

6.5 Concept Definitions

Following are discussions of concepts which will be important in a hydrologic analysis. These concepts will be used throughout the remainder of this chapter in dealing with different aspects of hydrologic studies.

Antecedent Moisture Conditions - Antecedent moisture conditions are the soil moisture conditions of the watershed at the beginning of a storm. These conditions affect the volume of runoff generated by a particular storm event.

Depression Storage - Depression storage is the natural depressions within a watershed which store runoff. Generally, after the depression storage is filled, runoff from these low areas will commence.

Frequency - Frequency is the number of times a flood of a given magnitude can be expected to occur on an average over a stated period of time. Frequency analysis is then the estimation of peak discharges for various recurrence intervals. Another way to express frequency is with probability. Probability analysis seeks to define the flood flow with a probability of being equaled or exceeded in any year.

Hydraulic Roughness - Hydraulic roughness is a composite of the physical characteristics which influence the flow of water across the earth's surface, whether the conditions are natural or channelized. It affects both the time response of a watershed and drainage channel as well as the channel storage characteristics.

Hydrograph - The hydrograph is a graph of the time distribution of runoff from a watershed.

Hyetographs - The hyetograph is a graph of the time distribution of rainfall over a watershed.

Infiltration - Infiltration is a complex process of allowing runoff to penetrate the ground surface and flow through the upper soil surface. The infiltration curve is a graph of the time distribution at which this occurs.

Interception - Storage of rainfall on foliage and other intercepting surfaces during a rainfall event is called interception storage.

Lag Time - The lag time is defined as the time from the centroid of the excess rainfall to the peak of the hydrograph.

Peak Discharge - The peak discharge, sometimes called peak flow, is the maximum rate of flow of water passing a given point as a result of a rainfall event or the maximum discharge on a runoff hydrograph.

Rainfall Excess - The rainfall excess is the water available to runoff after interception, depression storage and infiltration have been satisfied.

Stage - The stage of a river is the elevation of the water surface above some elevation datum.

Time Of Concentration - The time of concentration is the time it takes the drop of water falling on the hydraulically most remote point in the watershed to travel through the watershed to the point of analysis.

Unit Hydrograph - A unit hydrograph is the direct runoff hydrograph resulting from a rainfall event which has a specific temporal and spatial distribution, which lasts for a specific duration and has unit volume (or results from a unit depth of rainfall). The ordinates of the unit hydrograph are such that the volume of direct runoff represented by the area under the hydrograph is equal to one millimeter (inch) of runoff from the drainage area. When a unit hydrograph is shown with units of m^3/s (cfs), it is implied that the ordinates are m^3/s per millimeter (cfs per inch) of direct runoff. References - For a more complete discussion of these concepts and others related to hydrologic analysis, the reader is referred to – "Highway Hydrology" Federal Highway Administration Hydraulic Design Series No. 2, Second Edition, (FHWA-NHI-02-001, October 2002) and Guidelines for Hydrology - Volume II Highway Drainage Guidelines, prepared by the Task Force On Hydrology and Hydraulics, AASHTO Highway Subcommittee on Design.