

The background of the slide is a close-up photograph of parched, cracked earth. The cracks are irregular and form a complex, web-like pattern across the entire surface. The color is a dark, muted grey-brown, suggesting a lack of moisture and high temperatures.

An Analysis of 100-Degree Heat in Nashville

Justyn Jackson

100-Degree Stats

- **A 100-degree day occurs every 3-4 years (3.22 years, specifically)**
- **The most 100-degree days in a year is 20 days in 1954**
- **The most consecutive 100-degree days is 8 from June 23-30, 1952**
- **The hottest temperature on record is 109° on June 29, 2012**

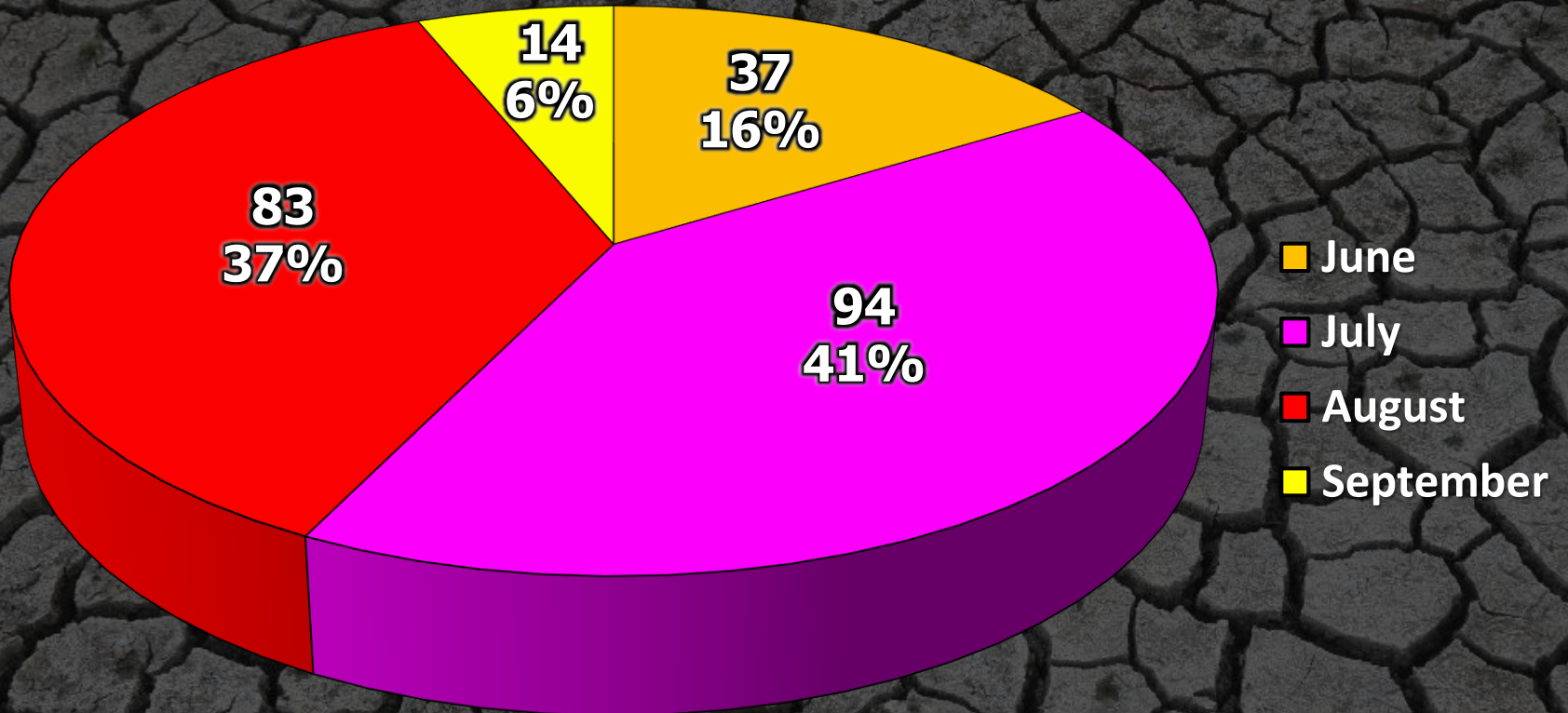
100-Degree Stats

- The most consecutive years with a 100-degree day is 4 years between 1951-1954
- The most consecutive years without a 100-degree day is 12 years between 1882-1893
- The most years in a decade with a 100-degree temperature is 5 years between 1951-1960
- Slight upward trend in annual and decadal 100-degree days over period of record

