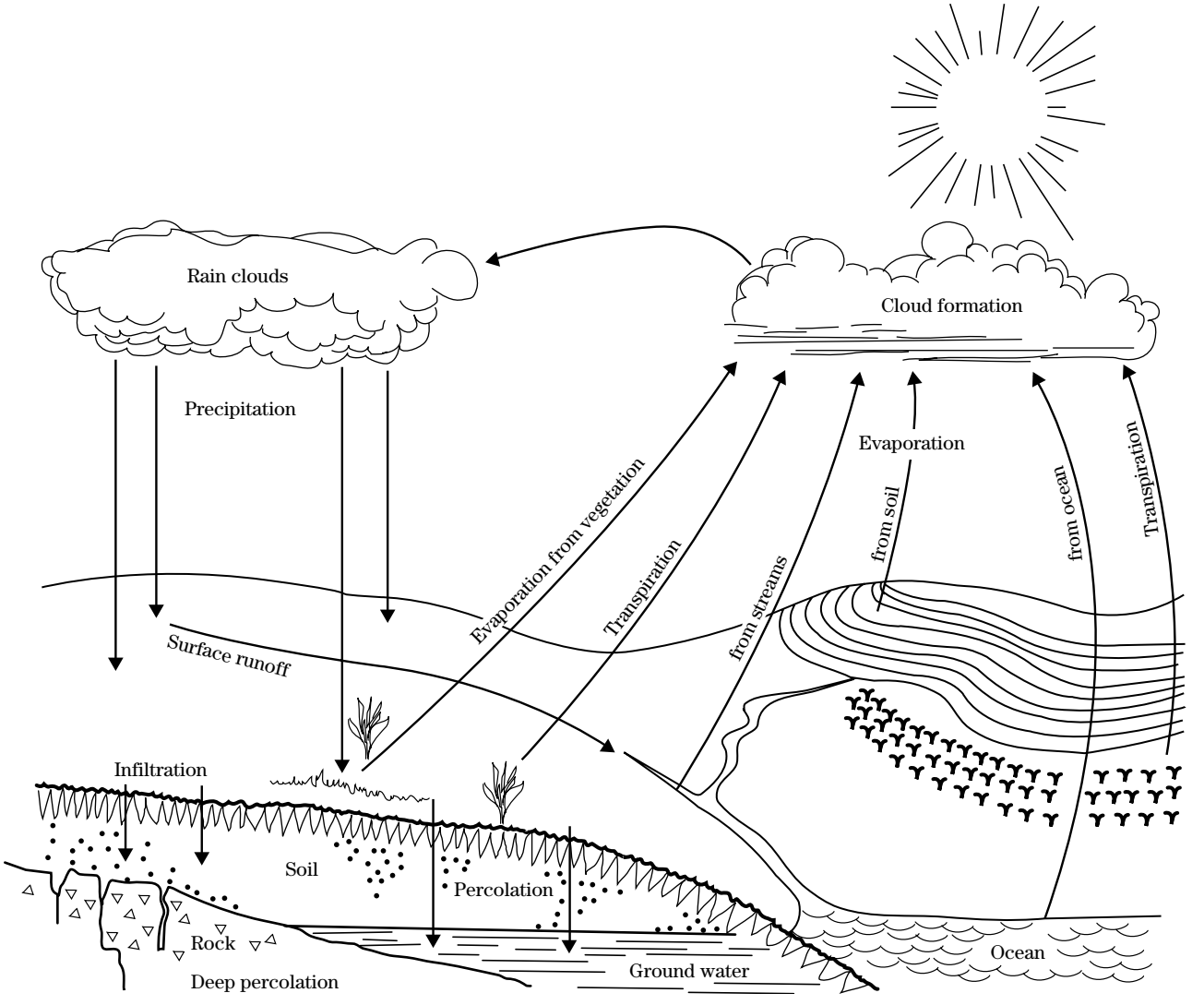
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Chapter 22 Glossary



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Chapter 22 Glossary

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Chapter 22 Glossary

630.2200 Introduction

A selected list of definitions of terms used in hydrologic evaluations is given in this chapter. This list is not intended to be exhaustive or to cover every hydrologic term. Other useful definitions are given in:

- Nomenclature for Hydraulics (1962) American Society of Civil Engineers, Manual No. 43
- Soil and Water Terminology (2007) American Society of Agricultural and Biological Engineers, Standard S526.3
- General Introduction and Hydrologic Definitions, (1960) Manual of Hydrology: Part 1. General Surface-Water Techniques, Geological Survey Water-Supply Paper 1541–A. Methods and practices of the Geological Survey. HTML version (1995) available at: *http://water.usgs.gov/wsc/glossary.html*
- Water Words Dictionary (2011) Nevada Department of Conservation and Natural Resources and Nevada Division of Water Planning, available at: *http://water.nv.gov/programs/planning/dictionary/*
- Environmental Management Glossary, Fourth Edition (2006) Soil and Water Conservation Society of American
- Glossary of Geology, Fifth Edition (2005) American Geological Institute

This chapter also contains a list of useful conversion factors.

