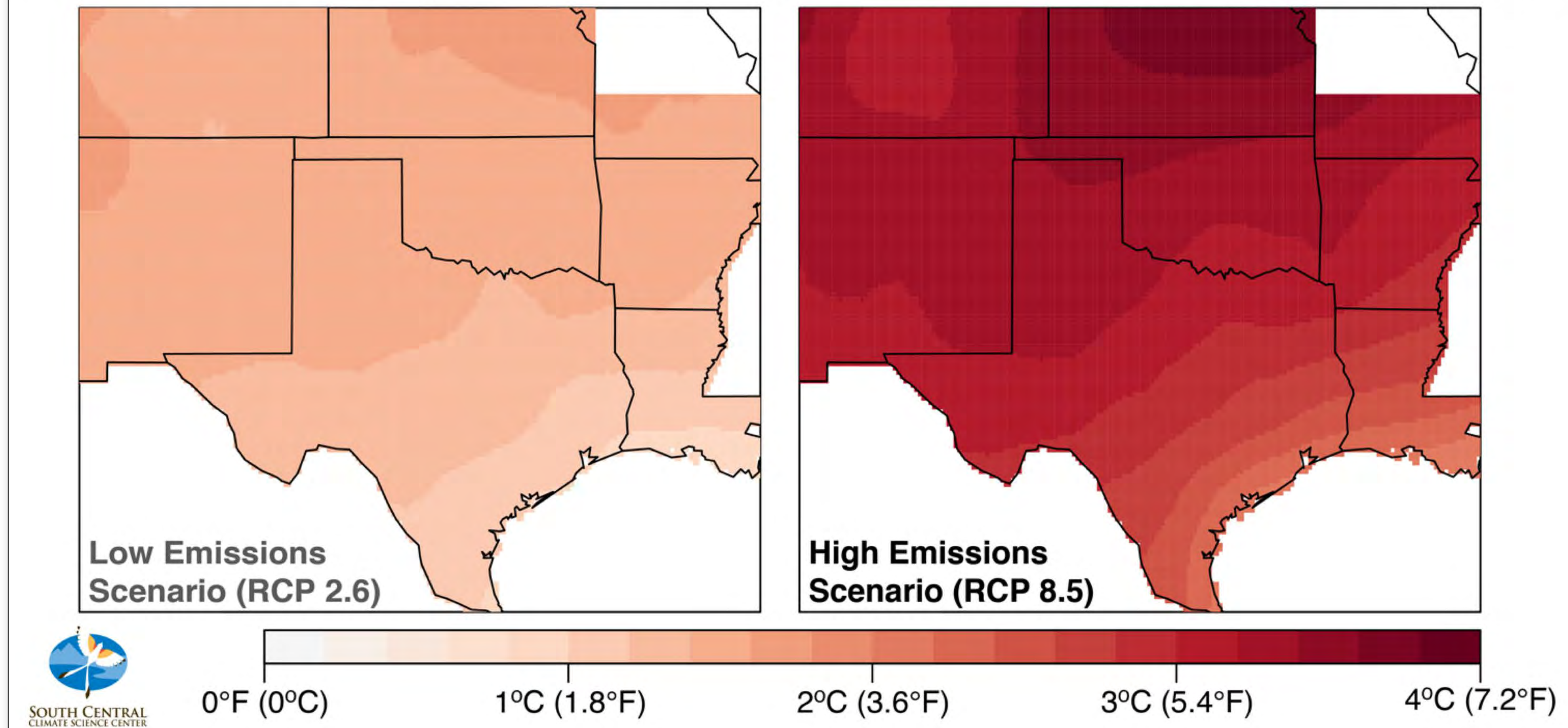
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# TEMPERATURE PROJECTIONS IN THE SOUTH-CENTRAL U.S.



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## Projected Change (2041-2070) of the Annual Average High Temperature

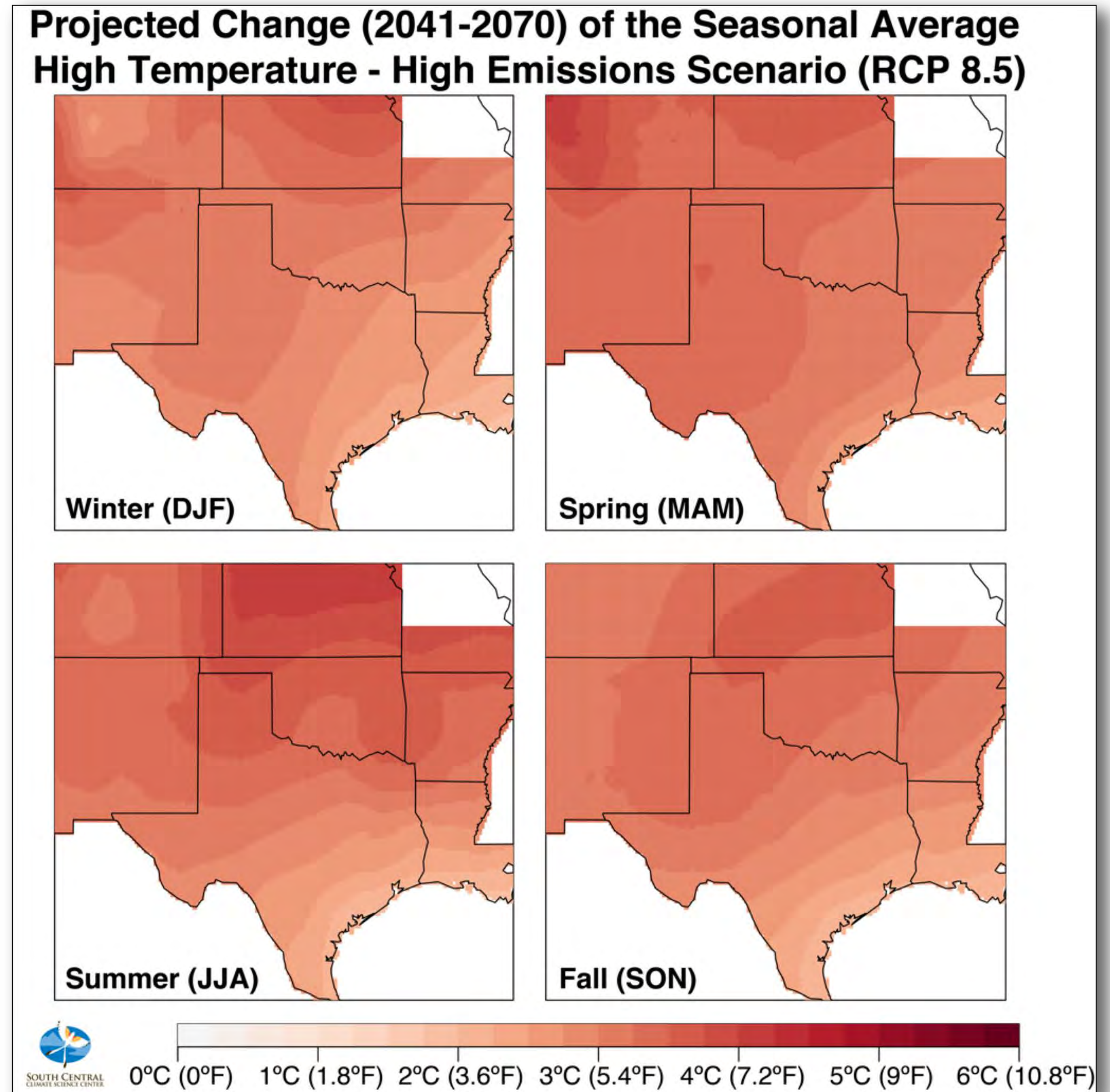


Daily high temperatures averaged for all days during the mid-century are projected to **increase by 3°F to 7°F** in Oklahoma

