Appendix B

Glossary

A

absorption
Incorporation of water or dissolved matter or both within the structure of a solid.

accumulative precipitation gauge; cumulative precipitation gauge
Precipitation gauge which is monitored at lengthy time intervals.

adhesive water
Water held in the soil by molecular attraction and forming a film around the solid particles of the soil.

adsorption capacity
Quantity of adsorbed water which the receiving substance can accept.

afflux
Rise in water level immediately upstream of, and due to, an obstruction.

alarm level
Water level at, or approaching, flood stage, which is considered to be dangerous, and at which warnings should be commenced.

annual exceedance series
Time series of the highest values of annual events, such as floods, occuring above a base value.

antecedent precipitation index
See also antecedent soil moisture, soil moisture deficit
Weighted summation of past daily precipitation amounts, used as an index of soil moisture.

antecedent soil moisture
See also antecedent precipitation index, soil moisture deficit
Soil moisture level in a catchment at the start of a precipitation event.

area-elevation curve
Syn. hypsometric curve
Curve showing the extent of the area of a river basin situated above an indicated elevation.

areal precipitation
See also point precipitation
Precipitation in a specific area expressed as the average depth of liquid water over this area.

automatic station
Station at which instruments record and, in some cases, also transmit observations automatically.

available moisture
Syn. soil moisture storage, water-holding capacity
Water in the soil between wilting point and field capacity.

B

bankfull discharge
Syn. in bank capacity
Discharge conveyed in a watercourse without overtopping its banks.

bankfull stage
Stage at which a stream is just below overflowing its natural banks.

base flow
Syn. base runoff
Discharge which enters a stream channel mainly from groundwater, but also from lakes and glaciers, during long periods when no precipitation or snowmelt occurs.

basin response
Syn. catchment response
Manner in which a basin reacts to a meteorological event or sequence of events.

bed profile
Longitudinal or transversal shape, in a vertical plane, of the bed of a watercourse.

brook
Small, shallow stream usually in continuous flow in a somewhat turbulent manner.

bubble gauge; bubble gage
Gauge using a gas-purged system to measure water level.

bypass channel
Channel built to divert flows from a point upstream of a region to a point downstream.

C

canyon
Deep valley with high, steep slopes, often with a river flowing along its bottom.

capillary conductivity
Syn. unsaturated hydraulic conductivity
Measure of the extent to which a permeable medium allows flow of water through its capillary interstices.

capillary interstice
Syn. capillary pore
Pore small enough to hold water by surface tension against gravity.

channel
(1) Clearly defined watercourse which periodically or continuously contains moving water.
(2) Watercourse forming a connecting link between two water bodies.
(3) Deepest portion of a watercourse, in which the main stream flows.

channel capacity
Maximum flow, at bankfull stage, which a given channel is capable of carrying without overtopping its banks.

channel frequency
Syn. stream frequency
Number of stream segments of all orders within a drainage basin, divided by its area.

channeling
Flow along preferred path in fractured media.

channelization
Straightening and deepening of a channel to increase the conveyance.

climatological station for hydrological purposes
Climatological station set up in a drainage basin, specifically to augment the existing climatological network, in order to meet hydrological requirements.

cloudburst
Rainstorm of extraordinary intensity and relatively short duration.

composite unit hydrograph
See also unit hydrograph
Superposition of unit hydrographs for the major subdivisions of a large catchment, with the times of beginning of rise appropriately lagged by the times of travel from the outlets of the sub-areas to the outlet of the catchment.

compound hydrograph
Hydrograph due to a sequence of precipitation events when the flow caused by one event continues during the next event.

conceptual model
See also hydrological model
Simplified representation of reality, described by diagrams and flow charts, governing relationships or natural laws.

confluence
Syn. fork
Joining, or the place of junction, of two or more streams.

contributing area
That part of a drainage basin which contributes to the direct runoff.

convective precipitation
Precipitation caused by convective motion in the atmosphere.

