Paper ID: 82184
student

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Assessing and Mitigating the Global Freshwater Crisis (6)

Author: Ms. Maria Paula Bustos Moreno
Technische Universität Berlin, Germany

Dr. Tilo Schöne
German Research Centre for Geosciences (GFZ), Germany
Mr. Najibullah Kakar
German Research Centre for Geosciences (GFZ), Germany

MONITORING INLAND WATER STORAGE USING RADAR ALTIMETRY DATA. A CASE STUDY: COLOMBIAN LAKES AND RESERVOIRS

Abstract

In recent decades, water scarcity has intensified in certain regions due to the combined effects of climate change and the overexploitation of surface and groundwater resources by human activities (Vargas-Pineda, et al., 2020). The variability in the extent and storage of water bodies is not well understood on a scale from regional to global (Frappart, F. et al, 2015), highlighting the critical need for sophisticated methods to accurately monitor freshwater resources. This research leverages Sentinel-1 satellite imagery and Sentinel-3 altimetry data to evaluate spatiotemporal changes in water storage for key inland water bodies in Colombia, such as Tominé Reservoir and Neusa Reservoir. By integrating radar altimetry—a tool proven to be highly effective for analyzing water storage (Berry, P.A.M. et al., 2005; Zhang, J. et al., 2006; Chander, S. et al., 2014; Frappart, F. et al., 2015; Schöne, T. et al., 2017; Normandin, C. et al., 2018)—with satellite imagery, this study estimates the surface area and height of these water bodies, thereby enabling the analysis of changes in water volume through hypsometry curves. The findings reaffirm the value of satellite data in tracking water storage fluctuations. However, they also underscore the necessity for additional research into swamp areas, where the correlation in hypsometry curves was found to be weak. This study improves our knowledge of water storage changes and supports the development of better water management strategies, emphasizing how important satellite observations are in addressing the worldwide water shortage. Importantly, it reveals new information about water storage fluctuations in Colombia, preparing the way for further research and enhancements in managing water resources in the area.