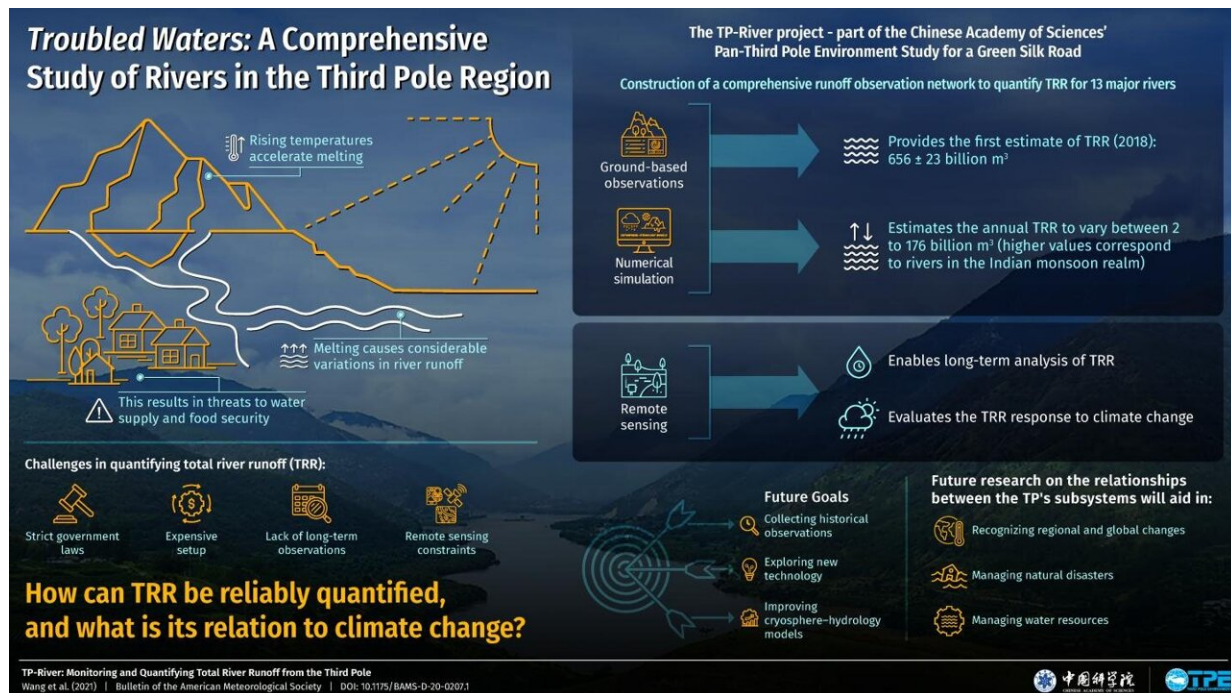


Water meters help scientists quantify river runoff

June 24 2021



A comprehensive study of rivers in the Third Pole region. Credit: TPE

The Third Pole centered on the Tibetan Plateau is home to the headwaters of multiple rivers in Asia. Despite the importance of these rivers, scientists have not known exactly how much water flows out of the mountains of the Third Pole as river runoff.

Now, however, researchers from the Institute of Tibetan Plateau

Research (ITP) of the Chinese Academy of Sciences have quantified the total [river runoff](#) of 13 major rivers in the region.

The study was published in the *Bulletin of the American Meteorological Society* and was based on data from an observational network of 'water meters' at mountain outlets in the Third Pole.

The network generates comprehensive discharge data for 13 major Third Pole rivers and was established by Pan-TPE, a research program under the Chinese Academy of Sciences. The water meters integrate both ground-based observations and numerical simulations.

"Monitoring changes in river runoff at mountain outlets in the Third Pole is particularly important because rivers in this region support millions of people in Asia and are very sensitive to climate change," said Prof. Wang Lei from ITP, lead author of the study.

Using data from the network, the scientists made the first-ever estimate of annual total river runoff for the 13 Third Pole rivers. The results, for 2018, peg total runoff at 656 ± 23 billion m^3 .

The scientists also found that the annual readings of the water meters varied widely among the different rivers, ranging from 2 to 176 billion m^3 . The higher values mainly corresponded to rivers in the Indian monsoon domain in the southern Third Pole, rather than in the westerly domain in the northern Third Pole.

Readings from these water meters offer valuable information about regional water resources. They also provide information relevant to hazard risk management. This is particularly important in the context of [climate change](#) since river runoff has significantly changed as a result of increasingly rapid snow and glacial melting in the region.

"We also plan to collect and [process data](#) for major rivers in the region prior to 2018 and improve the accuracy of discharge estimates, so that better cryosphere-hydrology models can be built for different river basins across the Third Pole," said Prof. Yao Tandong, co-author of the study and chief scientist at Pan-TPE.

More information: Lei Wang et al, TP-River: Monitoring and Quantifying Total River Runoff from the Third Pole, *Bulletin of the American Meteorological Society* (2021). [DOI: 10.1175/BAMS-D-20-0207.1](https://doi.org/10.1175/BAMS-D-20-0207.1)

Provided by Chinese Academy of Sciences

Citation: Water meters help scientists quantify river runoff (2021, June 24) retrieved 23 June 2024 from <https://phys.org/news/2021-06-meters-scientists-quantify-river-runoff.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.