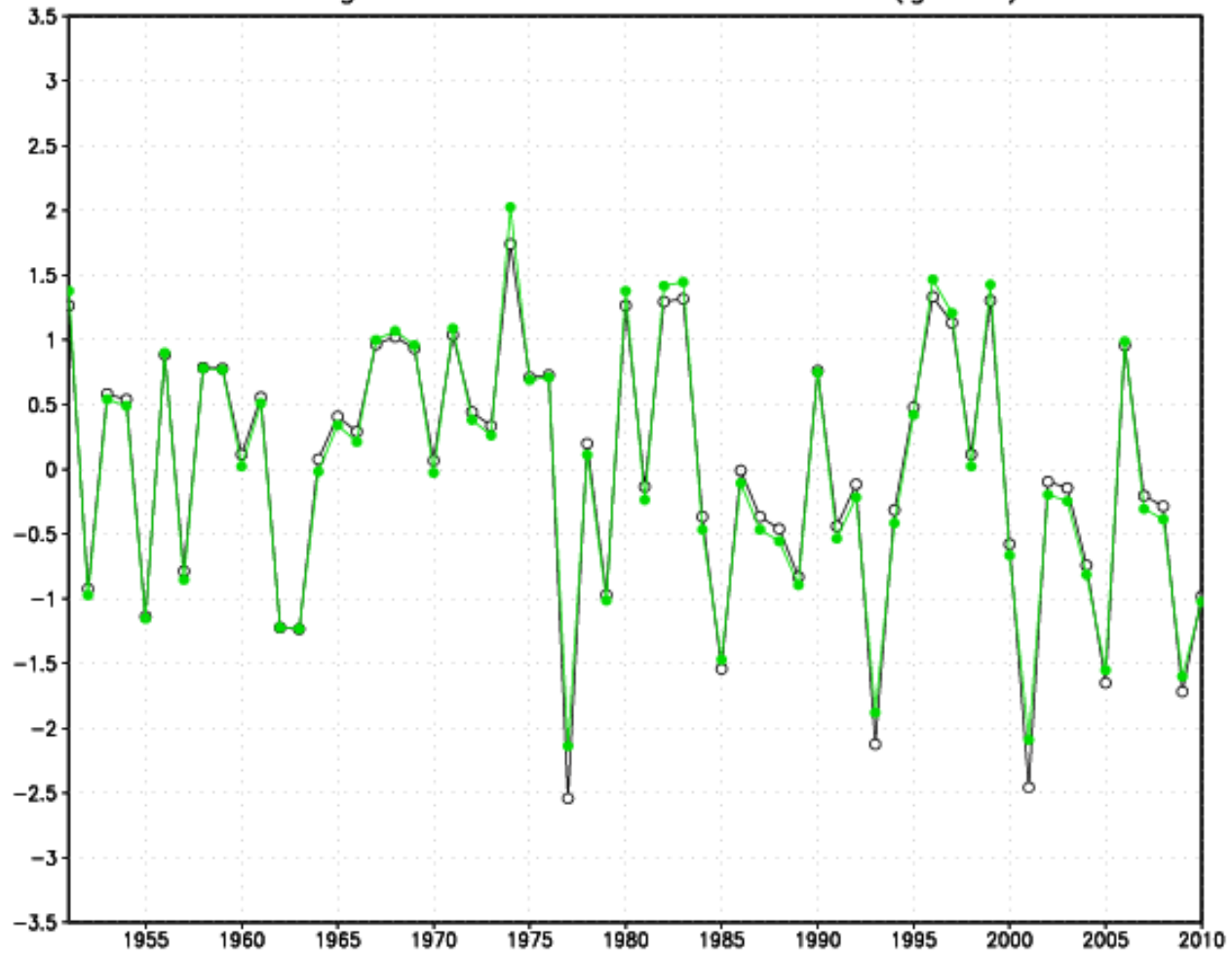


Homework #3 Key
ATMO 529, Fall 2013
80 points total

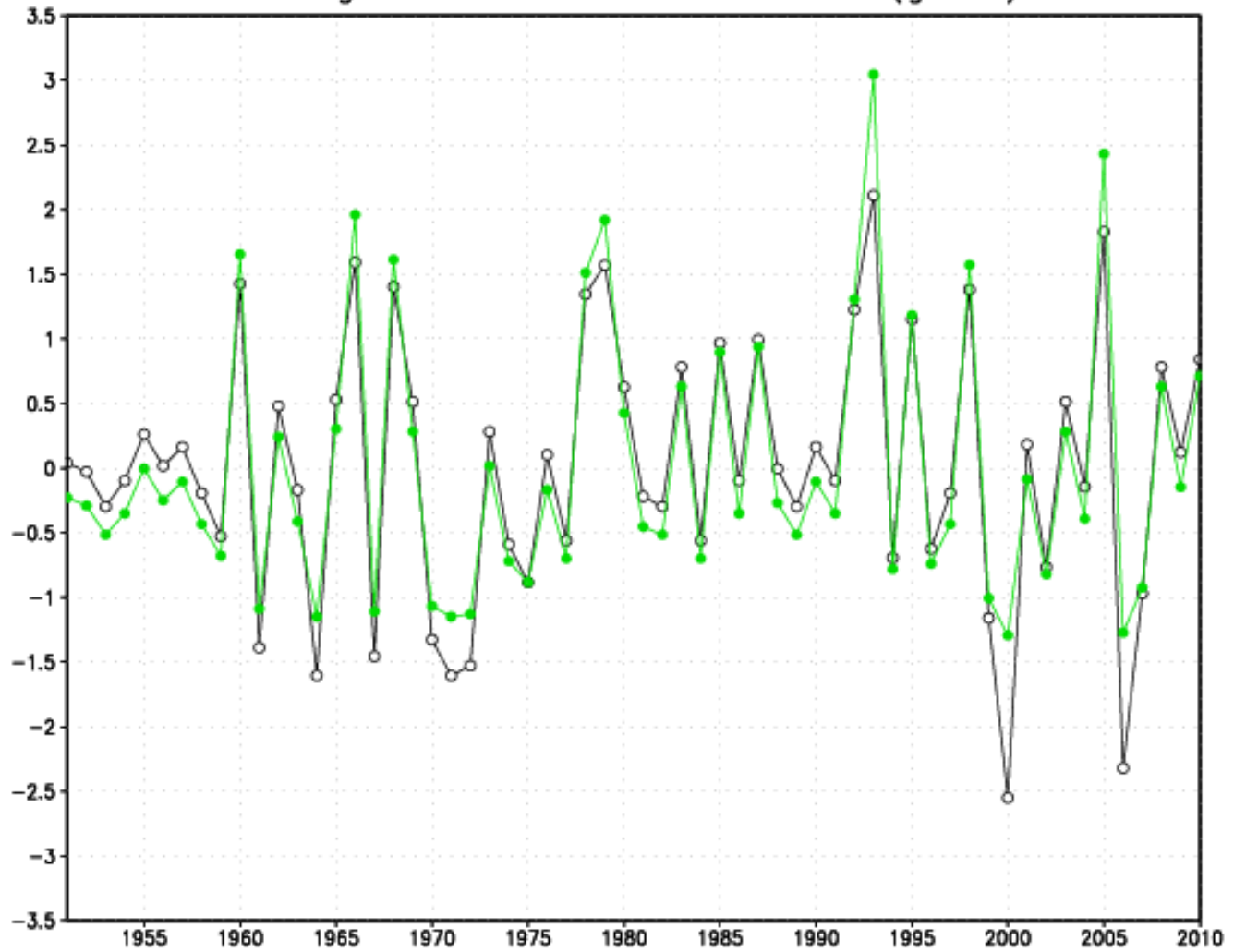
Part I: Computation of Winter SPI at
Phoenix and Seattle

20 points

Seattle: 3 month winter SPI (white)
and gaussian-normalized rainfall (green)



Phoenix: 3 month winter SPI (white)
and gaussian-normalized rainfall (green)



Part II: Composite analyses of UDEL
DJF precipitation anomalies, based on
Phoenix and Seattle extreme
precipitation years
30 points

Composite SPI years, critical t-value Seattle, WA

High years (10)

1951	1.26
1968	1.02
1971	1.03
1974	1.74
1980	1.26
1982	1.29
1983	1.31
1996	1.33
1998	1.13
1999	1.30

