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Verification of precipitation downscaling approaches for hydrologic forecasting using TRMM data

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Forecasting of severe large river floods globally is hampered by deficiencies in surface precipitation and hydrological networks. New approaches to flood forecasting that are based on use of global weather prediction nowcasts and forecasts, coupled with remote sensing precipitation estimates, offer some hope to mitigate the effects of these natural disasters. We evaluate several approaches to downscaling and calibration of precipitation forecasts via forecast verification at different temporal (daily and 5 day accumulations) and spatial (0.25 and 1 degree) scales. Although the methods are ultimately intended for application to observation-deficient areas such as Africa, and eventually globally, our initial testing is performed in the Ohio River basin where we have access both to a dense precipitation gauge network, and to TRMM data. In this study, we evaluate two alternative methods for downscaling and bias correction of precipitation nowcasts and forecasts – one using a statistical method, and another using an analog technique. Mean errors and various forecast skill measures are evaluated with respect to TRMM data, for the period 2002-2006.