630.2201 Definitions

This section contains definitions for hydrologic terms commonly used within the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). Definitions for underlined terms can be found elsewhere in the list of definitions. Abbreviations and symbols representing many of these terms are found in section 630.2202.

Acre-foot The amount of water that will cover one acre to a depth of 1 foot. Equals 43,560 cubic feet. Abbreviated AF.

Actual retention Actual retention after runoff begins, in inches. Abbreviated F.

Albedo The percentage of incoming radiation that is reflected by a natural surface such as the ground, ice, snow, or water. The term is often used for the reflectivity of snow in particular.

Annual flood The maximum instantaneous peak discharge in a water year.

Annual flood series A list of the maximum flood peak discharges occurring in each year for the period of record.

Annual runoff The total natural discharge of a stream for a year, usually expressed in inches depth or acre-feet. See water yield.

Annual yield The total amount of water obtained in a year from a stream, spring, well, etc. Usually expressed in inches depth, acre-feet, millions of gallons, or cubic feet.

Antecedent moisture condition See antecedent runoff condition. Abbreviated AMC.

Antecedent runoff condition The average condition of a watershed when flooding occurs. Abbreviated ARC. Formerly called antecedent moisture condition.

Area-depth curve A graph showing the change in average rainfall depth as the size of the area receiving the rainfall changes.

Areal rainfall The average rainfall over an area, usually derived from or discussed in contrast with point rainfall.

Atmospheric vapor The gaseous form of water that occurs in the atmosphere.

Auxiliary spillway A spillway designed to convey excess water safely through, over, or around a dam. May also be referred to as an emergency spillway.

Auxiliary spillway hydrograph The hydrograph used to evaluate the stability of the auxiliary spillway to pass flow at a safe velocity. May also be referred to as an "emergency spillway hydrograph."

Auxiliary spillway system A single auxiliary spillway or a combination of auxiliary spillways designed to work together.

Base flow The sustained or fair-weather discharge that persists after storm runoff and associated quick return flow are depleted. It is usually derived from groundwater discharge or gradual snow or ice melt over extended periods of time, but need not be continuous flow. It can be based on annual or seasonal periods depending upon when major floods usually occur. It may also be defined as the stream discharge derived from groundwater sources. It is sometimes considered to include flow from regulated lakes or reservoirs.

Channel flow Water flow in a defined channel, either natural or humanmade.

Connected impervious area Describes a situation where runoff from an impervious area flows directly to storm drains, street gutters, or steam channels.

Conservation storage Water impounded for consumptive uses, such as municipal, industrial, and irrigation water supply, and nonconsumptive uses such as recreation, and fish and wildlife.

Conservation tillage A tillage practice that leaves residues on the soil surface for erosion control and water conservation. It includes specific residue management practices, such as no-till, mulch-till, or ridge-till.

Consumptive use A term used mainly by irrigation engineers to describe the amount of water used in crop growth plus evaporation from the soil. See also evapotranspiration.

Correlation A statistical index that measures linear variation between variables.

Cover The vegetation and vegetational debris, such as mulch and residue, that exist on the soil surface. In some classification schemes, such as table 9–1 in NEH630.09, fallow or bare soil is considered the minimum cover class.

Cover class See land use and treatment class.

Crest The elevation of the uppermost surface of a dam or an earth spillway.

Crest staff gage A gage used to make a quick visual observation of water surface levels in reservoirs, rivers, streams, irrigation channels, weirs, and flumes.

Criterion variable The dependant variable in a statistical regression analysis.

Cross section The shape of a channel, stream, or valley determined by a line approximately perpendicular to the main path of water flow, along which measurements of distance and elevations are determined.

Cubic feet per second A volumetric unit of water flow. Sometimes called second-feet. Abbreviated cfs.

Cubic feet per second per square mile Measures the volume of water flowing per second per square mile of drainage area. Assumes uniformly distributed runoff. Abbreviated csm.