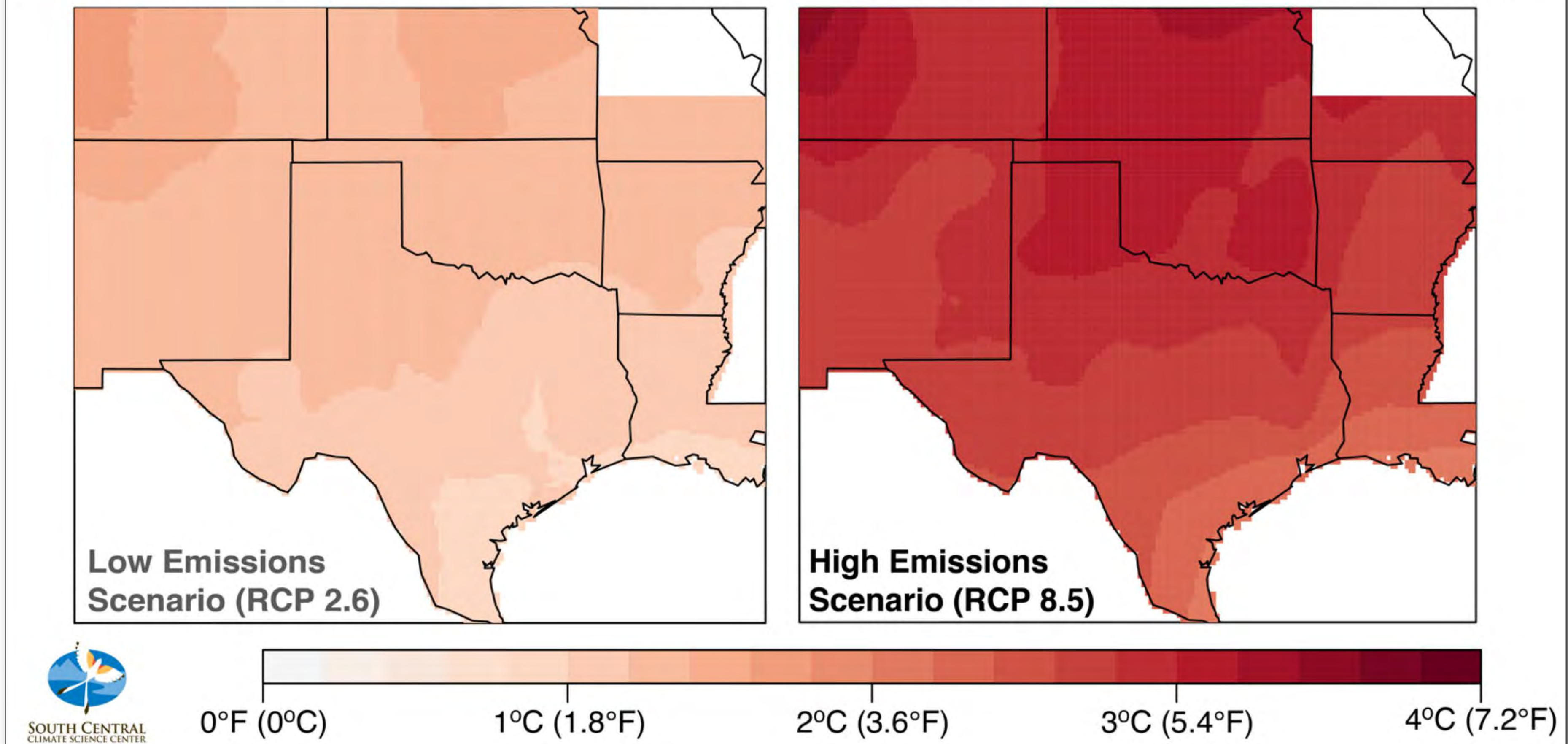


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Daily high temperatures projected to **increase more during summer** than other seasons in Oklahoma



## Projected Change (2041-2070) of the Annual Average Low Temperature

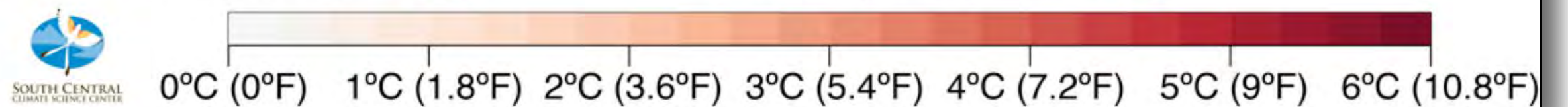
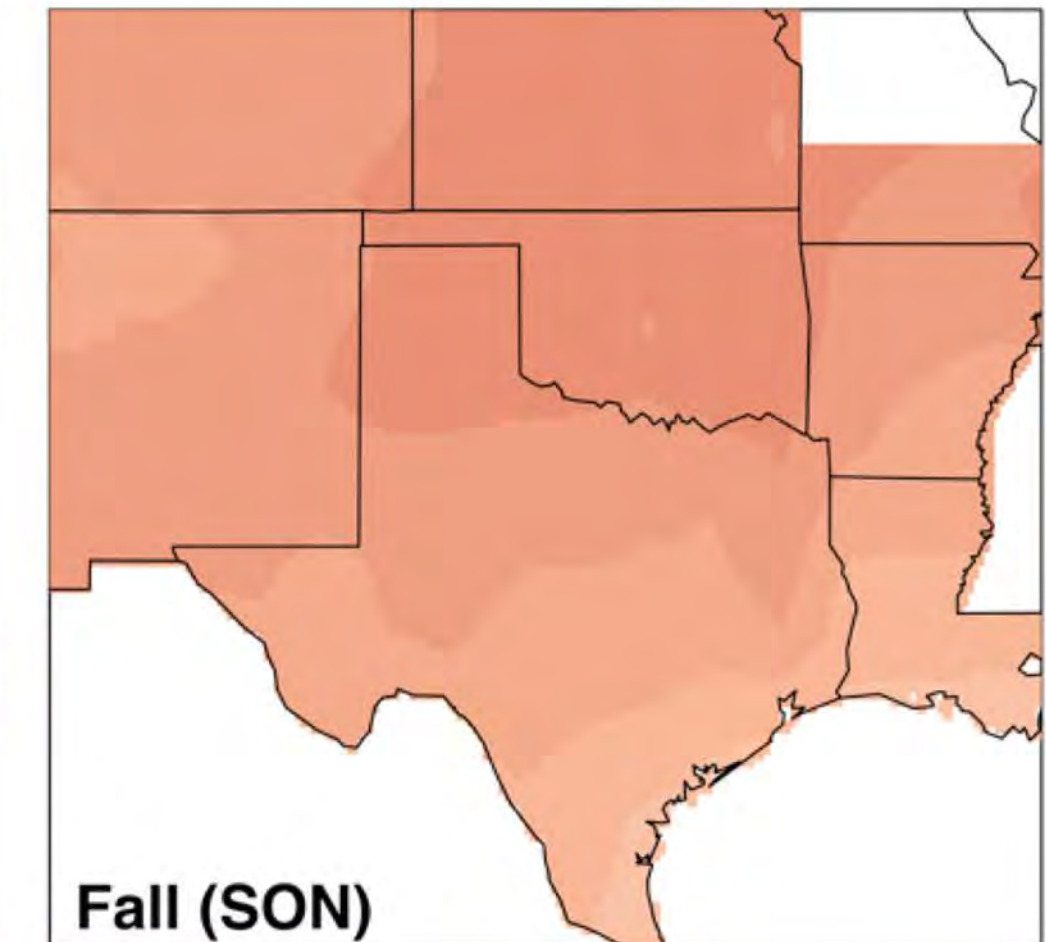
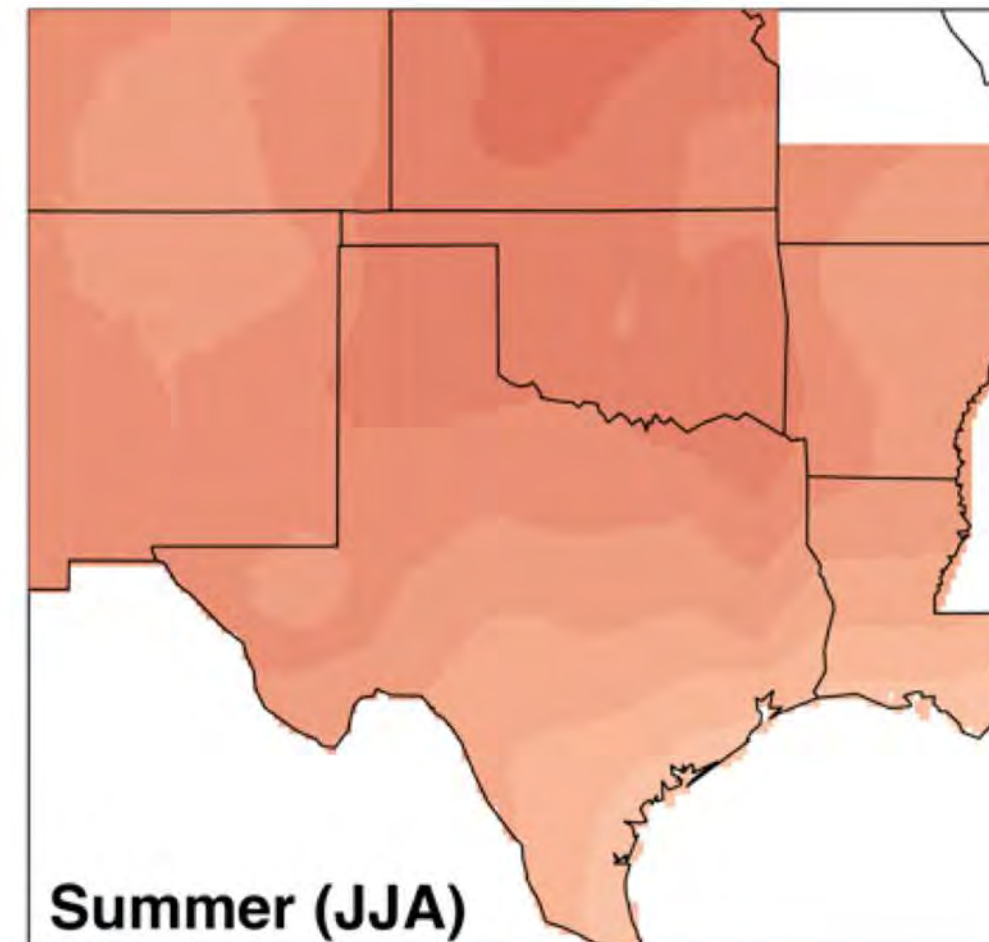
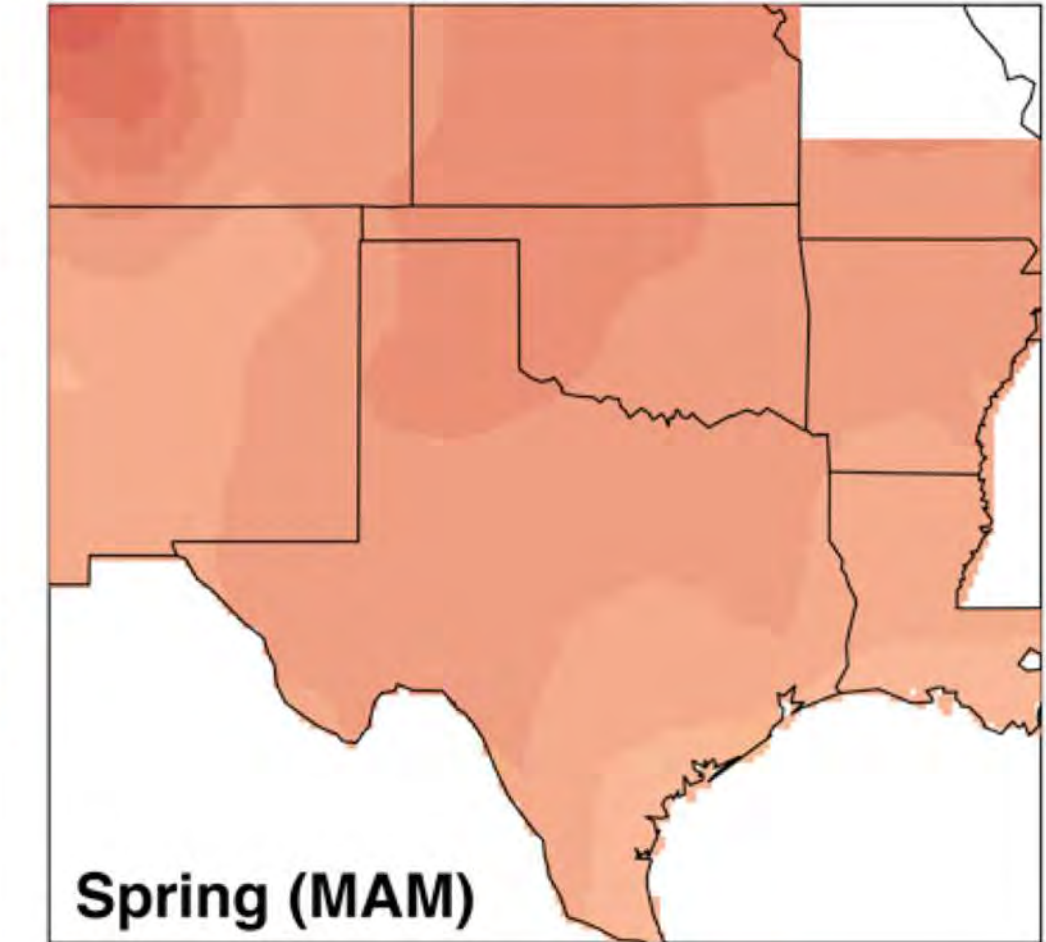
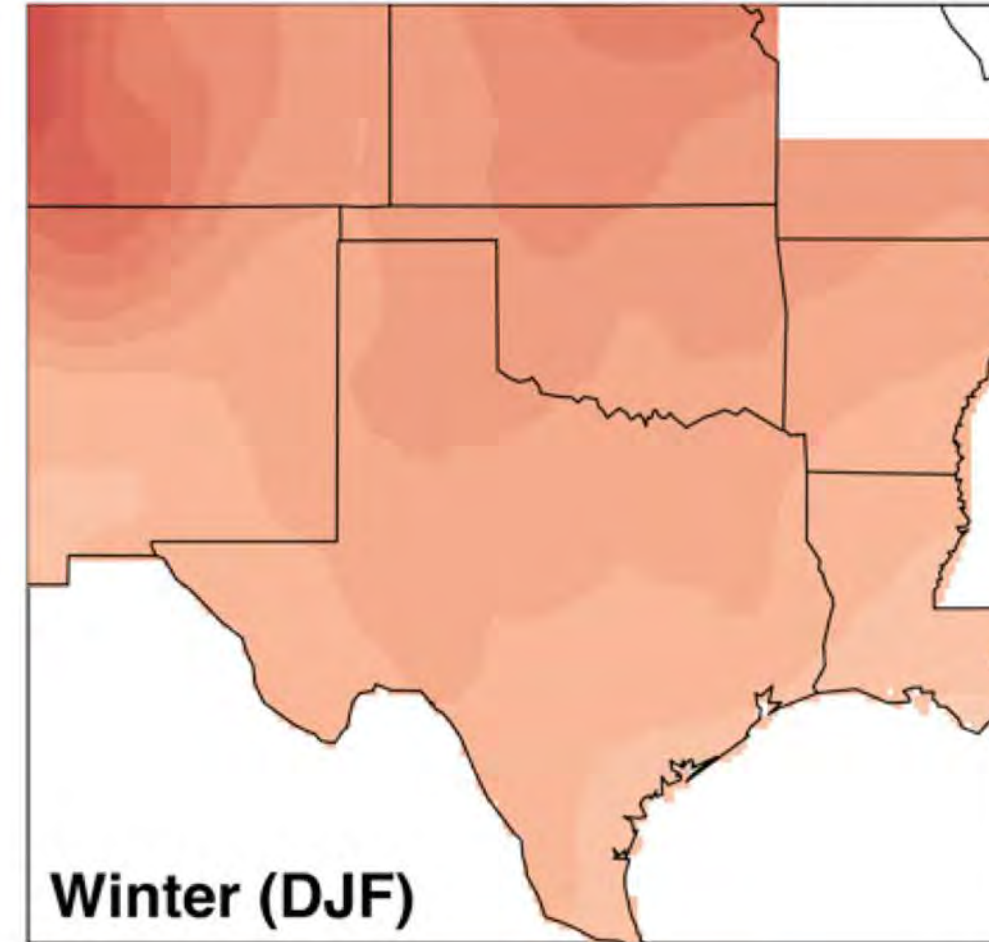


