

## The NEWS Water Cycle Climatology

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NASA's Energy and Water Cycle Study (NEWS) program fosters collaborative research towards improved quantification and prediction of water and energy cycle consequences of climate change. In order to measure change, it is first necessary to describe current conditions. The goal of the first phase of the NEWS Water and Energy Cycle Climatology project was to develop "state of the global water cycle" and "state of the global energy cycle" assessments based on data from modern ground and space based observing systems and data integrating models. The project was a multi-institutional collaboration with more than 20 active contributors. This presentation will describe the results of the water cycle component of the first phase of the project, which include seasonal (monthly) climatologies of water fluxes over land, ocean, and atmosphere at continental and ocean basin scales. The requirement of closure of the water budget (i.e., mass conservation) at various scales was exploited to constrain the flux estimates via an optimization approach that will also be described. Further, error assessments were included with the input datasets, and we examine these in relation to inferred uncertainty in the optimized flux estimates in order to gauge our current ability to close the water budget within an expected uncertainty range.