Low years(9)

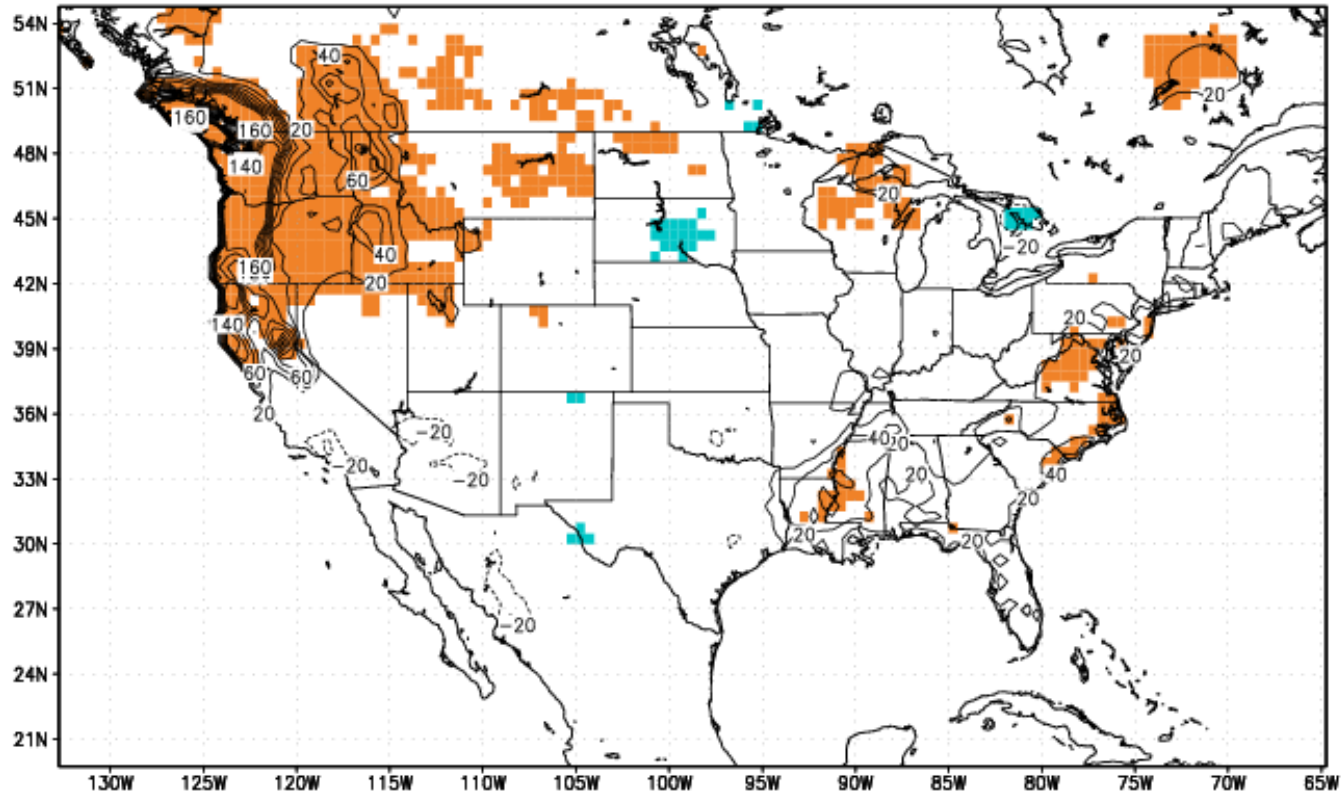
1955	-1.13
1962	-1.22
1963	-1.23
1977	-2.54
1985	-1.54
1993	-2.12
2001	-2.45
2005	-1.65
2009	-1.71

DOF = 17

tcrit at 90% level = 1.74

(plus or minus since 2-tailed test)

High Minus Low Winter SPI Years: Seattle, WA
Precipitation Anomaly Differences (mm)



Points with real data on grid = 5802

Statistically significant points = 903 (15% of total data points)

Composite SPI years, critical t-value Phoenix, AZ

High years (10)

1960	1.43
1966	1.52
1968	1.40
1978	1.34
1979	1.57
1992	1.22
1993	2.11
1995	1.15
1998	1.38
2005	1.82