D

data collection system
Coordinated system for collecting observations from a hydrological network and the transmission of the observations to a data-processing facility.

data processing
Handling of observational data until they are in a form ready to be used for a specific purpose.

database
Set of related data files for a specific application, usually on a direct access storage device.

datum level
Horizontal surface used as a reference to which elevations are related.

debris
See also sediment
Any accumulation of loose material arising from weathering of rocks or from man-made materials.

design flood
See also maximum possible flood, maximum probable flood
Flood hydrograph or instantaneous peak discharge adopted for the design of a hydraulic structure or a river control taking into account socioeconomic and hydrological factors.

design storm
Rainstorm, either observed or synthetic, which is chosen as the basis for the design of a hydraulic structure

digital elevation model
Computerized representation of land surface elevation.

discharge
Syn. rate of flow
Volume of water flowing through a river (or channel) cross section in unit time.

distributed parameters model
Syn. distributed model
Model taking into account spatial variations in variables and/or parameters within the domain of the model.

E

echo sounder

Syn. fathometer
Instrument using the reflection of an acoustic signal from the bottom of a water body to determine the depth.

eddy

Syn. vortex
Rotational movement occurring in flowing fluid.

effective permeability

Permeability of a porous medium to a fluid which only partly fills the pore space; the remaining portion of the pore space is occupied by other fluids. It is a function of the saturation.

effective porosity

Syn. kinematic porosity; see also porosity
Volume of the void spaces through which water or other fluids can travel in rock or sediment, divided by the total volume of the rock or sediment.

effective velocity

Syn. average interstitial velocity
Volume of water per unit time passing through a unit area of the interstitial space of a porous medium.

elevation head

See also hydraulic head
Elevation of a point, such as the base of a piezometer, above an arbitrary datum. It represents the energy required to raise a unit weight of fluid from the datum to the point.

empirical flood formula

Formula expressing peak discharge as a function of catchment area and other factors.

encoding

Process of converting data to a specific code.

ephemeral stream

Syn. intermittent stream; see also wadi
Stream which flows only in direct response to precipitation or to the flow from an intermittent spring.

erosion

Wearing away and transport of soil and rock by running water, glaciers, wind, or waves.

evaporation (of water)

See also evapotranspiration, transpiration
Process of water passing from liquid to vapour at a temperature below boiling point.

evapotranspiration

See also evaporation, potential evapotranspiration, transpiration

Process by which water is transferred to the atmosphere from the soil by evaporation and from the vegetation by transpiration.

F

falling limb

See also recession, rising limb

Part of a hydrograph in which the discharge is decreasing from a peak.

field capacity

Syn. effective capacity

Amount of water held in a soil after gravitational water has drained away.

flash flood

Flood of short duration with a relatively high peak discharge.

flash flood guidance

A numerical estimate of the average rainfall over a specified area and time duration required to initiate flooding on small streams.

flash flood warning

See also flood warning

A product (text, graphical, or audible) issued when rapid-onset flooding is occurring, imminent, or likely. This product should be reserved for those short-term events that require immediate action to protect life and property, such as dangerous small stream or urban flooding and dam or levee failures.

float

See also float gauge; float gage

Any natural or man-made body which is supported and partly or fully immersed in water, its vertical motion indicating the changes in water level or its horizontal movement indicating the velocity of water, either at the surface or at various depths.

float gauge, float gage

See also float

Gauge consisting of a float which rides on the water surface and rises or falls with it; its movement is transmitted to a recording or indicating device.

flood

See also flooding, high water

(1) Rise, usually brief, in the water level in a stream to a peak from which the water level recedes at a slower rate.

(2) Relatively high flow as measured by stage height or discharge.

flood channel

(1) Channel for flood water.

(2) Stream channel occupied during periods of high water.

flood control

Syn. flood alleviation, flood protection

Detention and/or diversion of water during flood events for the purpose of reducing discharge or downstream inundation.

flood crest

Syn. crest stage

Peak elevation of the water level during a flood.

flood forecasting

Estimation in advance of stage, discharge, time of occurrence, and duration of a flood, especially of peak flood, at a specified point on a stream, resulting from precipitation and/or snowmelt.

flood frequency

See also flood probability, return period

Number of times a flood above a given discharge or stage is likely to occur over a given number of years.

flood probability

See also flood frequency, return period

Probability of a stream discharge of a given magnitude being equaled or exceeded in a given time period.

flood proofing

See also flood control

Techniques for preventing flood damage in a flood-prone area.

flood stage

Stage at which the overflow of the natural banks of a stream begins to cause damage in any portion of the reach.

flood statement, flash flood statement

Text product that provides supplemental information, such as updated observations and impact information, on active flood (flash flood) warning products.

