



# Exploring Runoff Generation Processes: A Global Comparative Study of Experimental Watersheds

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## 1. Introduction

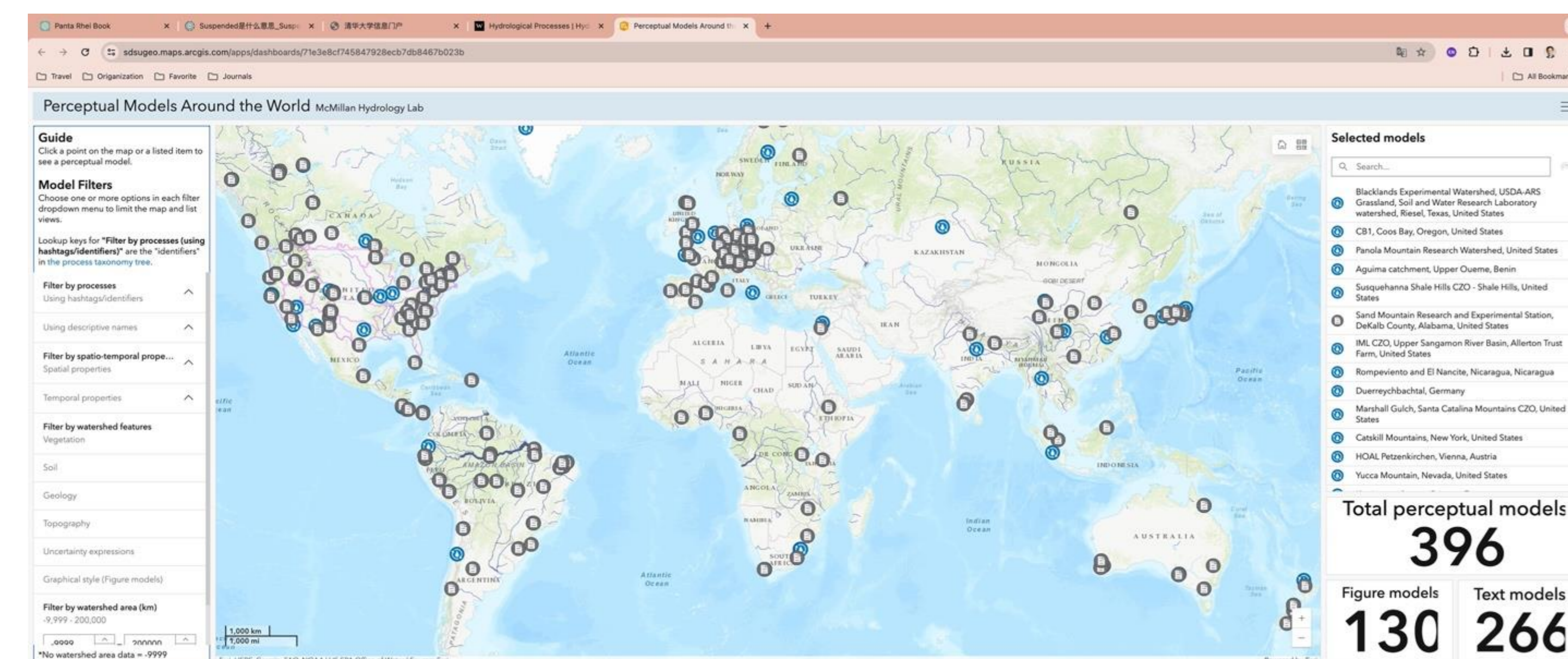
Comprehending runoff generation processes remains a formidable challenge for hydrologists. This study advocates for a comparative examination of these processes across global experimental watersheds. As part of the HELPING decadal initiative, a dedicated working group has been established. Embracing a Darwinian methodology, our objective is to synthesize information through comparative studies across a diverse array of local ecosystems, with the aim of cultivating a global perspective and formulating overarching theories. We warmly welcome and invite research groups managing experimental watersheds worldwide to actively participate in this collaborative effort.

## 2. The goals of the working group

The working group is designed to achieve the following objectives:

- Compile datasets for experimental watersheds globally, maximizing the utilization of available information.
- Identify both similarities and differences in watershed characteristics and processes across diverse experimental sites.
- Develop a more quantitative framework to discern dominant processes within specific watersheds, thereby contributing to a profound understanding of hydrological dynamics.

