



15 years of inland water monitoring using satellite radar altimetry

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The most well-established use of altimetry over land surfaces is the application to measurement of inland water heights. However, this field has evolved rapidly over the past two decades. Initial work over a handful of large targets has now expanded to the current capability to monitor thousands of river and lake heights worldwide. Two factors have been critical to the advances made in inland water monitoring. The first is the inclusion of a designed capability to track rapidly varying land surfaces, deployed on ERS RA-1 and Envisat RA-2. The second is in the analysis of inland water echoes, with the ability to identify and retrack to that part of a complex return corresponding to the underlying water surface.

This paper presents a global overview of the abilities of past and current altimeters to monitor the earth's changing inland water resources. Utilising a unique database of retracked heights from ERS-1, ERS-2, Envisat, Topex and Jason-1, a 15 year synthesis of the behaviour of the earth's inland water resources is shown. Together with additional information from the RA-2 I.E. echoes, and a land echo simulator, the unique database of global information captured in the existing datasets is utilised to demonstrate both the requirements of, and potential capabilities for a future hydrology mission