Second Quarter Progress:

- Linkage with GCM modeling effort

A number of new PCM simulations have become available during the second quarter. These simulations were initialized with the assimilated ocean data and the cases listed are B0640, B0642, and B0643. Data are available for 1995 – 2100.

- RCM simulations

Two long-term RCM simulations are being performed to evaluate how well the RCM reproduces the observed climate. The simulations are driven by the NCEP/NCAR reanalyses for 1980-1999 and the ECMWF reanalyses for 1980-1993. Analyses have been performed for the simulations in the nested domain that covers the western U.S. at 40 km spatial resolution.

A comparison of the observed and simulated seasonal (December-February and June-August) mean surface temperature and precipitation is provided in Figures 1-4. Observations are based on the Climate Research Unit (CRU) global data at 0.5 degree resolution. In general, we find that the model-simulated precipitation has a positive bias near the coastal region during winter. However, the model produced much less precipitation in the southwest compared to the observed during summer. We will examine this further with the observational dataset that Dennis Lettenmaier's group is preparing at 1/8 degree for the US. Their dataset combine observations from the NCDC stations and snotel stations and uses the elevation-dependence relationship of the PRISM model. The lack of observational data at the higher elevation in the CRU data tends to under estimate cold season precipitation in the western US that has a strong orographic component.

To examine the model's ability to simulate the interannual climate variability, we analyzed time series of precipitation and surface temperature averaged over three regions (Pacific Northwest, western US, and southwestern US) shown in Figure 5. Figures 6 and 7 show the comparison of the observed and simulated monthly mean temperature and precipitation averaged over the 3 subregions and the overall mean.

