# Rapid and Widespread Soil Moisture Declines in the Contiguous United States

Credit: Olesia Bilkei, Adobe Stock

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# Forecast-Informed Decisions Related to Rapid Soil Moisture Declines

## Agriculture

*Forecasts inform when to plant, what to plant, and when to irrigate.*

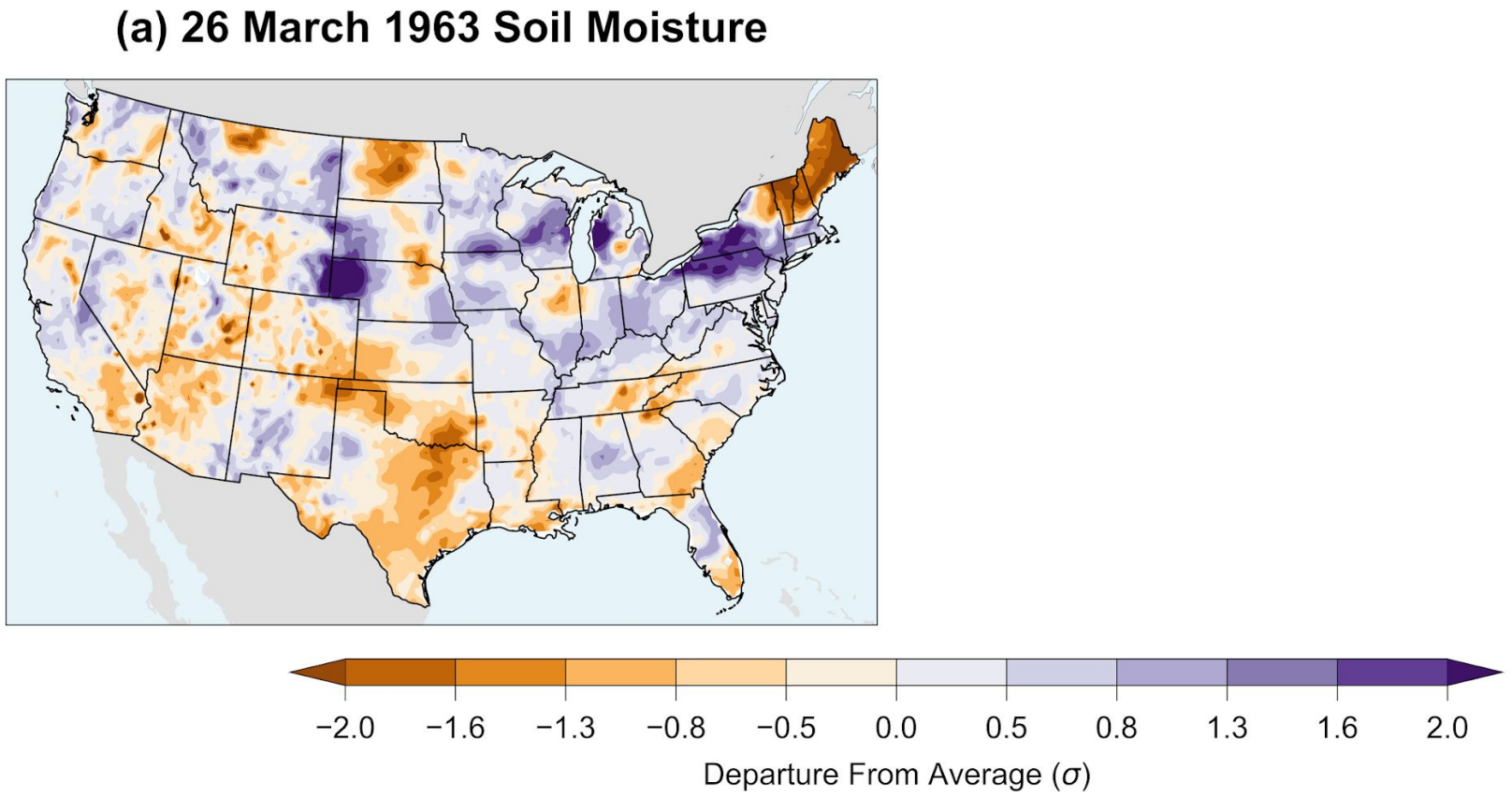
## Wildfire

*Forecasts inform vegetation health, fuel loads, and fire spread.*

## Health

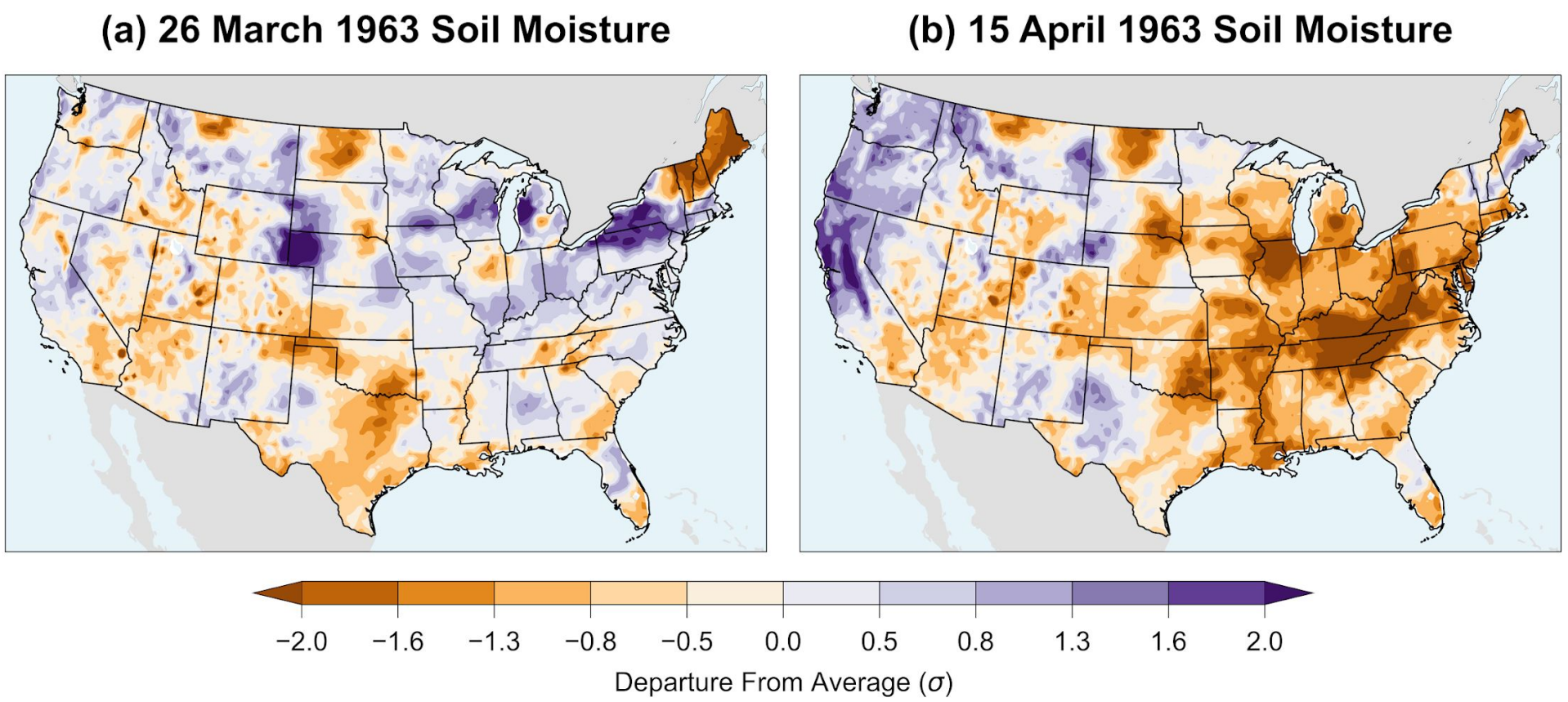
*Forecasts inform air quality and disease spread.*

