GEWEX WCRP
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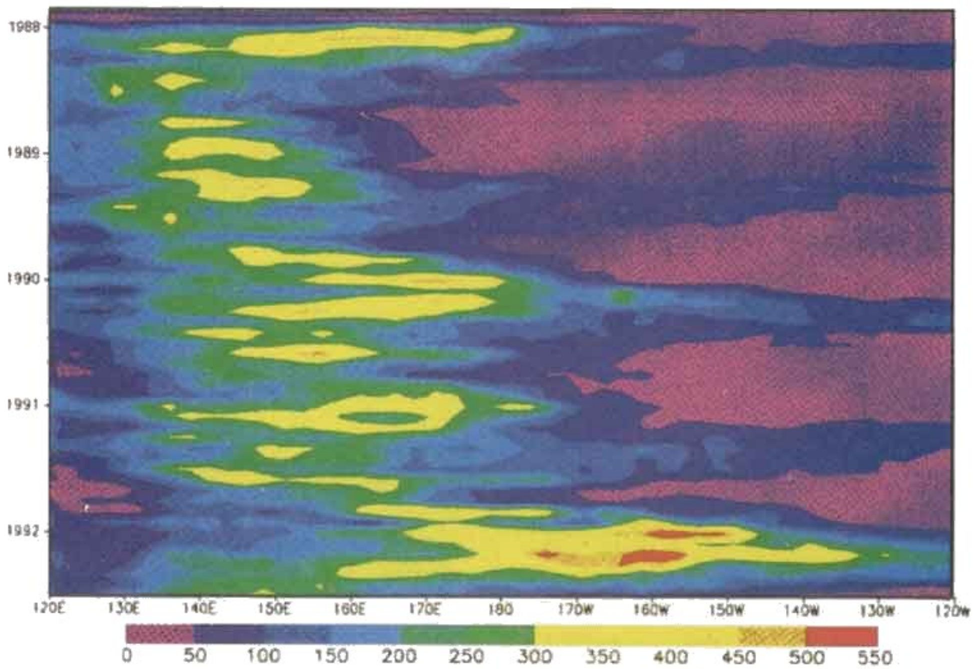
GPCP Precipitation (mm/month)



The new Global Precipitation Climatology Project data set shows significant interannual variability (note the 1989 and 1990 El Nino effect) in this time and longitude depiction of precipitation for latitude zone 5°N to 5°S (December 1987 data were not available). See article on page 4.

GLOBAL SOIL WETNESS RESULTS USING ISLSCP CD-ROM

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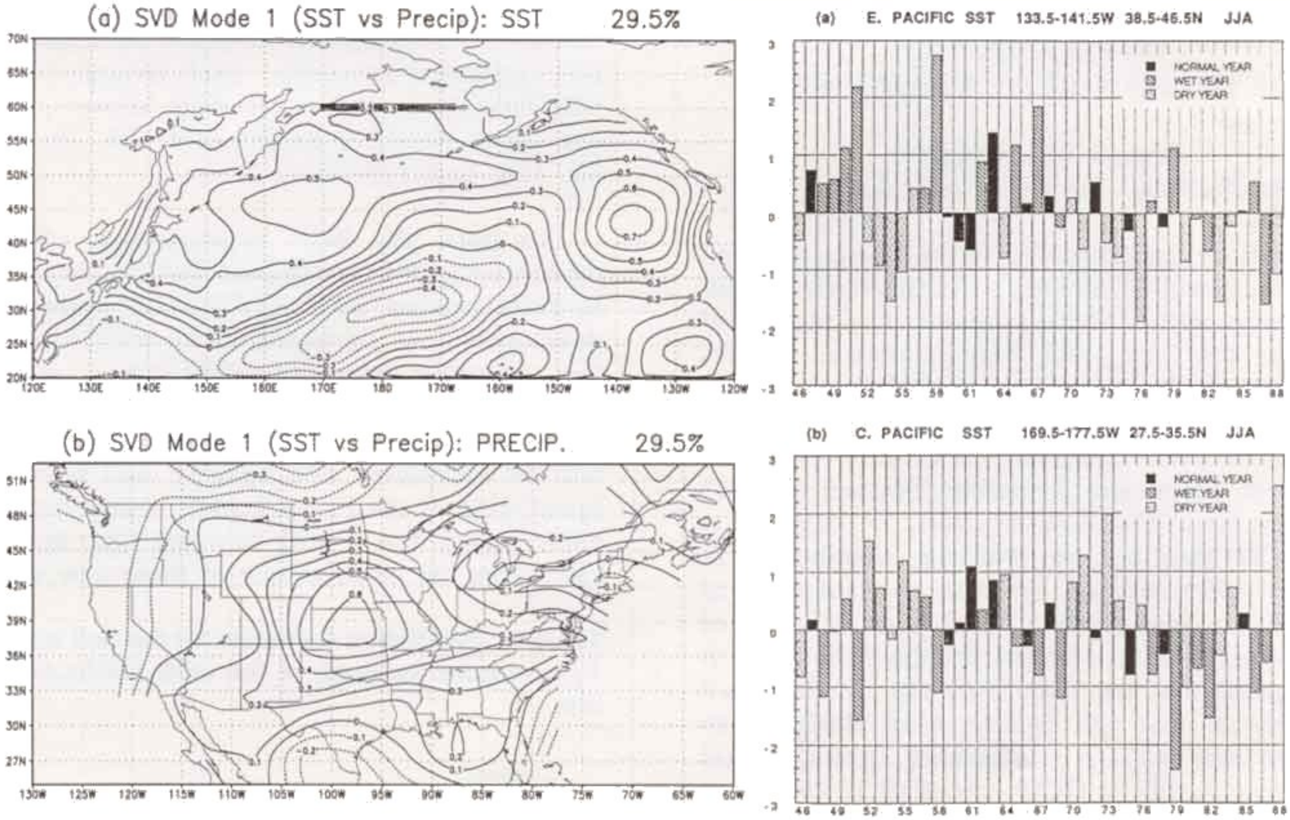
The global distribution of soil wetness and snow water equivalent was computed to 1x1 degree grids by integrating a land surface parameterization scheme [modified version of the Simple Biosphere Model (SiB)] as a pilot study of the International Satellite Land Surface Climatology Project (ISLSCP) Global Soil Wetness Project.

