This 4kmx4km spatial Drought Index maps were generated based on PDSI methods and the 111 years PRISM dataset, in the 6 Southwest US states (including CA, NV, UT, CO, AZ and NM).

Precipitation and temperature time series data

PRISM(Daly et al., 1994, 2001, 2002, 2003; Daly, 2006) is a knowledge-based system developed primarily to interpolate climate elements in physiographically complex landscapes. Reports and papers describing PRISM are available from http://prism.oregonstate.edu. The data are available from 1895 to present (2010). This global monthly data product is provided at 4km x 4km spatial resolution. In this research we used 1900-2010, 111 years monthly precipitation and average temperature as input dataset for PDSI algorithm.

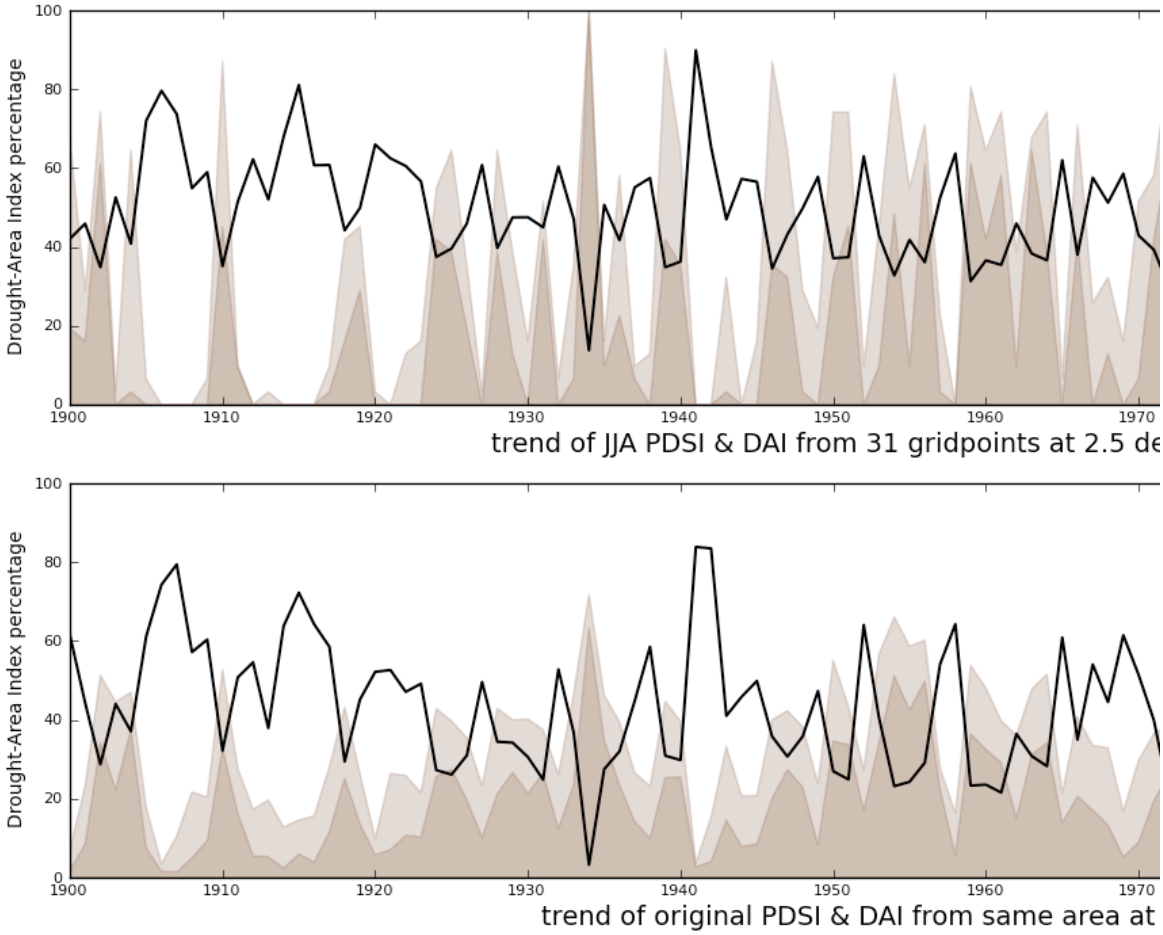

Figure 1: PDSI and Drought Area Index (DAI) Curve (TOP: Jeffrey's data from Cook et al, Bottom: from PRISM data by Jun), black line is annual PDSI, light fill-curve is percent area where PDSI < -1, deep fill-curve