Daily low temperatures averaged for all days during the mid-century are projected to **increase by 2.5°F to 6.5°F** in Oklahoma



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**Projected Change (2041-2070) of the Seasonal Average  
Low Temperature - High Emissions Scenario (RCP 8.5)**

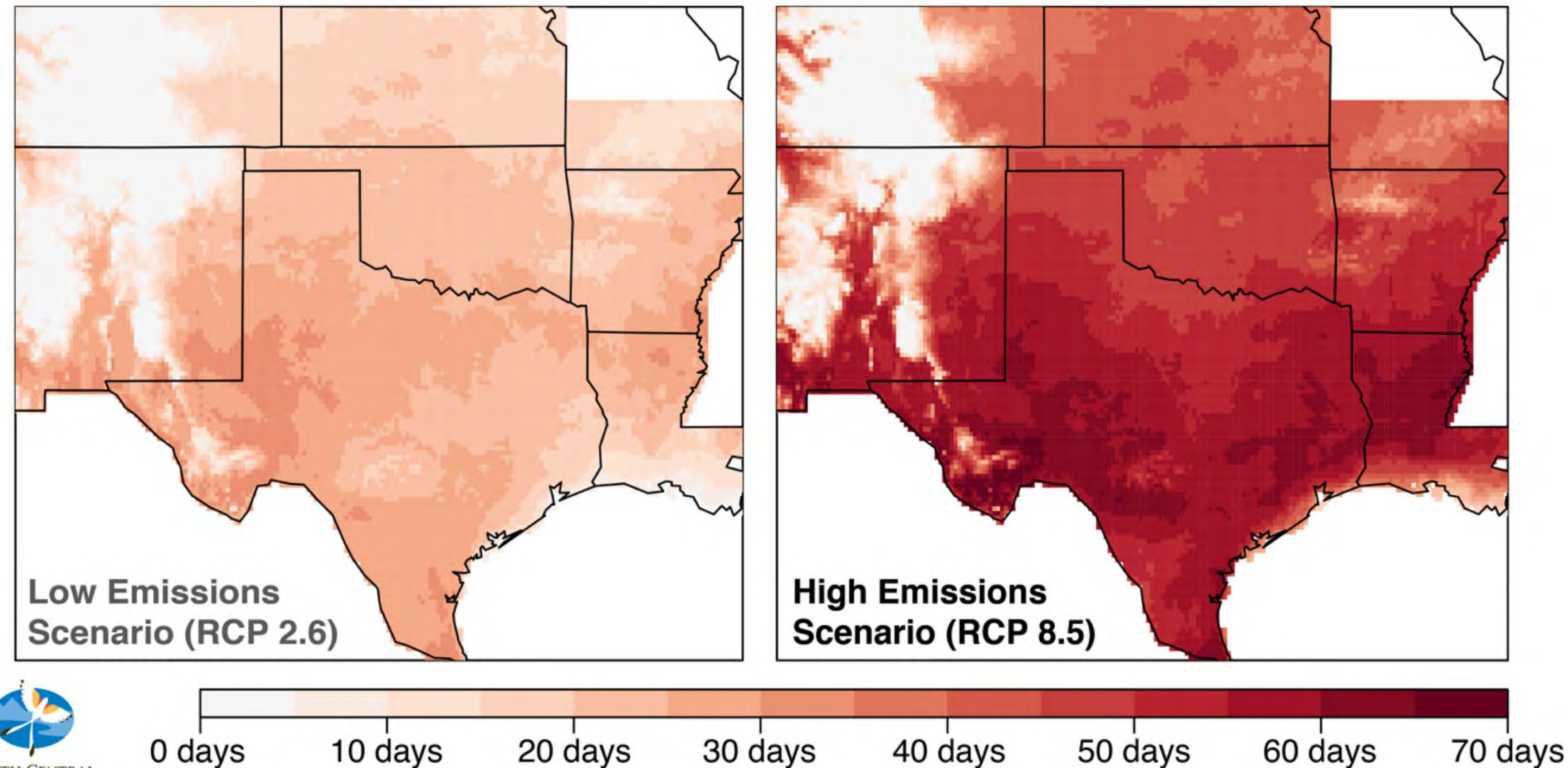


Daily low temperatures  
projected to **increase most**  
**during summers** in  
Oklahoma