Curve number A dimensionless number of 98 or less that relates runoff to the soil-cover complex of a watershed. The curve number indicates the runoff potential of a soil-cover complex during periods when the soil is not frozen. Higher numbers mean greater runoff. Abbreviated CN. Also called a runoff curve number (RCN).

Dam An artificial barrier, together with any associated spillways and appurtenant works, across a watercourse or natural drainage area, that does or may impound or divert water.

Damage reach A length of floodplain or valley selected for damage evaluation.

Degree-day A day with an average temperature one degree above a defined basis or threshold. The average is usually obtained by averaging the maximum and minimum temperature for the day. Depending on usage, the threshold temperature may vary. For example, in snowmelt studies, a degree-day is defined as a day with an average daily temperature above 32 °F, so a day with an average temperature of 40° F gives (40°– 32°) = 8 degree-days.

Degrees of freedom The number of independent pieces of information, or parameters, required to form a statistical estimate.

Depression storage The volume of water stored on the soil surface.

Depth-area curve A graph showing the change in average rainfall depth as size of area changes.

Design storm A specified rainfall depth and rainfall distribution used to estimate runoff in design of hydraulic structures.

Digital elevation model A digital representation of a topographic surface. Abbreviated DEM.

Dimensionless unit hydrograph A discharge hydrograph resulting from one inch of direct runoff distributed uniformly over the watershed, with the direct storm runoff generated at a uniform rate during the unit storm duration.

Direct runoff Water that enters the stream channel during a storm. It mainly consists of rainfall on the stream surface, surface runoff, and quick return flow. Abbreviated Q.

Discharge Quantity of water flow at a location in a stream or river, commonly measured and reported in units of cubic feet per second or cubic meters per second. Abbreviated q.

Drainage area The area of a watershed draining into a stream at a given point. The area may be of different sizes for surface runoff, subsurface runoff or flow, and base flow. Generally the surface runoff area is used as the drainage area. See watershed.

Drainage system The set of streams and other bodies of impounded surface water that drain a region.

Duration of excess rainfall The time of a rainfall event during which direct runoff occurs, measured in hours. Abbreviated D.

Duration of unit excess rainfall The incremental time of a storm during which direct runoff occurs for the unit hydrograph, in hours. Abbreviated ΔD.

Effective duration The time in a storm during which the water supply for direct runoff is produced. Also the duration of excess rainfall.

Emergency spillway See auxiliary spillway.

Emergency spillway hydrograph See auxiliary spillway hydrograph.

Energy grade line A graphical representation of the kinetic head of water flowing in a pipe, conduit, or channel. The line is plotted above the hydraulic grade line at a distance equal to the velocity head. Abbreviated EGL.

Evaluation series A list of floods or storms that produced floods during a representative period that is used in water project evaluation to obtain estimates of flood damages.

Evaporation The process by which surface or subsurface water is converted to atmospheric vapor.

Evapotranspiration Water withdrawn from soil by evaporation and plant transpiration. See consumptive use. Abbreviated ET.

Exceedance probability The probability that a random event will exceed a specified magnitude in a given time period, usually one year.

Excess rainfall The part of rainfall during a given storm that exceeds the infiltration capacity and is available for direct runoff.

Excessive precipitation Standard term for rainfall in which the rate of fall is greater than certain adopted limits, chosen with regard to the normal precipitation of a given place or area. Not the same as excess rainfall.

Fallow Cropland kept unseeded for a period of time. This may be a normal part of the cropping system for weed control, water conservation, soil conditioning, etc.

Flood A relatively high flow as determined by either gage height or discharge quantity. An event during which a stream overflows its normal banks.

Flood pool Floodwater storage in a reservoir. In a floodwater retarding structure it is the temporary storage between crests of the principal spillway and the auxiliary spillway or spillways.

Flood routing The process of progressively determining the time and shape of a flood wave in a stream or reservoir.

Flood wave The rise and fall in streamflow during and after a storm.

Floodplain The strip of relatively smooth land adjacent to a stream channel constructed by the present water course and covered by water when the stream flows over its banks.

Floodwater retarding structure A dam, usually made with an earth fill, having a flood pool where incoming floodwater is temporarily stored and slowly released downstream through a principal spillway.

Flow duration The percentage of time during which specified flow rates are exceeded.

