Lecture 14. Year-to-year wintertime variability in midlatitudes

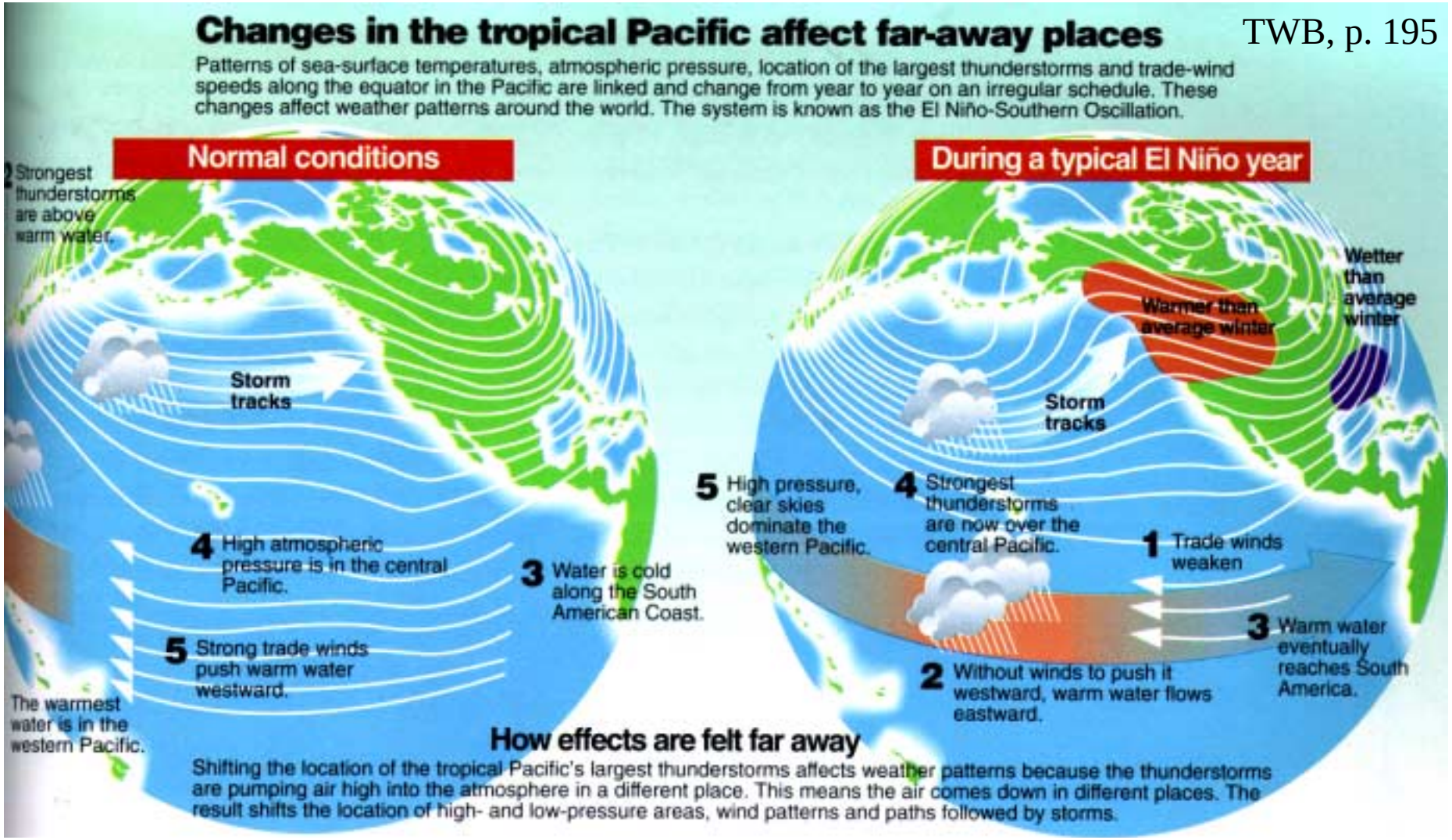
- Every year's weather is different.
- In midlatitudes, wet vs. dry and warm vs. cold years are associated with changes in the jet stream.
- These occur in association with variations in

1. tropical ocean temperatures (El Nino)
2. mid-latitude ocean temperatures (e. g. 'Pacific Decadal Oscillation')

...but mostly (despite what you sometimes hear in the media)...