Low years(9)

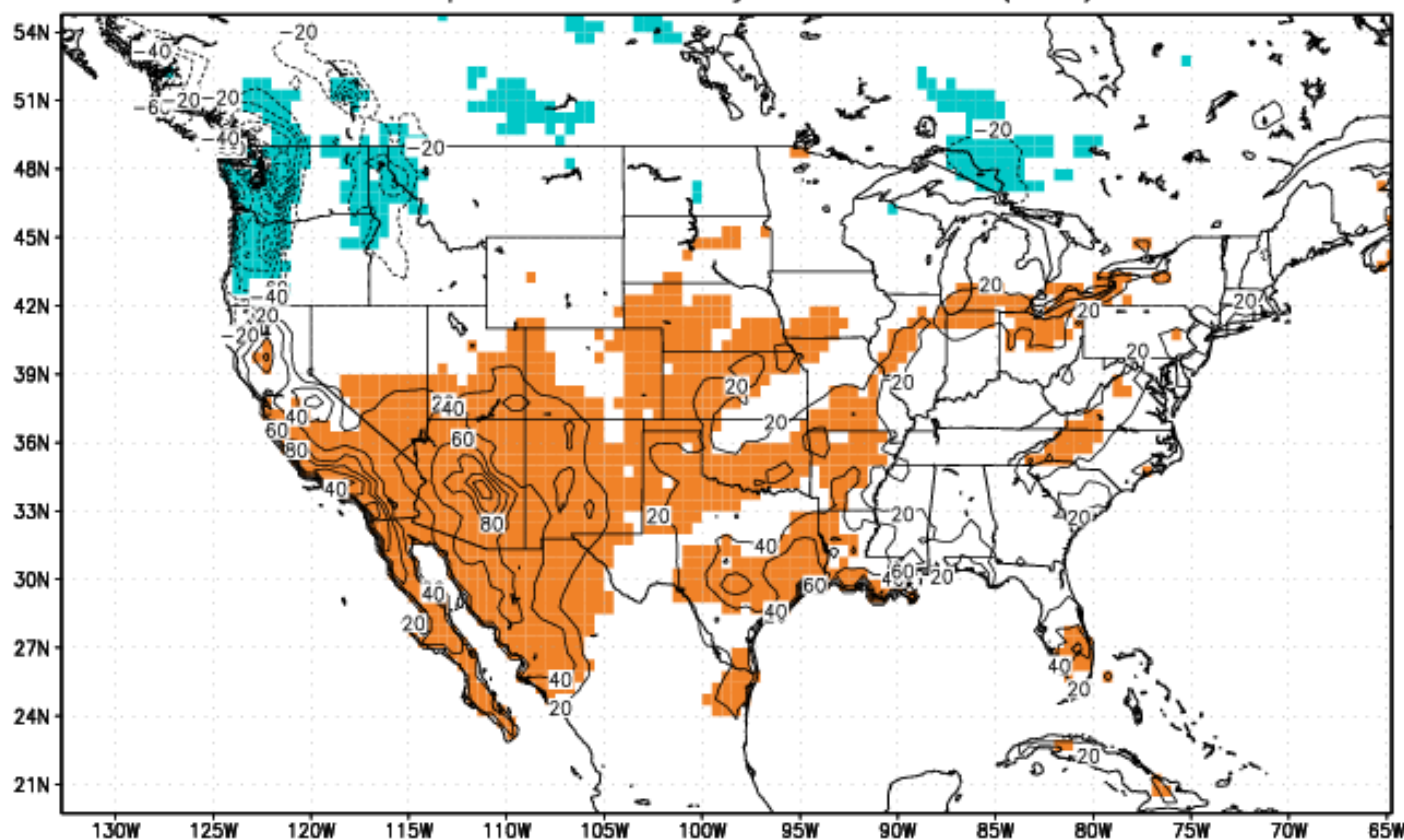
1961	-1.38
1964	-1.60
1967	-1.45
1970	-1.32
1971	-1.60
1972	-1.52
1999	-1.15
2000	-2.55
2006	-2.32

DOF = 17

tcrit at 90% level = 1.74

(plus or minus since 2-tailed test)