Flow retardance The degree to which flow is impeded as it travels over a surface. Thick mulches in forests and hay meadows with high stem densities have high flow retardance, as well as high infiltration rates. Bare surfaces have little flow retardance. Flow retardance is measured by a retardance factor, which is inverse to retardance. Therefore, surfaces with high retardance have low retardance factors and surfaces with low retardance have high retardance factors. Also referred to as surface retardance.

Freeboard hydrograph The hydrograph used to evaluate the total spillway flow capacity of a dam and the structural integrity of the spillway system. It is also used to establish the minimum settled crest elevation of the dam. Abbreviated FBH.

Frequency The number of occasions that the same numerical measure of a particular quantity has occurred between definite time periods. Often stated in terms such as return interval, recurrence interval, or percent chance.

Frequency analysis An analysis of the frequency at which a given event occurs or repeats over a particular time period or in a given sample.

Frequency array A sequence of actual events (floods, etc.) suitable for use in frequency analysis, or a sequence of hypothetical events obtained from a frequency analysis.

Frequency curve The line on probability paper that represents a series of events and their exceedance probabilities.

Frequency distribution A generalized cumulative density function of known shape and range of values.

Friction slope The friction head loss per unit length along an open channel or a conduit.

Groundwater The water in the saturated zone beneath the water table.

Historical series A systematic record or series of all events, including both measured and nonmeasured events, in a given period of years, with the date of each event being known.

Hydraulic grade line A line or an elevation representing the hydraulic head in a closed conduit or open channel. In an open channel, the hydraulic grade line is the water surface. Abbreviated HGL.

Hydrograph A graph showing the discharge, stage, velocity, or other property of water with respect to time for a given point on a stream or for a given point in any drainage system.

Hydrologic condition An indication of the effects of ground cover and treatment on runoff.

Hydrologic soil-cover complex A combination of a hydrologic soil group and a land use and treatment class describing the potential runoff conditions.

Hydrologic soil group A group of soils having the similar physical and runoff characteristics.

Hydrologic unit Watershed boundaries organized in a nested hierarchy by size. Abbreviated HU.

Hydrology The science that deals with the occurrence and distribution of naturally occurring water on, around, and under the Earth's surface.

Impervious area The ground cover where there is little to no infiltration and there could be some surface detention, such as pavement, roof tops, and other similar surfaces.

Infiltration The part of rainfall that enters the soil; the process by which part of the rainfall enters the soil.

Infiltration rate The rate at which water enters the soil after prolonged wetting of the soil profile. Abbreviated F_c.

Initial abstraction All of the rainfall that occurs before runoff occurs, consisting of interception, evaporation, infiltration, and depression storage. Abbreviated I_a.

Integrity analysis Evaluation of an earth or vegetated earth spillway to pass a given flood without eroding to the point of breach. For purposes of spillway design, an earth spillway must retain its integrity (not erode to the point of lowering the hydraulic control) during the passage of the freeboard hydrograph through the reservoir.

Interception Precipitation caught and stored on plants and finally absorbed, evaporated, or sublimated.

Interflow Water that infiltrates into the soil profile and moves laterally until it returns to the surface or stream.

Irrigation pool Reservoir storage used to store water for release as needed in irrigation.

Isohyet A line on a map connecting points of equal rainfall amounts.

Joint use storage Volume in a reservoir that is used for two or more purposes; for instance, irrigation and floodwater purposes.

Karst topography An area of a watershed where the subsurface geology is primarily carbonate rocks resulting in sink holes and large surface flow losses.

Kinematic wave A variation in surface flow that maintains a unique function relating flow to stage.

Lag On a hydrograph, the time from the centroid of rainfall to the peak of the hydrograph. Abbreviated L.

Land cover A broad land classification such as agricultural or forest, etc.

Land treatment measure A tillage practice, a pattern of tillage or land use, or any land improvement with a substantial effect of reducing runoff and sediment production or improving use of drainage and irrigation facilitates. Examples are contouring, improved crop rotations, controlled grazing, land leveling, and field drainage. In hydrologic computations, nonbeneficial measures (such as straight row or poor rotation corn) are included for convenience in evaluation. In general conservation work, "land treatment measure" has a broader meaning that includes measures to improve the soil, control sheet erosion, and/or increase soil fertility.

Land use A land classification, such as row crops or pasture, that indicates a type of land use. Roads may also be classified as a separate land use.

Land use and treatment class Class that consists of use and treatment combinations that actually occur on watersheds. Often referred to as cover class.

Landscape elements The landforms, water, vegetation, and structures that make up any landscape we see and experience.