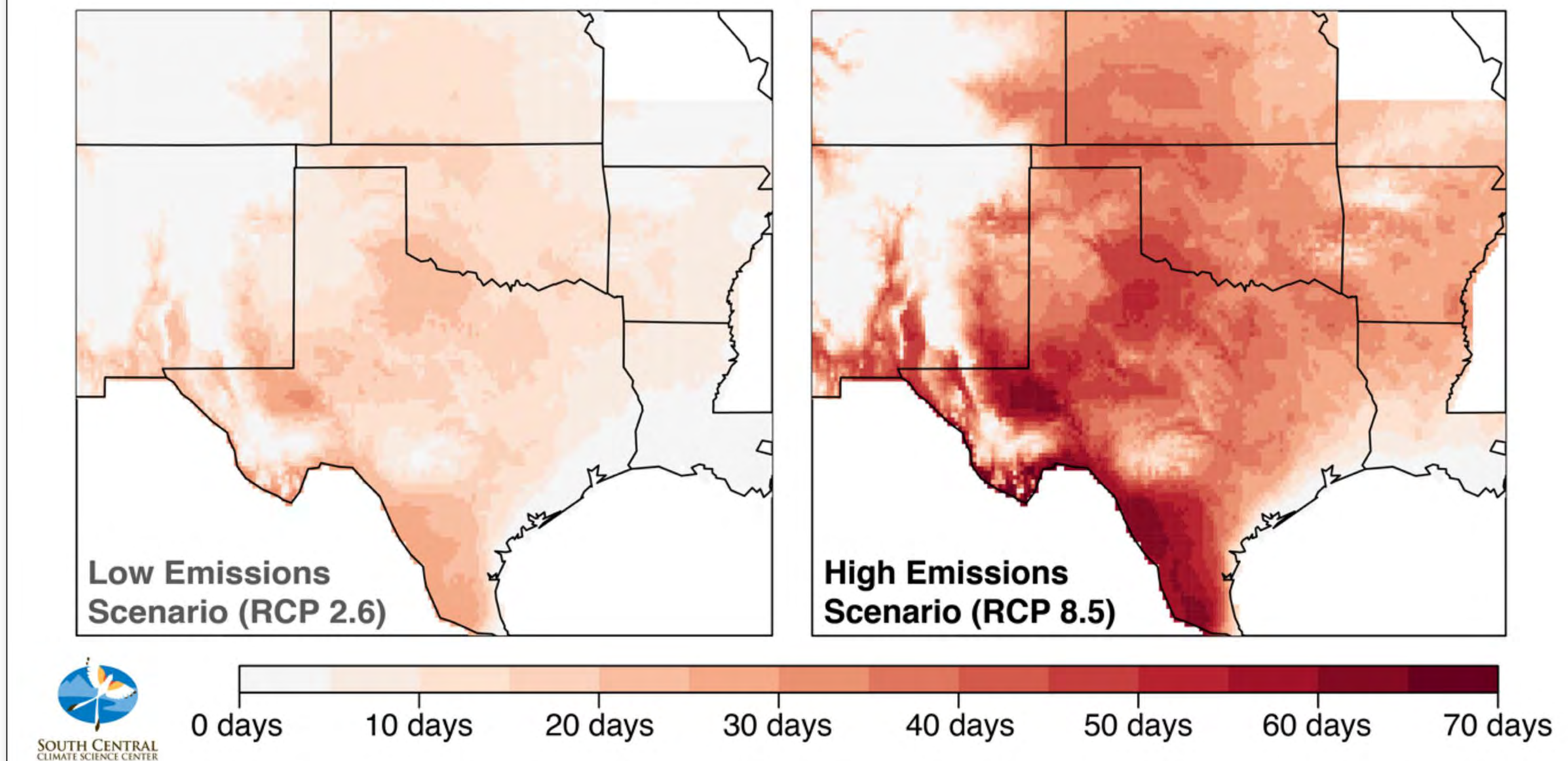
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## Projected Change (2041-2070) of the Average Annual Number of Days the High Temperature is Greater than 95°F



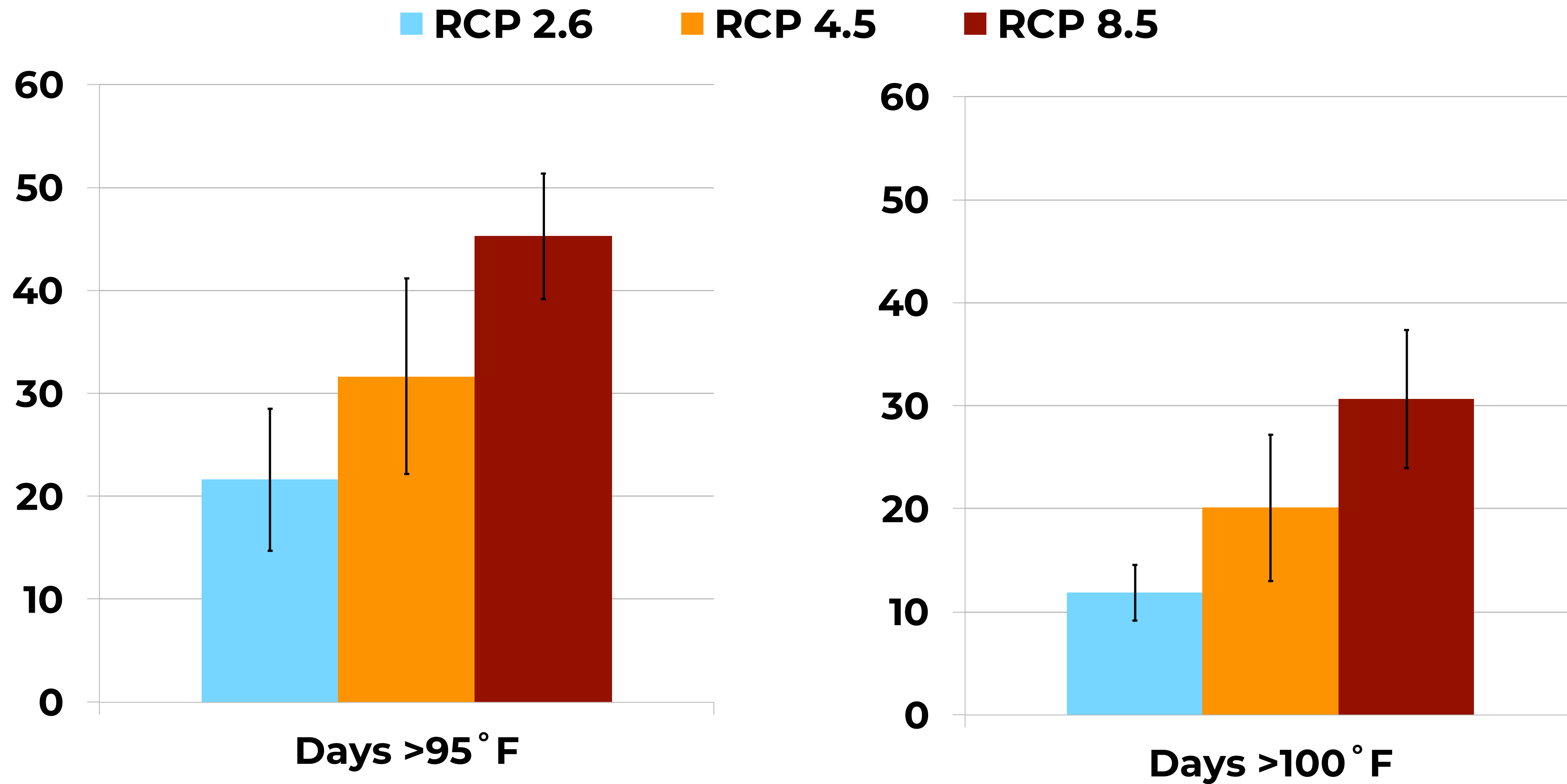
Across Oklahoma, the number of hot days ( $>95^{\circ}\text{F}$ ) are projected to **increase by 20-45 days** by the mid-century