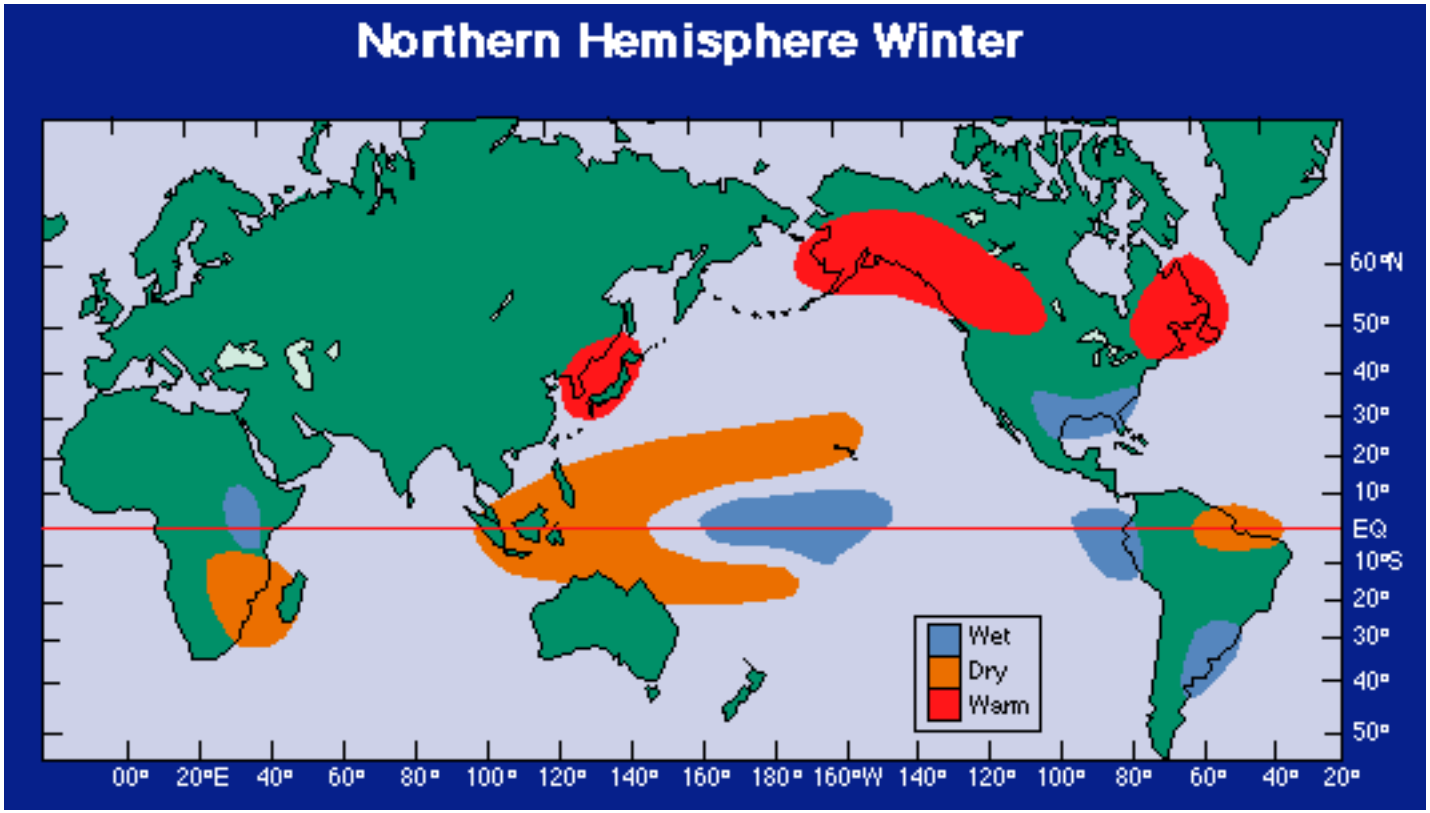
3. the intrinsic 'chaos' of the atmosphere.

