Assessment Of The Severe Weather Environment Of North America Simulated By CCSM3

Patrick Marsh
School of Meteorology
University of Oklahoma

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Background

- "...there is little guidance from AOGCMs concerning the future behavior of tornadoes, hail, or lightning."

- "Due to the fact that these severe weather phenomena are sub-grid scale...we cannot reach any definitive conclusions concerning possible future increases in hail and lightning, and there is no information from AOGCMs concerning future change in tornado activity."

- IPCC Third Assessment

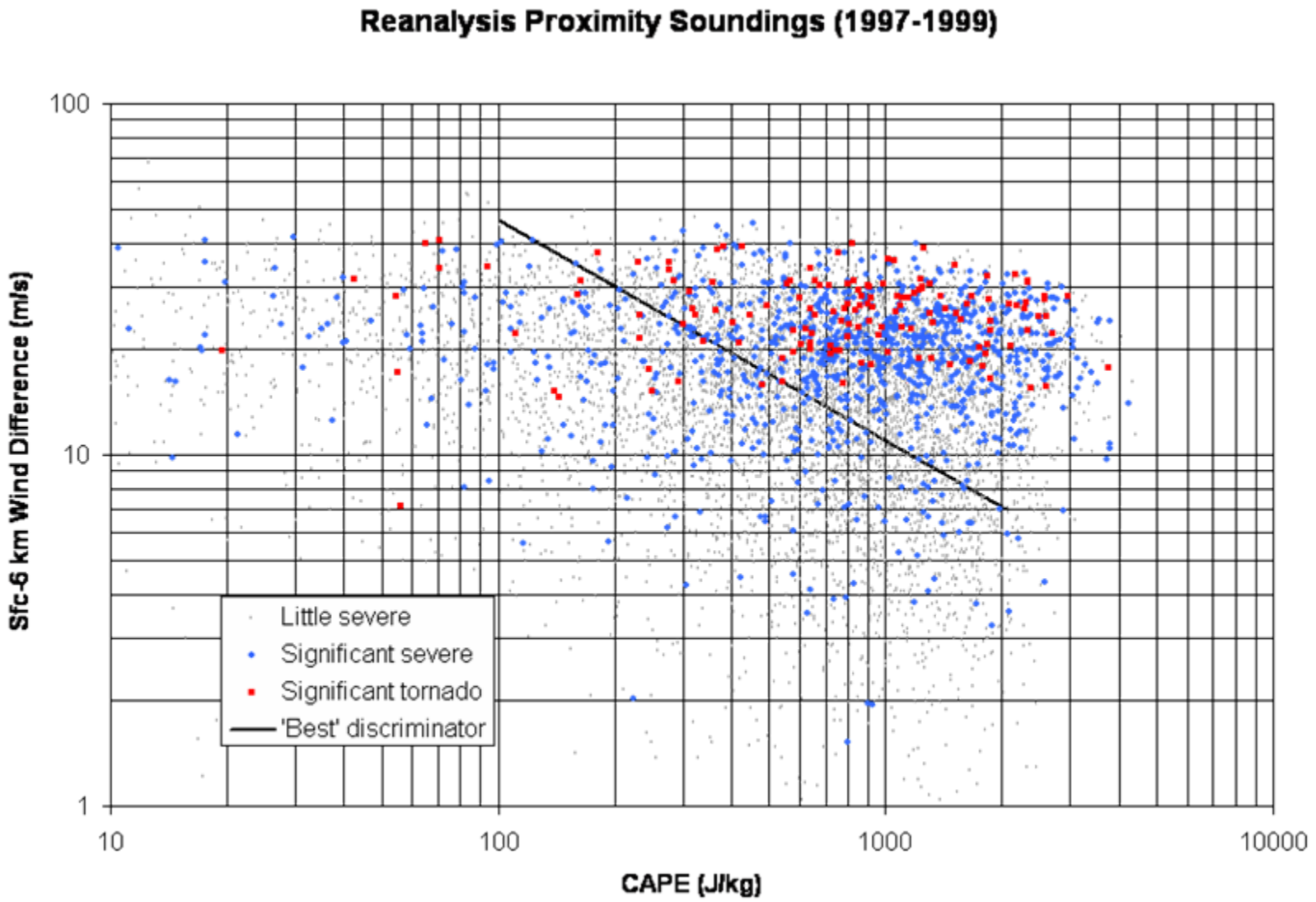
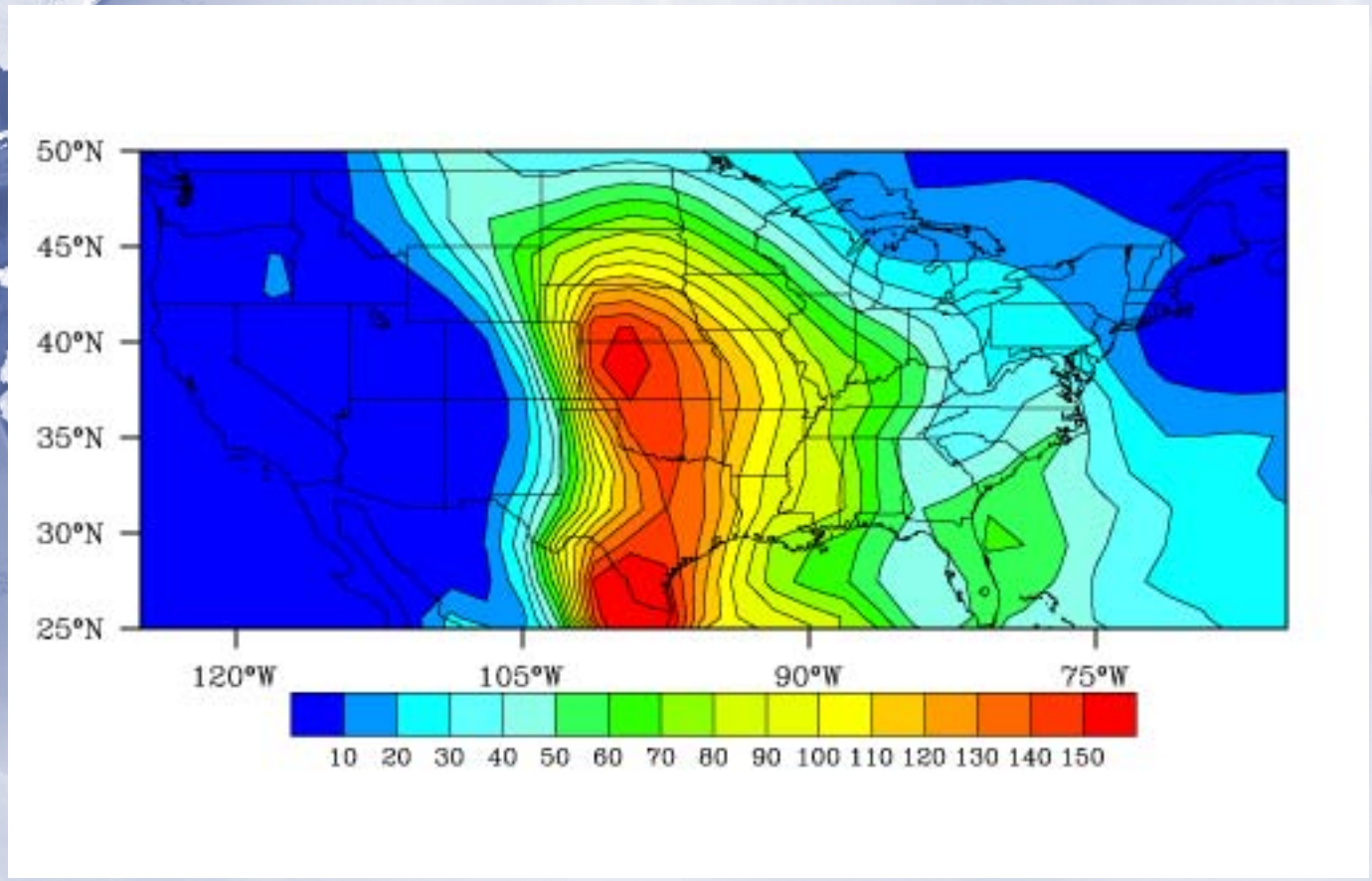
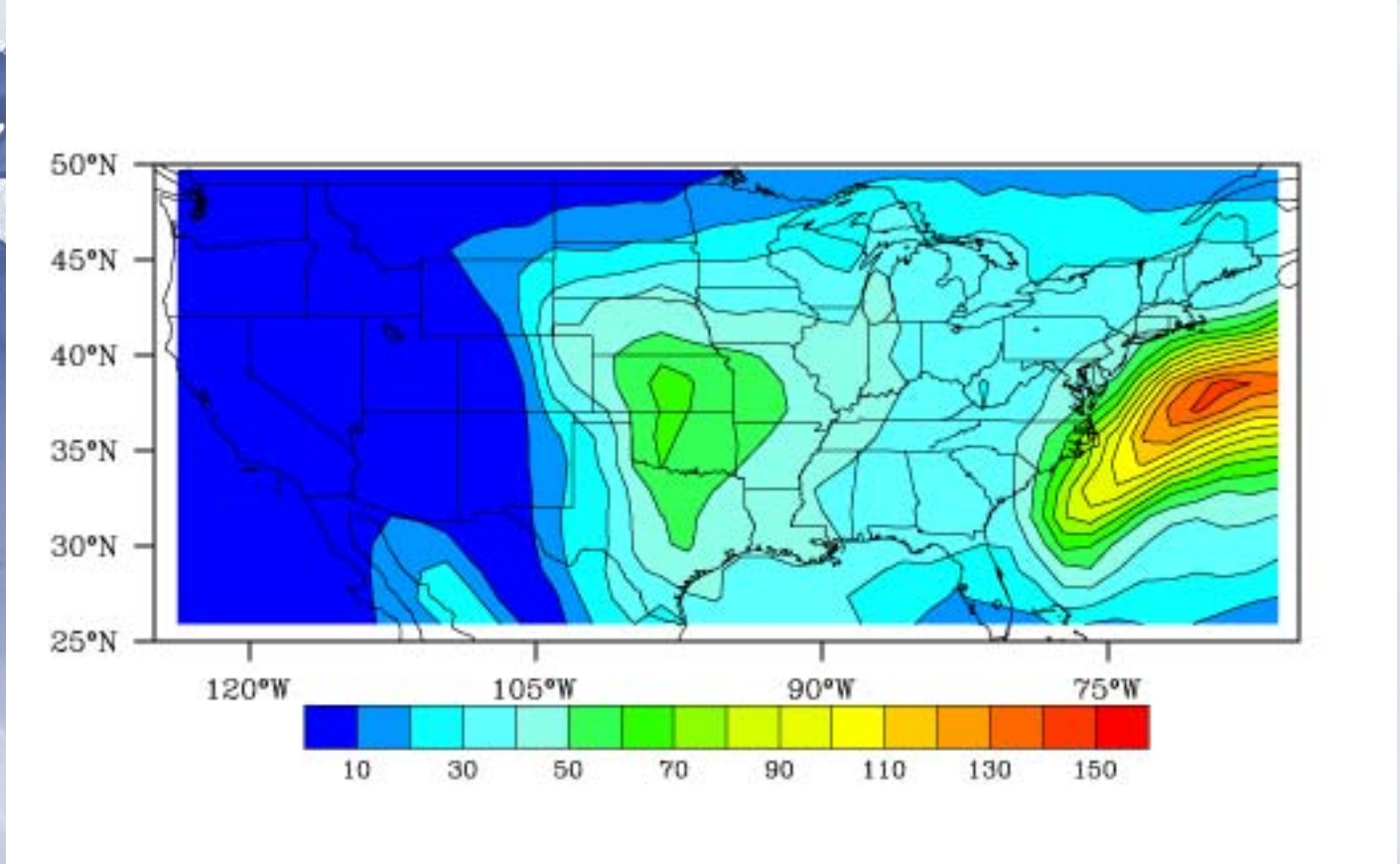