is percent area with PDSI <-2. The results are slightly different between Cook et al and PRISM/PDSI because of the scale of data.

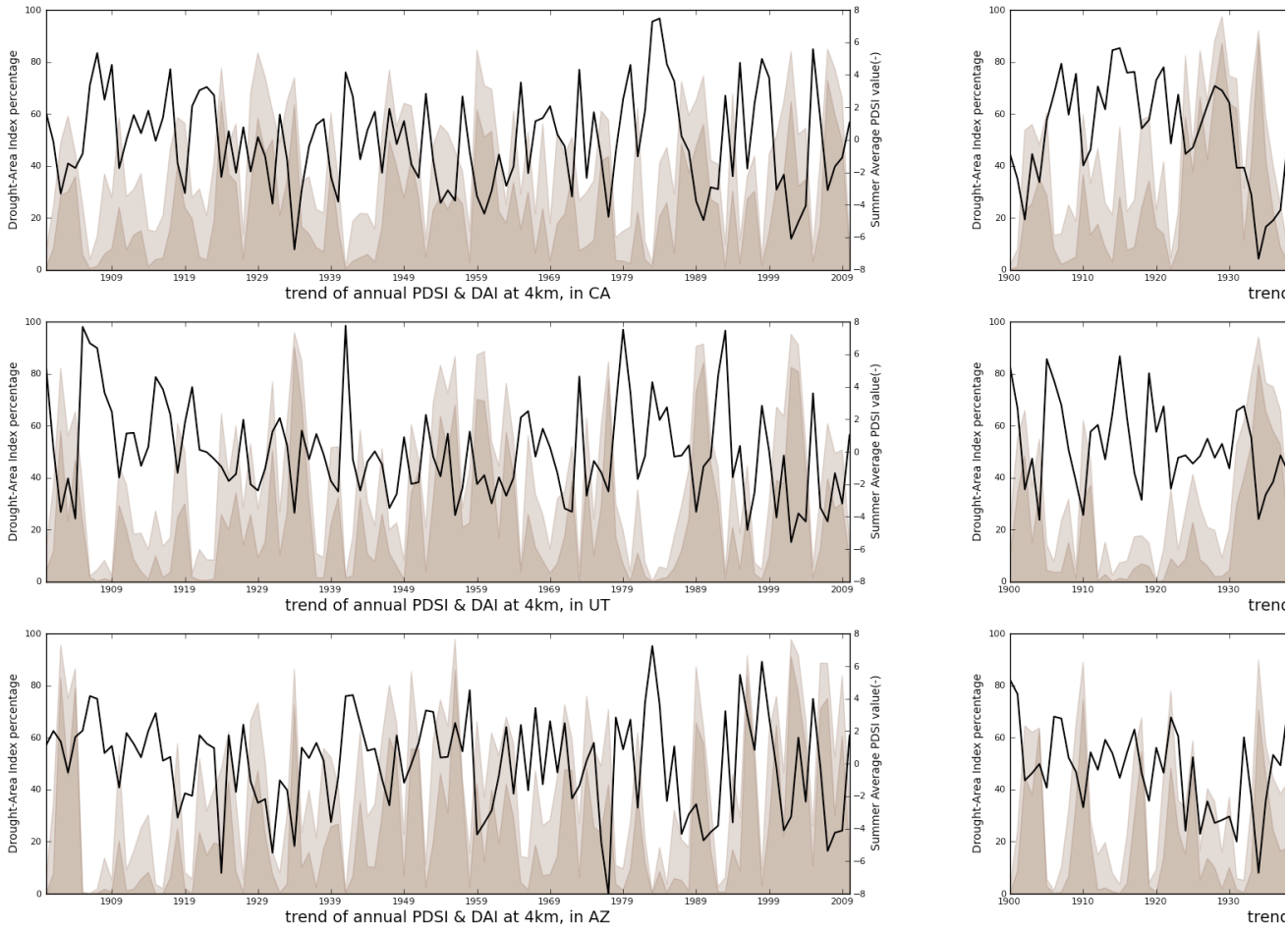

Figure 2: Same as above with PRISM data but for different states in SW.