By bringing together researchers and research groups from across the globe, this collaborative initiative seeks to transcend geographical boundaries and foster a holistic understanding of runoff generation processes.



A database contains published descriptions of runoff generation processes worldwide

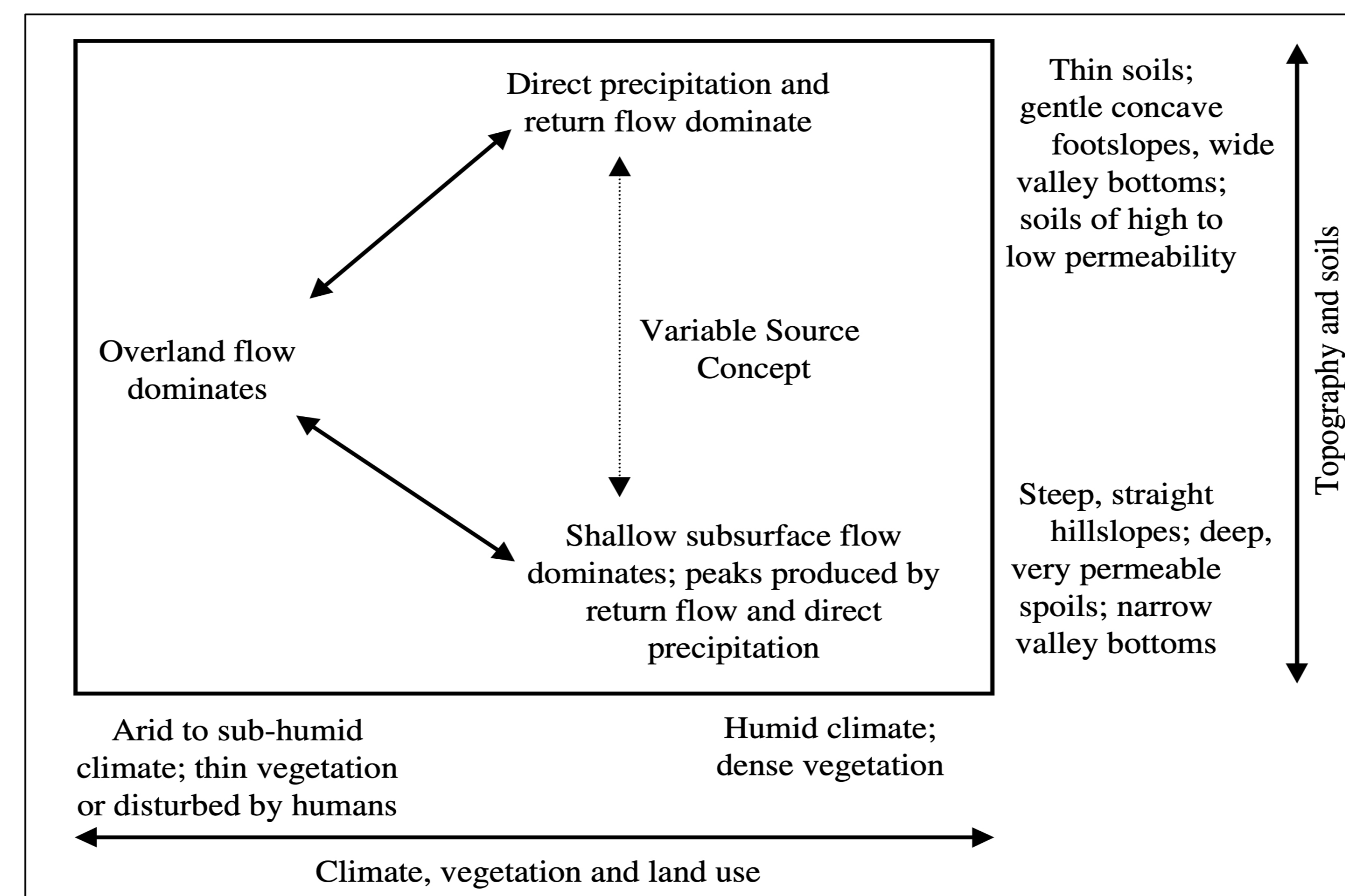
## 3. Methods

- Comparative studies among different research groups running experimental watersheds.
- Based on extensive observational experiments, comparative research was conducted to draw conclusions.
- Through an integrated study comparing rainfall-runoff phenomena, the runoff generation mechanisms were explored.
- Summarizing the processes under different climatic, vegetative, and topographic-geological conditions to ultimately identify universal patterns.