The vegetation and soil parameters used in the original version of SiB were adopted. The

(Continued on page 3)

***Excess Solar Absorption in Cloudy Atmospheres* article on page 6 (related Commentary page 2)**

WHAT'S NEW IN GEWEX



The squared covariance explained by this mode is 29.5%. The values shown are correlation coefficients with a contour interval of 0.1. The maps illustrate that the north Pacific SST anomalies are strongly tied to the Great Plains precipitation in summer. The two bar graphs are the eastern and central Pacific SST indices based on area averaged SST over the key region. The stipling indicates the corresponding precipitations over the United States Great Plains.

RELATIONSHIP BETWEEN NORTH PACIFIC SST ANOMALIES AND U.S. PRECIPITATION ANOMALIES

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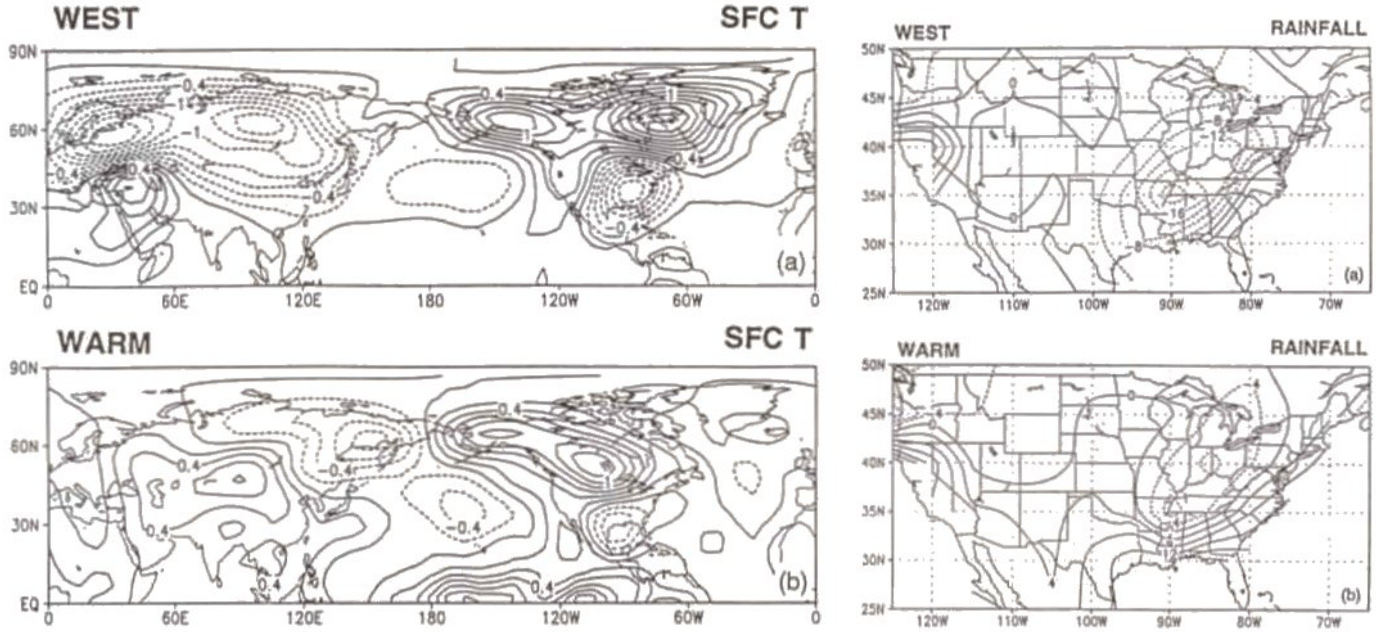
In a recent study (Ting and Wang, 1996), the relationship between North Pacific sea surface temperature (SST) anomalies and Great Plains precipitation anomalies during the June, July and August season was explored. The precipitation data used were from the Oak Ridge National Laboratory's Historical Climatology Network for the period 1946-1988. The SST data were from the Geophysics Fluid Dynamics Laboratory (GFDL) analyses of the Comprehensive Ocean-Atmosphere Data Set (COADS) for the same period. A singular value decomposition (SVD) between North Pacific SST and the United States precipitation was performed. The maps in the figure above illustrate the first singular mode, which shows the pattern of precipitation is co-varying with the SST. The squared covariance between the two fields explained by this mode is about 30%. **The maps illustrate a large single positive precipitation anomaly over the Great Plains to be associated with positive SST anomalies over the eastern North Pacific and negative SST anomalies over the central North Pacific.**

The eastern and central north Pacific SST indices were constructed based on the area average of the SST centered at the maximum SST anomalies on the SVD map. The bar graphs in the figure above illustrate the normalized SST indices over the two regions and the associated wet and dry conditions over the United States Great Plains. **With very few exceptions, a wet year over the Great Plains is accompanied by**