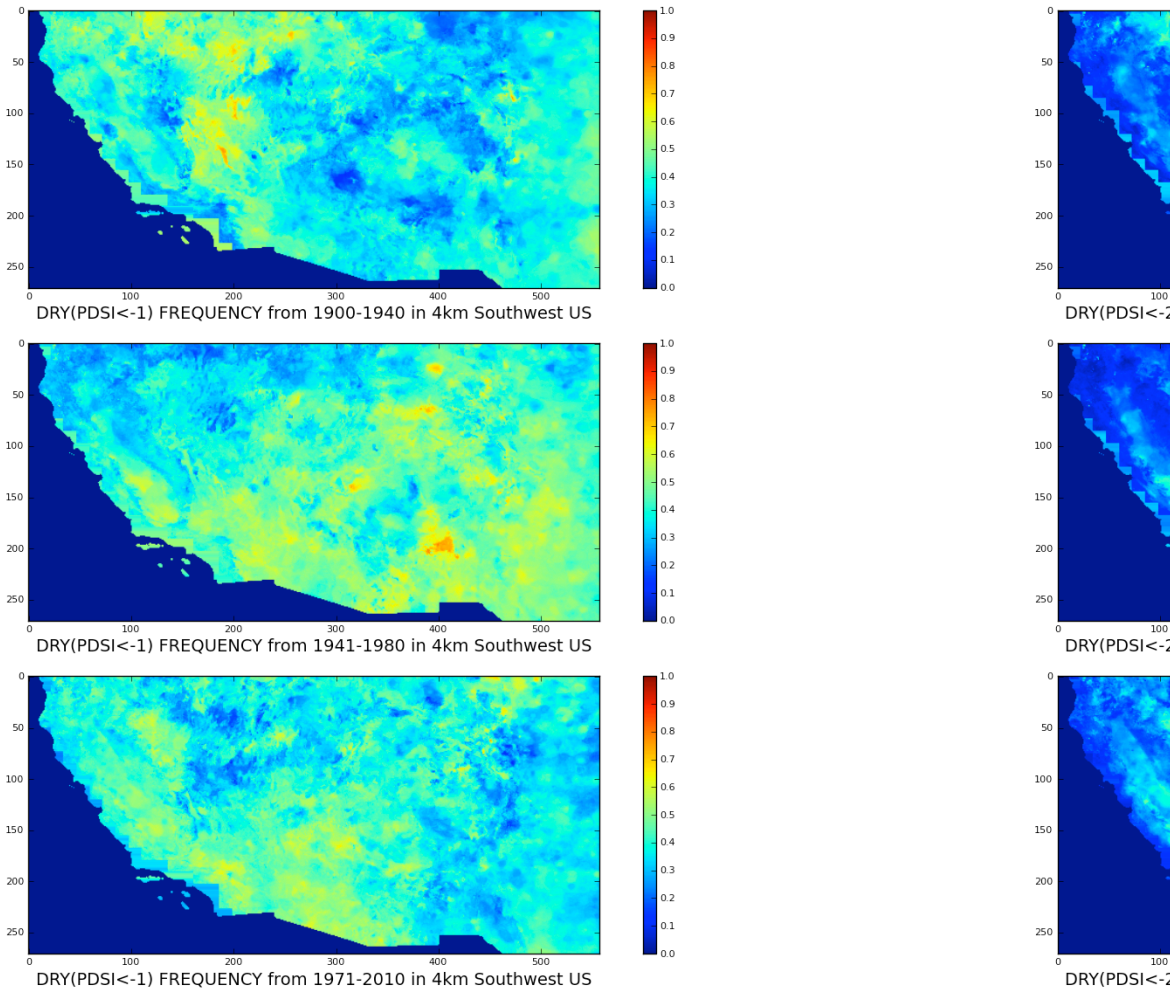

Figure 3: Frequencies of Moderate Drought (left, PDSI <-1) and Severe Drought(right, PDSI <-2) over a 41yr period (1900-1940, 1941-1980, 1971-2010). Frequencies are calculated and normalized at monthly scale.