Image taken from Brooks et al., 2003

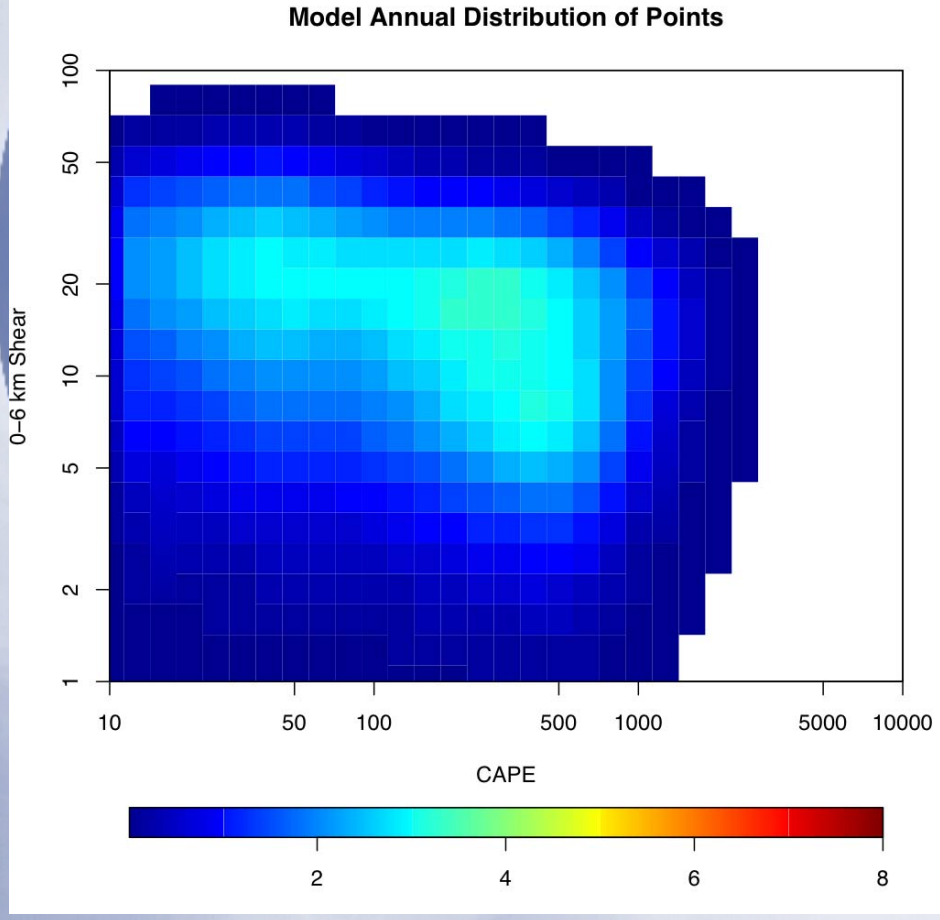
*Average number of 6 hour periods per year with CAPE*Shear > 10,000 (Global Reanalysis)*