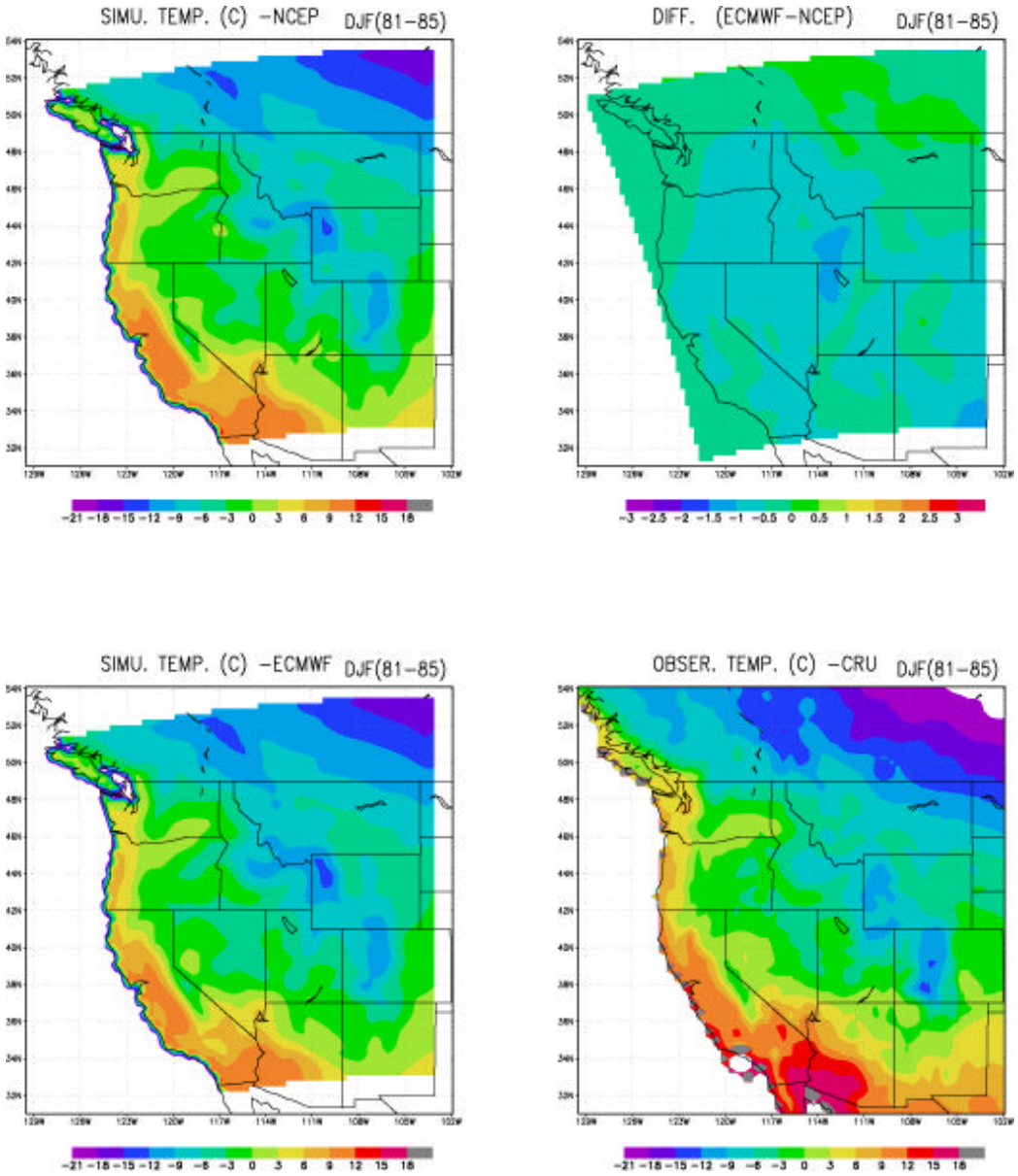

Figure 1. The observed (CRU) and simulated (NCEP and ECMWF) surface temperature averaged over December-February of 81-85. Also shown in the upper right panel is the difference between the simulations driven by NCEP and ECMWF reanalyses.