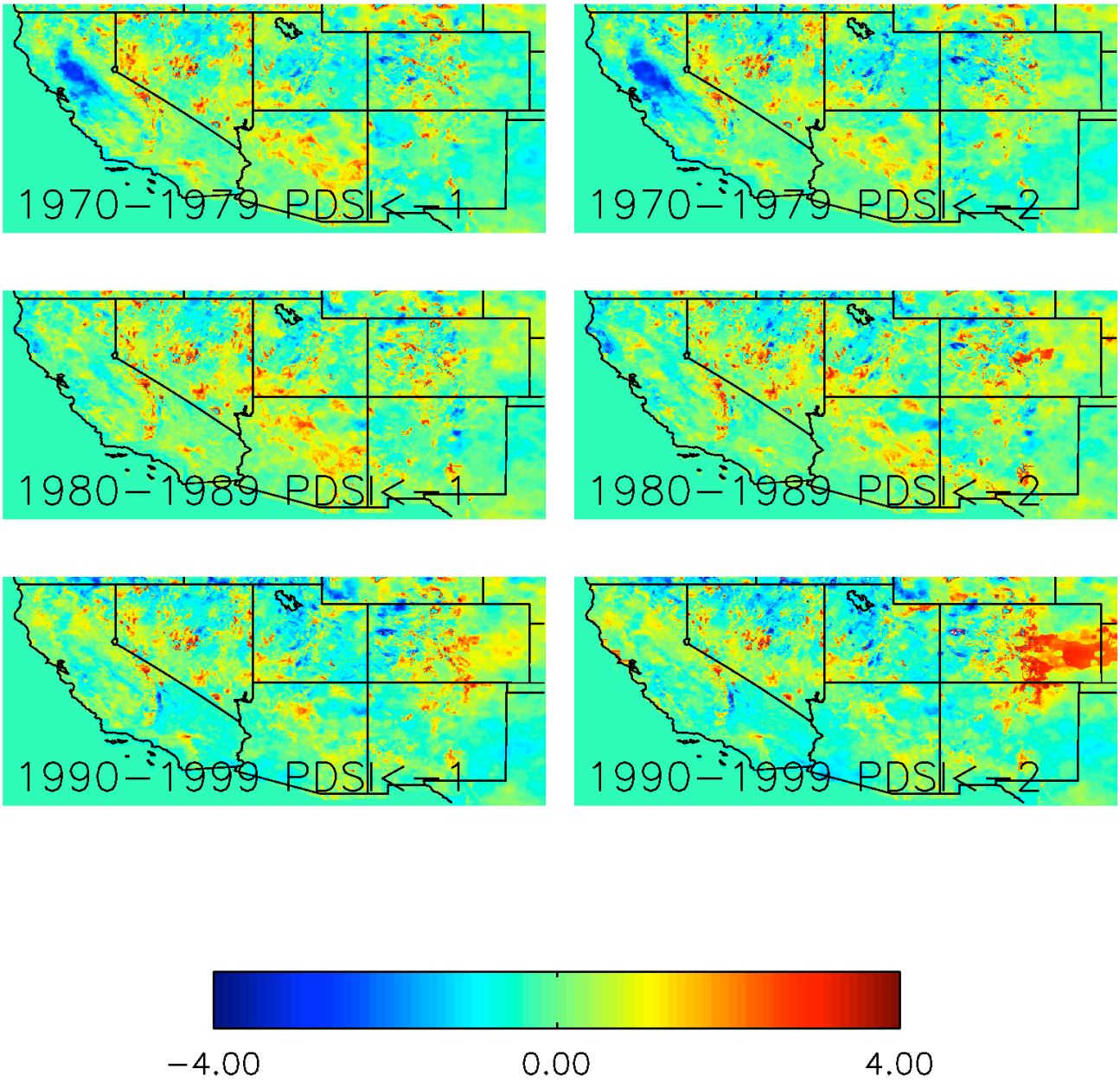

Figure 4: 2001-2010 Anomaly of PDSI (<-1 and <-2) estimated from different periods

