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A comparison of GPCP, NCEP and ECMWF precipitation records

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We have compared three precipitation climatologies for the period 1979-2000. The GPCP dataset is purely derived from satellites and rain gauges, whereas the NCEP and ECMWF ones are from reanalyses of meteorological models. The mean spatial patterns of rainfall are the same in all three datasets, although the models do not show the South Atlantic and South Pacific convergence zones to be as well developed as in the GPCP dataset. ECMWF shows a strong long-term increase in tropical rainfall, due to problems in the assimilation of humidity observations; NCEP shows a slight increase with time, whereas the GPCP exhibits no trend at all. In most regions, all three datasets do show the same seasonal cycle; however, when averaged over an ocean basin the anomalies from the monthly means have only a limited correlation between datasets. All three datasets show similar regions of sensitivity to wide-scale climatic phenomena, such as NAO and ENSO. However, these tend to redistribute the freshwater flux rather than affect its magnitude, hence the smaller amplitude and correlation of interannual anomalies.