ENSO and changes in our winter weather patterns

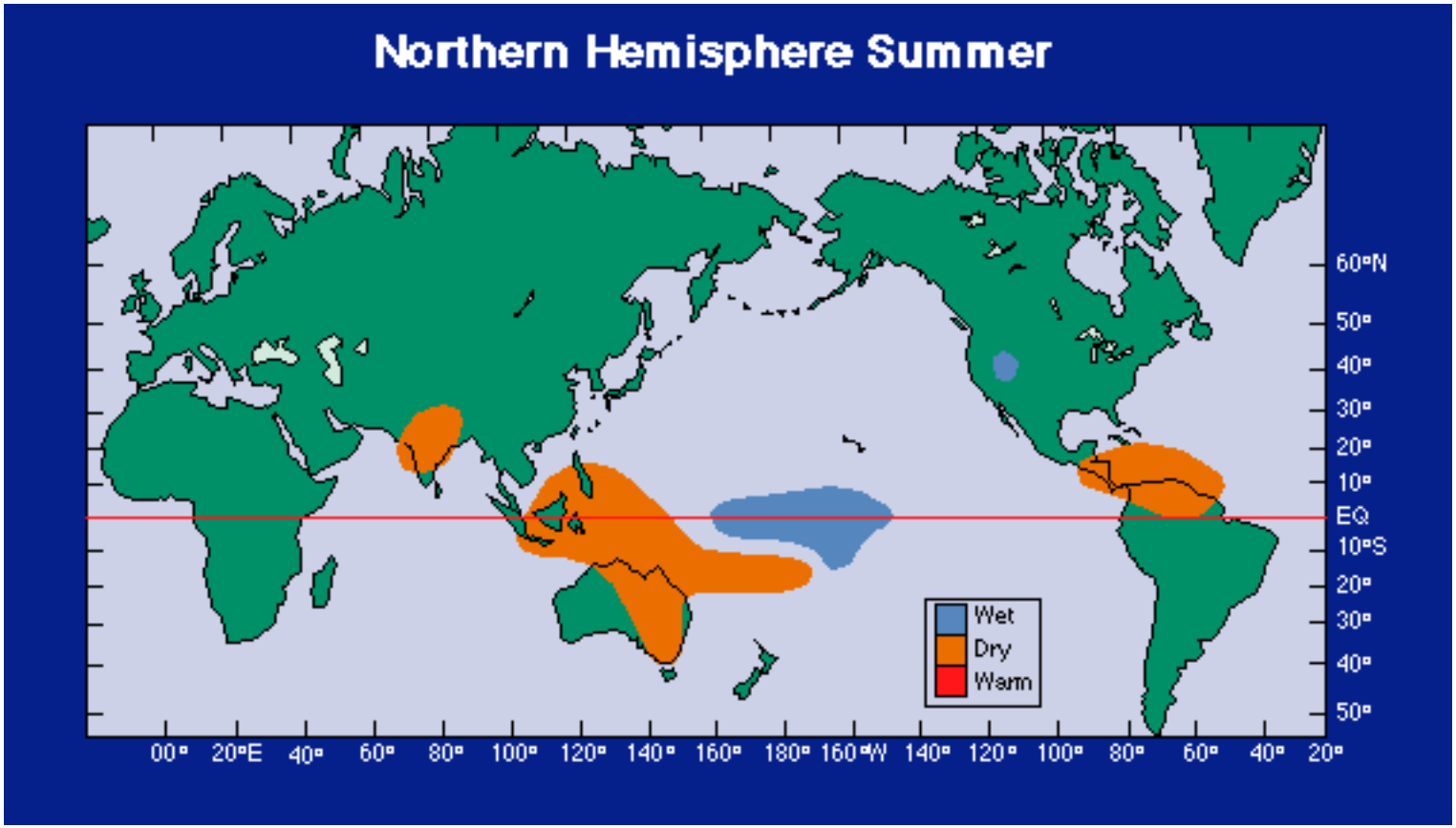


For Seattle, El Nino tends to brings a warm, wet late winter and spring. However, only 25% of our winter-to-winter variability is connected to El Nino.