# Soil Moisture Generally Above Average in the Eastern U.S. Ahead of Key Springtime 1963 Milestones




ERA5 1-m Soil Moisture Compared to 1951-2024

# Low Soil Moisture Over Nearly the Entire Eastern United States Just Three Weeks Later




ERA5 1-m Soil Moisture Compared to 1951-2024

# Takeaways

## Features

*Uncommon and occur in the eastern contiguous U.S. in spring.*

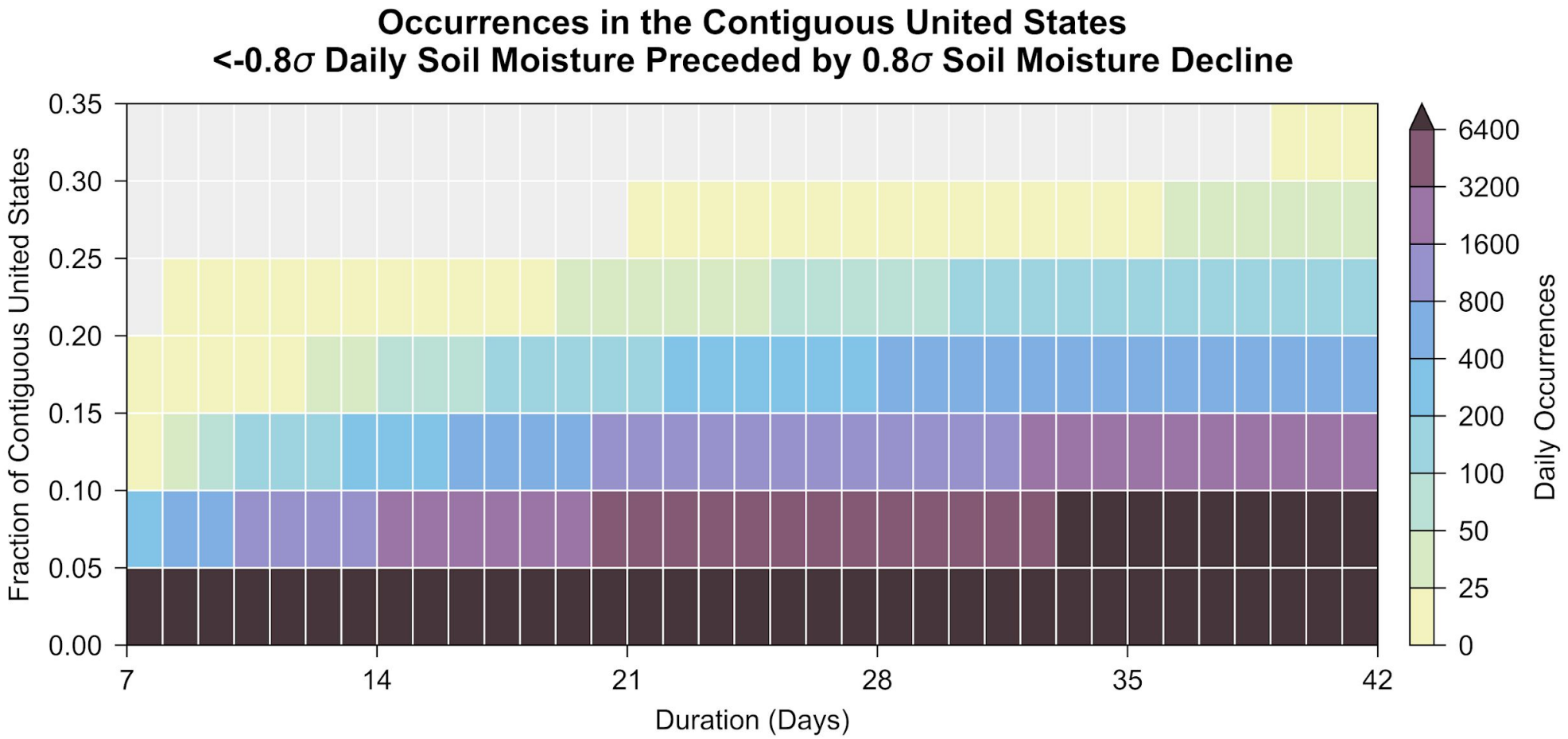
## Local Drivers

*Below-average precipitation and above-average evaporative demand.*

## Predictability

*The Madden-Julian Oscillation over the Maritime Continent before and during event.*

# Rapid and Widespread Soil Moisture Declines in the Contiguous United States are Uncommon

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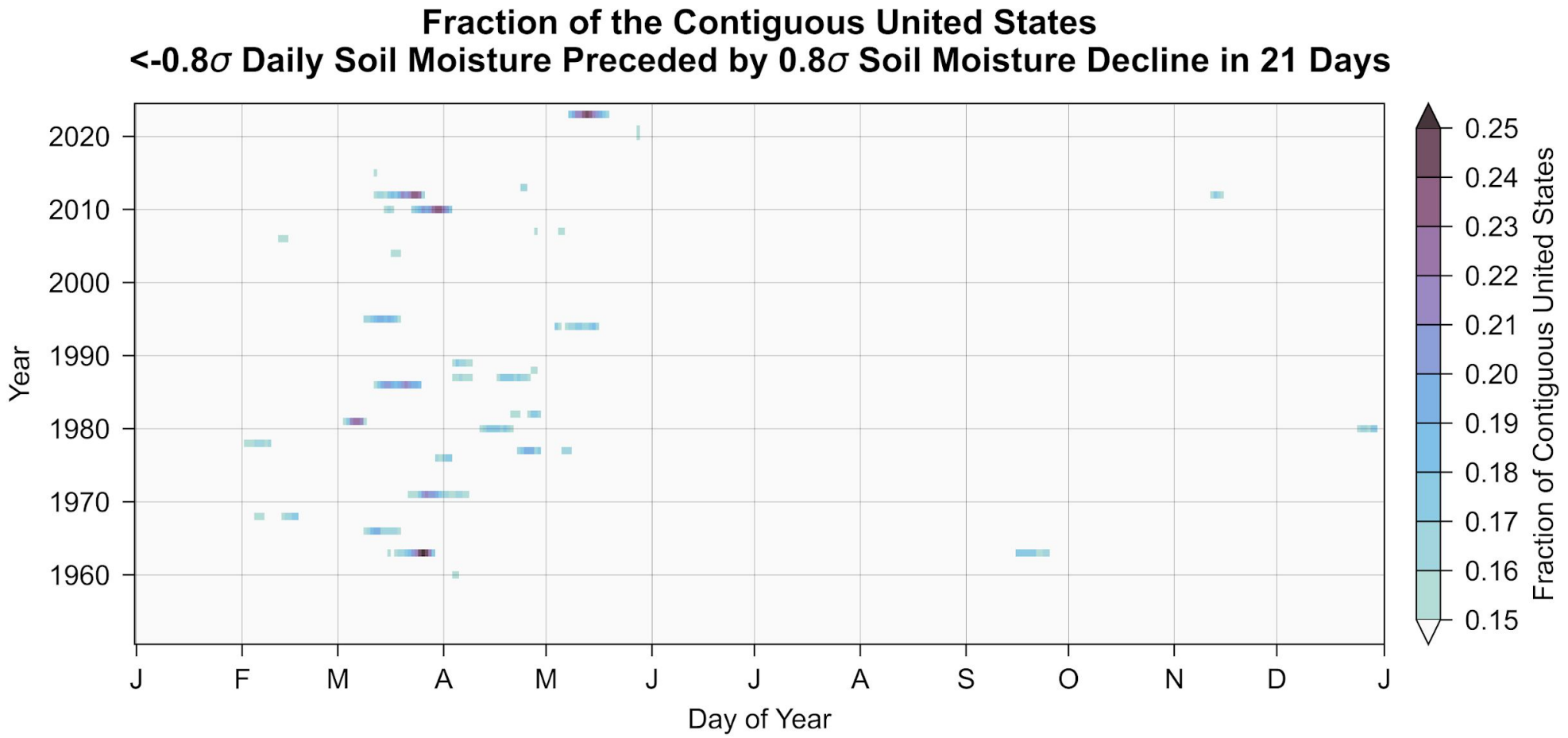
# 90% of Rapid and Widespread Soil Moisture Declines Occurred in February-May

