

Editorial Note on Flood Hydrology

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Editorial

A flood occurs when water overflows and submerges normally dry terrain. In the sense of "flowing water," the term can also refer to the tide's inflow. Land use changes such as deforestation and destruction of wetlands, changes in river channel or flood barriers such as levees and bigger environmental challenges such as climate change and sea level rise all contribute to increased flooding intensity and frequency. Flooding can occur as a consequence of an overflow of water from a water body, such as a river, lake, or ocean, where the water overtops or breaks levees, allowing some of the water to escape its regular confines, or as a result of rainwater accumulating on wet land in an area flood. While seasonal fluctuations in precipitation and snow melt will affect the size of a lake or other body of water, these changes are unlikely to be deemed important unless they flood property or drown domestic animals. When the flow rate of a river exceeds the capacity of the river channel, particularly near bends or meanders in the waterway, flooding can occur.

Floods in natural flood plains of rivers can cause damage to homes and businesses. While moving away from rivers and other bodies of water might reduce riverine flood damage, people have traditionally lived and worked near rivers because the terrain is usually flat and productive, and rivers give easy navigation and access to commerce and industry. In addition to property loss, flooding can result in long-term relocation of populations and an increase

in the spread of waterborne infections and vector-borne diseases caused by mosquitos. Floods can occur on flat or low-lying terrain when rainfall or snowmelt supplies water faster than it can infiltrate or flow off. The surplus builds up in places, sometimes to dangerous depths. Where the water table is shallow, such as a floodplain, or from intense rain from one or a series of storms, surface soil can get saturated, essentially stopping penetration. Infiltration through frozen ground, rock, concrete, paving, or roofs is also slow to non-existent.

Because the velocity of overland flow is dependent on the surface slope, areal flooding occurs in flat regions such as floodplains and local depressions not connected to a stream channel. When precipitation surpasses evaporation, endorheic basins may experience areal flooding. From the smallest ephemeral streams in humid zones to generally dry channels in desert climates to the world's greatest rivers, floods occur in all types of river and stream channels. Overland flow on tilled fields can cause a muddy flood, with sediments being picked up by runoff and conveyed as suspended matter or bed load. Drainage impediments such as landslides, ice, debris, or beaver dams can cause or worsen localised flooding. Floods that rise slowly are most typical in major rivers with huge catchment basins. Sustained rainfall, quick snow melt, monsoons, or tropical cyclones could all contribute to the increased flow. Enormous rivers, on the other hand, may experience quick flooding in dry climate zones because they have large basins but narrow river channels, and rainfall can be highly heavy in smaller portions of those basins.

How to cite this article: Benedikt Gönsch. "Editorial Note on Flood Hydrology". *Hydrology Current Res* (2021) 12: 352.

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Received 15 July 2021; **Accepted** 22 July 2021; **Published** 28 July 2021