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A Web-Based Tool for GRACE Satellite Data Processing and Visualization

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A Web-Based Tool for GRACE Satellite Data Processing and Visualization

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Abstract: Since 2002, NASA's GRACE Satellite mission has allowed scientists of various disciplines to analyze and map the changes in Earth's total water storage on a global scale. Although the raw data is available to the public, the process of viewing, manipulating, and analyzing the GRACE data can be tedious and difficult for those without strong technological backgrounds in programming or other related fields. In addition, simply knowing the changes in total water storage in a particular region typically isn't enough to plan remediation efforts as there is no indication of whether the changes in storage are occurring in the groundwater, surface water, or soil moisture (groundwater being one of the most difficult of these components to estimate). The GRACE Web-based application helps bridge the technical gap for decision makers by providing a user interface to visualize (in both map and time series format), not only the data collected from the GRACE mission, but the individual components of water storage as well. Using the GLDAS Land Surface model, the application allows the user to isolate and identify the changes in surface water and groundwater storage that makeup the total water storage quantities measured by the raw GRACE data. The application also includes the capability to upload a custom shapefile in order to perform a regional analysis of these changes allowing decision makers to aggregate and analyze the change in groundwater, surface water, and total water storage within their own personal regions of interest.

Keywords: GRACE; groundwater; groundwater modeling