flood warning

See also flash flood warning

Advance notice via a product (text or graphical) that a flood is imminent or may occur in the near future at a certain station or in a certain river basin.

flood watch, flash flood watch

A product (text or graphical) that informs of the possibility of flooding (flash flooding), typically within a 6- to 48-hour time frame before the event. The product is more general than a warning because a watch is usually based on model QPF guidance for the occurrence of rainfall in the future and estimated antecedent soil conditions, both of which have uncertainty in time and space.

flood wave

Rise in streamflow to a crest, and its subsequent recession, caused by precipitation, snow melt, dam failure, or hydroelectric plant releases.

flooded area

Area covered by water when stream flow exceeds the carrying capacity of a channel or as a consequence of damming a river downstream.

flooding

Syn. inundation; see also flood

(1) Overflowing by water of the normal confines of a watercourse or other body of water.
(2) Accumulation of drainage water over areas which are not normally submerged.
(3) Controlled spreading of water for irrigation.

flow model

Mathematical or numerical tool to describe and quantify the various components of the flow of water in a hydrosystem, such as a groundwater flow model, a river flow model, or a coupled flow model containing all components simultaneously.

flux

See also discharge

Discharge per unit cross-sectional area.

forecast

Estimate of the magnitude and occurrence of a future event.

forecast (warning) lead time

Interval of time between the issuing of a forecast (warning) and the expected occurrence of the forecast event.

forecast updating

Revising a previous estimate of an event by using information acquired between the time of the estimate and the present.

forecast verification

Syn. forecast evaluation

Determination of the accuracy of a forecast through the statistical analysis of forecasting errors.

forecasting error

Difference between a forecast and the observed value.

frazil ice

Accumulation of primary ice crystals in water and at the bottom of water body, formed by supercooled turbulent waters.

free convection

See also convection

Convection created by density (buoyancy) gradients. These can be caused by variations in water temperature, salinity, or suspended matter.

frequency analysis

Procedure involved in interpreting a past record of hydrological events in terms of probabilities of occurrence.

frequency curve
Curve relating the possible values of a variate, such as the value of a specific hydrological event, to the frequency of its occurrence.

frequency distribution
Relationship between the measured values of a variable and their frequency of occurrence.

freshet
Minor flooding or overflowing of a watercourse caused by heavy rains or snowmelt.

friction losses
Total energy losses in the flow of water due to friction between the water and the walls of the conduit, channel or porous medium in which it flows, including internal friction. Usually expressed in units of height.

front
(1) Zone of interface or transition between air masses of different densities (temperature, humidity).
(2) Moving air/water or water/water interface, generally in a porous medium.

frontal precipitation
Precipitation caused by the action of a front due to air ascending along or near a frontal surface.

Froude number
Dimensionless number expressing the ratio of inertia forces to gravity forces.

G

gamma distribution
Probability density function for a random variable which can take on all non-negative values.

gauge datum; gage datum
Vertical distance of the zero of a gauge referred to a certain datum level.

gauge height; gage height
Syn. stage level
Height of a water surface above a gauge datum.

gauging station; gaging station
Location on a stream where measurements of water level and/or discharge are made systematically.

general circulation model (GCM)
Numerical meteorological model at large scale to simulate atmospheric circulation.

geographical information system (GIS)
Data managed by a software package which incorporates the superimposition of different levels of characteristics, in the form of maps, related to tables of data and sets of models.

glacial outburst
Sudden emptying of a glacier-dammed lake.

glacier-dammed lake
Body of water accumulated behind ice sheets or in mountain valleys dammed by valley glaciers.

global circulation
General term for the motion of the earth's atmosphere embracing the totality of meteorological processes.

gradex method
Method which allows the substitution of a frequency distribution for floods by a distribution for rainfalls (for a given interval of time). It is based on the exponential behaviour of frequency distribution curves for low frequencies (log-log law of representation) and assumes storms large enough to saturate the soil.

gravitational water
Water in the unsaturated zone which moves under the influence of gravity.

gravity flow
Flow of water due to gravity

ground data
Syn. ground truth
Information obtained on surface/subsurface features to aid in interpretation of remotely sensed data, e.g. rain gauge data to calibrate a radar ZR-relationship.

groundwater
Subsurface water occupying the saturated zone.

gully
Syn. gulch
Deeply eroded watercourse, which flows only due to storm runoff and/or during the melting of snow.