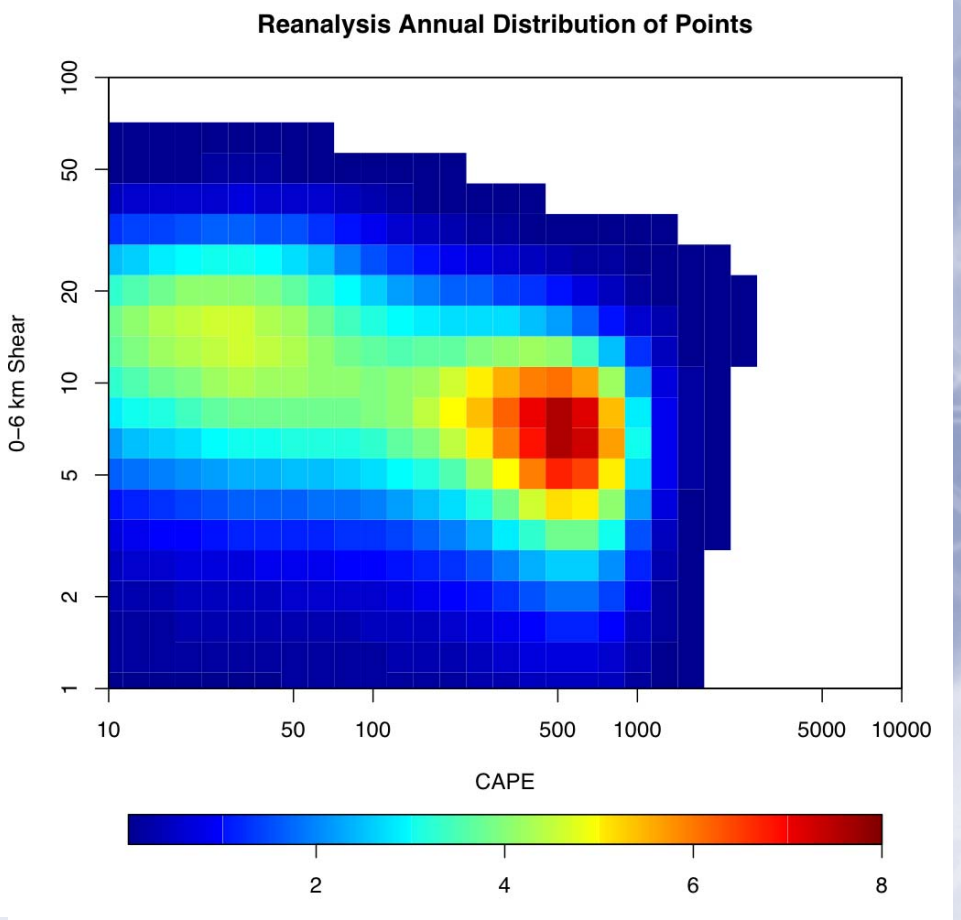


*Average number of 6 hour periods per year with CAPE*Shear > 10,000 (CCSM3)*

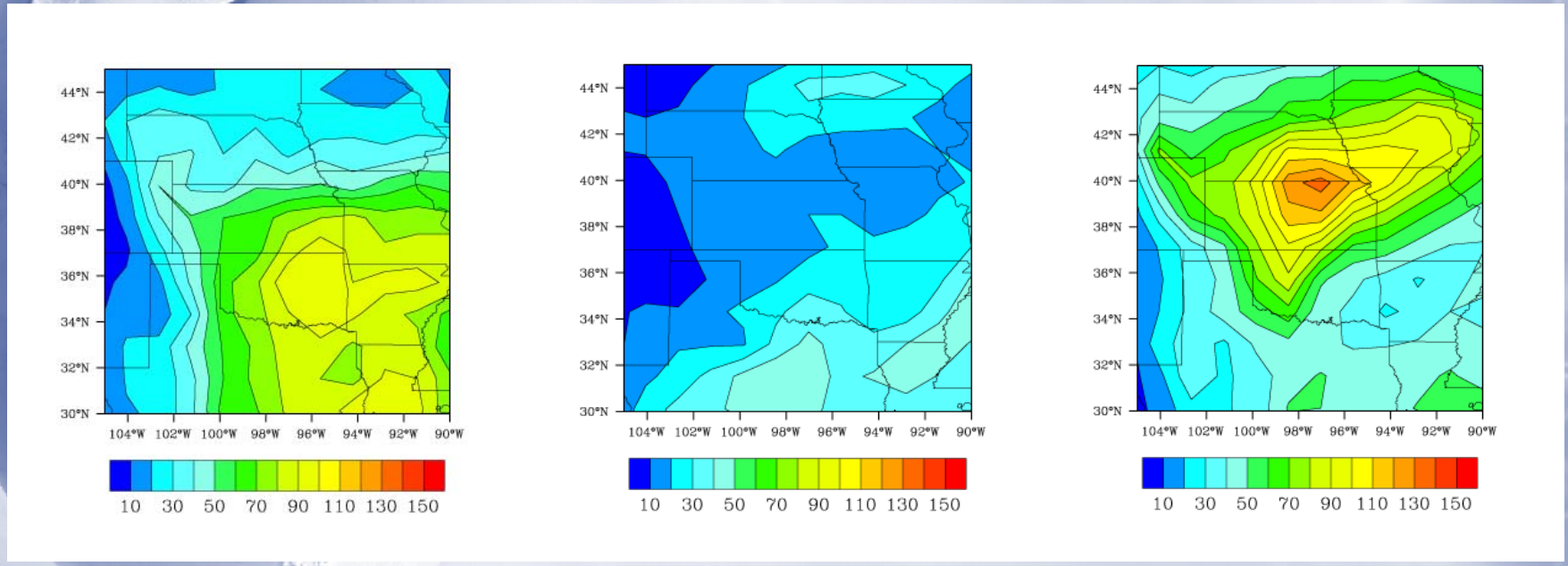


Normalized CAPE - Shear Distribution (Central)