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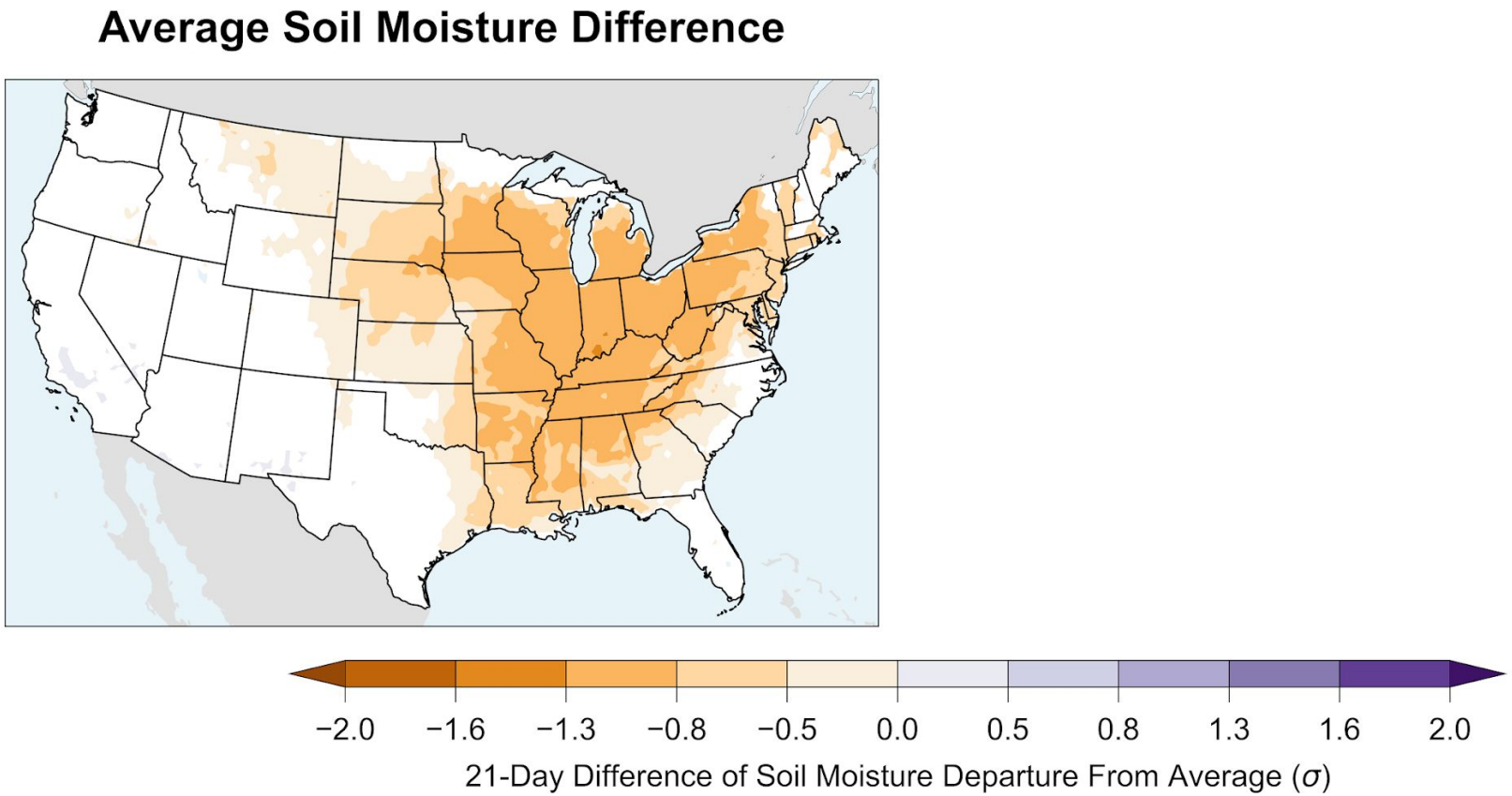
# Rapid and Widespread Springtime Soil Moisture Declines Occurred in the Eastern United States

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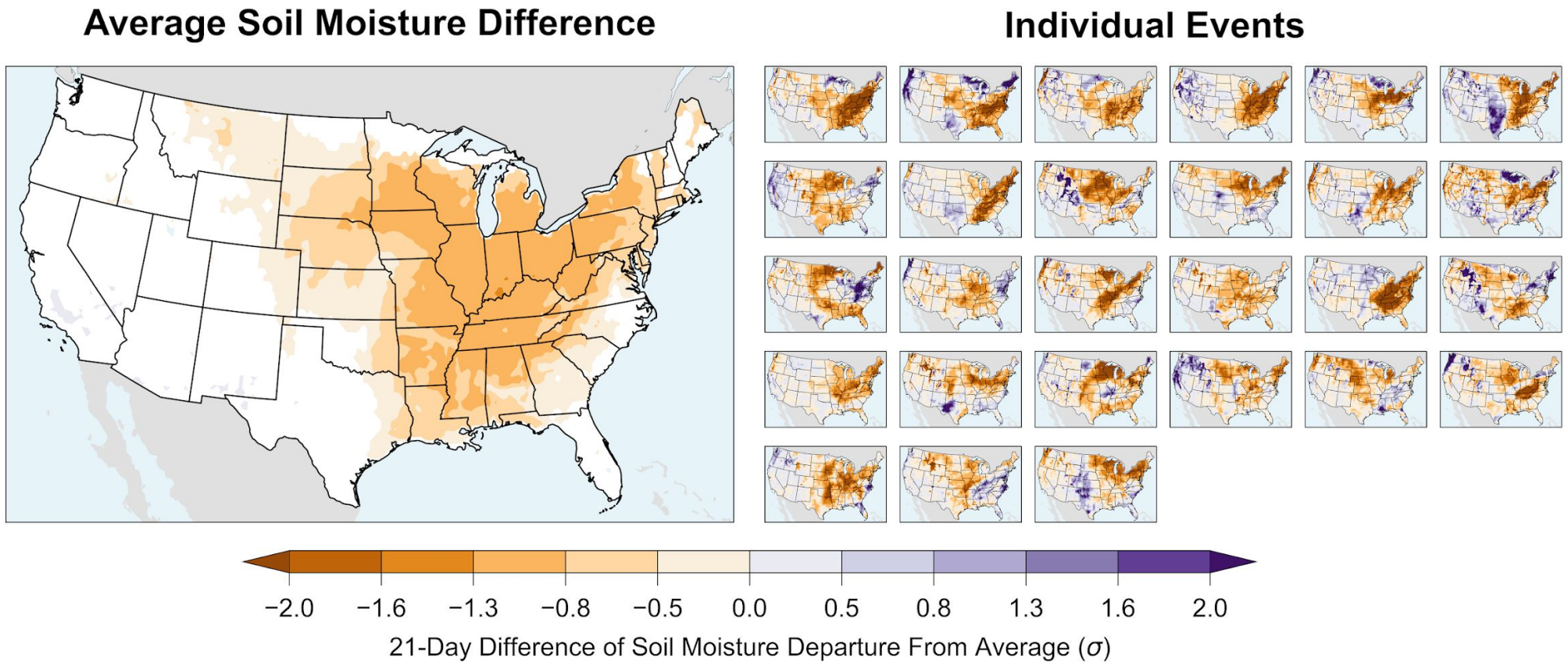