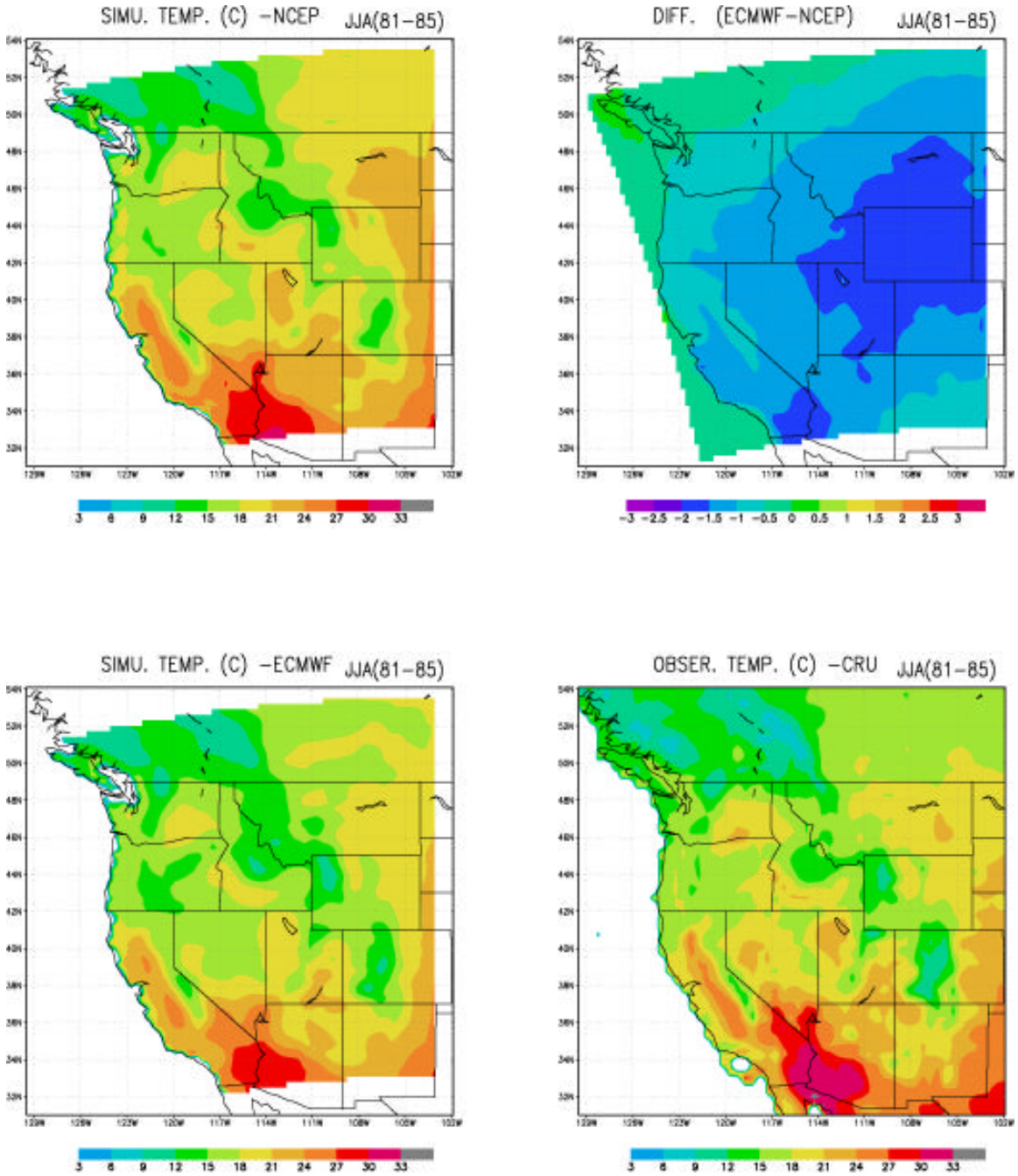

Figure 2. Comparison of June-August mean surface temperature.