## 4. Desired research outcomes

The (a) short-term, (b) the long-term and (c) the ultimate results you hope to achieve:

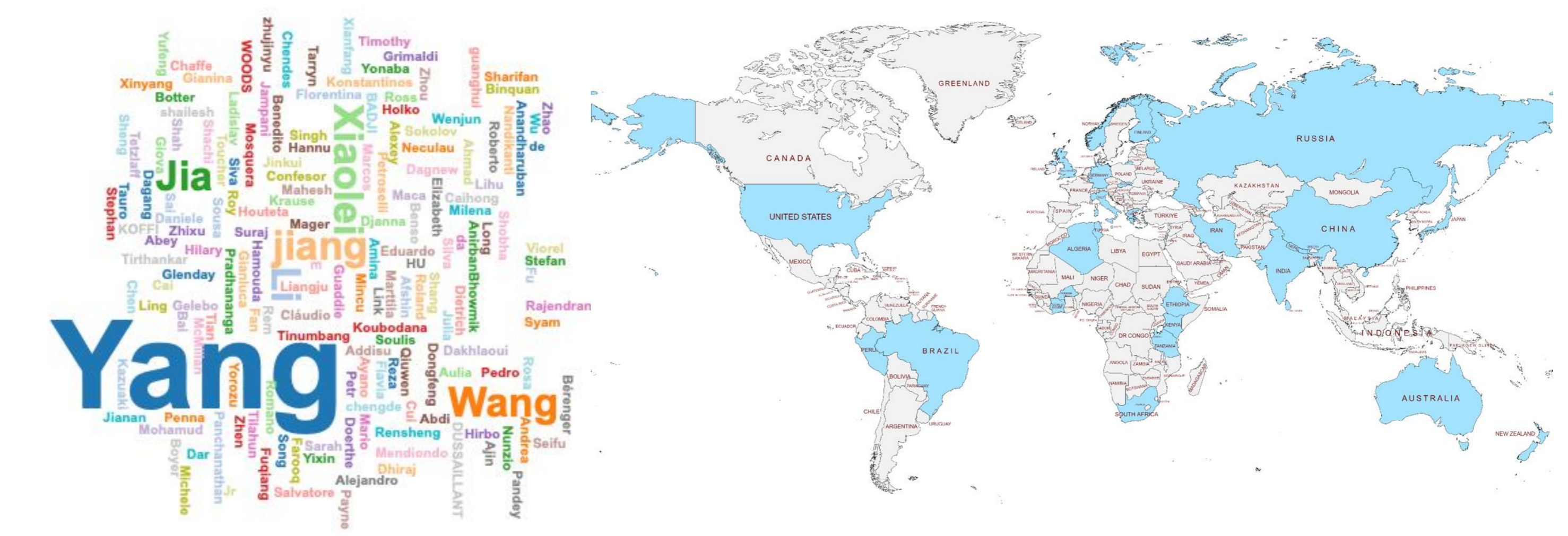
- **Short-term:** to compile datasets for experimental watersheds as many as possible.
- **Long-term:** to identify similarities and differences of watershed characteristics and processes of experimental sites.
- **Ultimate results:** to develop a more quantitative framework to identify dominant processes in a specific watershed.



Schematic illustration of the occurrence of various runoff processes in relation to their major controls (Dunne, 1978. in Hillslope Hydrology, edit by Kirkby)

## 5. Group members

The WG currently has 81 members from over 30 countries representing universities and research institutions worldwide, which can offer a unique opportunity to collaborate with experts in the field of hydrology.



Members and their country distribution

## 6. Main information and call for members

In the coming weeks, we will schedule regular online meetings to exchange hydrological experimental work, share data, and enhance our comparative understanding of runoff generation processes across global experimental watersheds.

If you are passionate about hydrology and would like to contribute to our research efforts, we welcome you to join our discussion group. For inquiries and to express your interest in joining, please contact at [tianfq@mail.tsinghua.edu.cn](mailto:tianfq@mail.tsinghua.edu.cn).

We look forward to welcoming dedicated individuals who share our passion for hydrological research and innovation. Join us and be part of an exciting global research initiative!