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ROBIN - A Reference Observatory of Basins for International hydrological climate change detection

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Future climate projections suggest hydrological extremes (floods and droughts) will become more frequent and severe, further heightening the already substantial impacts they cause to lives and livelihoods, infrastructure and economies. To adapt to future changes in water availability, we need projections of future flood and drought occurrence. Numerical simulation models are used to provide such scenarios, but they are complex and highly uncertain. To better understand and constrain these model-based projections, we need to quantify emerging trends in the water cycle. This requires long records of past hydrological observations; river flows are especially useful because river flows integrate climate processes over the large areas covered by drainage basins.

There have been many studies of long term changes in river flow around the world, but past research, confidence in observed trends remains very low. This is primarily due to the modification of river flows by human activities (e.g. presence of dams, abstraction of water for irrigation or human consumption, etc.). These disturbances can obscure the 'signal' of climate change, i.e., trends in many rivers may bear no relation to global warming and may be opposing the climate trend. To detect climate-driven trends we need to analyse river basins that are relatively undisturbed by such human impacts. To this end, many countries have 'Reference Hydrometric Networks' (RHNs) of minimally altered catchments providing high quality data. However, these are sparse, globally, and there is a need for an integrated approach to advance international assessments of hydrological change, that are a foundation of international assessments such as the IPCC Reports.

Here we introduce the ROBIN initiative, where we are advancing a worldwide effort to bring together a global RHN. With a growing network of partners from 20 countries spanning a broad range of climates and geographies, ROBIN will develop a network of catchments across the world to undertake the first, truly global scale analysis of trends in river flows using undisturbed catchments. With the support of international organisations, including WMO, UNESCO and IPCC, ROBIN will lay the foundations for an enduring network of catchments, and scientists, to support global trend assessments in the future.