Logarithmic-normal probability distribution A normal probability distribution using the logarithmic transformation of the data.

Log-normal Short for logarithmic-normal probability distribution.

Log-normal paper Graph paper used in estimating frequencies of floods, etc. The paper has a logarithmic scale for the flood (or other event) amounts and a cumulative distribution scale (also called frequency or percent chance scale) for the probability plotting positions.

Log paper Short for "full logarithmic graph paper," is a graph paper that has logarithmic scales on both horizontal and vertical axes. Sometimes called "log-log paper." The scales may be any number of cycles, but usually in combinations such as 1x1, 2x2, 3x3, 3x5, 4x7, etc.

Loss The portion of precipitation lost as runoff from the surface of the land due to evaporation and/or deep percolation.

Manning's *n* A coefficient of roughness, used in a formula for estimating the capacity of a channel or a pipe to convey water. Generally, n values are determined by inspection in the field.

Maximum potential retention Maximum potential retention represents the potential maximum amount of water in inches that will be retained on the watershed surface after storm runoff begins. This is an important variable in the NRCS runoff equations. It is not a directly measurable watershed variable. Abbreviated S.

Mean The average of a series of numbers. It can be arithmetic or geometric, depending on the equation used to compute the mean.

Mean daily flow The average or mean discharge of a stream for one day. Usually given in cubic feet per second.

Median The value in an array of numbers that has as many lower values as it has higher values.

Mulch-till Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting.

Muskingum-Cunge A flood routing technique that applies to channel or reach routing.

NEH630 The NRCS National Engineering Handbook (NEH), Part 630, Hydrology. Formerly National Engineering Handbook Section 4, or NEH–4.

Non-structural measures Non-structural measures alleviate flood losses or reduce the impact of flooding by modifying the susceptibility of land, people, and property to flood damage. Non-structural measures include, but are not limited to, certain conservation practices, flood warning systems, flood-proofing measures, acquisition, and/or relocation of individual properties.

Normal A mean or average value established from a series of hydrological or meteorological observations.

No-till Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round, while limiting the soil-disturbing activities.

Outliers Extreme event represented by data points which depart from the trend of the rest of the data.

Partial-duration series A list of all events, such as floods, occurring above a selected base, without regard to the number, within a given period. In the case of floods, the selected base is usually equal to the smallest annual flood in order to include at least one flood in each year.

Peak discharge The maximum discharge attained during a flood. Abbreviated q_p.

Percent chance A statistical description of the probability that an event of a given size will be equaled or exceeded during any given year. This name is often given to the probability scale on log-normal paper. Percent chance is the inverse of recurrence interval.

Percolation The movement of groundwater in streamline flow in any direction through small interconnected and saturated interstices of rock or earth.

Period of record The time during which data were collected.

Pervious area An area with some type of ground cover where infiltration can occur.

Plotting position The point computed by an equation and used to locate given data on probability paper.

Point rainfall Rainfall at a specific location such as a rain gage. Point rainfall is commonly associated with duration over which rain is recorded or assumed.

Precipitation The total measurable supply of water of all forms of falling moisture, including dew, rain, mist, snow, hail, and sleet; usually expressed as a depth of liquid water on a horizontal surface in a day, month, or year, and designated as daily, monthly, or annual precipitation.

Population The entire (usually infinite) number of data points from which a sample is taken or collected. The total number of past, present, and future floods at a location on a river is the population of floods for that location even if the floods are not measured or recorded.

Predictor variable The independent variable or variables in a regression equation or the variable used to predict the criterion variable or dependent variable.

Preliminary investigation A brief study of a potential project to estimate whether a detailed investigation is justified. Abbreviated PI.

Principal spillway A spillway designed to convey, in a safe and nonerosive manner, all ordinary discharges coming into a reservoir and all of an extreme amount that does not pass through the auxiliary spillway.

Principal spillway hydrograph The hydrograph used to determine the minimum crest elevation of the auxiliary spillway. It is used to establish the principal spillway capacity and determine the associated minimum floodwater retarding storage.

Probability The likelihood that a certain event will occur.

Probability paper Any graph paper prepared especially for plotting magnitudes of events versus their frequencies or probabilities. See log-normal paper.

Quick return flow The diminishing discharge directly associated with a specific storm that occurs after surface runoff has reached its maximum. It includes base flow, prompt subsurface discharge (commonly called interflow), and delayed surface runoff. This flow reappears rapidly in comparison to base flow and is generally much in excess of normal base flow. It is common in humid climates and in watersheds with soils of high infiltration capacities and moderate to steep slopes. Abbreviated QRF.

