

Mahanama, S. P. P., B. Livneh, R. D. Koster, D. Lettenmaier, and R. H. Reichle:

"Soil Moisture, Snow, and Seasonal Streamflow Forecasts in the United States"

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Abstract:

Land surface model experiments are used to quantify, for a number of United States river basins, the contributions (isolated and combined) of soil moisture and snowpack initialization to the skill of seasonal streamflow forecasts at multiple leads and for different start dates. Snow initialization has a major impact on skill during the spring melting season. Soil moisture initialization has a smaller but still statistically significant impact during this season, and in other seasons, its contribution to skill dominates. Realistic soil moisture initialization can contribute to skill at long leads (over 6 months) for certain basins and seasons. Skill levels in all seasons are found to be related to the ratio of initial total water storage (soil water plus snow) variance to the forecast period precipitation variance, allowing estimates of the potential for skill in areas outside the verification basins.