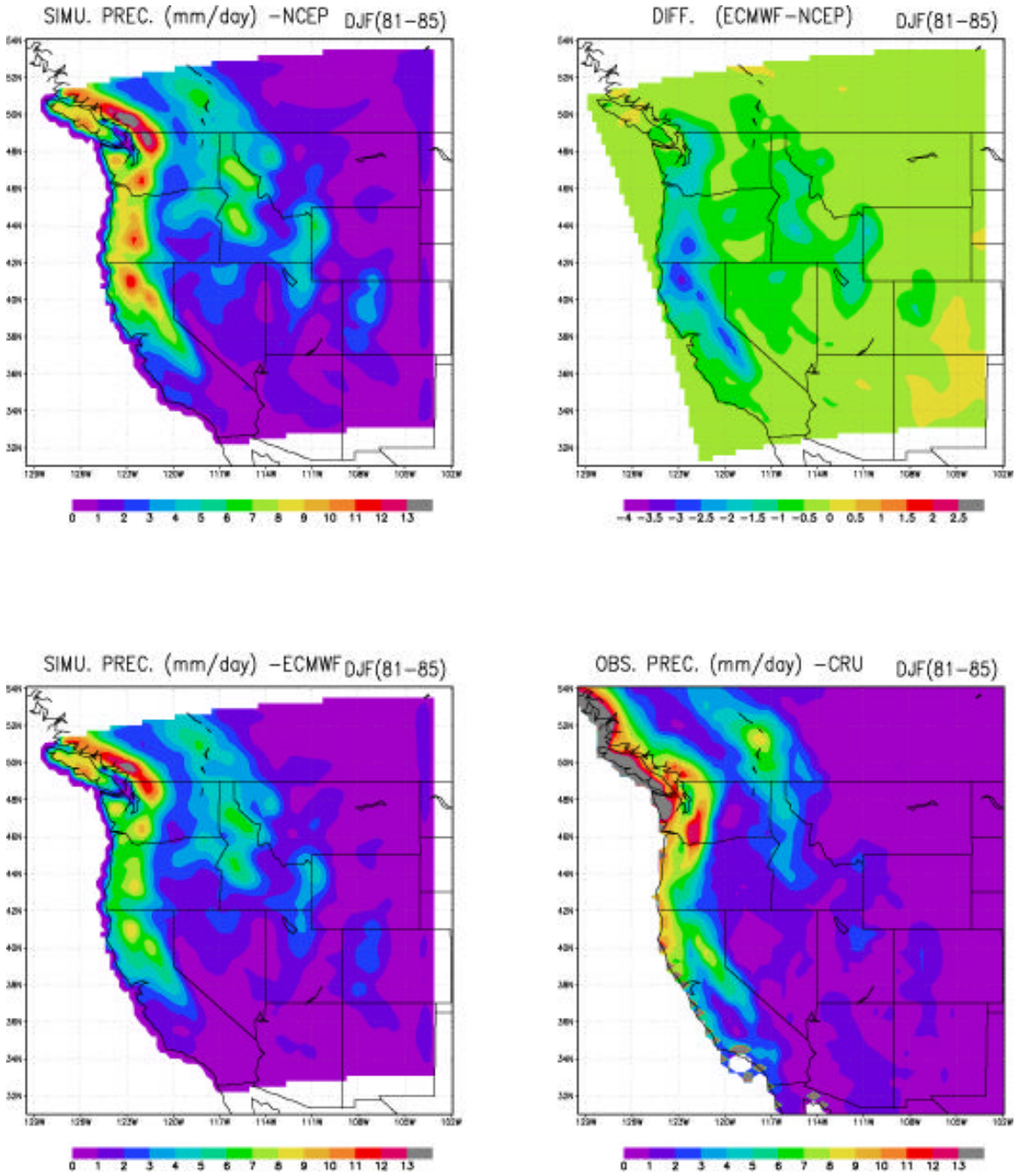

Figure 3. Comparison of December-February mean precipitation.

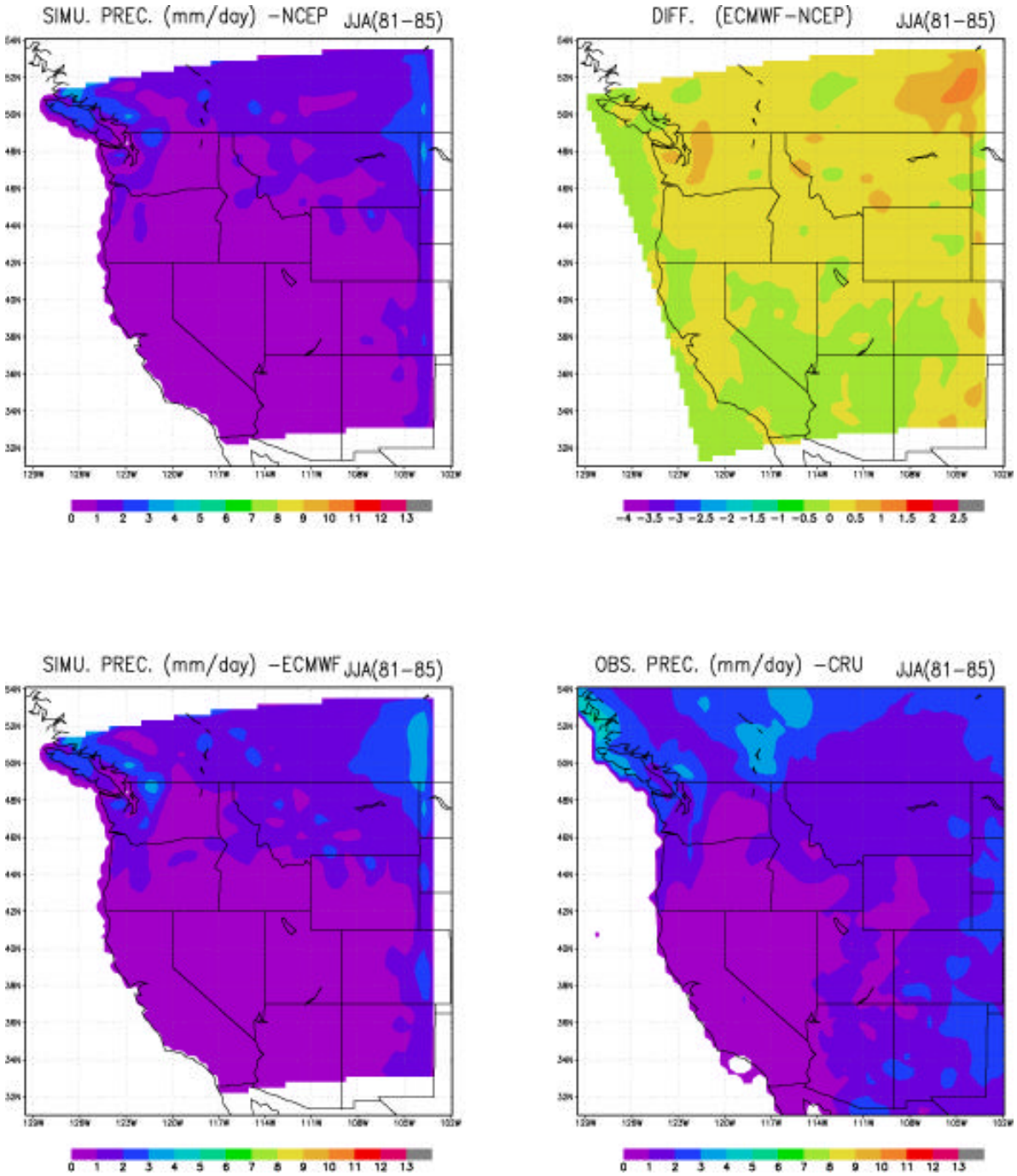

Figure 4. Comparison of June-August mean precipitation.

