

# Geohydrology: Watershed Hydrology

Mayuka b

Trinity college, JNT University, India

## Editorial

The coupled/integrated water exchanges that occur in all areas that contribute flow to the stream corridor make up the hydrology of a watershed. The water balance controls these water exchanges; however, the morphology of the basin, which is determined by the spatial location in the watershed, the underlying lithology, and sediment-delivery processes operating within the watershed, determines the rates of hydrologic processes within each watershed.

Many studies focused on the watershed scale aim to understand the interconnected processes that lead to river corridor or basin outlet observations during the water and sediment cycle. The contributing land area that drains water, such as rainfall or snowmelt, to a basin outlet, or pour point, is referred to as a watershed. A drainage basin or catchment is another term for a watershed. It is a spatially scalable organisational system in which it is possible to define the complex elements of the water balance from the origin and reception of precipitation to the subsequent infiltration and runoff generation. The hydrology of the watershed is regulated not only by the morphology of the basin, including the form of the basin and the characteristics of the hillslope, but also by the existence of the underlying geology of the bedrock and the mantle of the soil, the land use and the land cover. Although the drainage basin is often used to describe only surface-water movement or fluvial processes, it is more than that.

The topographic ridge that surrounds the lake, directing water flow towards the stream or river network and finally the basin outlet, is known as a watershed divide. In areas with near-surface bedrock and little vegetation cover, this division can be sharp and well defined; in areas with thick soils and dense vegetation, it can be more subtle.

The basin boundary may apply to any part of a drainage system; it is solely defined by the measurement point along a channel or the basin outlet in question. As a consequence, a watershed may refer to any part of a drainage system that contributes flow from a single tributary stream, up to all streams and rivers draining an entire continent.

Since the definition of drainage basins is so site-specific and application-specific, systematic hierarchical classification and naming conventions have been developed to encourage a common and reproducible vocabulary for the study of hydrological processes and watershed management. The National Hydrography Dataset (NHD) in the United States contains six watershed scales with an assigned numbering scheme.

The shape of the basin is of interest to hydrologists because of the relationship between the shape and the length of the watershed, which is the distance along the From the watershed divide, the main channel to the outlet of the basin, or base level. In a circular basin, peak discharge is likely to be greater than an elongated basin of the same size since the length of the watershed along all flow paths would be nearly the same, converging flow faster to the channel.

**\*Address for Correspondence:** Mayuka.b, Jawaharlal Nehru University, Hyderabad, Telangana, India, Tel: +630452128; E-mail: mayuka.bejarapu@gmail.com

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**Received** 11 February 2021; **Accepted** 15 February 2021; **Published** 25 February 2021

**How to cite this article:** Mayuka b. "Geohydrology: Watershed Hydrology." *Hydrology: Current Research* 12:331 (2021).