Rainfall A fall of rain; precipitation in the form of liquid water. The amount of rain, usually expressed in inches depth of water on an area, that reaches the surface of the Earth.

Rainfall distribution The distribution of rainfall with time. There are standard distributions that are used for design of conservation measures.

Random error Errors that occur in any kind of measured data from time to time because of a variety of unrelated causes.

Reach A length of spillway channel, stream channel, or valley selected for use in hydraulic or other computations. Reaches are usually selected to have constant hydraulic properties. See damage reach, stream reach.

Recession curve The part of the descending limb on a hydrograph that extends from the point of inflection to the time when direct runoff has ceased.

Recurrence interval The average number of years within which a given event will be equaled or exceeded. A 50-year frequency flood has an average recurrence interval of 50 years, and so on. It is the inverse of percent chance. It is often referred to as return interval.

Regional analysis An analysis of parameters on gaged watersheds in a region that is used to estimate the same parameters for ungaged watersheds in the same region. It is often used in making flood frequency or other types of hydrologic analyses.

Regression A method of developing a relationship between a criterion variable and one or more predictor variables, with the objective of predicting the criterion variable for given values of the predictor variable.

Reservoir A pond, lake, tank, basin, or other space, either natural in its origin or created in whole or in part by the building of engineering structures. A reservoir stores, regulates, and controls water.

Reservoir routing Flood routing through a reservoir.

Residual The difference between the value predicted with the regression equation and the criterion variable.

Retardance factor A measure of surface conditions related to the rate at which runoff concentrates at some point of interest. Retardance factor expresses an inverse relation to flow retardance. Low retardance factors are associated with rough surfaces having high degrees of flow retardance, or surfaces over which flow will be impeded. High retardance factors are associated with smooth surfaces having low degrees of flow retardance, or surfaces over which flow moves rapidly. The retardance factor is assumed to be equal to the curve number. Abbreviated cn'.

Return interval See recurrence interval.

Ridge-till Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface year-round, while growing crops on pre-formed ridges alternated with furrows protected by crop residue.

Rill erosion Small gullies that occur on the land slope in a random pattern.

Runoff The part of precipitation that runs off the surface of a drainage area.

Runoff curve number See curve number. Abbreviated RCN.

Saturated hydraulic conductivity The rate of flow of water through a unit cross section of a porous mass under a unit hydraulic gradient at a temperature of 60 °F.

Second-foot See cubic feet per second.

Second-foot-day The volume of water represented by a flow of 1 cubic foot per second for a period of 1 day or 24 hours.

Semi-log-paper Short for "semi-logarithmic graph paper," which is graph paper with an arithmetic scale along one axis and a logarithmic scale along the other. Either scale is used for the independent variable as the data require.

Shallow concentrated flow Flow collecting in small rills and gullies which forms as sheet flow begins to concentrate. Shallow concentrated flow is not assumed to have a well-defined channel. Shallow concentrated flow depths typically range from 0.1 to 0.5 foot.

Sheet erosion Erosion on a slope before a rill or small gully is formed.

Sheet flow Flow over plane surfaces. Sheet flow usually occurs in the headwaters of a stream. NRCS limits maximum sheet flow length to 100 feet. Maximum depths are normally in the magnitude of 0.1 foot.

Skew Skew is a shape parameter and the third moment about the mean, which measures the symmetry of a distribution.

Small grains Wheat, oats, barley, flax, rice, and other close drilled or broadcast grain crops.

Snow water equivalent The depth of water, in inches, contained in the snowpack. Abbreviated SWE.

Soil-cover complex See hydrologic soil-cover complex.

Soil-water-storage The amount of water the soils (including geologic formations) of a watershed will store at a given time. Amounts vary from watershed to watershed. The amount of soil-water storage for a given watershed is continually varying as rainfall or evapotranspiration takes place.

Spillway An open or closed channel, conduit, or drop structure used to convey water from a reservoir. It may contain gates, either manually or automatically controlled, to regulate the discharge of water. See principal spillway and auxiliary spillway.

Stability analysis Analysis of an earthen auxiliary spillway exit channel assuming water flowing through the channel at a peak velocity or stress.

Stability design hydrograph The hydrograph used to establish the dimensions of the earth auxiliary spillway from a stability analysis of the exit channel. Older documents use the term emergency spillway hydrograph. Abbreviated SDH.