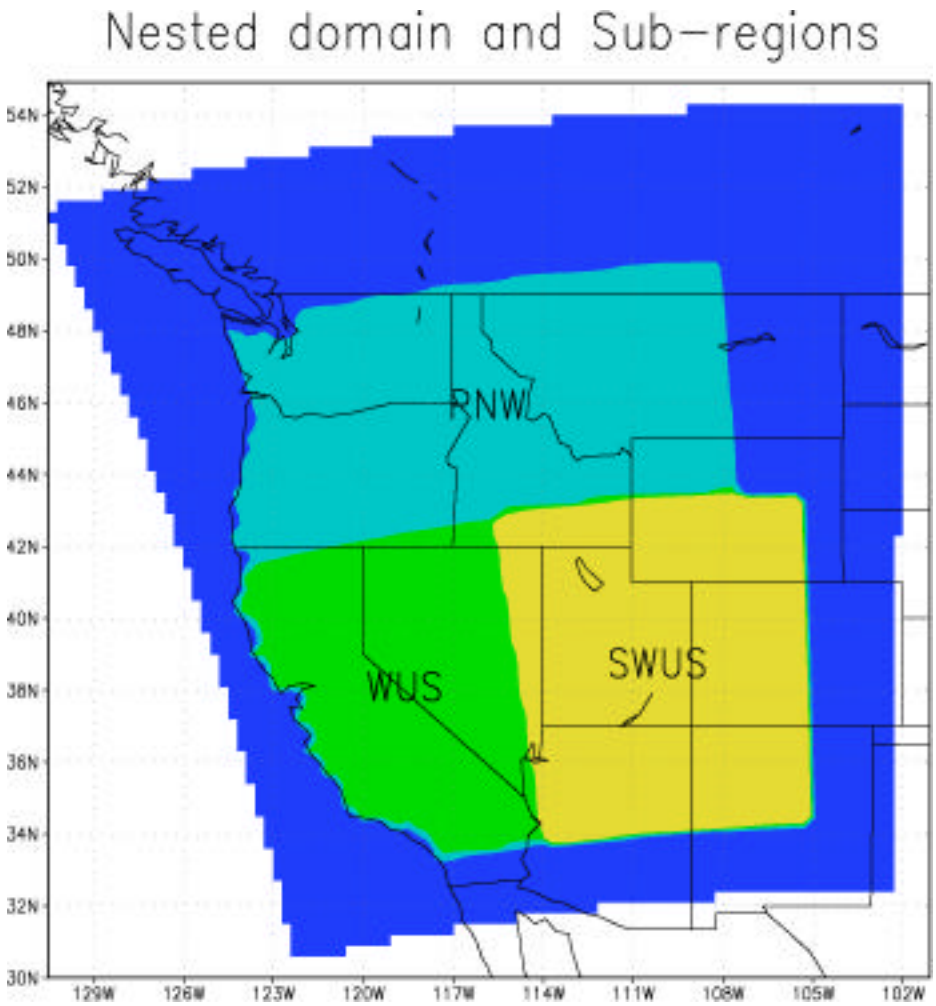

Figure 5. The three subregions, Pacific Northwest (PNW), western US (WUS), and southwestern US (SWUS), used in the model evaluation.