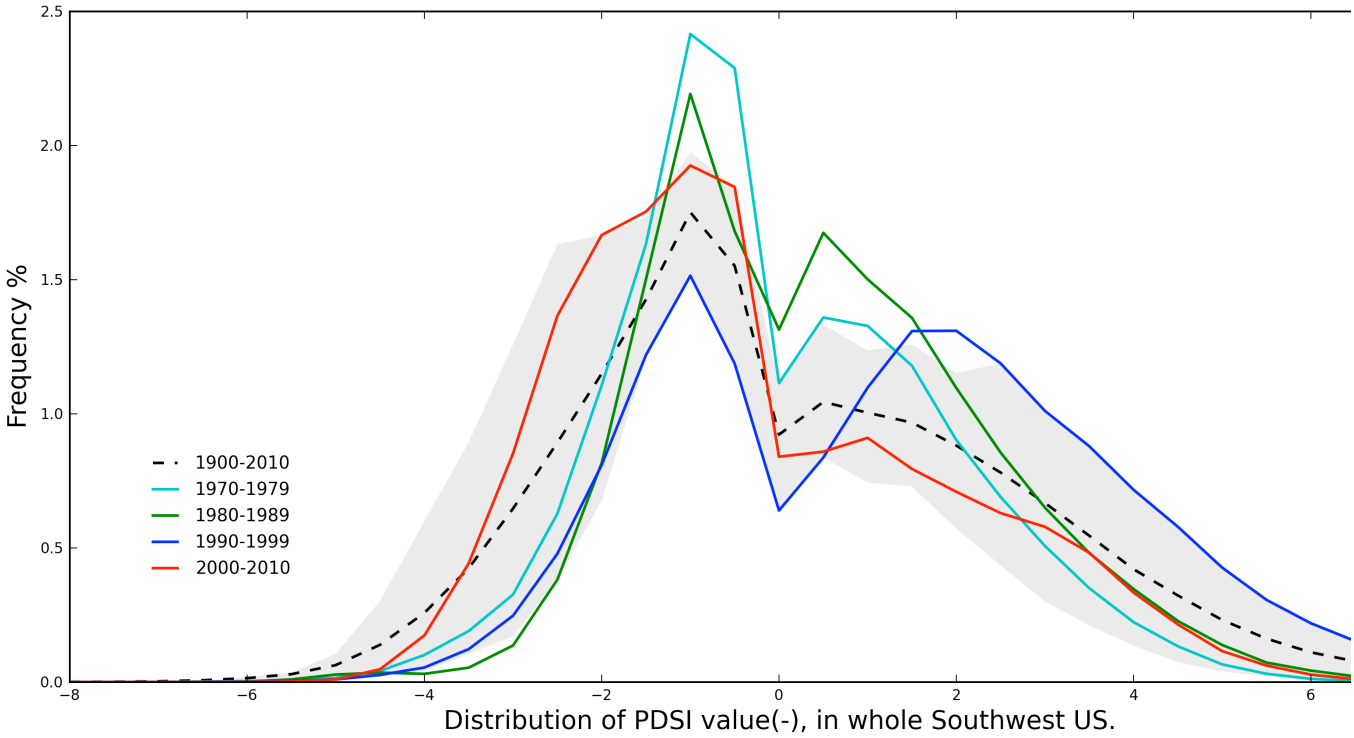

Figure 5: PDSI distribution for different time periods for the Southwest.