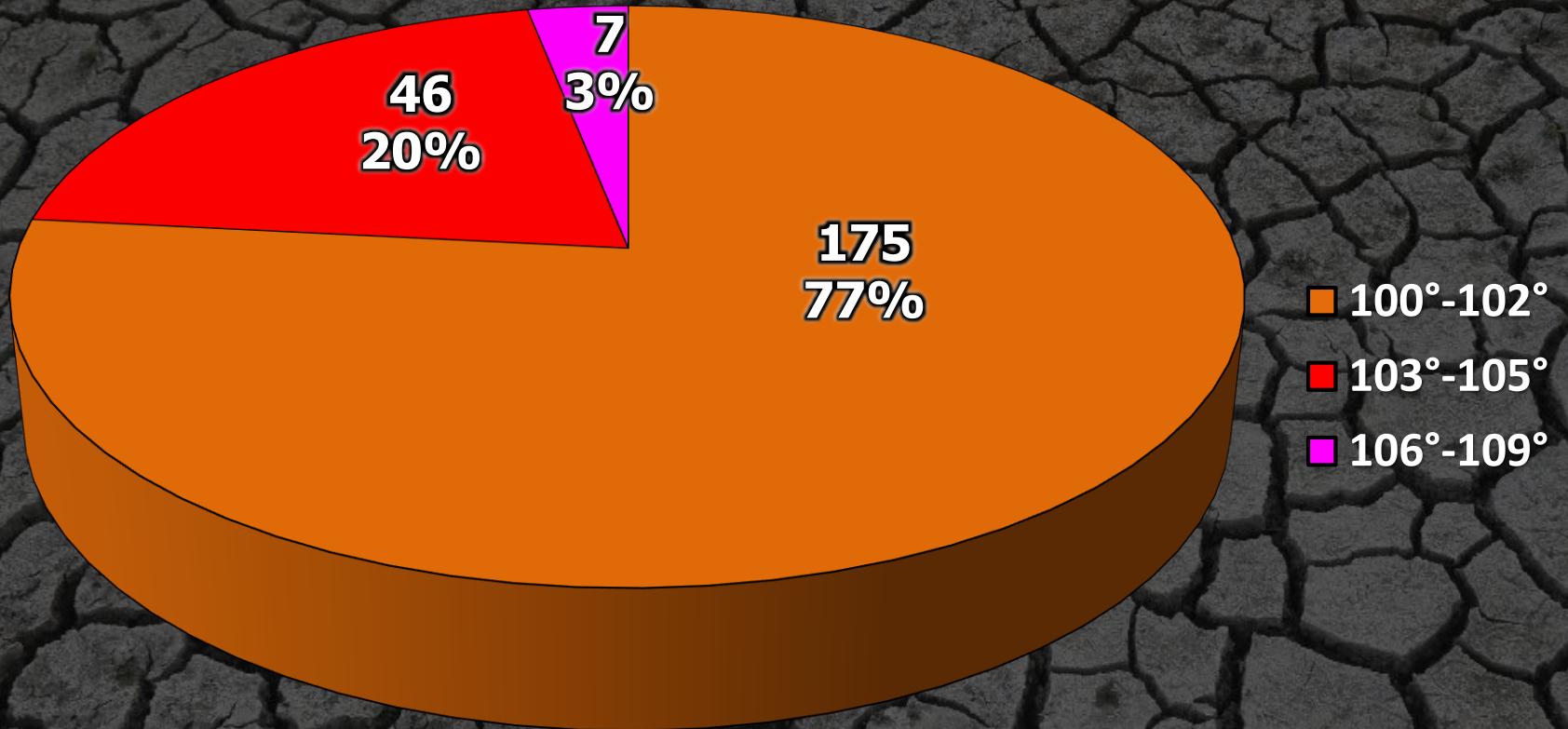
100-Degree Stats

- **The average first occurrence of a 100-degree day is July 15**
 - **The earliest 100-degree temperature occurred on June 15, 1952**
- **The average last occurrence of a 100-degree day is August 5**
 - **The latest 100-degree temperature occurred on September 11, 1983**

