



An updated view of global water cycling

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Unprecedented new observation capacities combined with revolutions in modeling, we are poised to make huge advances in water cycle assessment, understanding, and prediction. To realize this goal, we must develop a discipline of prediction and verification through the integration of water and energy cycle observations and models, and to verify model predictions against observed phenomena to ensure that research delivers reliable improvements in prediction skill. Accomplishing these goals will require, in part, an accurate accounting of the key reservoirs and fluxes associated with the global water and energy cycle, including their spatial and temporal variability, through integration of all necessary observations and research tools. A brief history of the lineage of the conventional water balance and a summary accounting of all major parameters of the water balance using highly respected secondary sources will be presented. Principally, recently published peer reviewed papers reporting results of original work involving direct measurements and new data generated by high-tech devices (e.g. satellite / airborne instruments, supercomputers, geophysical tools) will be employed. This work lends credence to the conventional water balance ideas, but also reveals anachronistic scientific concepts/models, questionable underlying data, longstanding oversights and outright errors in the water balance.