



Assessment of the quality of NCEP-2 and CFSR reanalysis daily temperature in China based on long-range correlation

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The daily temperatures from observational data, NCEP-2 and CFSR reanalysis data all exhibit long-range correlation (LRC) characteristics, which provides a test bed for assessing the reliability of reanalysis data. In this study, the quality of the NCEP-2 and CFSR data in China are evaluated on the basis of the LRC characteristics of daily temperatures, including daily average temperature (DAT), daily maximum temperature (DMAT), daily minimum temperature (DMIT), and diurnal temperature range (DTR). Compared with the observations, the quality of NCEP-2 daily temperature is relatively good in central and eastern Northwest China, and most of central and eastern China, especially for NCEP-2 DMAT. However, the NCEP-2 reanalysis data as well as CFSR has a significant difference with the LRC of the observations in most of Sichuan, Qinghai-Tibet Plateau and some areas of southwestern Xinjiang at a significance level of $\alpha=0.05$. In general, the LRC characteristics of NCEP-2 daily temperature perform better than that of CFSR data. As far as DAT is concerned, CFSR perform worse in central and eastern Northwest China, and better than NCEP-2 only in South China and eastern Jiangnan. The quality of the CFSR DMAT is worse than that of NCEP-2 in central and eastern Northwest China, western Inner Mongolia, and eastern China. The quality of NCEP-2 DMIT is better than CFSR in central and eastern Northwest China, most of Inner Mongolia, and is worse than it in most of South China and eastern Jiangnan. The reliability of the CFSR DTR is very low in most of China.