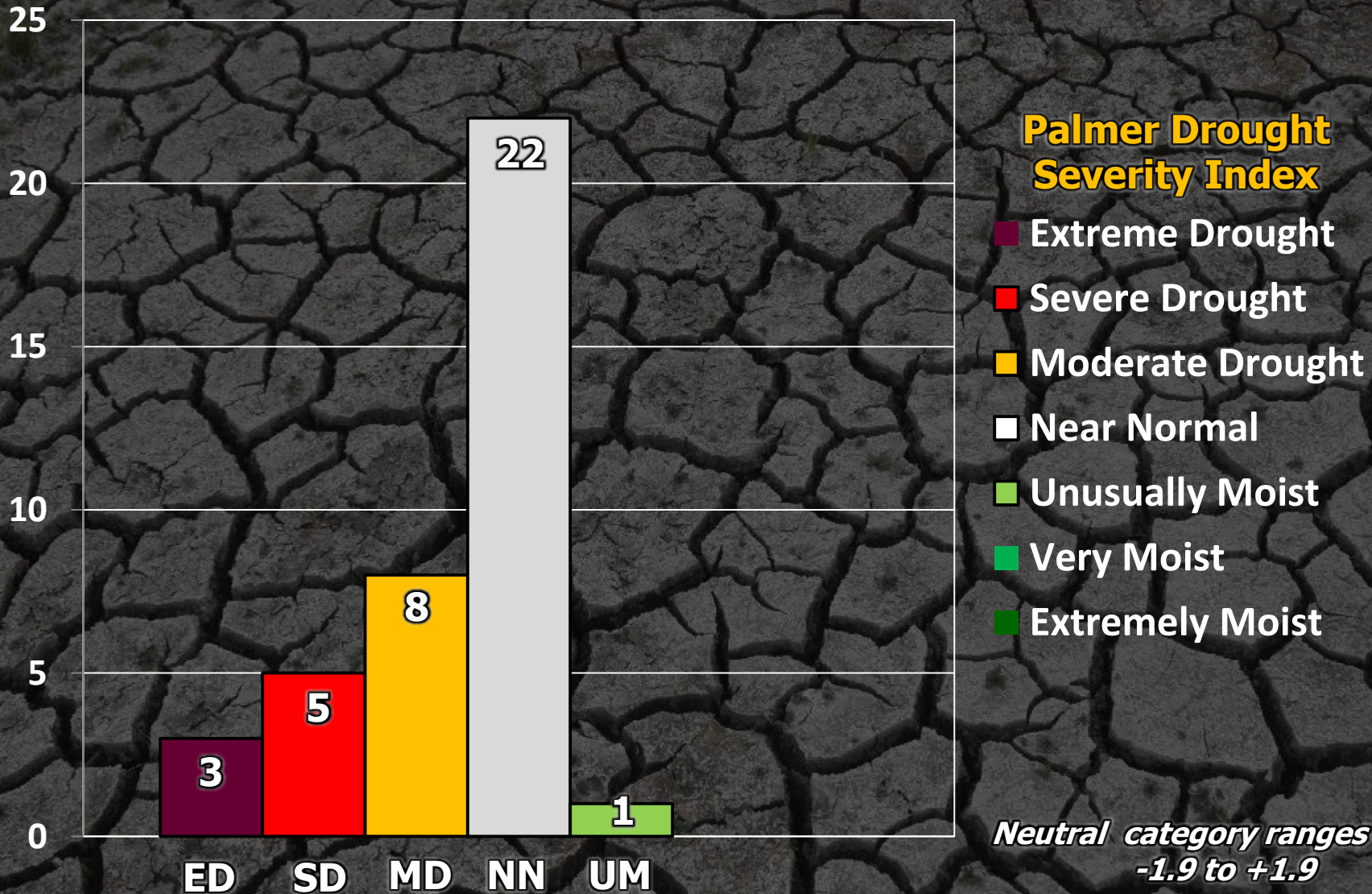
Monthly Frequency



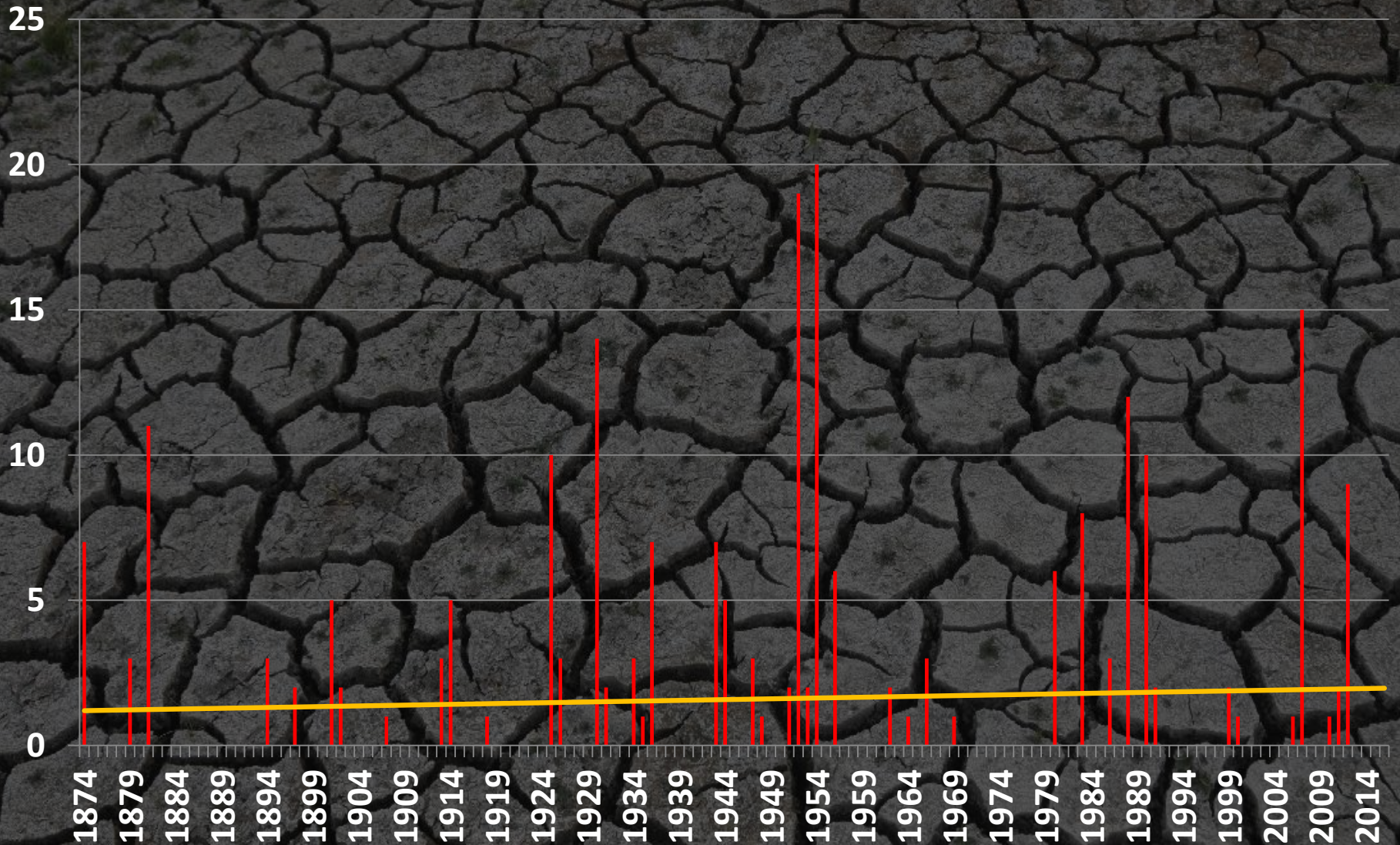
Temperature Distribution



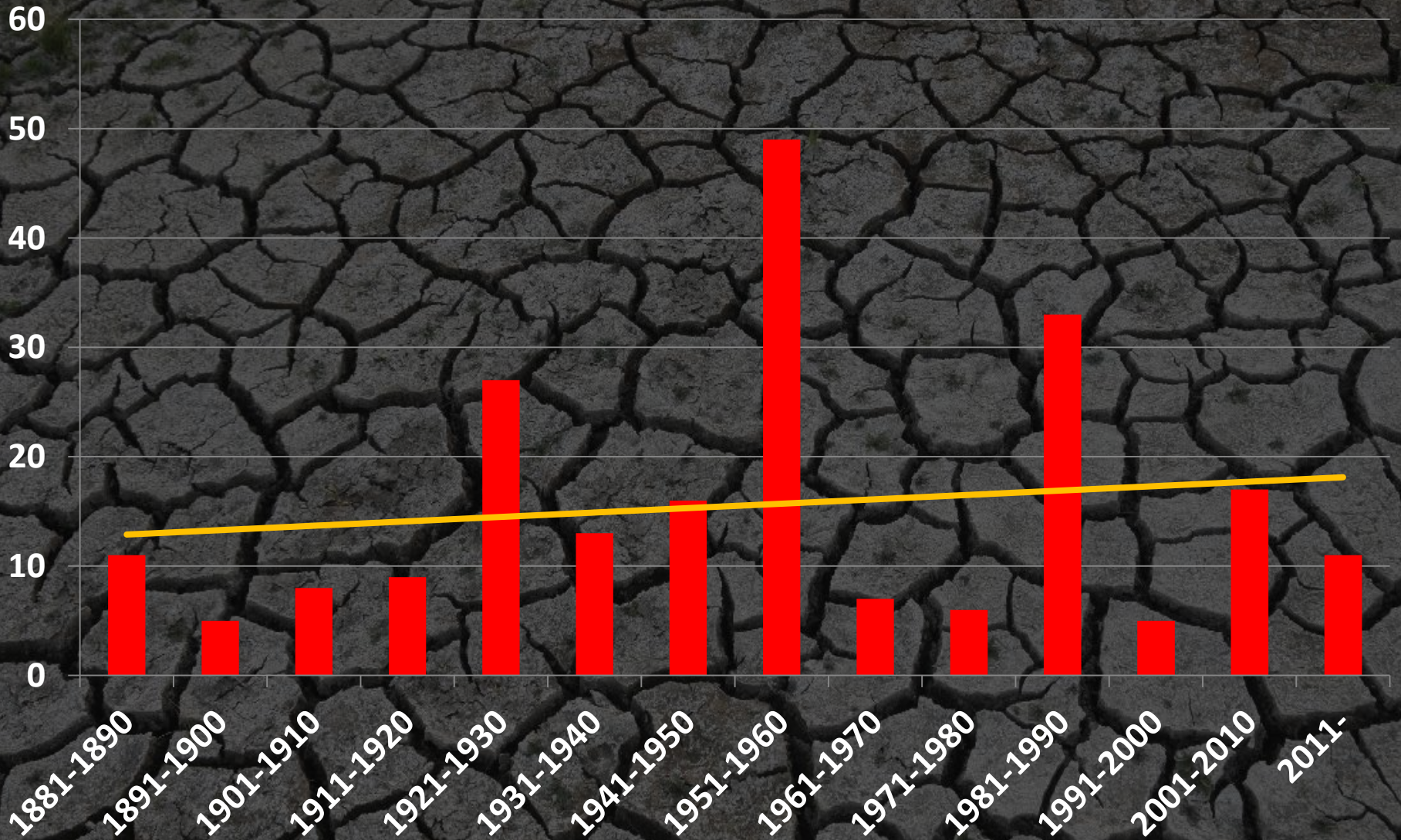
100-Degree Years vs. Long-Term Drought



Annual 100-Degree Days



Decadal 100-Degree Days

