Drought and Persistent Wet Spells over the United States and Mexico
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Objectives
1. To identify regions over the United States and Mexico that the drought and wet spells are most likely to occur and persist.
2. Understand the reasons for the regional preference.

Data set used
- Palmer Drought Severity Index (PDSI)
- Standardized Precipitation Index (SPI)
- CPC/NCEP/NOAA

Preferred regions for drought
The droughts and wet spells were identified based on the PDSI term 1900 to 2004. The ratio between the months that drought or wet spells occurred and the total months (Figure 1) indicate that the interior western United States (west of 90°W) is more prone to drought or wet spells. Once drought (wet spells) occur, they are more likely to persist.

Seasonal cycle
- The seasonal cycle has strong influence on the persistence of precipitation anomalies.
- It is estimated by the difference between the maximum (Smax) and the minimum (Smin) of climatological monthly means from 1948-2004 (Fig 4a).
- The uncertainties of the seasonal cycle are estimated by the standard deviations (Sdev) of the climatological monthly means.
- If Smax/Smin is smaller than Smin/Smax, then the seasonal cycle is weak and rainfall for all seasons can contribute to SPI or PDSI (Fig 4b).

Interannual time scales
- The wetting seasons over the Great Plains are spring and summer.
- Precipitation is controlled by SSTs over the Pacific Ocean for the entire wet season.
- An example is given in Fig 8.
- For the Southwest, monsoon rainfall is controlled by both ENSO and the North Pacific SSTs which have decadal interannual time scales.

Conclusions
- The wet and dry spells are more likely to persist over the northwestern Mexico and interior western United States. They are less persistent over the areas east of 90°W.
- Conditions for persistent extreme events:
  a) Associated with multi-decadal trends or interannual modes
  b) Rainfall has strong seasonal cycle

S-Plains Interannual time scales
1. The wetting season is from spring to fall (Fig 5).
2. ENSO and PDO are related to S-Plains rainfall.
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Conclusions
A) Drought persistent regions: Northwestern Mexico and western mountain region
B) Persistent regions: Great Plains and Southwest
C) Linear persistent region: Central Eastern United States (East coast) and the Chihuahua Valley
D) Rainfall has a weak seasonal cycle: rainfall occurs all the time
E) ENSO has opposite impact on precipitation for different seasons.