

## Global inland water monitoring from satellite radar altimetry – a glimpse into the future

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**Abstract** Satellite altimetry has been used to monitor the heights of the Earth's largest lakes for many years; however, river systems present far more challenging targets. Using an expert system approach, echoes from smaller lakes and river systems can be successfully retracked to yield height measurements. As the network of *in situ* gauges declines, this remote measurement technique gives a unique insight into the Earth's changing inland water resources. This paper presents a global analysis of the capability of the current generation of satellite radar altimeters to monitor inland water, including ERS2, EnviSat, TOPEX, Jason1 and Jason2. The results are analysed using an automated grading technique. A glimpse into the potential of future altimeters is gained from the EnviSat altimeter (RA-2) Individual Échoes, with 1800 Hz along-track sampling rate, demonstrating the substantial enhancement in monitoring capability afforded by the next generation of satellite altimeter missions.

**Key words** global; river; lake; satellite altimetry