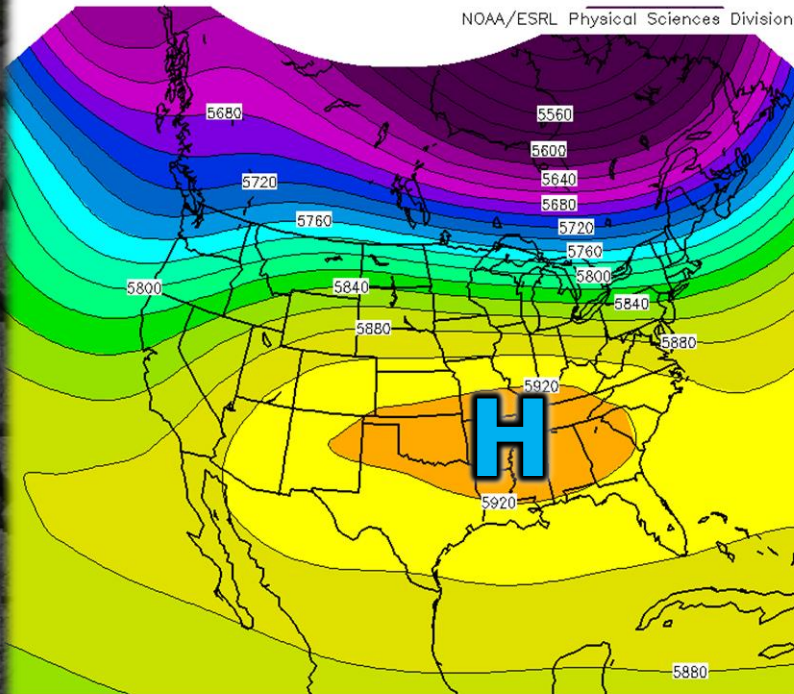




Synoptic Pattern

500 hPa Heights

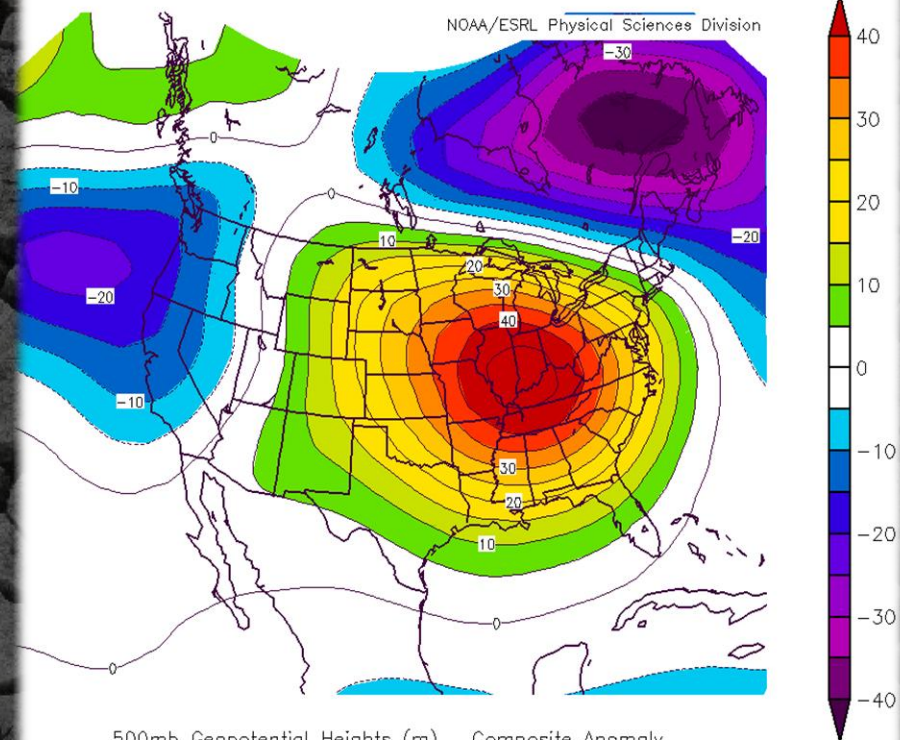
NOAA/ESRL Physical Sciences Division



500mb Geopotential Heights (m) Composite Mean
NCEP/NCAR Reanalysis

500 hPa Mean

NOAA/ESRL Physical Sciences Division