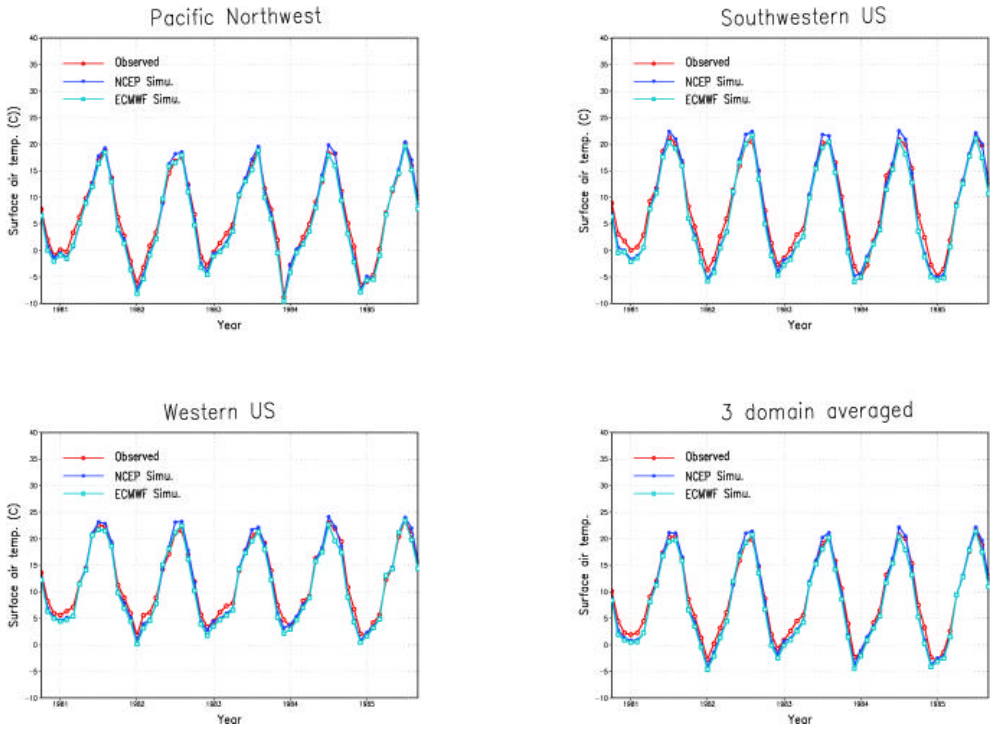

Figure 6. Comparison of observed and simulated regional averaged surface. Temperature.

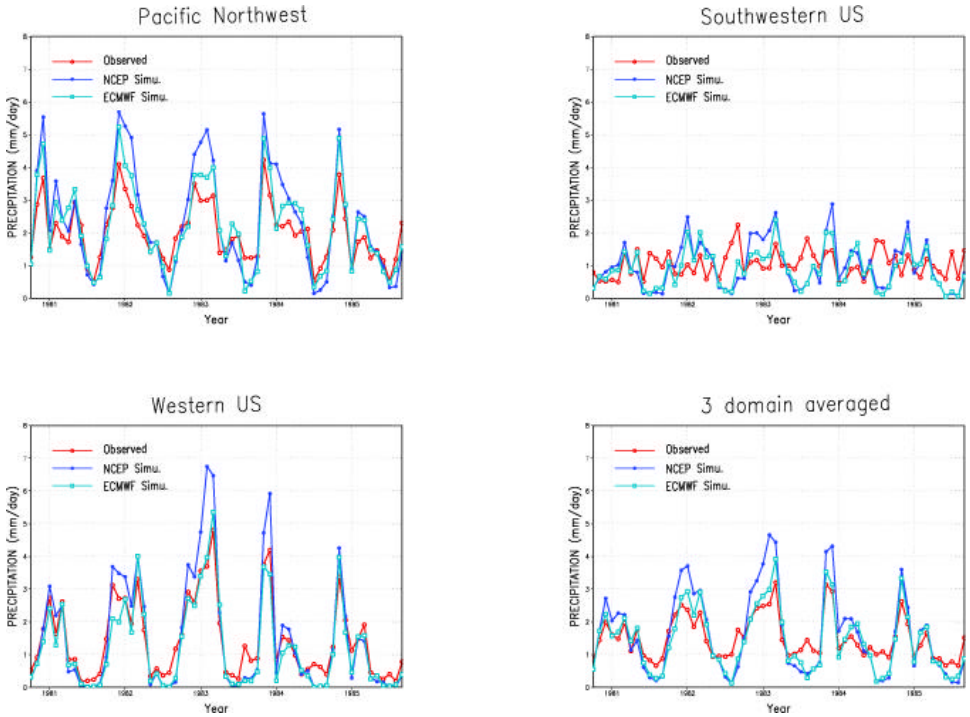

Figure 7. Similar to Figure 5, but for precipitation.