

Runoff Encyclopedia Article

Runoff

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Runoff

Runoff is the component of the **hydrologic cycle** through which **water** is returned to the ocean by overland flow. The term runoff is considered synonymous with streamflow and comprises surface runoff resulting from **precipitation** and that portion of the streamflow that is contributed by **groundwater** flow entering the stream channel.

Surface runoff consists of that portion of the precipitation reaching the surface that neither infiltrates into the ground nor is retained on the surface. The quantity of surface runoff is controlled by a complex variety of factors. Included among these are precipitation intensity and duration, **permeability** of the ground surface, vegetation type and density, **area** of drainage basin, distribution of precipitation, stream-channel geometry, depth to **water table**, and topographic slope.

In the early stages of a storm, much of the precipitation may be intercepted by vegetation or captured in surface depressions. Water held in this manner often presents a large surface area and is likely to be evaporated. Any water reaching the surface at this stage is more likely to infiltrate before the upper layer of the ground becomes saturated. Thus, storms of light intensity or short duration may produce little or no surface runoff. As storm intensity or duration increases, interception becomes less effective, infiltration capacity of the **soil** decreases, and surface depressions fill. The result is increasing surface runoff leading to greater flow rates within local stream channels.

Variations in permeability within the soil may cause a portion of the water that infiltrates into the soil to migrate laterally as interflow. Some of the remaining infiltrate will percolate downward to the water table and flow with the groundwater. Ultimately, both of these sources may intercept a stream channel and contribute to the total runoff.

During a particular storm event, the contribution of runoff to a stream varies significantly through time. Inflow to the stream begins with direct channel precipitation followed by overland surface runoff when the appropriate conditions exist. Lateral interflow and groundwater contributions typically move more slowly and impact the stream level later. The groundwater portion of the runoff frequently supports the flow of a stream both during and between storm events.

See Also

Evaporation