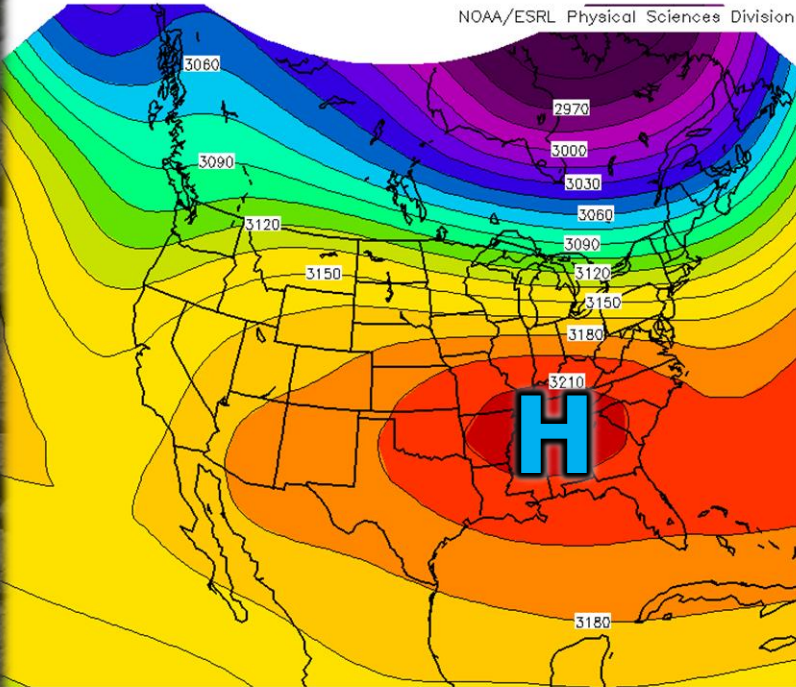


500mb Geopotential Heights (m) Composite Anomaly
NCEP/NCAR Reanalysis

500 hPa Anomaly

700 hPa Heights

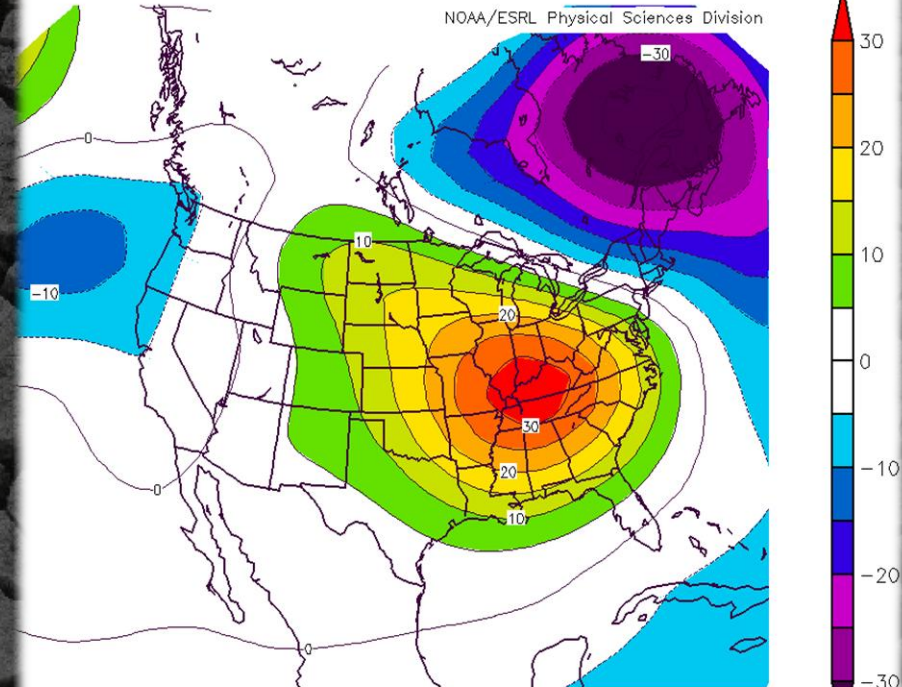
NOAA/ESRL Physical Sciences Division