H

hail
Precipitation of small balls or pieces of ice (hailstones) with a diameter greater than 5 millimeters, falling either separately or agglomerated into irregular lumps.

hanging dam
Piling up of frazil under an ice cover on a watercourse, which reduces the cross section of streamflow.

hardpan
Syn. caliche
Hard layer in the subsoil that obstructs penetration of roots and water.

headwaters
Sources of a river.

heat-capacity method
Method for determining soil moisture by measuring the heat capacity of soil, which varies approximately linearly with moisture content.

heavy rain
See also shower, storm
Rainfall of high intensity.

high water
Se also flood, low water
(1) State of the tide when the water level is highest for any given tidal cycle.
(2) Highest water level reached in a watercourse or on a lake during a flood or a reservoir operation.

histogram
Univariate frequency diagram with rectangles proportional in area to the class frequency, erected on a horizontal axis with width equal to the class interval.

hydraulic gradient
Measure of the decrease in hydraulic head per unit length in the direction of flow in a closed conduit, an open channel, or a porous medium. In an open channel, it coincides with the slope of the water surface, and in groundwater with the slope of the potentiometric surface.

hydraulic head
Syn. head
Sum of the elevation head, the pressure head, and the velocity head.

hydrodynamic model
Flow model where the movement of fluids is described by a set of hydrodynamic equations, in general representing the combination of a mass balance equation with a velocity equation resulting from an empirical relation like Darcy's law or momentum equations such as the Navier-Stokes equations.

hydrogeological map
Map showing the main hydrogeological features of a study area such as aquifer thickness, water level data, piezometric contour lines, water quality data, recharge and discharge areas, and flowlines.

hydrograph
Graph showing the variation in time of hydrological data such as stage, discharge, velocity, and sediment load.

hydrological cycle

Syn. water cycle

Succession of stages through which water passes from the atmosphere to the earth and returns to the atmosphere: evaporation from the land, sea, or inland water; condensation to form clouds; precipitation, interception, infiltration, percolation, runoff, and accumulation in the soil or in bodies of water; and re-evaporation.

hydrological drought

Period of abnormally dry weather sufficiently prolonged to give rise to a shortage of water as evidenced by below normal stream flow and lake levels and/or the depletion of soil moisture and a lowering of groundwater levels.

hydrological forecast

Estimation of the magnitude and occurrence of future hydrological events for a specified period and for a specified locality.

hydrological information

See also data

Result of analyzing or integrating hydrological data.

hydrological model

See also conceptual model

Simplified representation of a hydrosystem.

hydrological observation

Direct measurement or evaluation of one or more hydrological elements, such as stage, discharge, or water temperature.

hydrological observing station

Place where hydrological observations or climatological observations for hydrological purposes are made.

hydrological outlook

A product (text or graphical) that may be issued if forecast meteorological conditions indicate that a significant heavy precipitation event and/or snowmelt may occur that would cause flooding or aggravate existing flooding. Outlooks are usually issued in the range of 36-72 hours before an event.

hydrological warning

Emergency information on an expected hydrological event which is considered to be dangerous.

hydrological year

Syn. water year

Continuous 12-month period selected in such a way that overall changes in storage are minimal and carryover is reduced to a minimum.

hydrology

Science that deals with the waters above and below the land surfaces of the Earth; their occurrence, circulation and distribution in time and space; their biological, chemical and physical properties; and their interaction with their environment, including their relation to living beings.

hydrometeorology

Study of the atmospheric and land phases of the hydrological cycle, with emphasis on the interrelationships involved.

hydrometric network

Syn. hydrological network

Aggregate of hydrological stations and observing posts situated within any given area (river basin, administrative region) in such a way as to provide the means of studying the hydrological regime.

hydrometry

Science of the measurement and analysis of the water cycle including methods, techniques, and instrumentation used in hydrology.

hydrophobic (in hydrochemistry)

Lacking affinity for water.

hydrostatic pressure

Isotropic pressure exerted by water at rest.

hyetograph

See also rainfall intensity pattern

(1) Map or chart displaying temporal or areal distribution of precipitation.

