Unravelling the hydrodynamic behavior of karst systems through comparative hydrology

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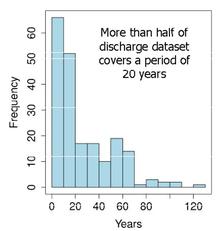
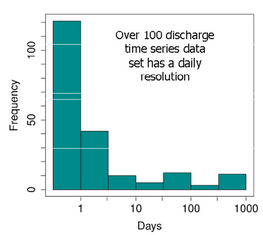
Motivation

Since most research in karst hydrology has being focusing on local and catchment scales, comparative knowledge about the hydrodynamic behaviour of karst systems in different regions of the world remains limited. **A large number of time series of spring discharges are important data required to initiate a comparative study of karst systems.** Although this data is often available in local databases, publications or reports, much effort is required to collect karst spring observations in a large number.

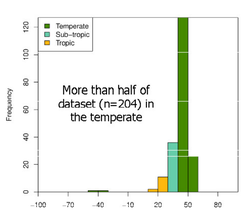
Time span of discharge data



Time series temporal resolution



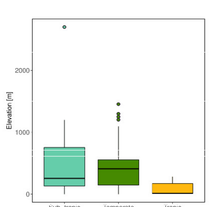
Latitude distribution



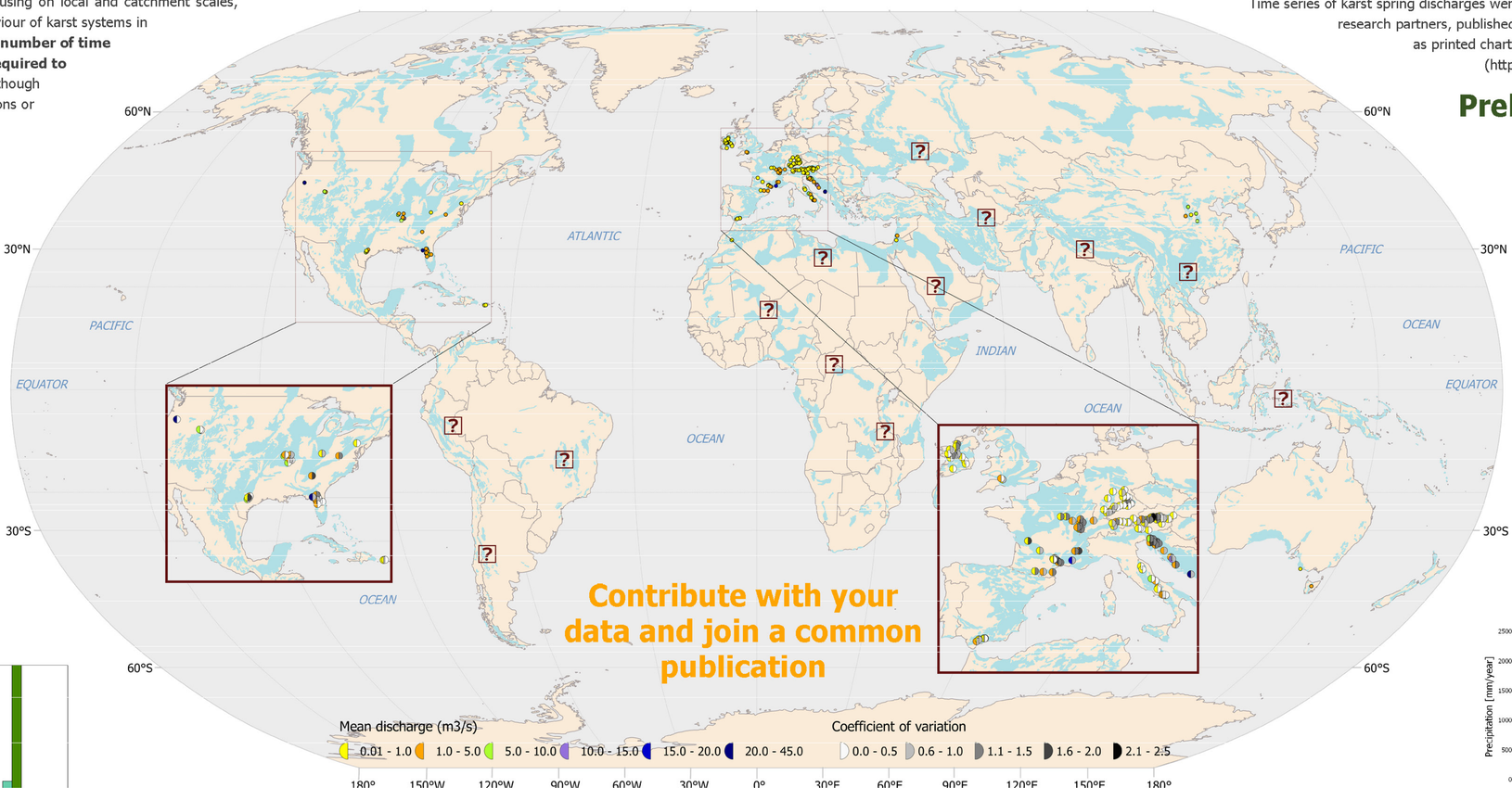
Data description

Presently, the database consist of 204 spring discharge time series across the globe. Most of the data points are in the temperate zone of northern hemisphere, in particular Europe. Time series data span between 1 and 120 years with majority of the data between the range of 1 to 20 years.

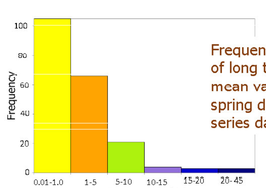
Altitude of springs



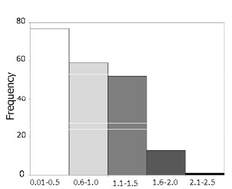
Global distribution of karst spring discharge



Frequency distribution of long term annual mean values of all spring discharge time series dataset



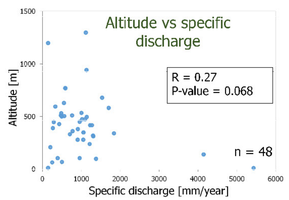
Frequency distribution of coefficient of variation of long term annual mean discharge values



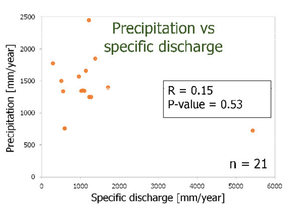
Data acquisition

Time series of karst spring discharges were acquired from government agencies and ministries, research partners, published papers, PhD thesis and NGO reports. Data published as printed charts were extracted using Webplotdigitizer (https://automeris.io/WebPlotDigitizer).

Preliminary analysis



Specific discharge was calculated for subsets of data with known recharge area and compared with altitude and precipitation. The weak relationship that we found suggests that more detailed analysis is require to explain the differences among the karst springs.



Conclusion

Our datasets cover a wide range of latitude across the globe and long time span. **Still, there are many gaps in the tropics and subtropics, as well as in the entire southern hemisphere. Therefore we ask for your support through data contribution.** With your help, the dataset will greatly contribute to karst hydrology research and beyond.

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References: Chen Z, Auler AS, Bakalowicz M, Drew D, Griger F, Hartmann J, Jiang G, Moosdorf N, Richts A, Stevanovic Z, Veni G, Goldscheider N (2017) The World Karst Aquifer Mapping project: concept, mapping procedure and map of Europe. Hydrogeology Journal, 25(3): 771-785. BGR, IAH, KIT and UNESCO (2017) World Karst Aquifer Map, 1:40 Million. Berlin, Reading, Karlsruhe and Paris.

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