Regional and Global Evaluation of Reanalysis for Estimating Potential Seasonal Predictability

Xia Feng

Department of Geography and Geoinformation Science, George Mason University, Fairfax, VA

Paul Houser

Department of Geography and Geoinformation Science, George Mason University, Fairfax, VA

Retrospective analyses have been an important source of information for climate studies. How well can we understand the strength and weakness of reanalysis products for estimating potential seasonal predictability? To tackle this question, we compare the potential predictability of surface climate in reanlaysis using the newly proposed analysis of covariance (ANOCOVA) method. This method tests whether interannual variability of seasonal means exceeds that due to weather noise under the null hypothesis that seasonal means are identical every year. It has the advantage of taking into account autocorrelation structure in the daily time series but also accounting for the uncertainty of the estimated parameters in the significance test. The reanalysis products to be evaluated include NCEP-1, NCEP-2, ERA40, ERA-Interim, MERRA, and JRA25. Surface climate variables include temperature and precipitation. For these two variables, the preliminary results from different reanalysis products consistently show a high fraction of predictable variance in the tropics, low predictability over the extratropics, more potential predictability over the ocean than land, and a stronger seasonal variation in potential predictability over land than ocean. In order to evaluate the accuracy of reanalysis in depicting predictability, we will compare predictability from reanalysis against estimates from global and regional observations, including in-situ and satellite measurements.

Corresponding Author:

Name:	Xia Feng
Organization:	Department of Geography and Geoinformation Science
Address:	George Mason University
	Fairfax, VA
	USA