



Monitoring the waters of the Nile Basin from space

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The Nile Basin is an essential natural resource that supports over 200 million people over East and Central Africa. However, the basin's environment is under intense pressure from both human exploitation and climate change, leading to a decline in available water, threatening livelihoods and the ecosystem as a whole. This study uses products from the GRACE (Gravity Recovery And Climate Experiment), ICESat (Ice, Cloud, and land Elevation Satellite) and TRMM (Tropical Rainfall Measuring Mission) earth observing satellite (EOS) missions to monitor variations in the water storage of the Nile Basin at high temporal resolutions (1 to 30 days), as well as Independent Component Analysis (ICA) to separate out the different temporal and spatial modes of variability. Results from such analyses potentially allows suitable management plans to be developed for the basin's sustainable use. We identify a general loss of water from the basin over the last decade, in particular, from the Lake Victoria basin and the Sudd wetland regions. Specifically, applying ICA to the GRACE products reveals that significant amounts of water was lost in the area between Lake Victoria, Lake Kyoga, Lake Albert and Mongolla between 2002 to 2006, probably due the expanded Nalubale (Owen Falls) dam and the 1999-2004 Sudd blockage of Lake Kyoga following the 1997 ENSO rains. This trend was, however, reversed following the 2007 ENSO rainfall. In addition, a gain in water storage is found in the Ethiopian highlands and the Bahr-El-Gazal river basin, emphasising the need to examine the basin as a whole, which can only be done using space techniques.