700mb Geopotential Heights (m) Composite Mean
NCEP/NCAR Reanalysis

700 hPa Mean

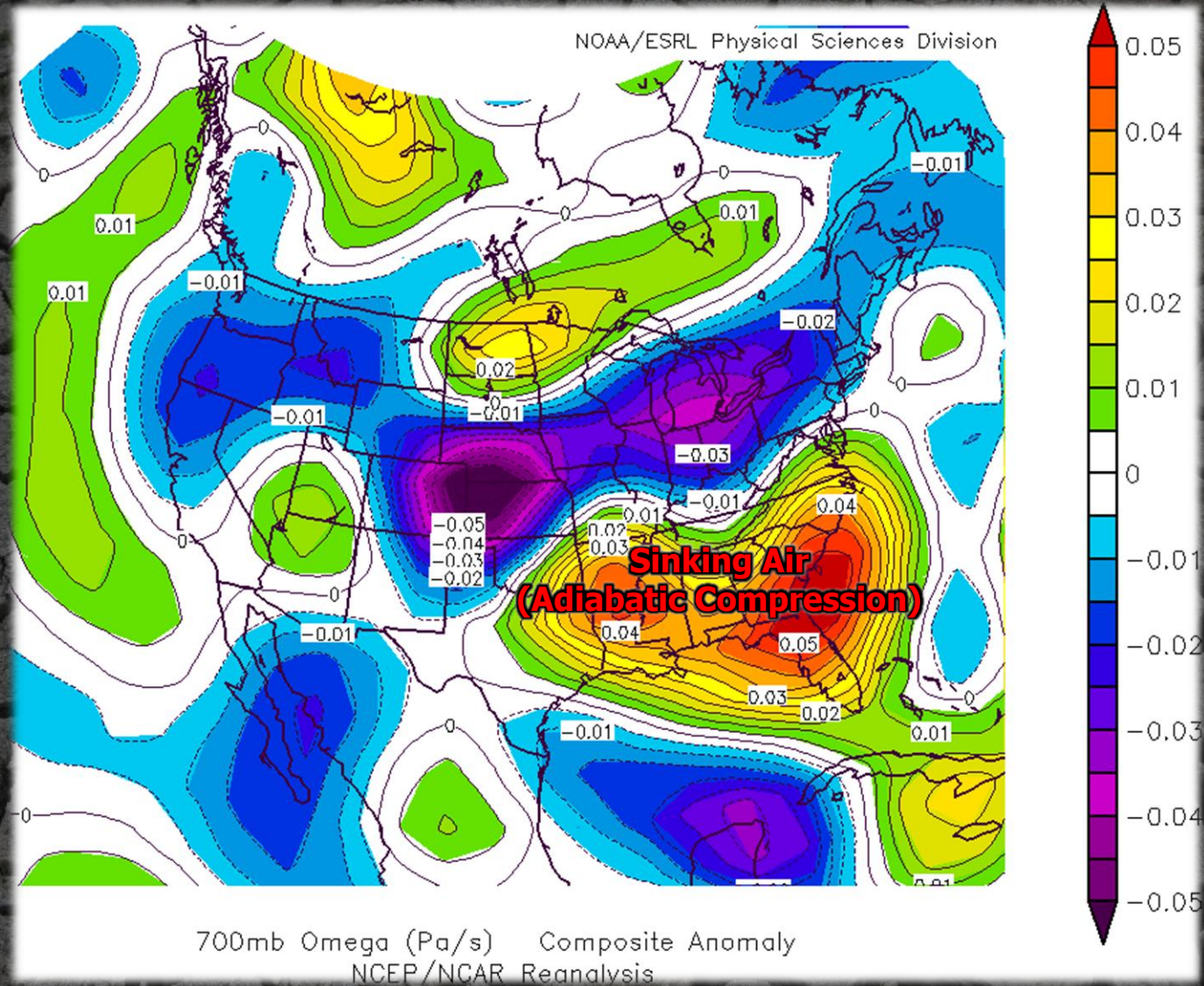
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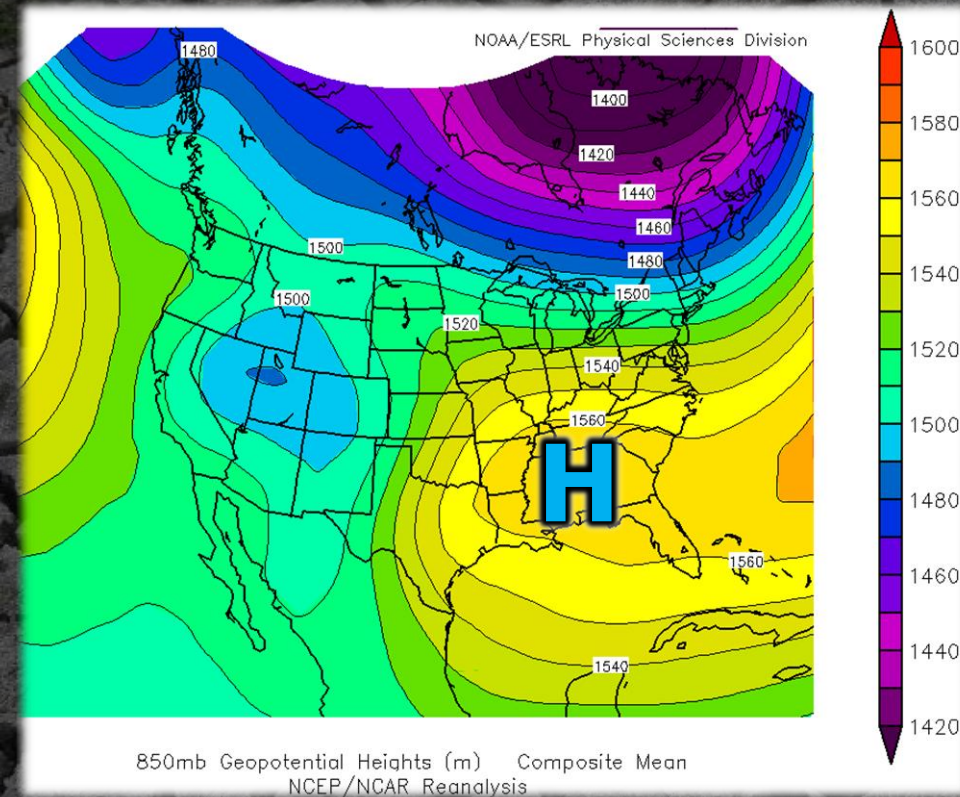
700mb Geopotential Heights (m) Composite Anomaly
NCEP/NCAR Reanalysis