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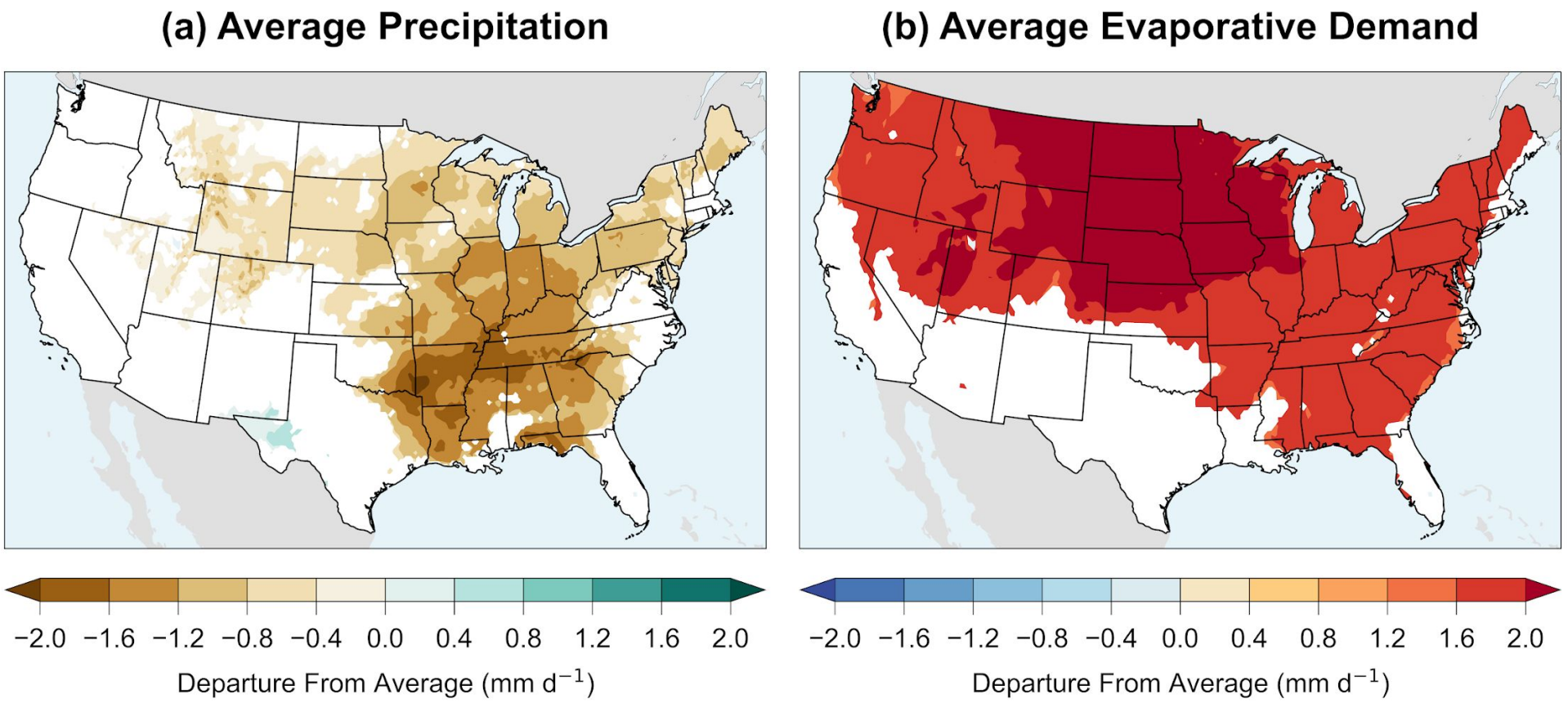
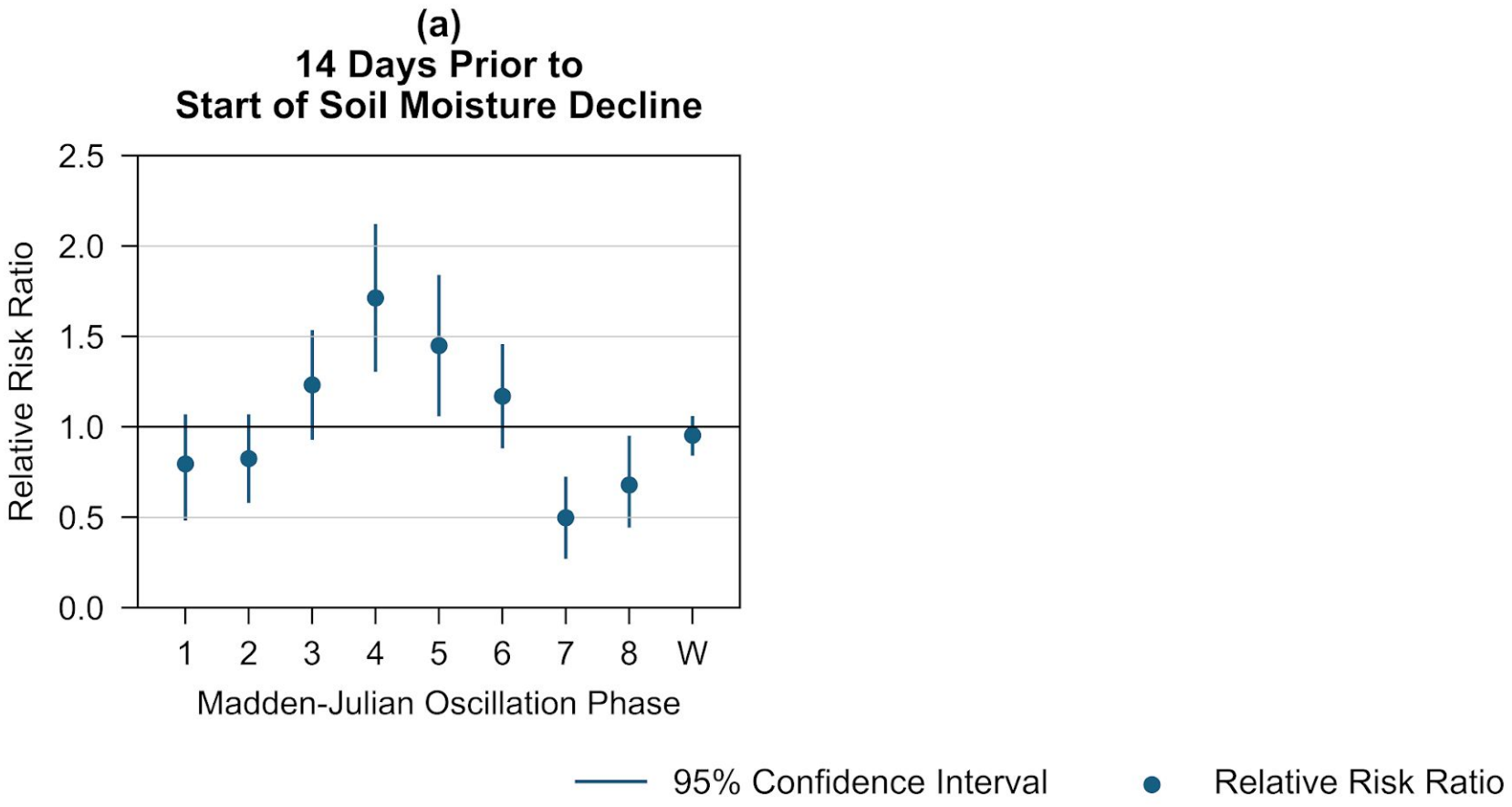
# Soil Moisture Declines Related to Below-Average Precipitation and Above-Average Evaporative Demand




