



## **Understanding Moisture and Energy Budget for South Asian Monsoon**

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Monsoon is mainly driven by the energy and moisture transfer between Earth's surface and atmosphere and hence, an understanding of the energy and moisture balance over South Asia is crucial in understanding the monsoon. The energy and moisture budgets are coupled together through processes like evaporation and condensation which contributes to the latent heat flux of energy budget. Therefore, quantification of various processes in the energy and water budgets over South Asia is essential to understand their contribution to the whole regional hydro-climate process. Since the physical processes like precipitation and evaporation are poorly modeled by reanalysis, atmospheric moisture budget is used to obtain more accurate estimates of E-P. At larger timescales, the E-P values can be approximated to the divergence term in the atmospheric moisture budget. Even though both energy and water budgets are closed cycles in nature, their closure is not achieved in atmospheric reanalysis, though some are better than others. In the present study, energy and moisture budgets over South Asia is studied at monthly time scales for the period of 2002 to 2013. Multiple reanalysis data sets and Gravity Recovery and Climate Experiment (GRACE) estimates are used to study moisture budget. In case of energy budget, Clouds and Earth's Radiant Energy System (CERES) estimates are used along with multiple reanalysis data sets. In this study, we attempt to study the inhomogeneities in reanalysis associated with physical processes like precipitation and evaporation during monsoon period over South Asia, by studying the energy and moisture budget.

Keywords: Moisture budget, Energy Budget, reanalysis data sets