Stage The height of a water column above a determined point of reference, usually measured in feet.

Standard deviation A measure of dispersion of data. Data grouped closely about their mean have a small standard deviation; data grouped less closely have a larger standard deviation. Abbreviated S_d.

Standard error of estimate The standard deviation of the residuals. Abbreviated S_e.

Standard rain gage Also "standard gage." The National Weather Service (NWS) nonrecording rain gage, having an opening 8 inches in diameter and a holding capacity of 24 inches of rainfall. The gage is usually examined once daily at a regular time, and the catch (if any) measured by depth in inches and hundredths of an inch.

Standard rain gage, recording A rain gage that automatically records the amount of precipitation collected, as a function of time. There are tipping bucket and weighing types of gages.

Storage The capacity of a reservoir below the elevation of the crest of the auxiliary spillway. Usually expressed as acre-feet of storage.

Storage-indication method A flood-routing method. Often called the Puls method (after Louis G. Puls), though it is actually a variation of the method devised by Puls.

Storm A rainfall event.

Storm distribution The variation with time of the precipitation within a storm.

Stream Water flowing in a watercourse or channel.

Streamline A vector drawn tangentially to the flow of water or other moving fluid.

Stream reach A length of stream channel selected for use in hydraulic or other computations. See reach.

Structural measure For flood prevention work, any form of earthwork dam, ditch, levee, drop spillway, jetties, riprap, etc., or installation of concrete, masonry, metal, or other material.

Sublimation The process by which a material changes state from solid directly to gas.

Subarea See subwatershed.

Subsurface Underground.

Subsurface flow See subsurface runoff.

Subsurface runoff Water that infiltrates the soil and reappears as seepage or spring flow and forms part of the flood hydrograph for that storm. Difficult to determine in practice and seldom worked with separately.

Subwatershed A watershed that is part of a larger watershed. It may be evaluated separately when necessary in order to improve computational accuracy for results on a whole watershed basis or to get results for that area only.

Surface The uppermost level of the land.

Surface retardance See flow retardance.

Surface runoff Total rainfall, minus interception, evaporation, infiltration, and surface storage, that moves across the ground surface to a stream or depression.

Surface storage Natural or human-made roughness of a land surface, that stores some or all of the surface runoff of a storm. Natural depressions, contour furrows, and terraces are usually considered as producing surface storage, but stock ponds, reservoirs, stream channel storage, etc., are generally excluded.

Synthetic record A storm or flood series obtained by taking selected values from a frequency curve based on historical data.

Synthetic storm A storm obtained by taking a selected value from the frequency curve based on historical series of storm data.

Systematic errors Errors that may occur because of defects in the instruments, in their exposure, or in the observational procedure. A gradual change in the surroundings of a station may be a source of systematic error.

Systematic record Hydrologic values or information systematically recorded by a Federal, State, or local agency.

Thiessen method A method of using a rain gage network for estimating average depth of rainfall over a watershed.

Tillage Cultivation of the land.

Time of concentration The time it takes runoff to travel from the hydraulically most remote point of the watershed to the outlet. Time of concentration varies from storm event to storm event, but is often used as a constant. Time of concentration consists of three hydraulic components: sheet flow, shallow concentrated flow, and channel flow. Abbreviated T_c.

Transmission loss A reduction in volume of flow in a stream, canal, or other waterway due to infiltration or seepage into the channel bed and banks.

Transpiration The process by which plants dissipate water into the atmosphere from leaves and other surfaces. Also, the term applies to the water that escapes as vapor from plant leaves and other surfaces.

Travel time The average time for water to flow through a reach or other stream or valley length that is less than the total length.

Treatment class Applies mainly to agricultural land uses and includes mechanical practices such as contouring or terracing, and management practices such as grazing control or rotation of crops. The classes consist of land use and treatment combinations that actually occur on watersheds.

Unconnected impervious area An area that is not directly connected to the drainage system. This term describes the condition where runoff from an impervious area flows over a pervious area as sheet flow before reaching the drainage system. One example is runoff flowing from down spouts that outlet onto a lawn, so the runoff must cross the lawn before reaching a storm drain or gutter.

Unit hydrograph A discharge hydrograph coming from one inch of direct runoff distributed uniformly over the watershed, with the direct runoff generated at a uniform rate during the given storm duration. A watershed may have a 1-hour, 2-hour, etc., unit hydrograph.

VDP Abbreviation for volume-duration-probability.

Vegetated spillway A vegetated open channel in earth materials.