700 hPa Anomaly

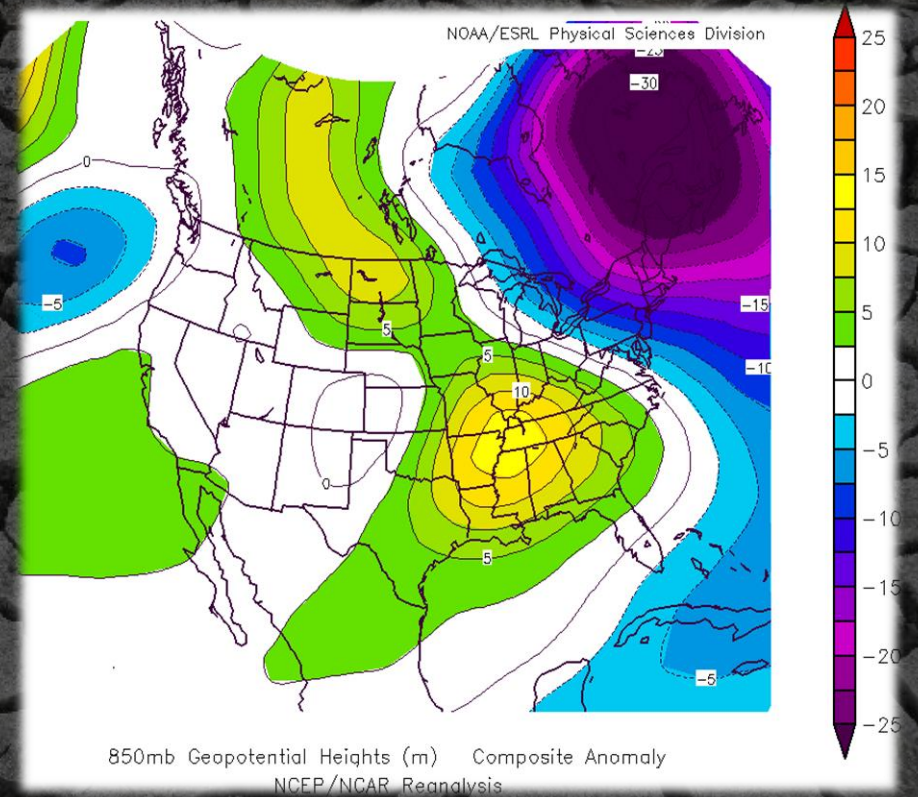
700 hPa Omega



850 hPa Heights



850 hPa Mean



850 hPa Anomaly

Composite Sounding

TROP Lvl: -- m AGL
FRZG Lvl: 4742 m AGL
BL Hgt: 12547 m AGL
LCL Hgt: 2489 m AGL
Water: 3.68 cm
Hail: 0.64 cm
T2Gust: 58 kt
WindEx: 63 kt
SWEAT: 169.9
CAP: 3.5
Boyden: 100.0
S(TT): 36.0
KO: -13.7
LI: -2.0
TT: 46.9
KI: 30.3
Tc: 40.7 °C

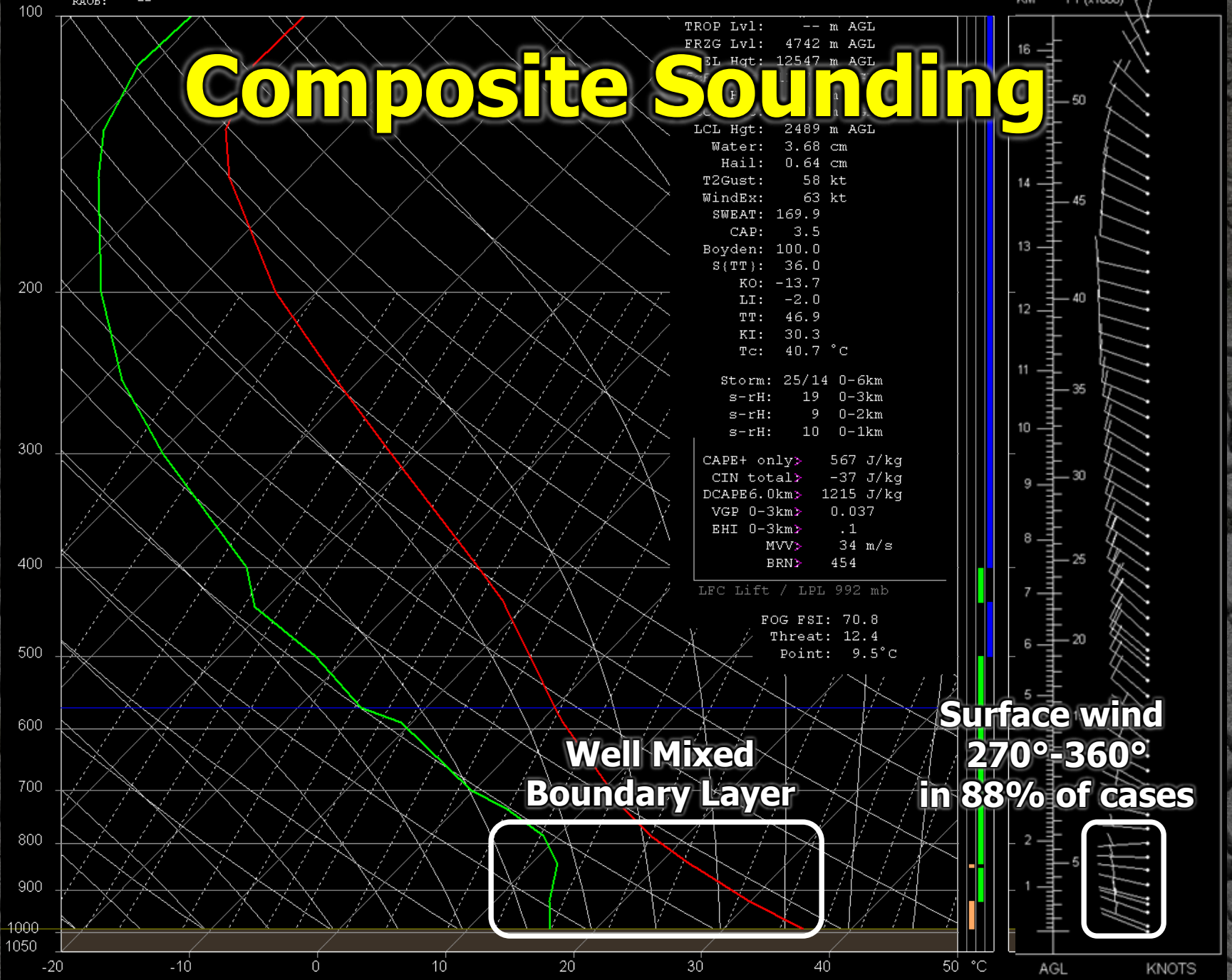
Storm: 25/14 0-6km
s-rH: 19 0-3km
s-rH: 9 0-2km
s-rH: 10 0-1km

CAPE+ only> 567 J/kg
CIN total> -37 J/kg
DCAPE6.0km> 1215 J/kg
VGP 0-3km> 0.037
EHI 0-3km> .1
MVV> 34 m/s
BRN> 454