NOAA/NCEI/NCLIMGRID

ERA5; Computed by Mike Hobbins

# Rapid and Widespread Springtime Soil Moisture Declines Related to the Madden-Julian Oscillation




ERA5 OLR MJO Index

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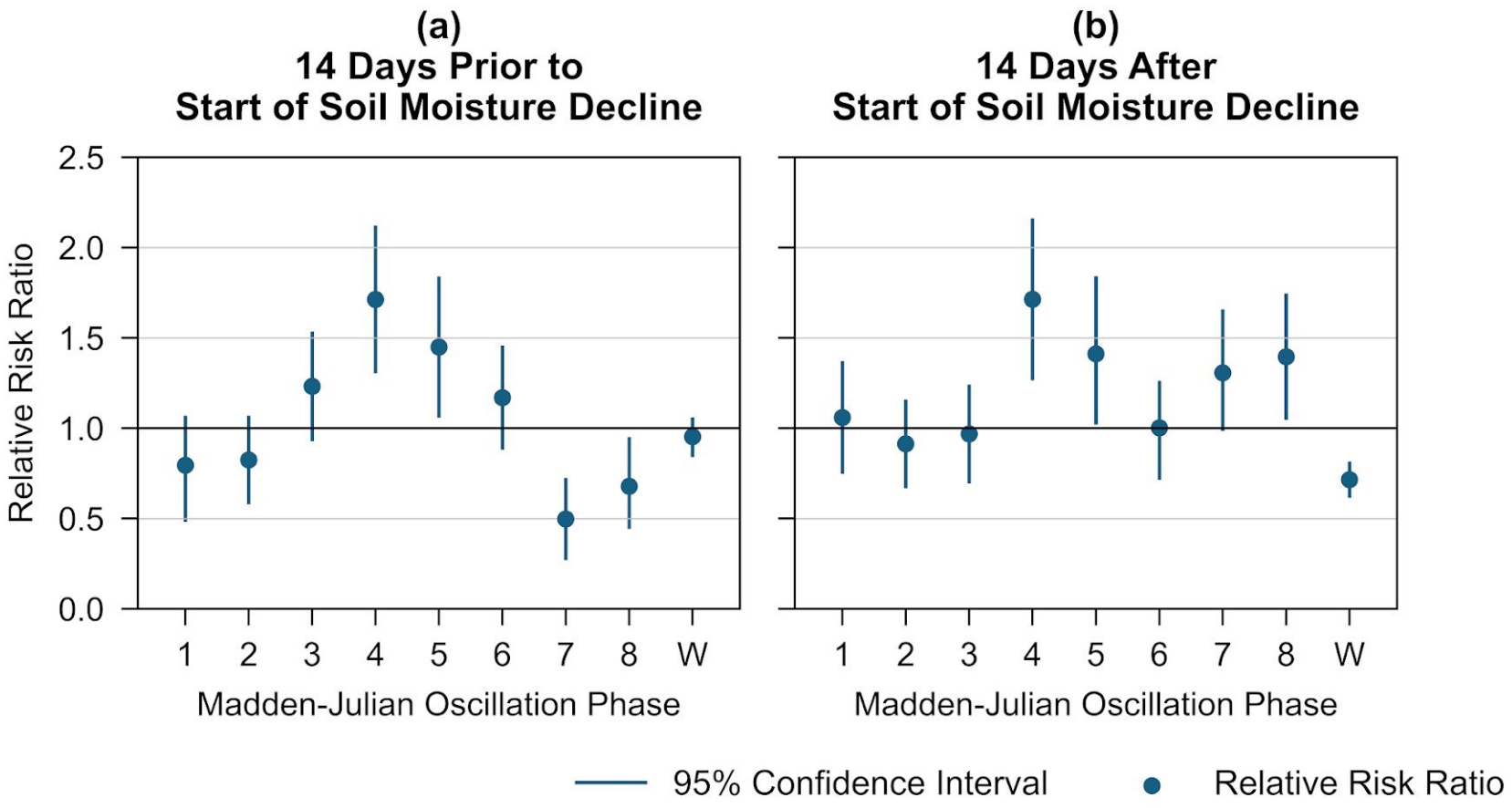


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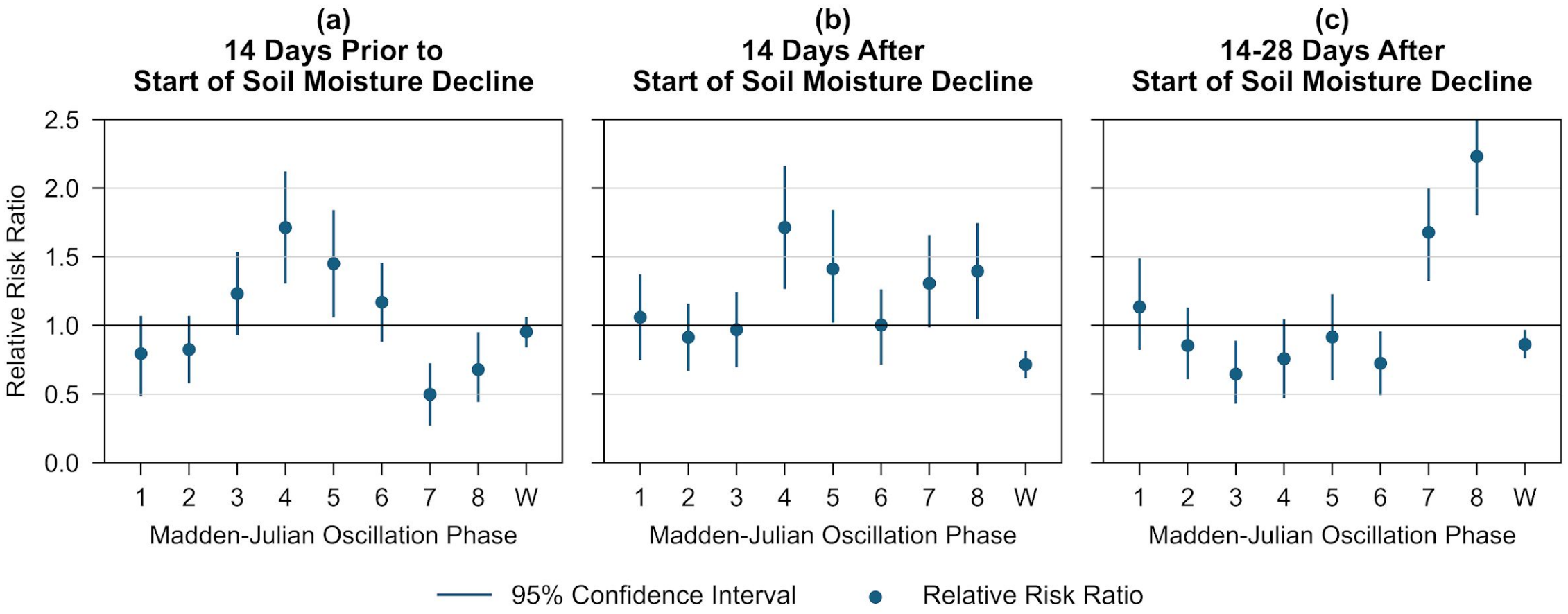


