Introduction

ESRL/PSD GEFS Reforecast V2 is an extensive dataset of historical weather forecasts generated with NCEP’s 2012 operational Global Ensemble Forecasting System (GEFS) version for past 29 years. It is developed mainly for the purpose of a number of applications, including statistical post-processing, diagnosis of the forecast ability of uncommon phenomena and initialization of regional model reforecasts. In particular, this long reforecast dataset gives us an unprecedented opportunity to develop a dataset of model precipitation climatology for GEFS, which could be used for forecast calibration and verification studies and anomaly forecast guidance. Due to non-Gaussian feature and heavy-tailed distributions of precipitation amount, the L-moment method with Gamma distribution as a fitting function was employed to derive the NCEP Climatology-Calibrated Precipitation Analysis (CCPA) daily climatology in our previous study, and also is utilized here to calculate model daily climatology based on 26 years (1985-2010) of the GEFS Reforecast as well.

Furthermore, it is necessary to evaluate model climatology from the Reforecast dataset. In this study, CCPA climatology for a period of 8-years (2002-2010) is used to evaluate Reforecast climatology with the coincident period for the Continental United States (CONUS) domain and each River Forecast Center (RFC). These datasets are compared at 1° grid resolution and various time scales ranging from daily, monthly to seasonal time scales. Detailed comparisons are provided to decide a sampling of methods in the calculations of daily climatology, to assess the quality of Reforecast and to understand the error characteristics associated with the Reforecast precipitation.

Climatological Analysis of Model Precipitation from NCEP GEFS Reforecast

Yan Luo and Yuejian Zhu
Environmental Modeling Center (EMC), NCEP/NWS
5830 University Research Court, College Park, MD 20740

ESRL/PSD GEFS Reforecast V2 is an extensive dataset of historical weather forecasts generated with NCEP’s 2012 operational Global Ensemble Forecasting System (GEFS) version for past 29 years. It is developed mainly for the purpose of a number of applications, including statistical post-processing, diagnosis of the forecast ability of uncommon phenomena and initialization of regional model reforecasts. In particular, this long reforecast dataset gives us an unprecedented opportunity to develop a dataset of model precipitation climatology for GEFS, which could be used for forecast calibration and verification studies and anomaly forecast guidance. Due to non-Gaussian feature and heavy-tailed distributions of precipitation amount, the L-moment method with Gamma distribution as a fitting function was employed to derive the NCEP Climatology-Calibrated Precipitation Analysis (CCPA) daily climatology in our previous study, and also is utilized here to calculate model daily climatology based on 26 years (1985-2010) of the GEFS Reforecast as well.

Furthermore, it is necessary to evaluate model climatology from the Reforecast dataset. In this study, CCPA climatology for a period of 8-years (2002-2010) is used to evaluate Reforecast climatology with the coincident period for the Continental United States (CONUS) domain and each River Forecast Center (RFC). These datasets are compared at 1° grid resolution and various time scales ranging from daily, monthly to seasonal time scales. Detailed comparisons are provided to decide a sampling of methods in the calculations of daily climatology, to assess the quality of Reforecast and to understand the error characteristics associated with the Reforecast precipitation.