

Usefulness of the Recent Reanalyses to Provide Indicators of Climate Change

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Reanalyses use multiple satellite and surface observation systems to produce a comprehensive analysis of the atmosphere's dynamical, thermal, and chemical state with time. By removing the noise of ever changing analysis models and transitions from one satellite to the next, a better data record for climate studies is expected. Reanalyses have been successful for assessing how the climate has been changing. But can they tell us how much the climate has been changing, i.e. are the reanalyses useful for generating climate trends. The answer may vary both geographically and vertically in the atmosphere. We will present two comparisons of long term satellite data sets with their reanalysis generated duplicate. Both data sets have been used by the climate community to characterize climate change. One data set is the MSU-4/AMSU-9 long term temperature time series and trends. The other is the SBUV/2 profile ozone data set. Even though both of the satellite data sets are assimilated into the CFSR, MERRA, and ERA-Interim reanalyses it is uncertain whether these reanalysis retain the observations' characteristics. This is because these reanalyses assimilate other data which may alter the signal provided by these two satellite data sets. A comparison of the correlation of the long term time series with the reanalysis generated ones is presented as well as a comparison of the trends. We will present what the possible causes are if the correlations and trends vary significantly. We conclude with a discussion about the usefulness of the reanalysis data for climate trends.