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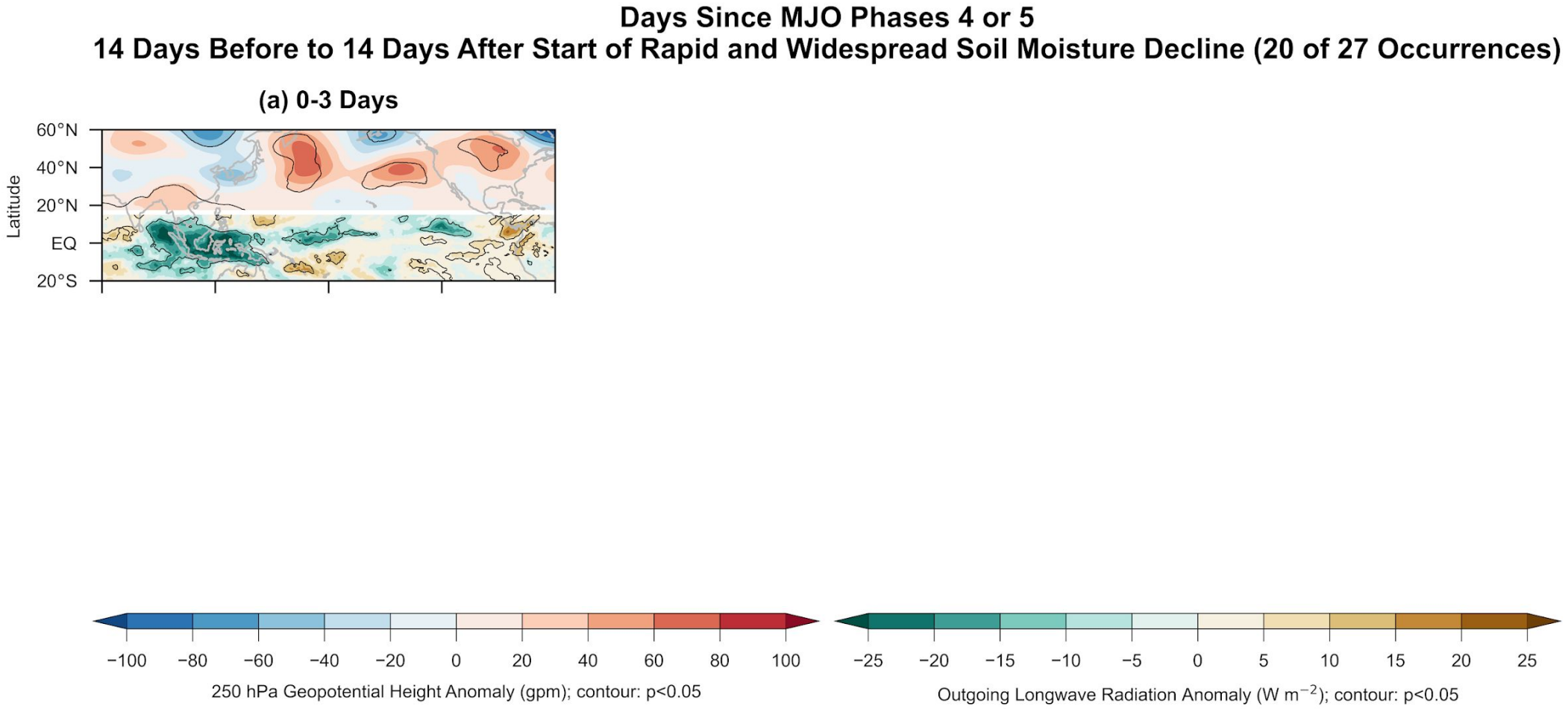


ERA5 250 hPa Geopotential Height and Outgoing Longwave Radiation

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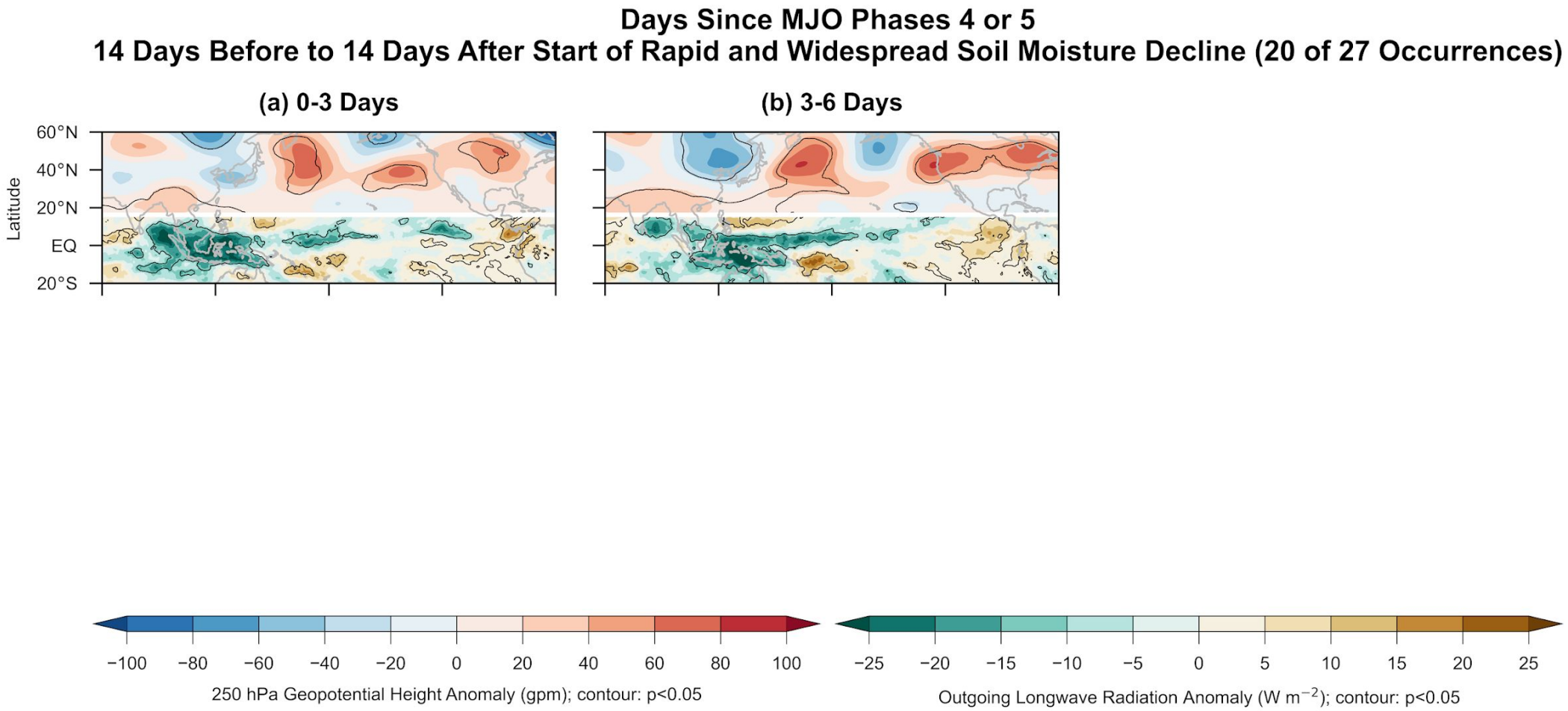


