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Global land hydrology and its effects on polar motion

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The global land hydrological budget has remained largely uncertain as far as its time variable geodynamic effects are concerned. Now, there are several different data sources available. In this paper, we compare estimates from different data sources, including one that we developed using post-model run processing tools. These tools estimate the global soil moisture field, based on atmospheric data as "proxy" assuming an equation of hydrological continuity, using both monthly NCEP Reanalysis (1958-present) and GRACE observations. The results of this method as well as NCEP Reanalysis estimates are then compared to state of the art numerical hydrology models by both NASA's Global Land Data Assimilation system driving the Mosaic land surface model and USGS's Land Dynamics Hydrology model. Finally, Stokes coefficients computed from these fields are used to estimate time-variable polar motion. We then compare these estimated values with the geodetically observed time-variable polar motion, for both seasonal and non-seasonal signals.