High Minus Low Winter SPI Years: Phoenix, AZ Precipitation Anomaly Differences (mm)

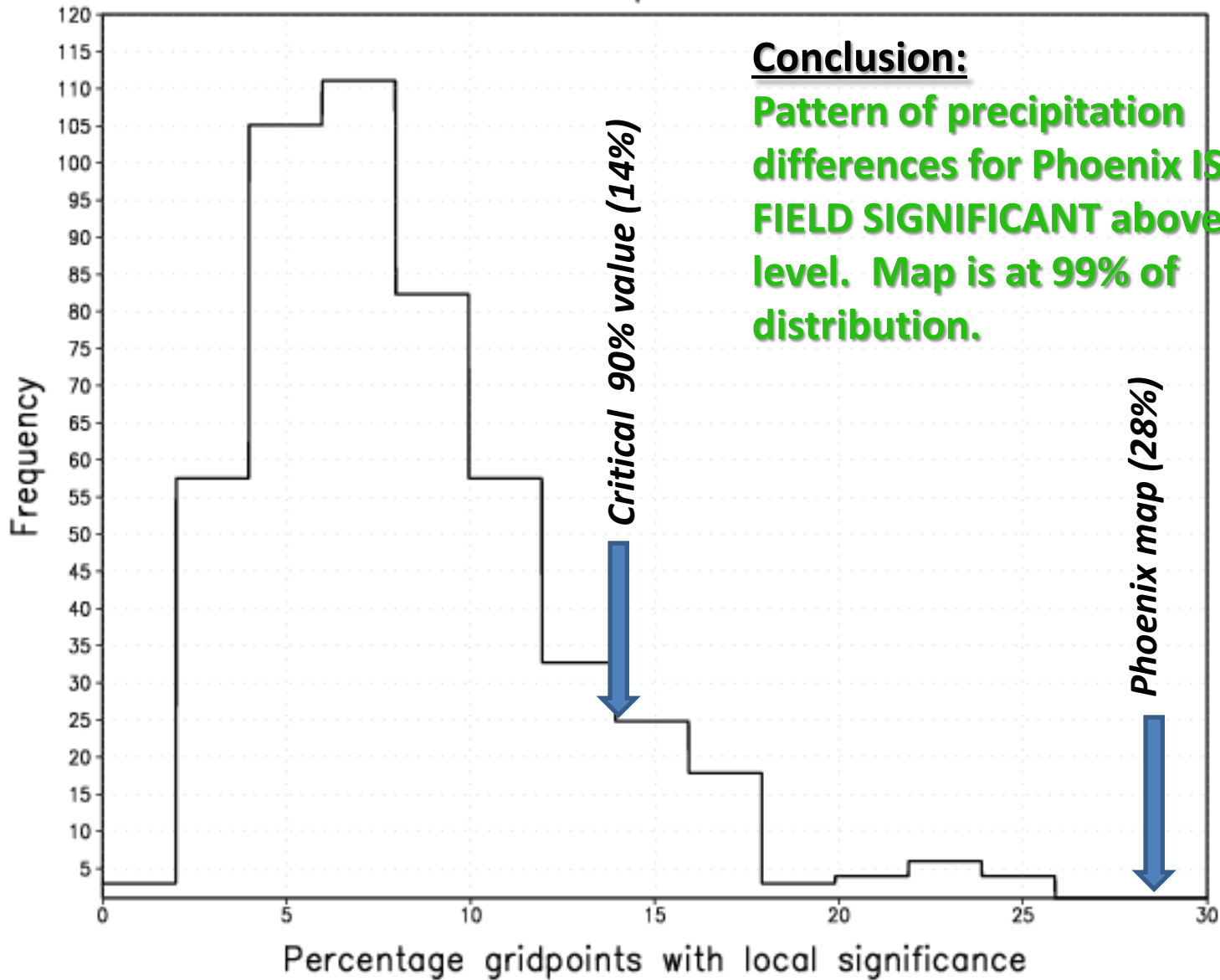


Points with real data on grid = 5777

Statistically significant points = 1639 (28% of total data points)