Visual focal point A landscape element to which the eyes are automatically attracted.

Visual resource quality The rating of the uniqueness or desirability of a visual resource. High resource quality is usually indicative of diverse size, form, color or texture in a given landscape. A unique landscape element, such as a mountain peak in an otherwise flat terrain will have a high visual resource quality—one that captures the viewer's attention due to the peak's contrast to the flat landscape.

Visual resources The definable appearance of a landscape described by its evisual elements: landform, water, vegetation, and structure.

Volume-Duration-Probability The volume of high or low flow for selected durations (1, 3, and 7 days for high flow and 7, 14, 30, 60, and 120 days for low flow) analyzed on a frequency basis. Abbreviated VDP.

Water loss That part of the storm rainfall that does not appear as runoff for the duration of the flood. See loss.

Watershed The surface area contributing direct runoff to a stream at a given point.

Watershed measure Any vegetative or structural means (including earthwork) of directly improving or conserving the soil and water resources of a watershed. See land treatment measure and structural measure.

Water supply The amount of water in a stream or reservoir, or groundwater, available to supply necessary demands.

Water-Supply Paper A publication of the U.S. Geological Survey (USGS), which reports research and/or data pertaining to surface water and/or groundwater resources for a geographic area within the United States. Abbreviated WSP.

Water table The upper surface of groundwater.

Water year The year taken as beginning October 1. Often used for convenience in streamflow work, since in many areas, streamflow is at its lowest at that time.

Water yield Natural annual runoff, measured at a given place in a watershed.

Weibull plotting position Values used to plot a frequency curve.

630.2202 Abbreviations and symbols

The following is a list of common abbreviations and sumbols for the terms defined in section 630.2201.

AF	Scre-foot or acre-feet
AMC	Antecedent moisture condition
ARC	Sntecedent runoff condition
cfs	Cubic feet per second
cfs-day	Second-foot-day
CN	Curve number
cn´	Retardance factor
csm	Cubic feet per second per square mile
D	Duration of excess rainfall
DEM	Digital elevation model
DUH	Dimensionless unit hydrograph
EGL	Energy grade line
ET	Evapotranspiration
F	Actual retention
FBH	Freeboard hydrograph
$\mathbf{F_c}$	Infiltration rate
HGL	Hydraulic grade line
HU	Hydrologic unit
$\mathbf{I_a}$	Initial abstraction
L	Lag
PI	Preliminary investigation
PS	Principal spillway
PSH	Principal spillway hydrograph
Q	Direct runoff volume
q	Discharge
$\mathbf{q_p}$	Peak discharge
QRF	Quick return flow
RCN	Runoff curve number
S	Maximum potential retention
$\mathbf{S_d}$	Standard deviation
SDH	Stability design hydrograph
$\mathbf{S_e}$	Standard error of estimate
SWE	Snow water equivalent
$\mathbf{T_c}$	Time of concentration
VDP	Volume-duration-probability
WSP	See Water-Supply Paper
ΔD	Duration of unit excess rainfall

630.2203 Conversion factors

The following lists some common conversion factors.

Multiply:	By:	To obtain:
AF	0.5042	cfs-days
AF	12.10	cfs-hours
AF	0.01875	inches depth on 1 square mile
AF	0.3258	million U.S. gallons
AF per day	0.5042	cfs
AF per square mile	0.01875	inches depth
centimeters	0.3937	inches
cfs	1.983	AF per day
cfs	724.0	AF per year
cfs	0.02832	cubic meters per second
cfs	0.6463	million U.S. gallons per day
cfs	448.8	U.S. gallons per minute
cfs-days	1.983	AF
cfs-days	0.03719	inches depth on 1 square mile
cfs-days per square mile	0.03719	inches depth
cfs-hours	0.08264	AF
cfs-hours per square mile	0.001550	inches depth
csm	0.03719	inches depth per day
csm	13.57	inches depth per year
cubic feet	7.481	U.S. gallons
feet per second	0.6818	miles per hour
hectares	2.471	acres
imperial (UK) gallons	1.200	U.S. gallons
inches depth	53.33	AF per square mile
inches depth on 1 square mile	53.33	AF
inches per hour	1.008	cfs per acre
inches per hour	645.3	csm
kilograms	2.205	pounds
liters	0.2642	U.S. gallons
meters	3.281	feet
millimeters	0.03937	inches
million U.S. gallons per day	1.547	cfs
square miles	2.590	square kilometers
U.S. gallons per minute	0.002228	cfs