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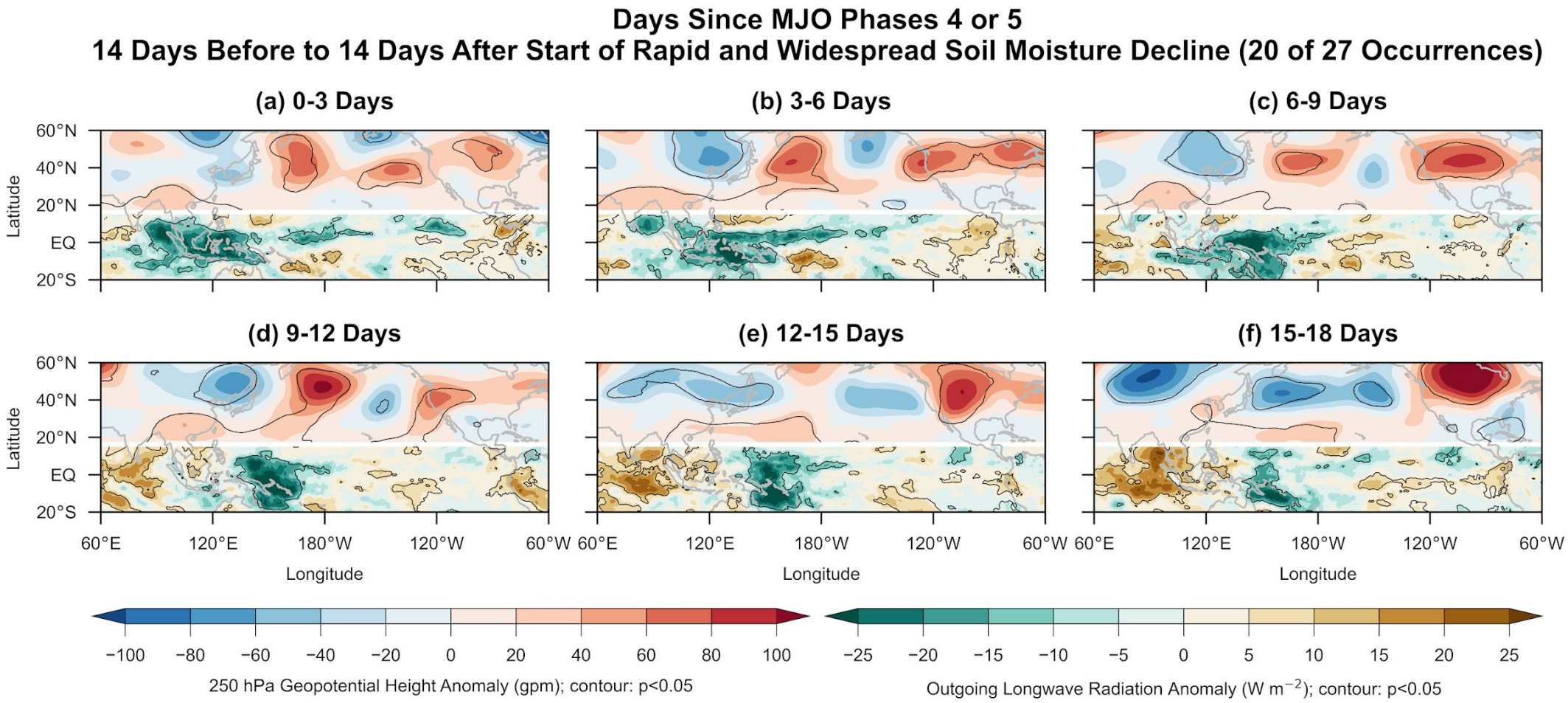


