



# The Abnormally Hot June 2021 in the Western U.S.: A MERRA-2 perspective

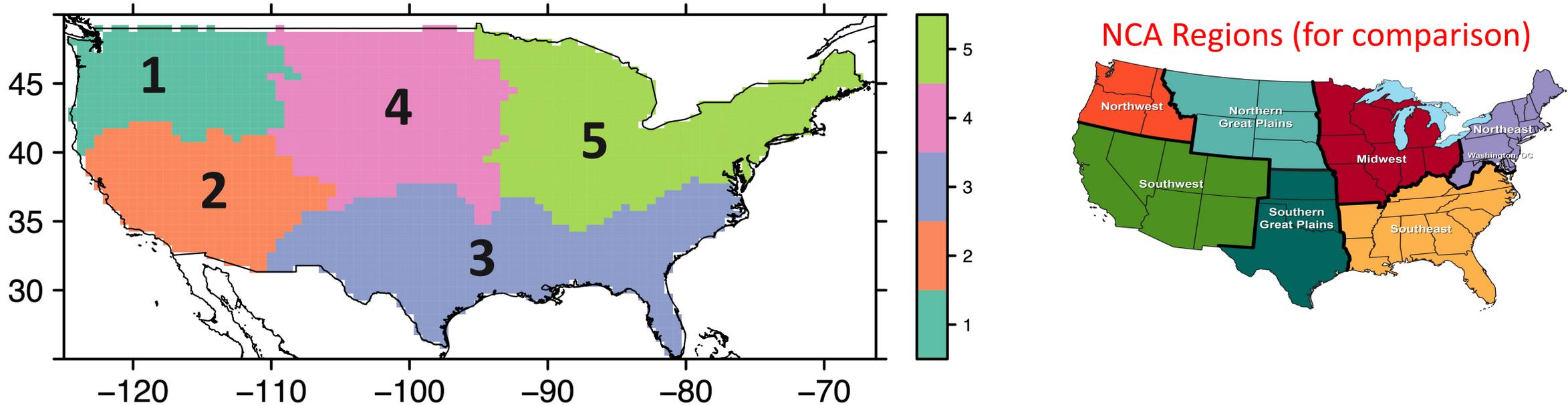
Amin Dezfuli

Collaborators: Steven Pawson & Joe Ardizzone

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# Regions based on similarity of interannual variability of T-2m



- The northwestern U.S.—identified as Region 1—is spatially coherent, therefore its areal average temperature was used to represent the entire region.
- Intra-regional correlations (a measure of homogeneity):