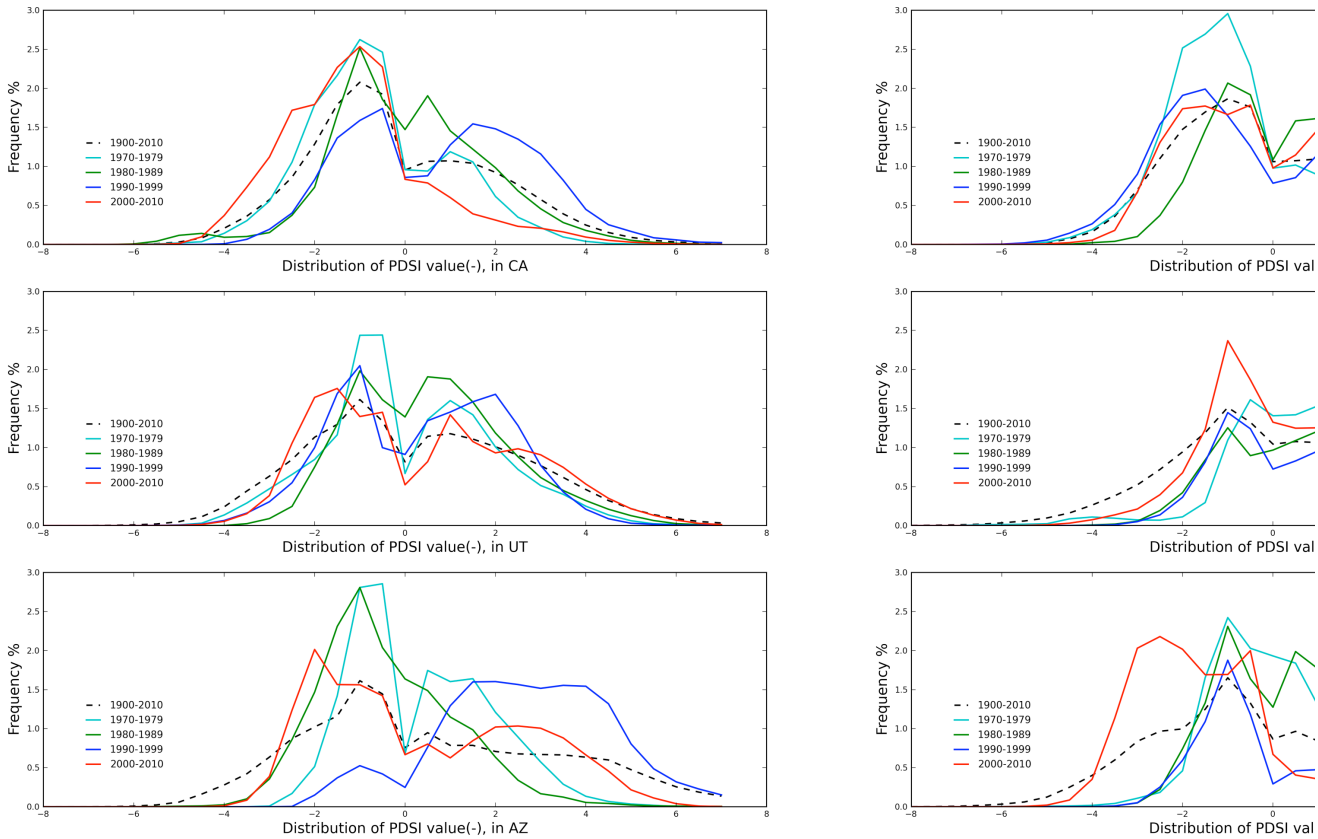

Figure 6: Same as in Figure 5 but for different states.