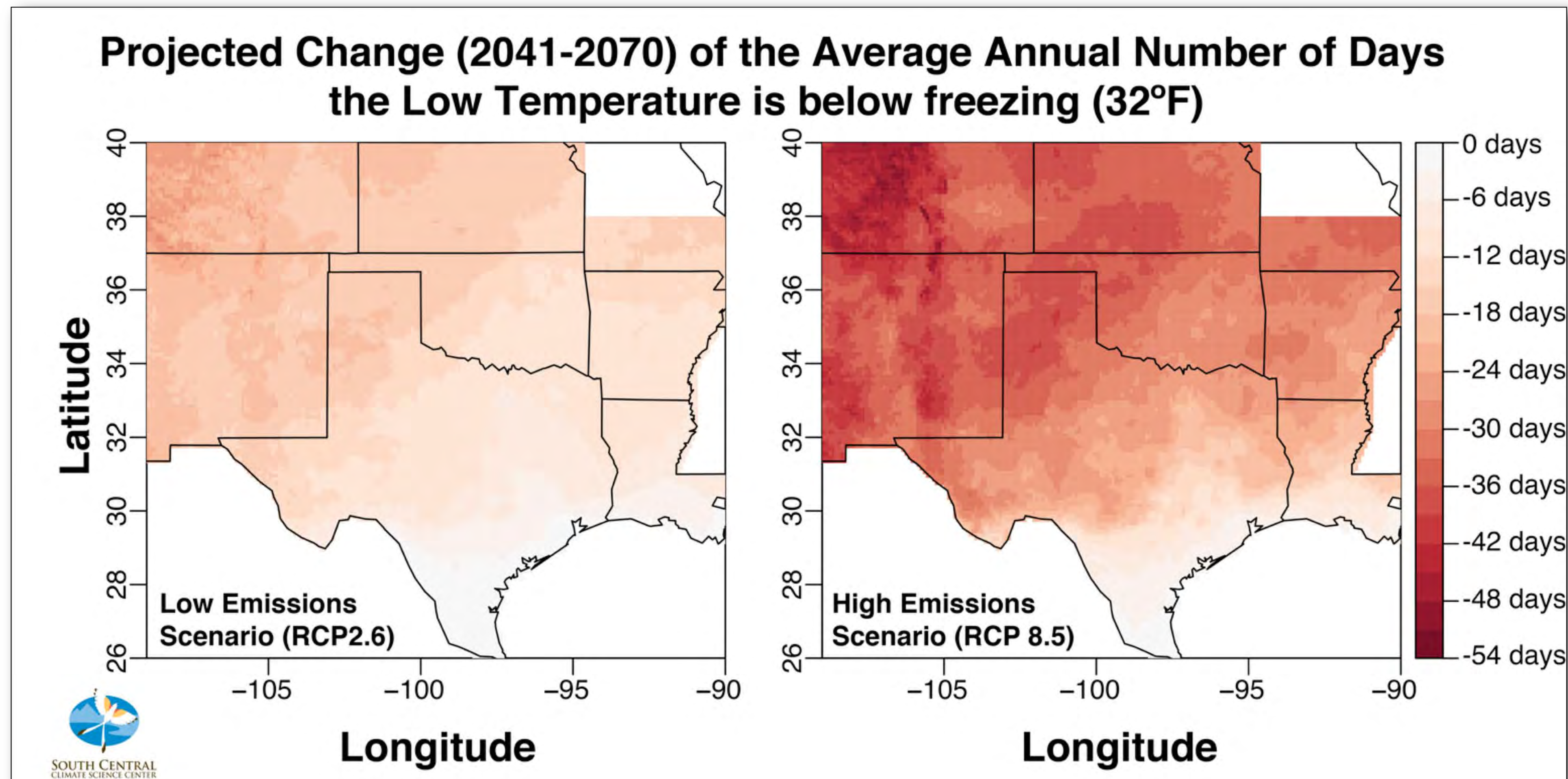
## Projected Change (2041-2070) of the Average Annual Number of Days the High Temperature is Greater than 100°F



Across Oklahoma, the number of very hot days ( $>100^{\circ}\text{F}$ ) are projected to **increase by 5-35 days** by the mid-century

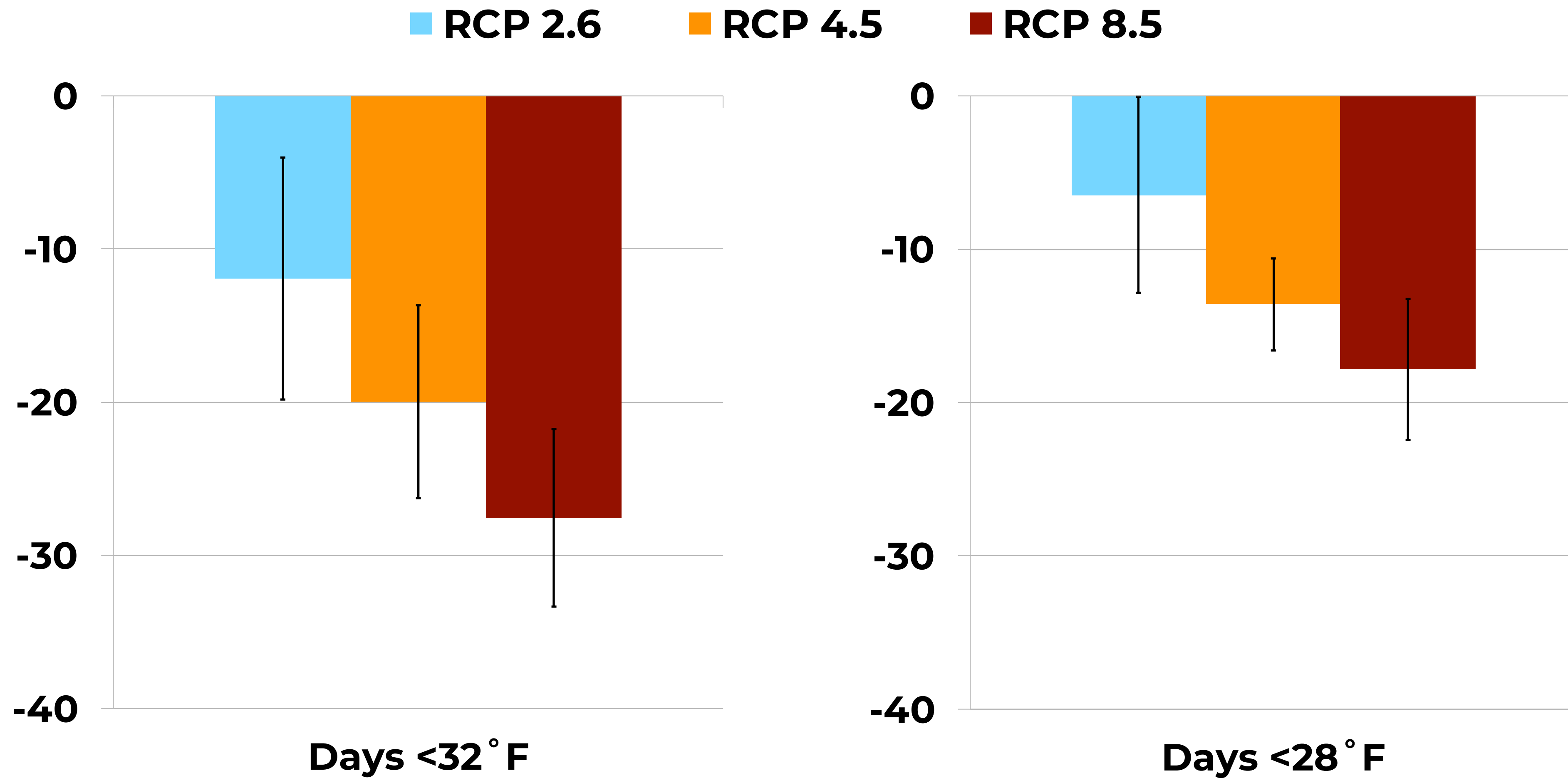
# OKLAHOMA CITY PROJECTIONS (2041-2070)





Across Oklahoma, the number of cold days (<32°F) are projected to **decrease by 5-35 days** by the mid-century