Part III: Field significance tests
30 points

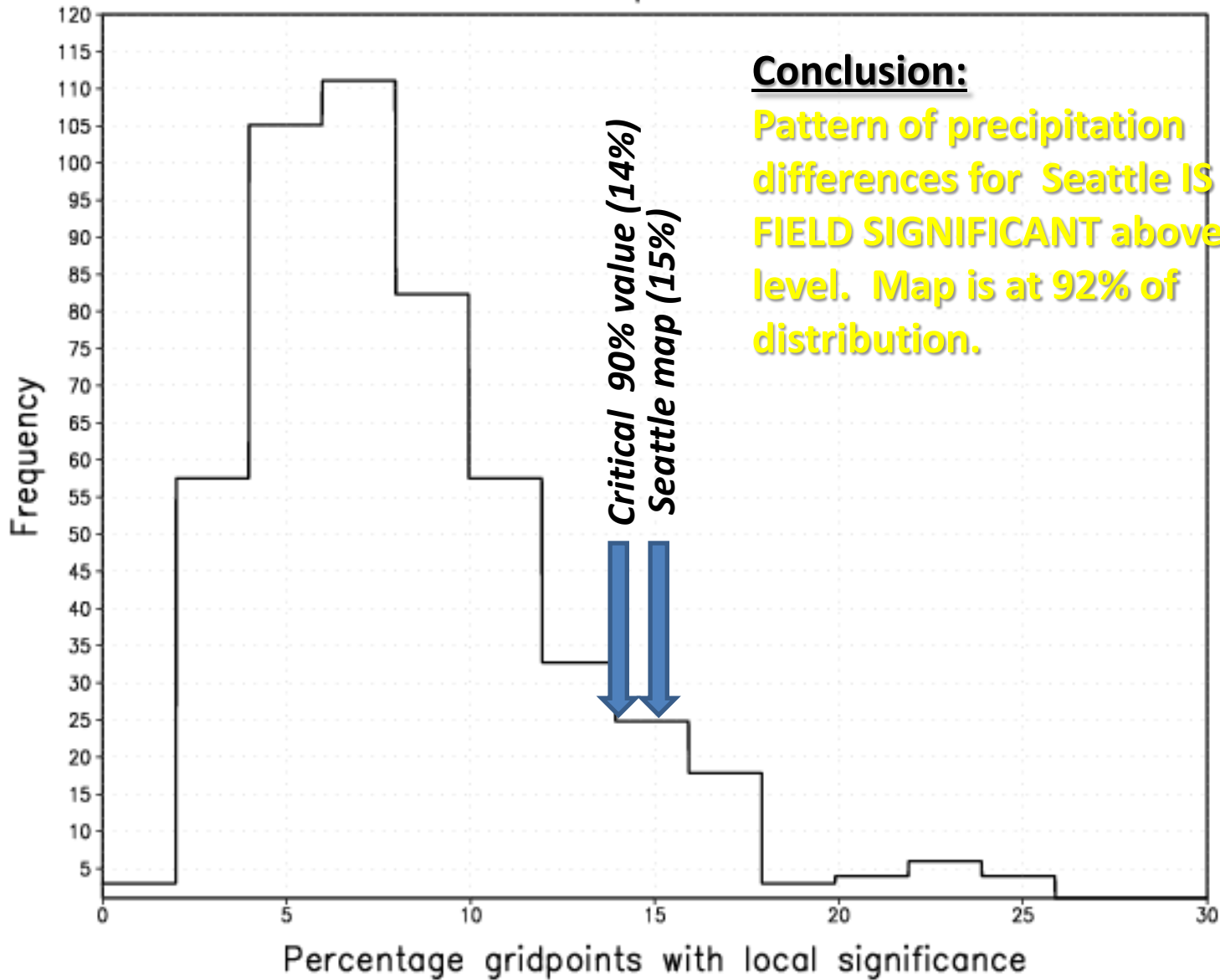
Null Distribution for Field Significance Precipitation



Conclusion:

Pattern of precipitation differences for Phoenix IS QUITE FIELD SIGNIFICANT above the 90% level. Map is at 99% of distribution.

Null Distribution for Field Significance Precipitation



Conclusion:

Pattern of precipitation differences for Seattle IS BARELY FIELD SIGNIFICANT above the 90% level. Map is at 92% of distribution.