Composite surface temperature over the northern hemisphere and rainfall over the United States based on the zonal wind index (westerly phase indicates westerly anomalies at 35°N and easterly anomalies at 55°N) and the equatorial SST index (warm phase indicates El Nino). Contour intervals are 0.2°C for surface temperature and 4 mm/mon for precipitation.

above normal SST over the eastern North Pacific and below normal SST over the central North Pacific and vice versa.

For the winter season, the United States precipitation is believed to be largely associated with the tropical SST anomalies, the so called El Nino and El Viejo (O'Brien and Sittel, 1995). However, the large mid-latitude natural variability may also contribute significantly toward the anomalous United States precipitation.

In Ting et al. (1996), the winter time teleconnection patterns during extreme phases of the zonal mean circulation (u-bar) were studied. The seasonal mean anomalies associated with the mid-latitude u-bar were compared to those associated with the El Nino/Southern Oscillation (ENSO) during the 1947-1994 period. This revealed that a significant fraction of the Northern Hemisphere wintertime stationary wave variability is associated with meridional shifts in the mid-latitude westerlies. These are reminiscent of the index cycle pattern characterized by out-of-phase u-bar anomalies at 35°N and 55°N, and are shown to occur largely independent of the interannual variability in tropical Pacific sea surface temperatures. The composite surface temperature and the United States precipitation associated with the extremes in zonal mean circulation and the tropical Pacific SST are shown above. The maps in the figure clearly show a wave number one pattern having out-of-phase temperature anomalies between Eurasia and North America and out-of-phase precipitation anomalies between eastern and western United States associated with the meridional shift of zonal mean wind, and composite amplitudes considerably larger than those experienced during a composite ENSO event.

References:

Ting, M., and H. Wang, 1996. Relation between North Pacific SST anomalies and Great Plains precipitation during summer. Submitted to J. Climate.

Ting, M., M. P. Hoerling, T. Xu, and A. Kumar, 1996. Northern Hemisphere Teleconnection patterns during extreme phases of the zonal mean circulation. Submitted to J. Climate.

O'Brien, J.J., and M. C. Sittel, 1995. Differences of precipitation in the United States as related to ENSO extremes. GEWEX News, Vol. 5 No. 4, 12-13.