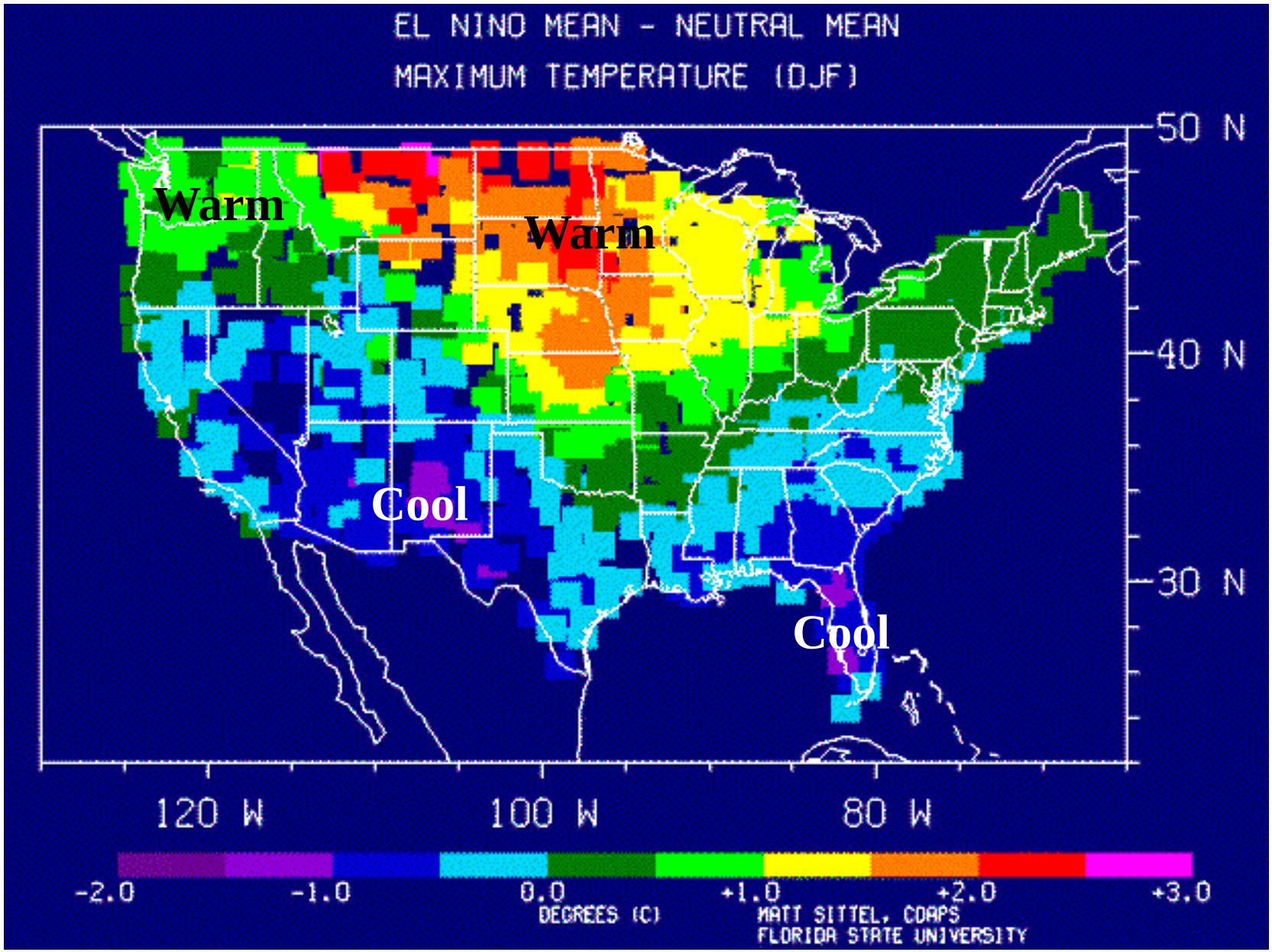
Global impacts of El Nino - strongest in NH winter

