



GRACE Assessment of Hydrologic Contributions to Global Mean Sea Level Change

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GRACE data have previously demonstrated the ability to detect changes in the annual variation of global ocean mass, which is due to the exchange of freshwater with the continents. In this paper, we use GRACE data to examine this mass exchange signal in detail to determine the geographic contributions to the global ocean mass signal. It is shown that more than half of the annual variation in global ocean mass is due to the exchange of mass between the ocean and the South American continent, with the majority of this signal coming from the Amazon basin. We validate the annual signal in the GRACE measurements with estimates of P-E-R for the Amazon basin, and then examine an approximately 40-year record of Amazon discharge to quantify the level of interannual variability that might be expected in global mean sea level from hydrology. The possibility of secular changes in the hydrologic cycle in the Amazon, and its implications for long-term sea level change, are also discussed.