A 50-yr Monthly Analysis of Global Oceanic Precipitation and its Potential Applications in Verifying the NCEP/NCAR Re-analysis

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An analysis of monthly precipitation anomalies has been created on a 2.5^o lat/lon grid over global oceans for a 50+ years period from 1948 to the present by EOF reconstruction of historical gauge observations. The EOF reconstruction defines monthly precipitation anomaly over a grid box by interpolating gauge observations based on EOF patterns derived from satellites estimates with complete spatial coverage available for later years. In this study, the historical gauge observations are taken from the CAMS and the GHCN version 2 data sets, while the satellite estimates are those of the OLR-based Precipitation Index (OPI, Xie and Arkin 1998). Cross validation tests are conducted and the results showed that the reconstruction is able to retrieve precipitation variation associated with ENSO and major large-scale circulation patterns with reasonable accuracy. The magnitude of the reconstructed anomaly, however, is reduced compared to the satellite estimates.

The monthly precipitation anomaly defined by the reconstruction is compared to that from the NCEP/NCAR reanalysis to explore the potential applications of the reconstructed precipitation data set in climate model verifications. Preliminary results showed that the reanalysis presents evolution of large-scale precipitation anomalies associated with ENSO very similar to that in our reconstructed data set. The location of the ENSO-related action centers in the reanalysis, however, is shifted eastward and the magnitude is smaller compared to those in the reconstruction. Further work is underway to improve the reconstruction and to complete the comparisons with the reanalysis. Detailed results will be reported at the workshop.