(2) Graph displaying the intensity of precipitation in relation to time.

hygrometer

Instrument for measuring the relative amount of moisture in the atmosphere and for determining the dewpoint.

hysteresis (in stage-discharge relation)

Syn. looped rating curve; see also rating curve

Variability of the stage-discharge relation at a gauging station subject to variable water surface slope where, for the same gauge height, the discharge on the rising stage is different from that on the falling stage.

I

ice fracturing

Destruction of the ice cover on rivers before breakup under the impact of flood waves or from ice breaking away from the banks.

ice jam

Syn. ice gorge
Accumulation of shuga with inclusions of ice cakes below ice cover.
Also, broken river ice which causes the narrowing of a river channel, the rise of water level, and local floods.

ice laying

Syn. ice duration
Period of time from freeze-up to ice break-up.

impervious

Syn. impermeable
Having a texture that does not permit water to move through perceptibly under the static pressure ordinarily found in subsurface water.

impoundment

Body of water formed by collecting water, as by a dam.

infiltration

Flow of water through the soil surface into a porous medium.

infiltration capacity (of soils)

Maximum rate at which water can penetrate the soil matrix per unit area under certain conditions.

infiltration coefficient

Ratio of rate of infiltration to rate of rainfall.

infiltration index

Average rate of infiltration derived from a time intensity graph of rainfall in such a manner that the volume of rainfall in excess of this rate will equal the volume of storm runoff.

instantaneous unit hydrograph

See also unit hydrograph
Unit hydrograph resulting from unit amount of effective precipitation applied to a drainage basin in an infinitesimally short time.

intensity-duration-frequency curve

Curve showing the probability of exceedance of various short-period rainfall rates for various durations of precipitation at a given location.

isobath

(1) Contour line of equal depth of the water table below the ground surface.
(2) Line of equal depth in a lake, a reservoir or a river.

isochrone map

Set of lines (isochrones) on map or chart of a drainage basin in which each line connects points of equal travel time from that point to the outlet of the basin.

isohyet

See also isopluvial

Contour line joining the points where the amount of precipitation, in a given period, is the same.

isopleth

See also contour, isogram

Contour line of equal value of a function of two variables, such as elevation of land as related to longitude and latitude.

isopluvial

See also isohyet

Isopleths pertaining to rainfall for a given duration and for a given return period.

L

lag time

Time interval between the center of mass of net rainfall and the center of mass of the peak runoff.

laminar flow

Flow in an open channel, in a closed conduit or through a porous medium when viscous forces dominate; the fluid particles tend to move along smoothly defined paths, there is no significant transverse mixing, and the critical threshold Reynolds number for the turbulent flow is not exceeded.

land cover

The physical material at the surface of the earth, including grass, asphalt, trees, bare ground, water, etc. There are two primary methods for capturing information on land cover: field survey and analysis of remotely sensed imagery.

land use

The human modification of natural environment or wilderness into built environment such as fields, pastures, and settlements; urban and agricultural land use are two of the most commonly recognized high-level classes.

levee

Syn. bund, dike, dyke, embankment

Earthwork used to confine stream flow within a specified reach or to prevent flooding due to waves or tides.

lower reach

See also reach, upper reach

Part of a stream channel in the lower region of a drainage basin.

lumped parameters model

Model where the catchment is regarded as one unit; the variables and parameters thus represent average values for the entire catchment.

M

Manning equation

Syn. Manning formula

Empirical equation for calculating the water velocity for uniform flow in an open channel represented by $V = 1/n\ R^{2/3}\ S^{1/2}$, where :

V is water velocity (m/s)
n is a roughness coefficient (non-dimensional)
R is the hydraulic radius (m)
S is the energy gradient (non-dimensional)

manometer

A device employed to measure pressure, often using a liquid column in a vertical or inclined tube.

Markov chain

See also Markov process

Random series whose future values depend on the current state and that can take only discrete values; used in recurring time series and sequential decision processes.

