

EGU2020-6720

<https://doi.org/10.5194/egusphere-egu2020-6720>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Large-sample hydrology to foster open and collaborative research: a review of recent progress and grand challenges

Gemma Coxon¹, Nans Addor², Camila Alvarez-Garreton³, Hong X. Do⁴, Keirnan Fowler⁵, and Pablo A. Mendoza^{6,7}

¹University of Bristol, Geographical Sciences, Bristol, United Kingdom of Great Britain and Northern Ireland (gemma.coxon@bristol.ac.uk)

²Department of Geography, College of Environmental and Life Sciences, University of Exeter, UK

³Center for Climate and Resilience Research, CR2, FONDAP 15110009, Santiago, Chile

⁴School for Environment and Sustainability, Ann Arbor, Michigan, US

⁵Department of Infrastructure Engineering, University of Melbourne, Parkville, Australia

⁶Department of Civil Engineering, Universidad de Chile, Santiago, Chile

⁷Advanced Mining Technology Center (AMTC), Universidad de Chile, Santiago, Chile

Large-sample hydrology (LSH) relies on data from large sets (tens to thousands) of catchments to go beyond individual case studies and derive robust conclusions on hydrological processes and models and provide the foundation for improved understanding of the link between catchment characteristics, climate and hydrological responses. Numerous LSH datasets have recently been released, covering a wide range of regions and relying on increasingly diverse data sources to characterize catchment behaviour. These datasets offer novel opportunities for open hydrology, yet they are also limited by their lack of comparability, accessibility, uncertainty estimates and characterization of human impacts.

Here, we underscore the key role of LSH datasets in open hydrologic science and highlight their potential to enhance the transparency and reproducibility of hydrological studies. We provide a review of current LSH datasets and identify their limitations, including the current difficulties of inter-dataset comparison and limited accessibility of hydrological observations. To overcome these limitations, we propose simple guidelines alongside long-term coordinated actions for the community, which aim to standardize and automatize the creation of LSH datasets worldwide. This presentation will highlight how, by producing and using common LSH datasets, the community can increase the comparability and reproducibility of hydrological research.

This research was performed as part of the Panta Rhei Working Group on large-sample hydrology and is based on <https://doi.org/10.1080/02626667.2019.1683182>.