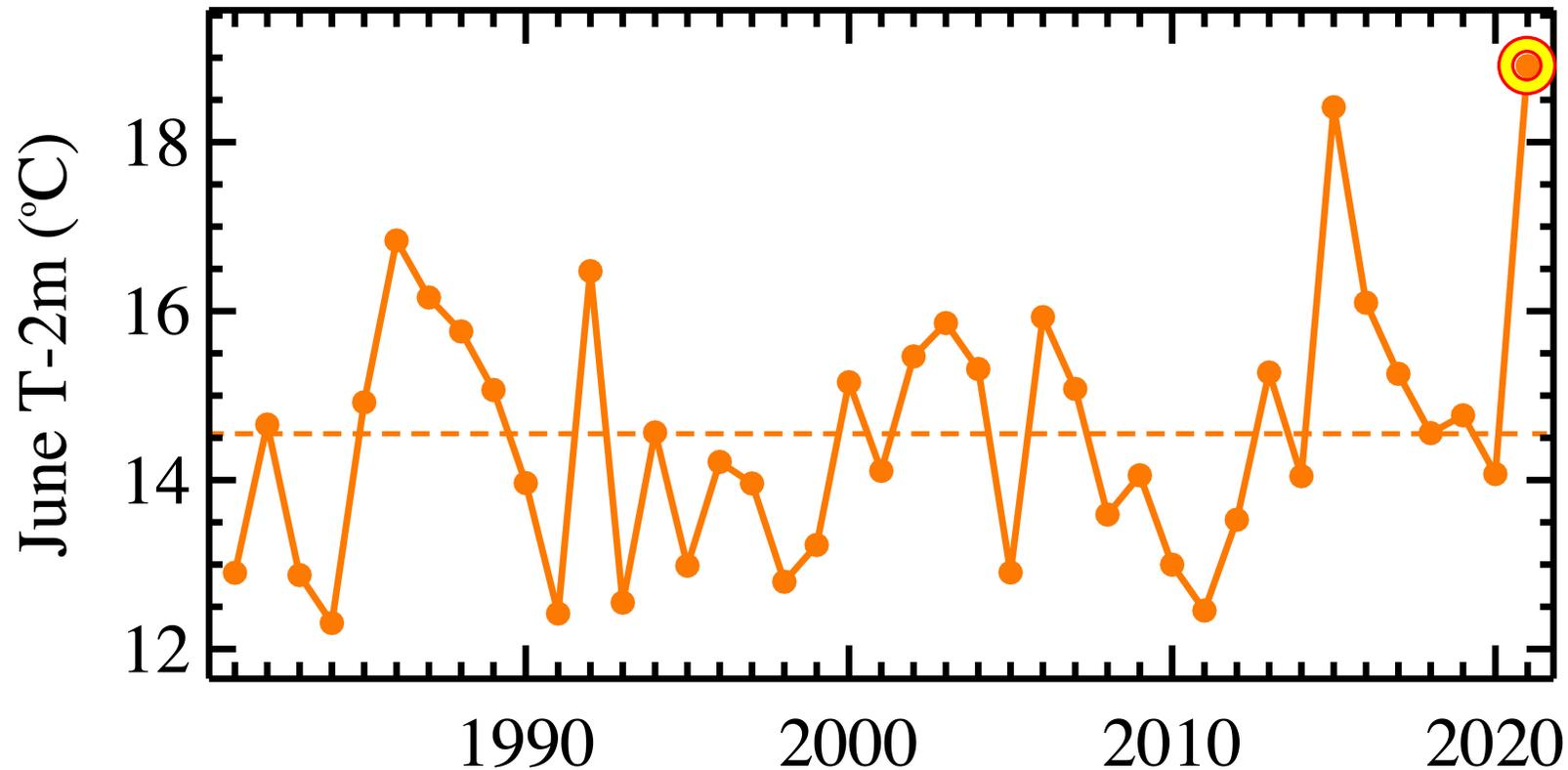
R1 = .87 – Northwest

R2 = .90 – Southwest

R3 = .70    R4 = .84

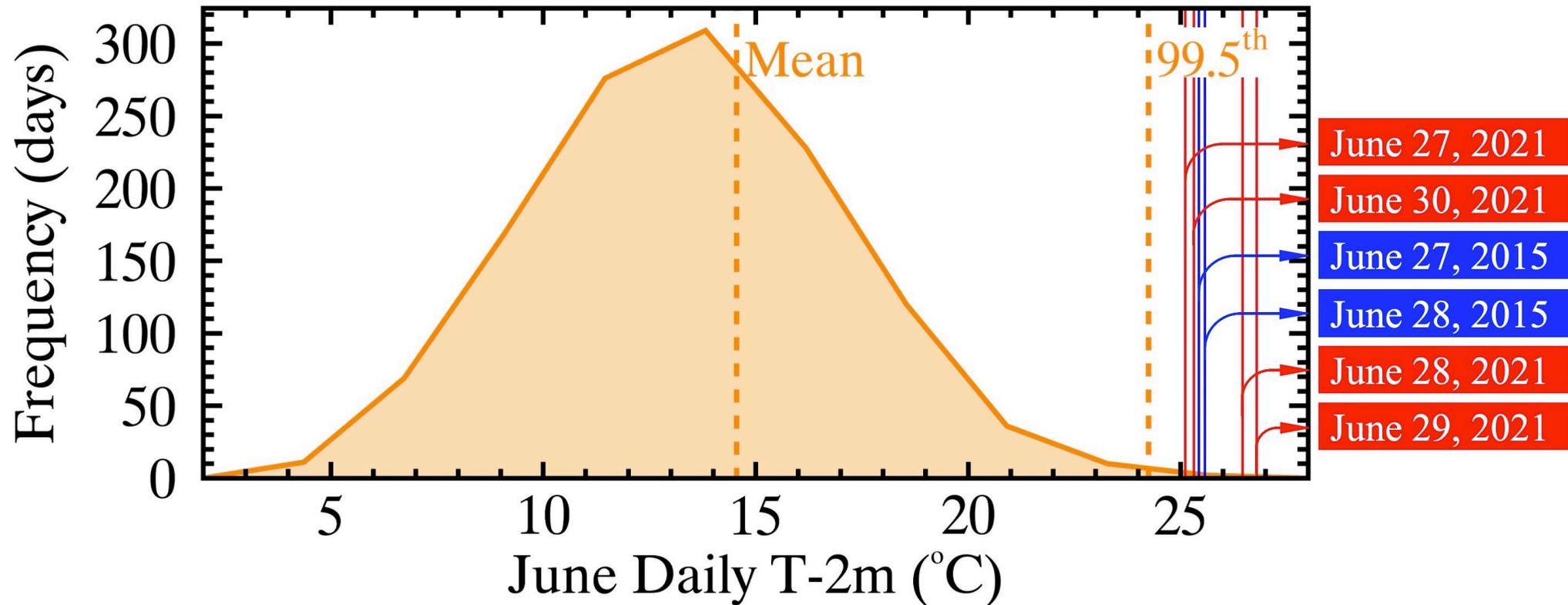
R5 = .76

# Time-series of regional monthly mean T-2m, for June 1981-2021



- 2021 stands out as the hottest June, followed by 2015.
- Max T-2m shows a quite similar variability (not shown).

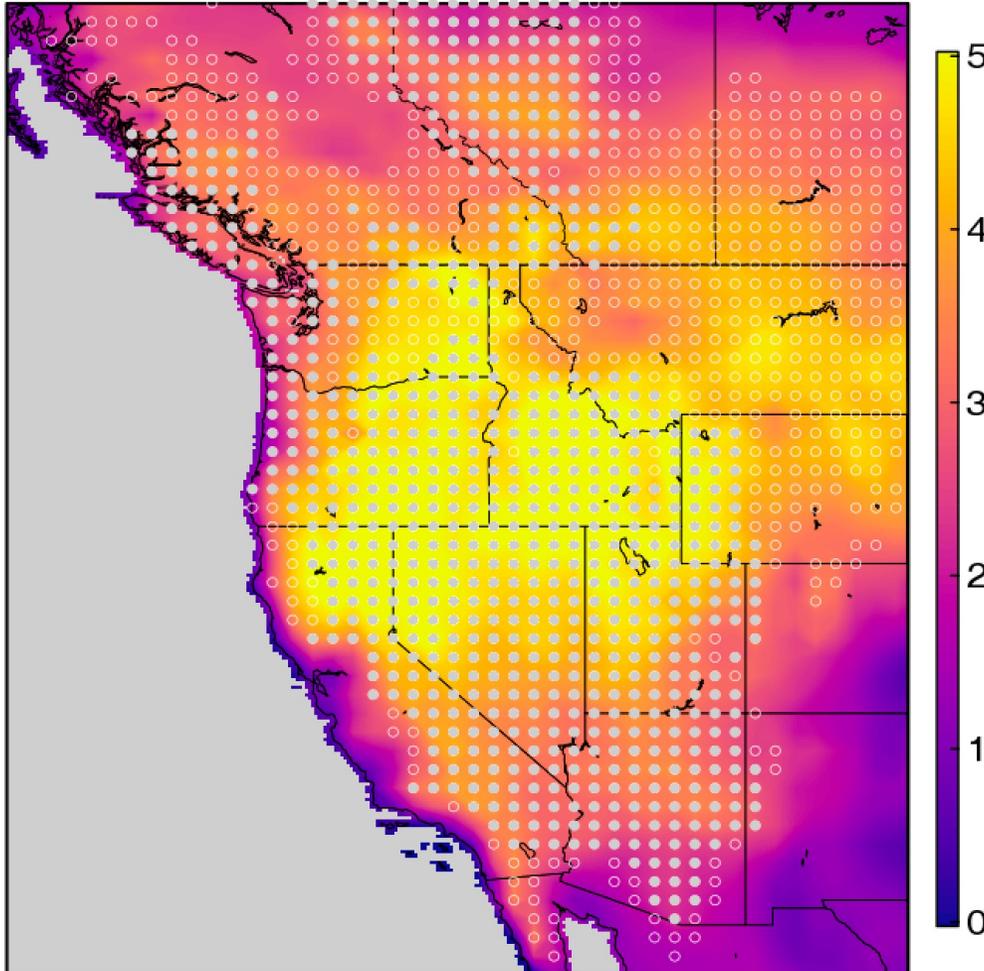
# Histogram of daily mean T-2m, for June 1981-2021



- The hottest day happened on June 29, 2021, over the northwestern region.
- Of the six days warmer than the 99.5th percentile, four occurred in 2021 (red lines) and two in 2015 (blue lines)

# Spatial pattern of T-2m anomaly of June 2021

T anomaly ( $^{\circ}\text{C}$ ), June 2021



- Large areas of the Northwestern USA, as well as parts of western Canada, experienced extreme temperatures.
- Areas with temperature greater than the 99<sup>th</sup> percentile (closed circles) and between 95<sup>th</sup> and 99<sup>th</sup> percentiles (open circles) are shown.