Markov process

See also Markov chain

Stochastic process that has the property that the dependence of future values of the process on past values is summarized by the current value.

maximum annual flood

Highest annual flood discharge attained during the period of record.

maximum possible flood

See also design flood, maximum probable flood

Greatest flood to be expected, assuming complete coincidence of all factors that would produce the heaviest rainfall and maximum runoff.

maximum probable (possible) flood

See also design flood

Greatest flood that may be expected, taking into account in a deterministic manner all pertinent factors of location, meteorology, hydrology, and terrain.

model validation

Assessment of the capability of a given site-specific model to be used for making a sufficiently accurate prediction or forecast.

monitoring

Continuous or frequent standardized observation, measurement, and evaluation of phenomena occurring in the environment; used for warning or control.

monitoring network

Measurement stations with a given spatial distribution in a basin or an ecosystem for the systematic measurement of variables to enable the assessment of related trends (reference network) or specific behaviors (problem-specific network).

multiple-purpose project

Project designed, constructed, and operated to serve more than one interest or purpose, such as flood control, hydroelectric power, navigation, irrigation, fisheries, water supply, and recreation.

N

net storm rain

Portion of rainfall during a storm which reaches a channel as direct runoff.

non-structural flood mitigation

Systems for reduction of the effects of floods using non-structural means, such as land-use planning, advanced warning systems, and flood insurance.

numerical model

Syn. digital model

Numerical approximation for the resolution of a mathematical model which consists of a set of equations that can be solved by a computer.

n-year event

See also return period

Magnitude of a hydrological event, the return period of which is n years.

O

optimal design

System design based on the selection or combination of all pertinent variables so as to maximize an objective function, subject to the requirements of the design criteria.

orographic precipitation

Precipitation caused by the ascent of moist air over orographic barriers.

overland flow

Syn. Hortonian flow see also surface flow

Flow of water over the ground surface before it enters a defined channel.

P

peak discharge

Syn. maximum instantaneous discharge, peak flow

Maximum instantaneous discharge of a given stream, as measured by the discharge hydrograph, for a specific event.

perched aquifer

Region in the unsaturated zone where the soil may be locally saturated because it overlies a low-permeability unit.

perched groundwater

See also perched aquifer

Groundwater body, generally of moderate dimensions, supported by a relatively impermeable stratum and which is located between a water table and the ground surface.

percolation

See also infiltration

Flow of a liquid through an unsaturated porous medium, such as of water in soil under the action of gravity.

performance criteria

Indices describing the results of a system's activity, in relation to the objectives, inputs, and outputs.

persistence

Tendency of a hydrological process or time-series to recur or continue, incorporating a positive correlation between successive values.

physically-based model

Model which describes the water system using the basic mathematical representations and physical laws of the flows of mass, momentum, and various forms of energy.

piezometer

A small-diameter observation well used to measure the hydraulic head of groundwater in aquifers. Similarly, a standpipe, tube, vibrating wire piezometer or manometer may also be used to measure the pressure of a fluid at a specific location in a column.

playa

Lake bed found in arid regions in the lowest part of an enclosed valley whose drainage is inward. The lake bed is usually dry, except after heavy rainstorms, when it may be covered by a thin sheet of water which quickly disappears through evaporation and/or infiltration.

point data

Observations at a specific site, such as the site of a rain gauge or a stream-gauging station.

point precipitation

See also areal precipitation

Precipitation at a particular site.

porosity

Syn. total porosity; see also effective porosity, isolated porosity, primary porosity, secondary porosity

Ratio of the volume of the interstices in a given sample of a rock or soil medium to the gross volume of the sample inclusive of voids.

potential evaporation

See also actual evaporation

Quantity of water vapor which could be emitted by a surface of pure water in the existing conditions.

potential evapotranspiration

See also evapotranspiration

Maximum quantity of water capable of being evaporated in a given climate from a continuous stretch of vegetation covering the whole ground and well supplied with water. It thus includes evaporation from the soil and transpiration from the vegetation of a specified region in a given time interval, expressed as depth.

precipitation

See also rain, snow

(1) Liquid or solid products of the condensation or sublimation of water vapour falling from clouds or deposited from air on to the ground.

(2) Amount of precipitation on a unit of horizontal surface per unit time.

precipitation duration

Period of time during which continuous precipitation occurs, at a specific point or within a specific area.

precipitation gauge; precipitation gage

General term for any device that measures the amount of precipitation; principally a rain gauge or snow-gauge.

precipitation intensity

See also rainfall intensity

Rate at which precipitation occurs, expressed in units of depth per unit of time.

principal hydrometric station

Syn. base station , primary station; see also secondary hydrometric station

Hydrometric station at which one or a number of elements are observed for a period of many years taking into account the significance of such elements in relation to the physical environment. Such a station is usually equipped with recording instruments.

probability

See also conditional probability

Basic statistical concept either expressing in some way a “degree of belief” or taken as a limiting relative frequency of occurrence in an infinite series.

probable (possible) maximum precipitation (PMP)

Syn. extreme rainfall

Amount of precipitation that is the physically-based upper limit for a given duration over a particular basin.