# OKLAHOMA CITY PROJECTIONS (2041-2070)

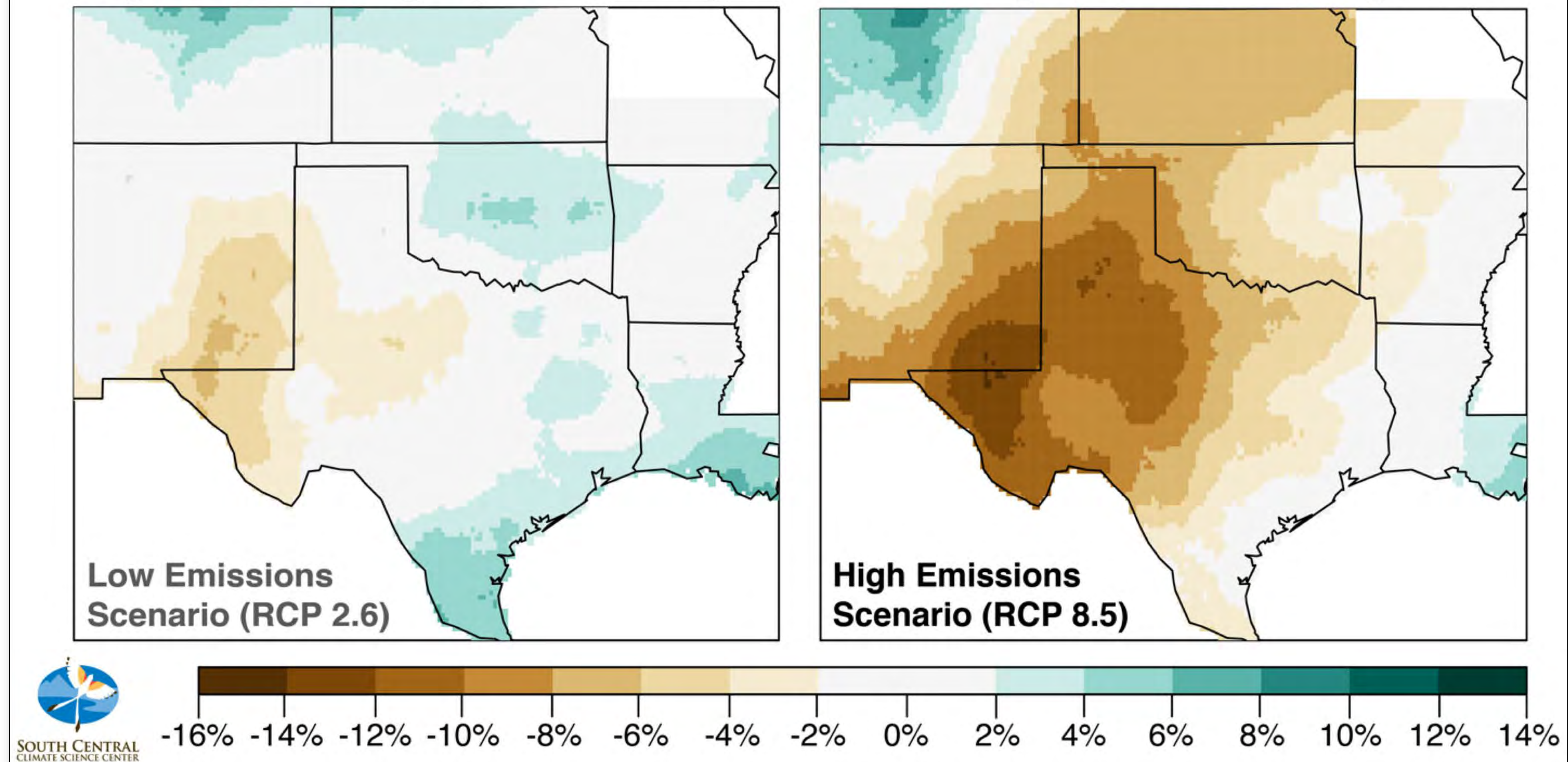


# PRECIPITATION PROJECTIONS IN THE SOUTH-CENTRAL U.S.



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## Projected Change (2041-2070) of the Average Annual Precipitation

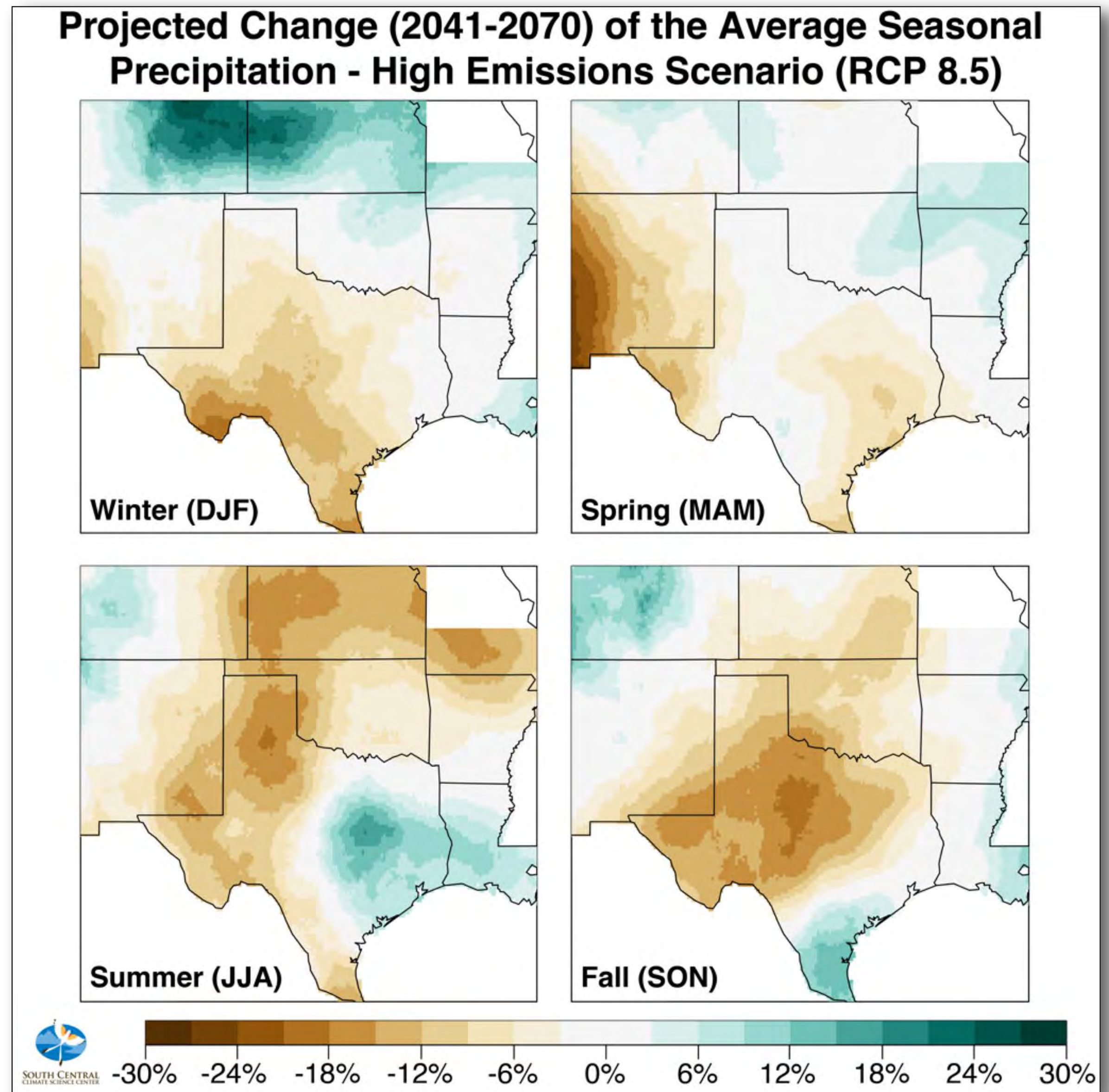


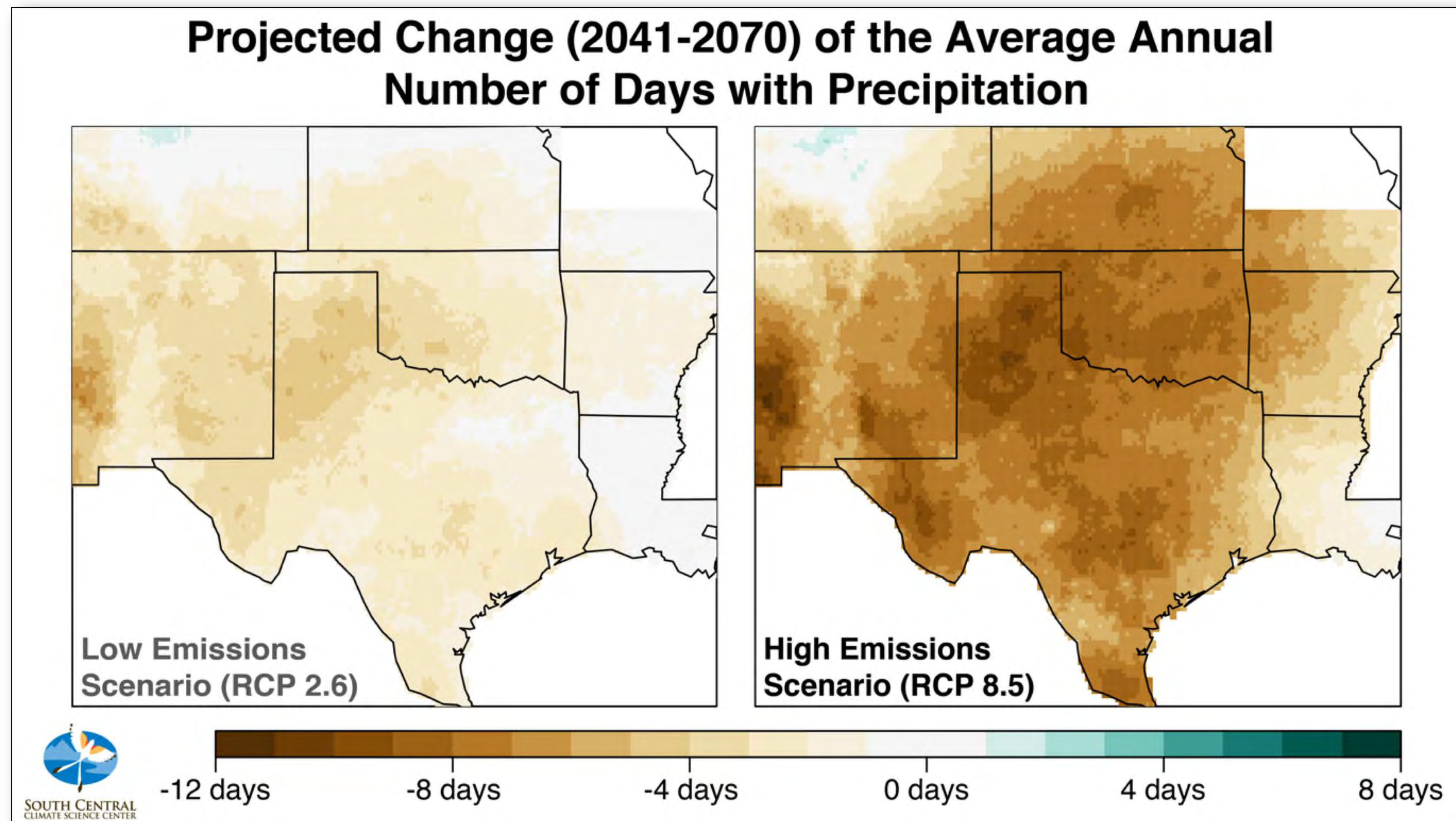
Average annual precipitation during the mid-century is projected to **decrease by 2-10 percent** in Oklahoma