LFC Lift / LPL 992 mb
FOG FSI: 70.8
Threat: 12.4
Point: 9.5 °C

**Well Mixed
Boundary Layer**

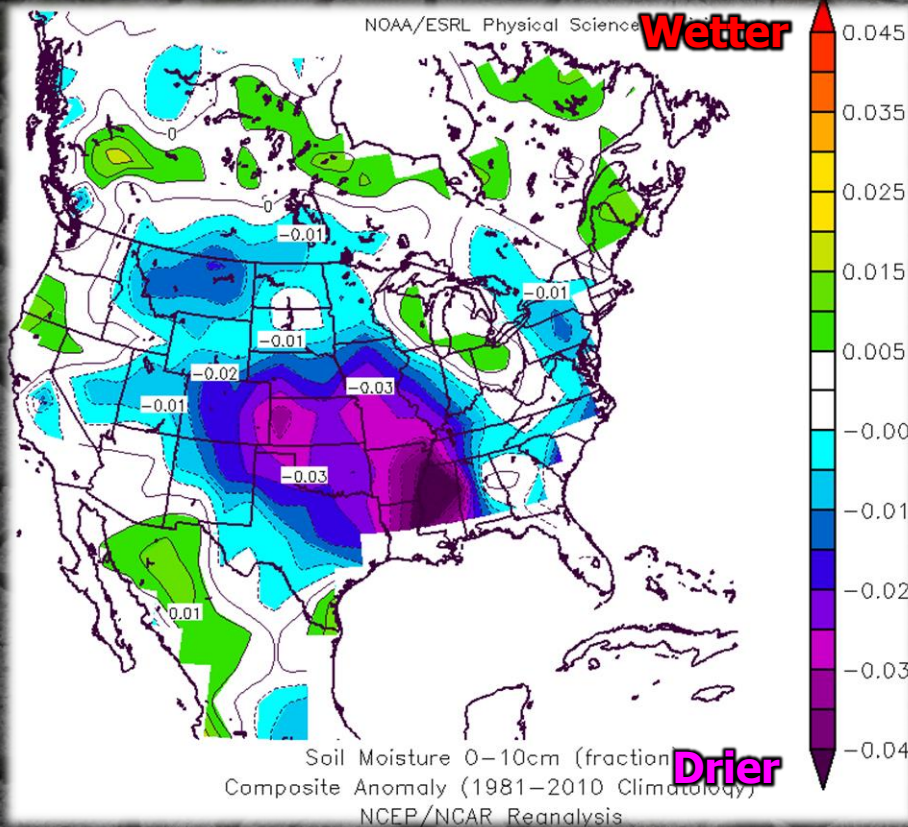
**Surface wind
270°-360°
in 88% of cases**



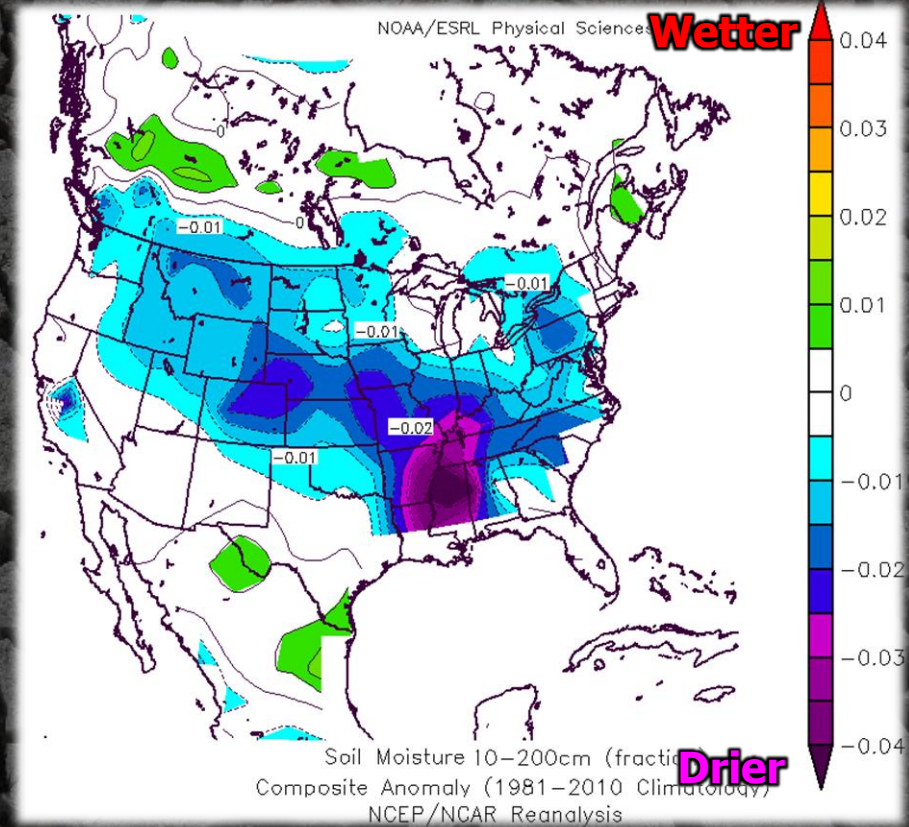


Moisture & Rainfall

Soil Moisture



Shallow Soil Moisture Anomaly



Deep Soil Moisture Anomaly

Rainfall

	Previous 30-Days Rain	30-Day Departure	Year-To- Date Departure	Days Since Last 1" Rain
Mean	1.65"	-1.99"	-4.18	54
Highest	6.90"	2.99	11.75	170
Lowest	0.05"	-4.35	-15.52	7

The 30-day rainfall departure was only above normal 8 times out of 228 times. 96.5% of the time a 100-degree temperature occurred, the 30-day rainfall departure was below normal.

Rainfall -- Isolated vs. Multiple 100-Degree Days

Isolated 100 Days (< 4)	30-Day Departure	Year-To-Date Departure	Days Since Last 1" Rain
Mean	-1.19"	-1.16	46

Multiple 100 Days (> 4)	30-Day Departure	Year-To-Date Departure	Days Since Last 1" Rain
Mean	-2.01"	-4.48	54

T-Test	30-Day Departure	Year-To-Date Departure	Days Since Last 1" Rain
P-value	0.04	0.01	0.27

30-day & YTD rainfall departure are statistically significant between isolated 100 days and multiple 100 days.

Dew Points -- Isolated vs. Multiple 100-Degree Days

Isolated 100 Days (< 4)	Dew Point
Mean	67.3°

Multiple 100 Days (> 4)	Dew Point
Mean	64.1°

T-Test	Dew Point
P-value	0.03

Dew point is statistically significant between isolated 100 days and multiple 100 days.

100-Degree Decision Tree