ERA5 250 hPa Geopotential Height and Outgoing Longwave Radiation

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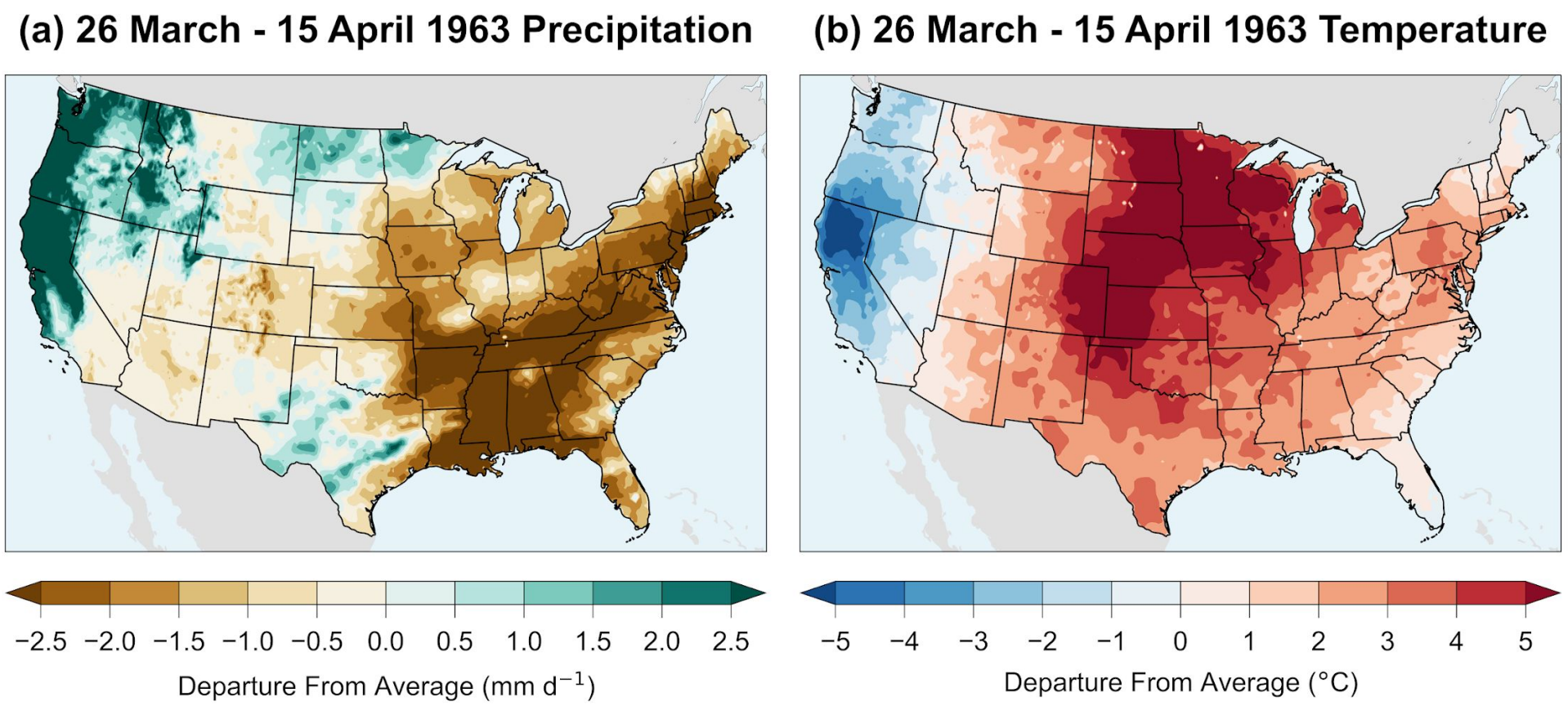
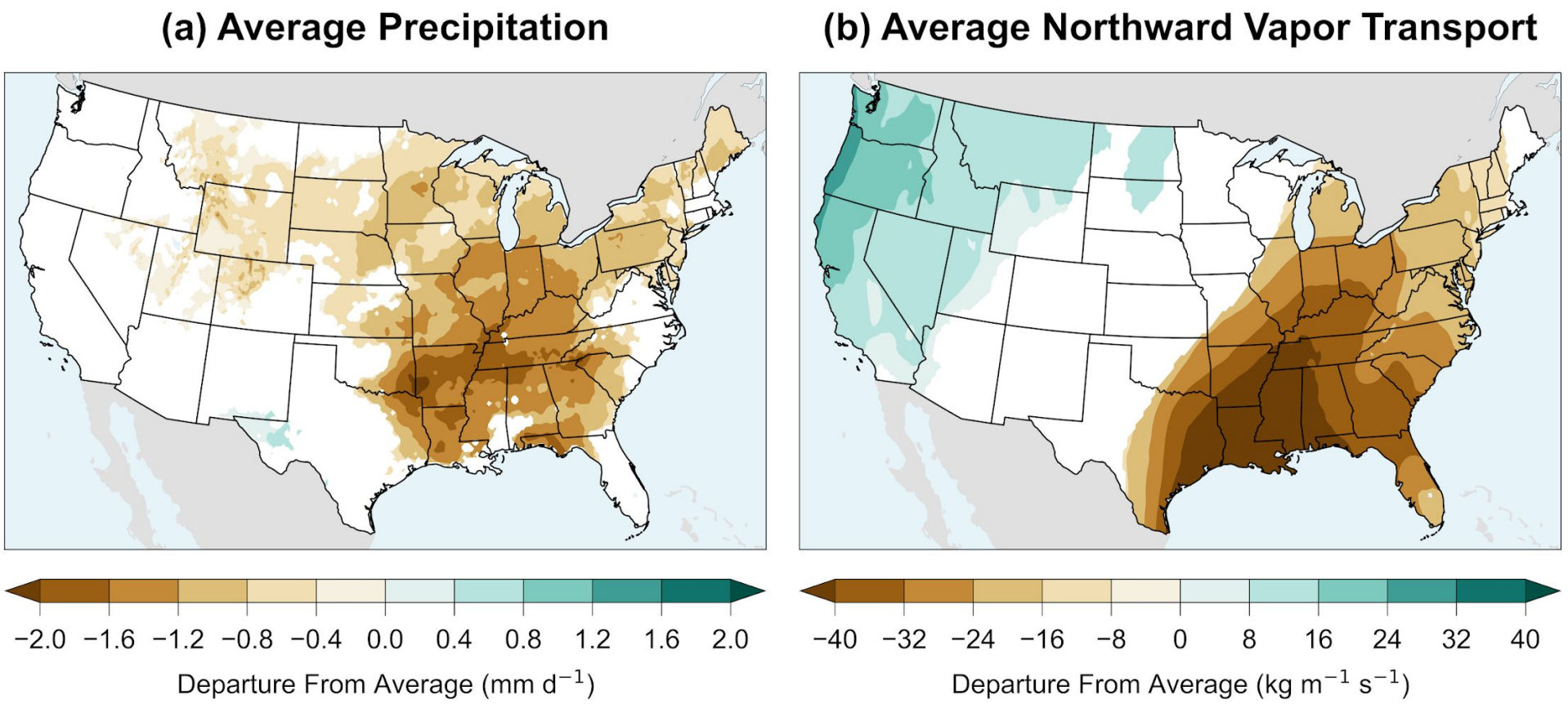
# Spring 1963 Soil Moisture Decline Related to Below-Average Precipitation & Above-Average Temperatures




NOAA/NCEI/NCLIMGRID Compared to 1951-2024

# Soil Moisture Declines Related to Below-Average Precipitation and Northward Vapor Transport

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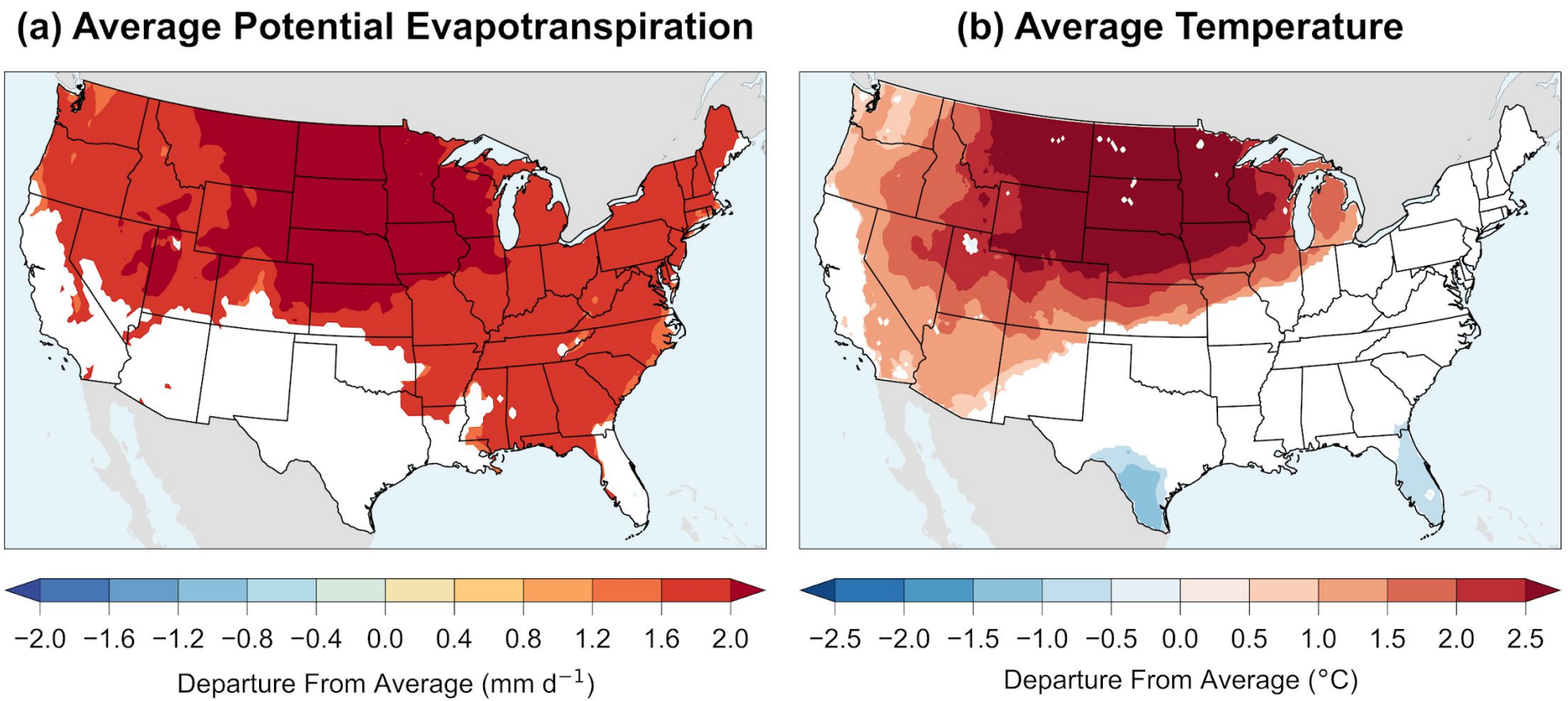
# Soil Moisture Declines Related to Above-Average Potential Evapotranspiration, Not Temperature

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