This 4km x 4km 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 $\leq$ -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.