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Seasonal precipitation is projected to **decrease most during summer** than other seasons in Oklahoma, especially in the Panhandle



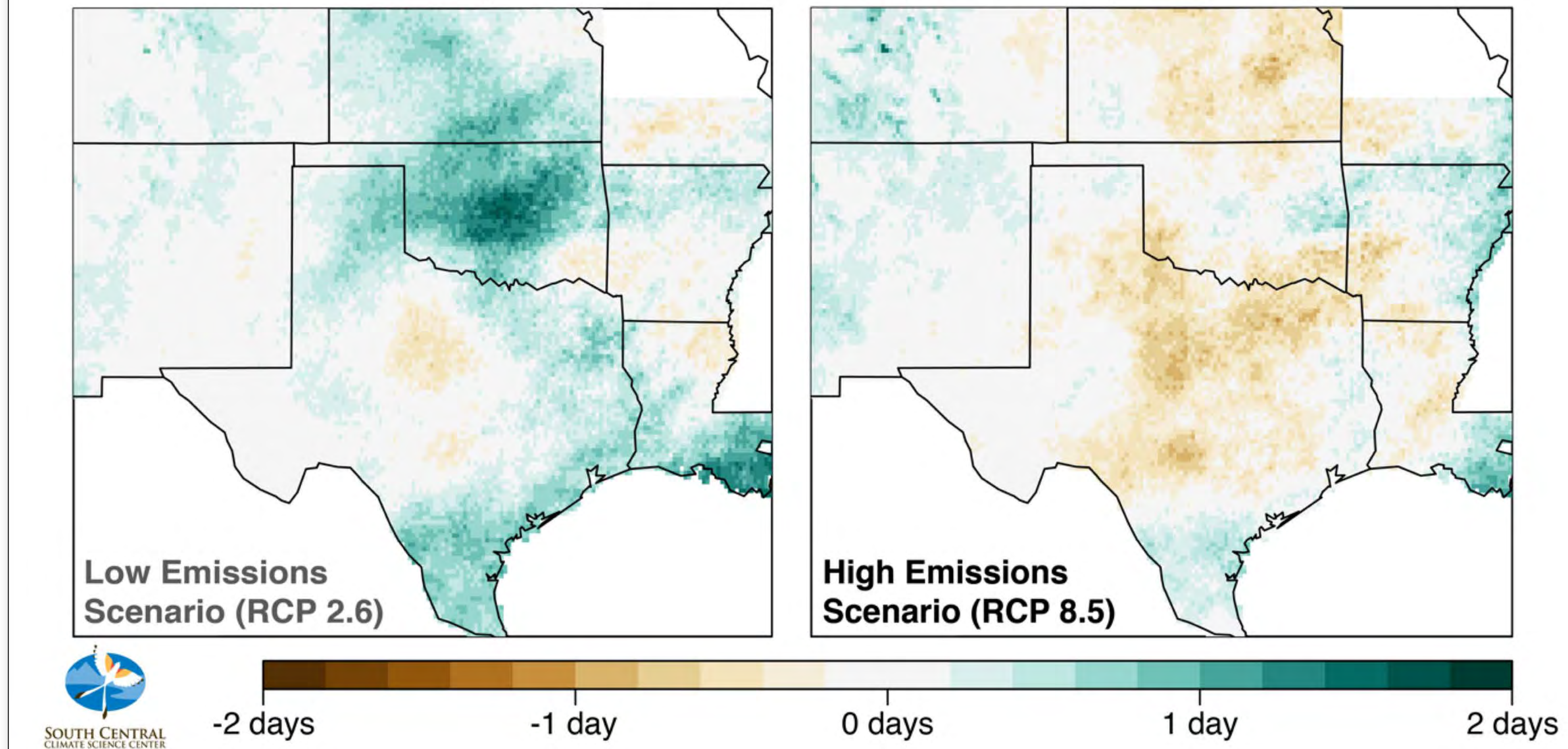


Across Oklahoma, the number of days with precipitation are projected to **decrease 2-12 days** by the mid-century



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## Projected Change (2041-2070) of the Average Annual Number of Days with Precipitation Greater than 1 inch (25.4 mm)

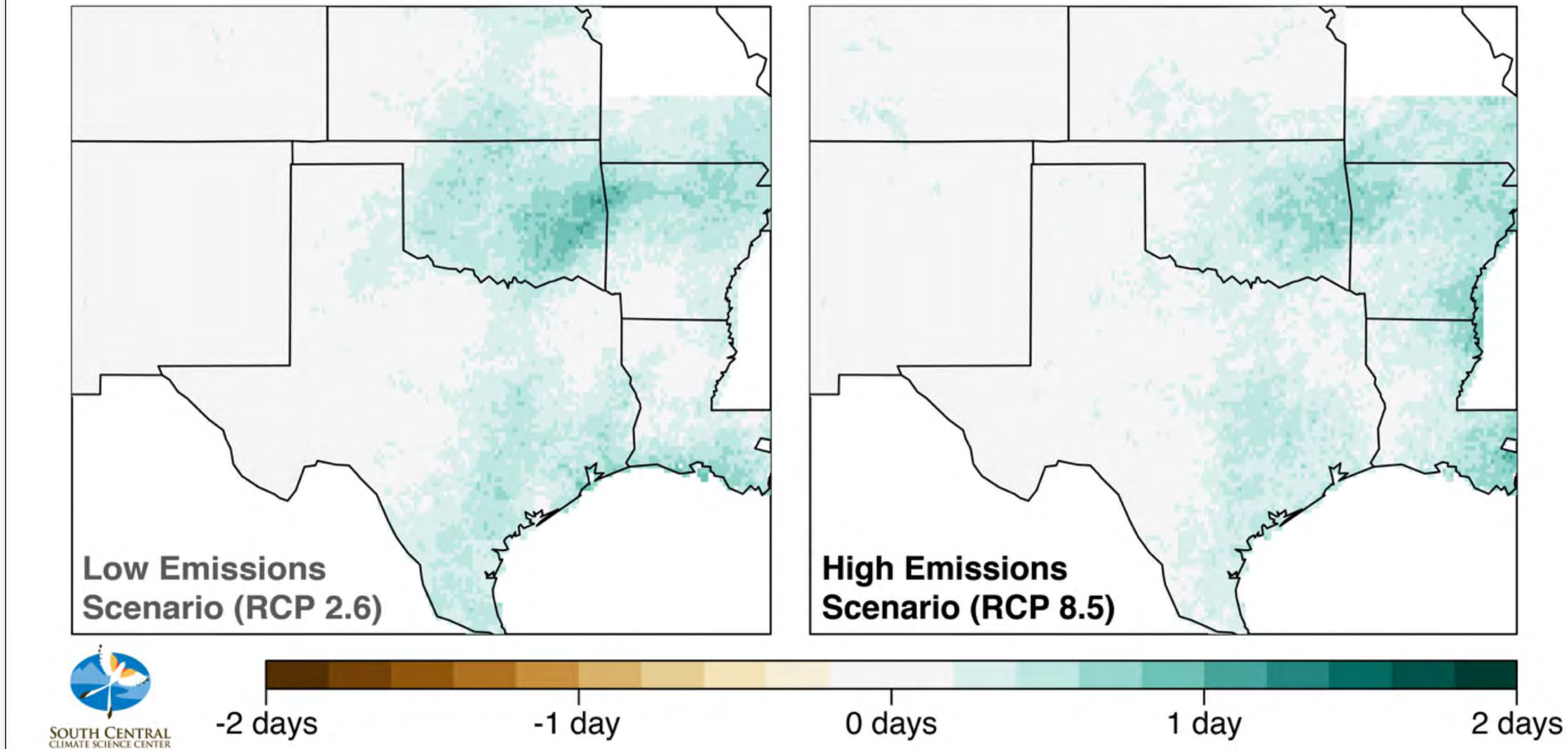


Across Oklahoma, the number of days with moderate rainfall (>1 inch) or snowfall over 1 foot are **to change by 1-2 days** by the mid-century