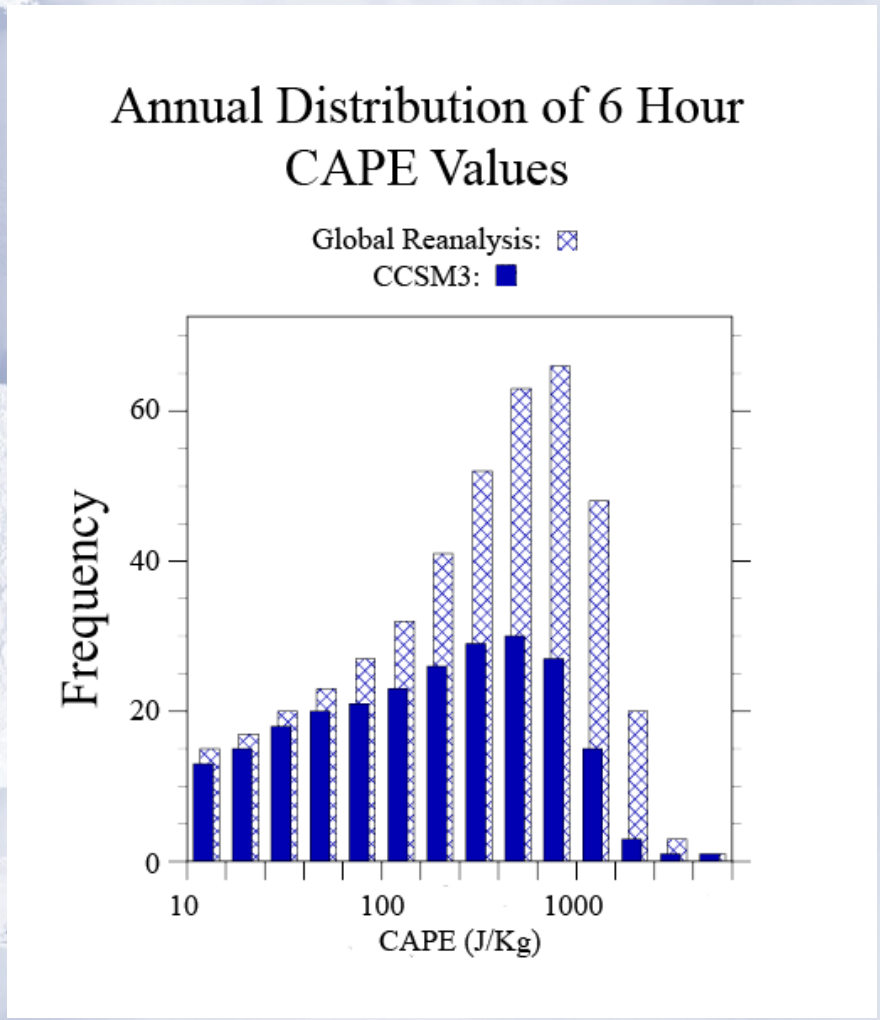


*Number of 6 hour periods with Cape*Shear > 10,000*

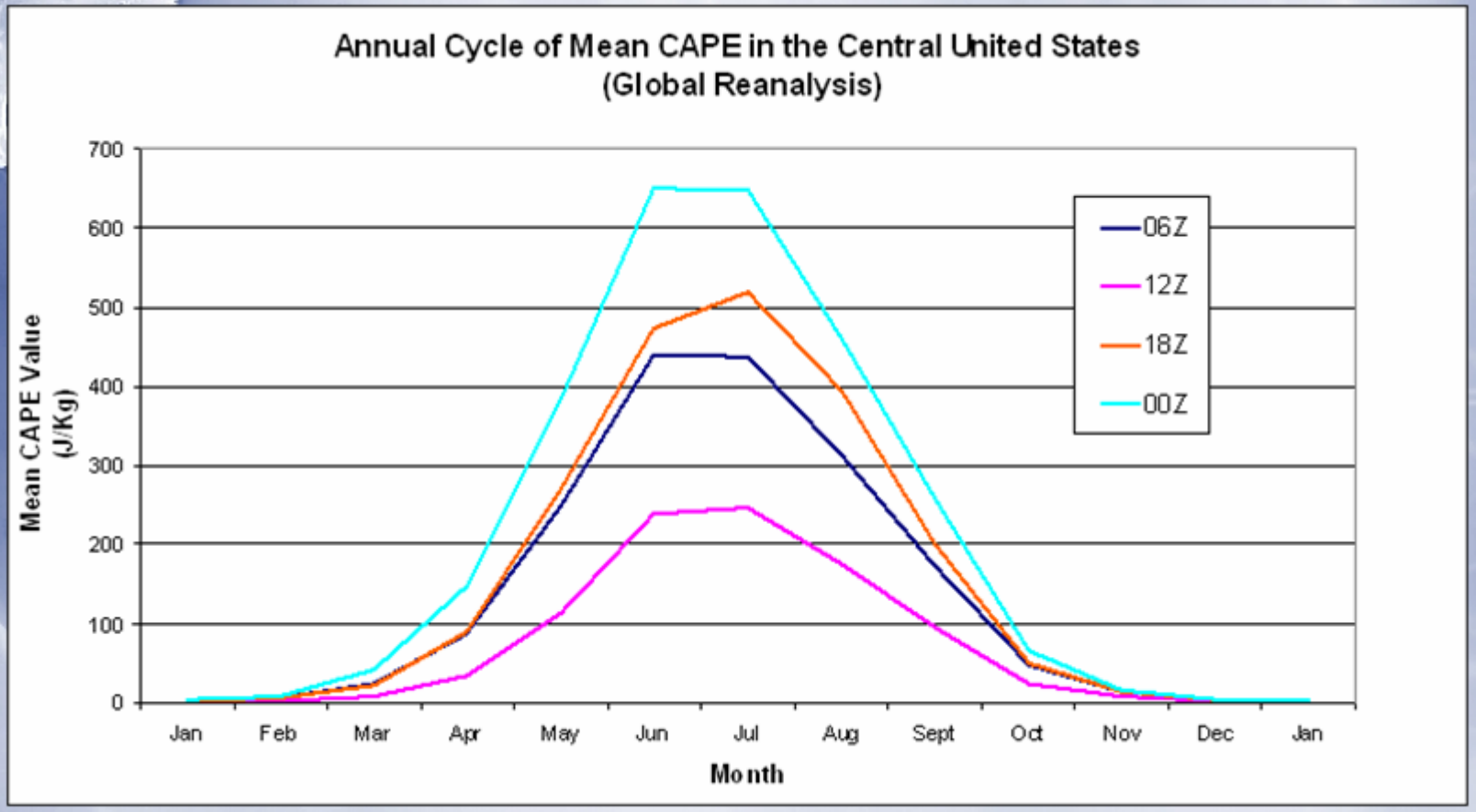


1990 1996 1999

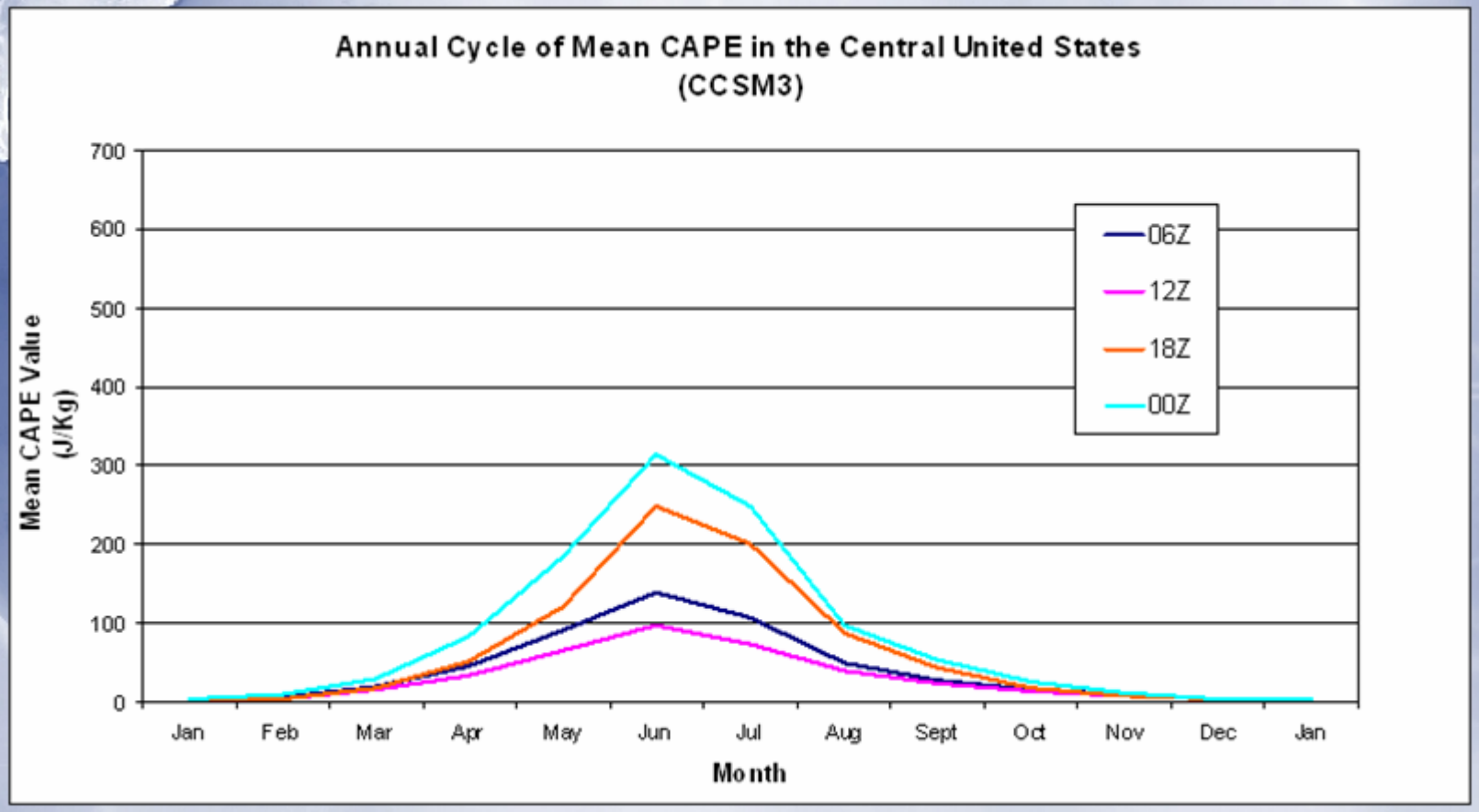
Normalized CAPE Distributions (Central)



Mean CAPE by Month per 6 hour period (Global Reanalysis)



Mean CAPE by Month per 6 hour period (CCSM3)



Conclusions

- CCSM3 resolves spatial distribution of CAPE reasonably well
- CCSM3 mean CAPE is about half of Global Reanalysis mean CAPE
- CCSM3 is a little high with the magnitude of the 0-6km shear