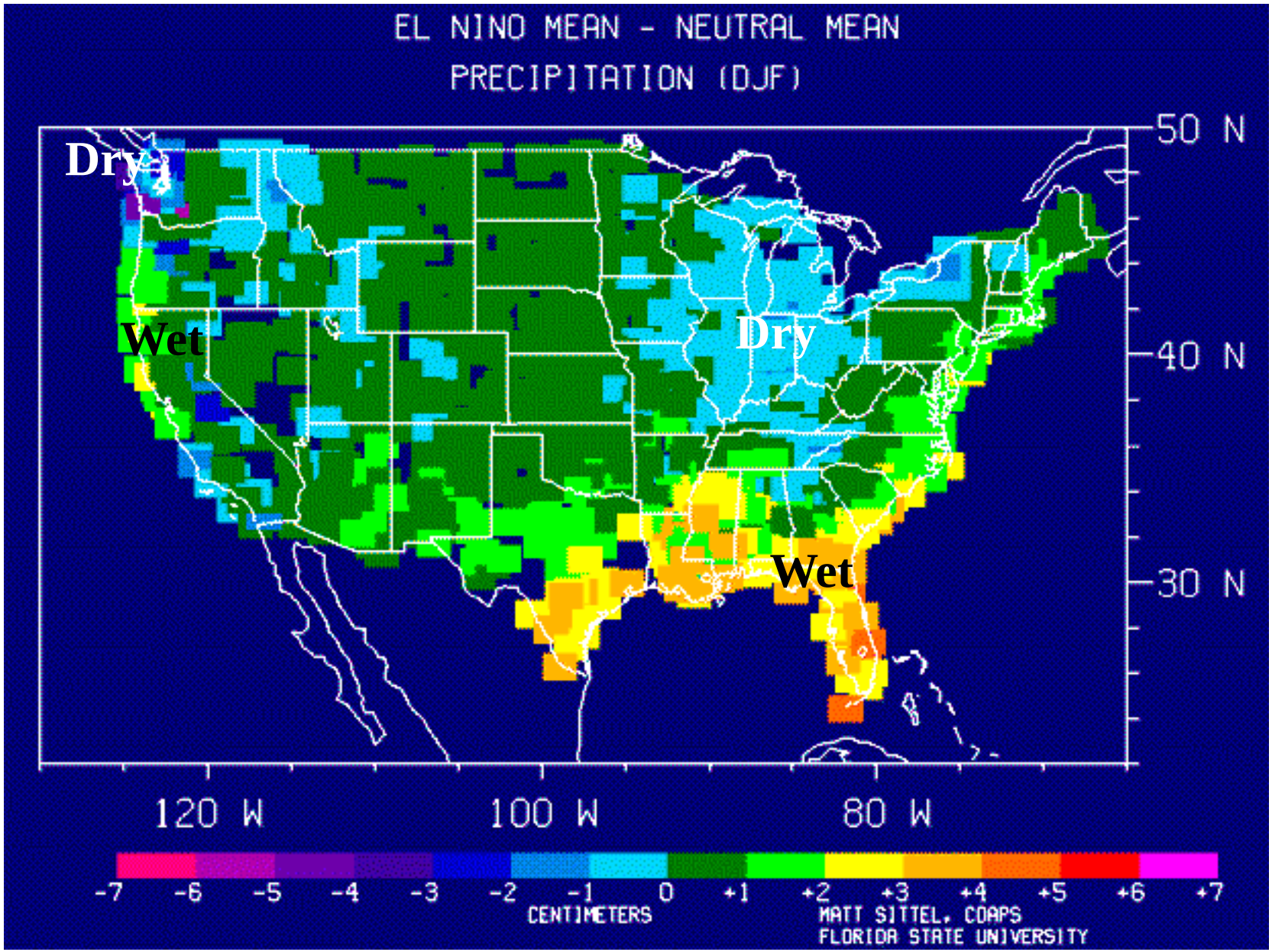


NH summertime effects of El Nino are mainly felt within the tropics



US wintertime effects of El Nino




EL NINO MEAN - NEUTRAL MEAN
PRECIPITATION (DJF)
Dry
Wet
Dry
Wet
50 N
40 N
30 N
120 W
100 W
80 W
-7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7
CENTIMETERS
MATT SITTEL, COAPS
FLORIDA STATE UNIVERSITY

Pacific Decadal Oscillation (PDO)

- An irregular variation in N Pacific ocean temperatures and storm track on timescales of decades, affecting Pacific NW climate, salmon migration, etc.