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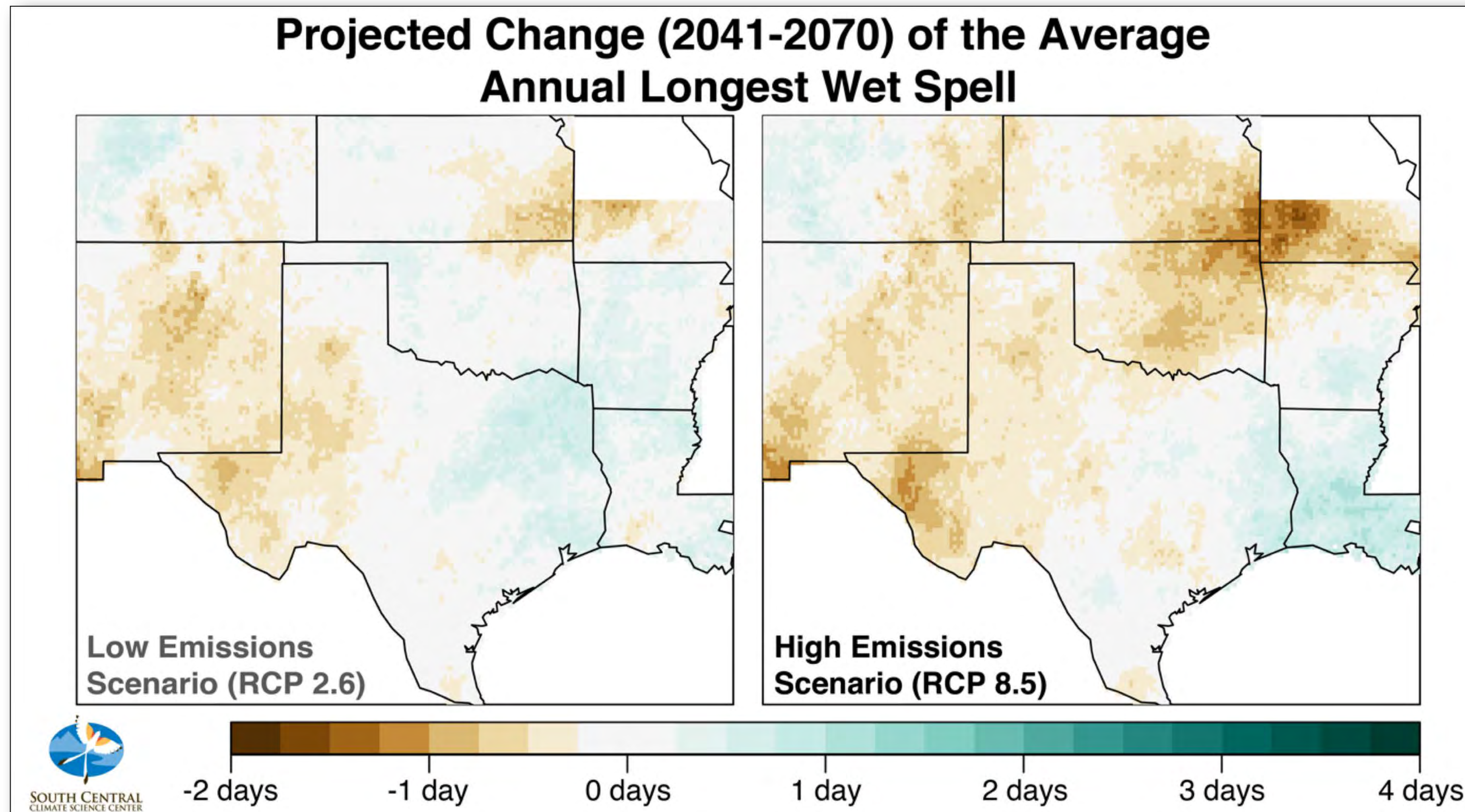
## Projected Change (2041-2070) of the Average Annual Number of Days with Precipitation greater than 2 inches (50.8 mm)



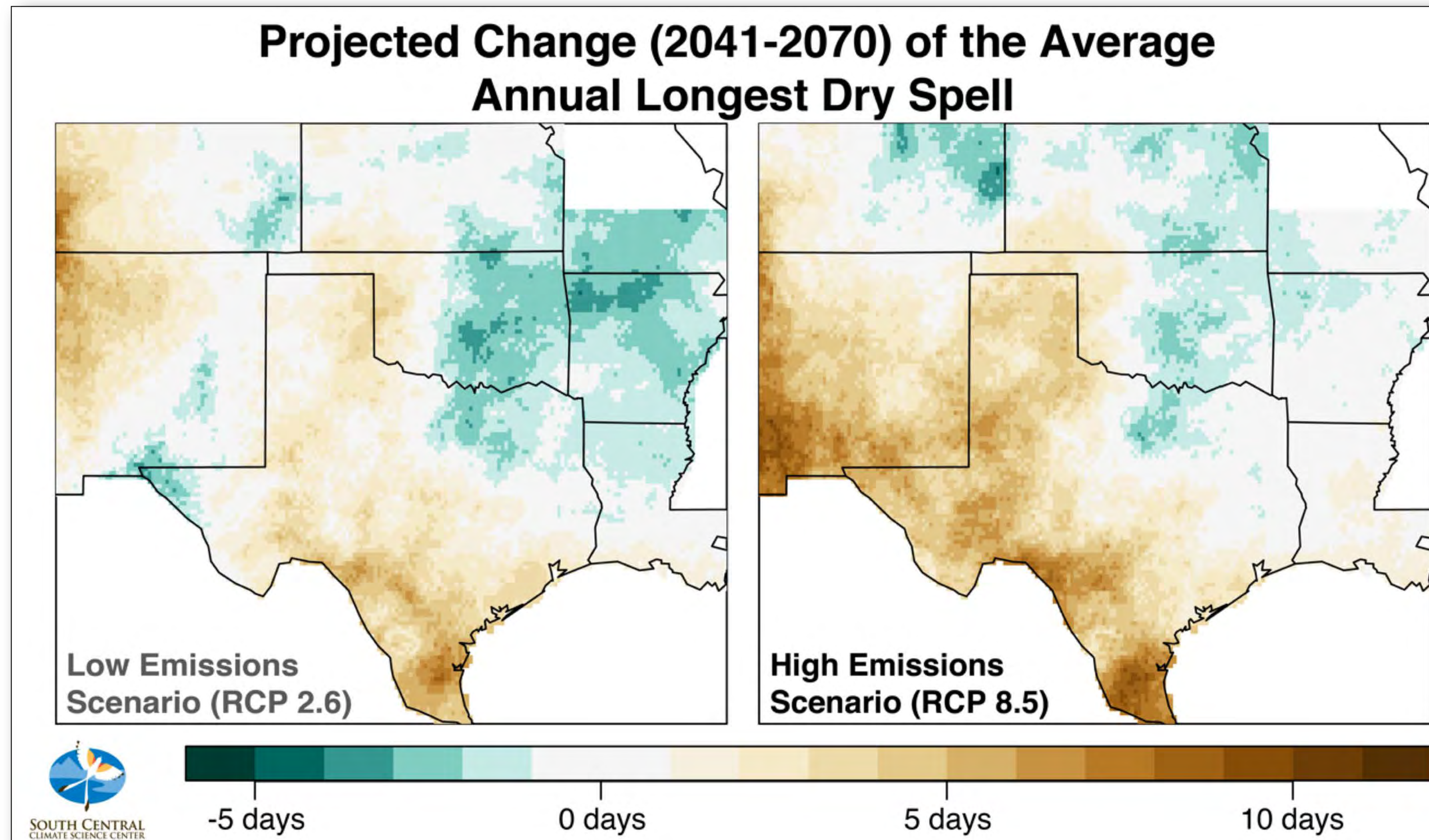
Across Oklahoma, the number of days with heavy rainfall (>2 inches) or snowfall over 2 feet are projected **to increase by 1 day** by the mid-century



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In central Oklahoma, the length of the longest wet spell each year is projected to **decrease by 1-2 days**



Across most of Oklahoma, the length of the longest dry spell each year is projected to **decrease by 1-5 days**

# COMMENTS ON PROJECTIONS

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- Projections are not forecasts or predictions
- Examples were created based on input from users prior to seeing our results — **interest in other maps or graphics should be sent to [info@southcentralclimate.org](mailto:info@southcentralclimate.org) or visit us** via Facetime, Skype, in person, etc. to discuss needs
- We have **end-of-century** projections too
- Only **one downscaling method** was used here, and we plan to **add two more** — **stay tuned** for those results!

# FIND INFORMATION AT...

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  - [climate.ok.gov](http://climate.ok.gov)
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# ACKNOWLEDGEMENTS

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# QUESTIONS?



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