Q

quantitative precipitation estimate (QPE)

Estimate of the quantity of precipitation that occurred in a specified area during a specified time interval.

quantitative precipitation forecast (QPF)

Forecast of precipitation amounts in a specified area for some time period in the future.

R

rain shadow

Region situated on the lee side of a mountain or mountain range where the rainfall is much less than on the windward side.

rainfall depth

Amount of rain falling expressed as depth of water on a horizontal surface.

rainfall distribution

Manner in which the amount of rainfall varies in space and time.

rainfall excess

See also effective rainfall
That part of rainfall which contributes directly to surface runoff.

rainfall intensity

See also precipitation intensity
Rate at which rainfall occurs, expressed in units of depth per unit of time.

rainfall intensity pattern

Syn. storm-intensity pattern; see also hyetograph
Distribution of rainfall rate in time.

rainfall intensity return period

Average time interval in years between the occurrence of rainfall of a given intensity and that of an equal or greater intensity.

rainfall-runoff model

Any mathematical model relating runoff to rainfall data.

rain gauge; rain gage

Syn. pluviometer
Instrument for measuring the depth of water from precipitation at a point.

rating curve

Syn. rating table; see also hysteresis (in stage-discharge relation), stage-discharge relation
Curve showing the relation between stage and discharge of a stream at a hydrometric station.

rational method

Formula expressing the estimated peak rate of storm runoff as the product of the catchment area, the peak rate of rainfall, and the runoff coefficient.

raw data

Data which have not been processed.

reach

See also lower reach, upper reach

Length of open channel between two defined cross sections.

real-time processing

Concurrent processing of data upon their reception.

real-time transmission

Transmission of data immediately upon observation.

recession

See also falling limb, groundwater recession

Period of decreasing discharge as indicated by the falling limb of a hydrograph starting from the peak.

recording rain gauge; recording rain gage

Syn. rain recorder, pluviograph

Instrument which records the depth of water from precipitation over time.

reference climatological station

Climatological station whose data are used to determine climatic trends.

regionalization (of data)

See also representative sample, water sample

(1) Extension of the results of the analysis of point data to a region.

(2) Identification of distinct areas, within a large region, which have similar hydrological characteristics.

regression

Process of quantifying the dependence of one variable on one or more other variables.

remote sensing

Measurement or acquisition of information on some property of an object or phenomenon by a recording device that is not in physical or direct contact with the object or phenomenon under study.

representative basin

Individual basin in which hydrological stations are installed to make simultaneous hydrometeorological and hydrometric observations so that the measurements would represent a broad area in lieu of making measurements on all basins in a given region.

residual damage

Damage occurring beyond that which is prevented by existing or planned flood mitigation measures.

retention

That part of the precipitation falling on a drainage area which does not escape as surface stream flow during a given period.

return period

Syn. recurrence interval; see also flood frequency, flood probability, recurrence
Long-term average interval of time between events in which a specific magnitude of a hydrological variable is equalled or exceeded.

Reynolds number

See also laminar flow, turbulent flow
Dimensionless number expressing the ratio of inertia forces to viscous forces.

rill

Very small channel, created by erosion, in which the water flow is concentrated.

rising limb

See also falling limb
Part of a hydrograph in which the discharge is increasing towards a peak.

river order

Syn. stream order
Number expressing the degree of branching in a stream system.

runoff

Part of the precipitation which flows towards a river on the ground surface (surface runoff) or within the soil (subsurface runoff or interflow).

runoff coefficient

(1) Ratio of runoff depth to precipitation depth.
(2) Coefficient used in the rational method.

S

saturated zone

Part of a water-bearing formation in which all voids are filled with water.

S-curve hydrograph

Hydrograph that would result from an infinite series of sequential excess rainfall increments of unit rate by adding a series of t-hour unit hydrographs, each lagged t hours with respect to the preceding one.

sediment

See also debris
Material transported either in suspension or as bed load by water from the place of origin to the place of deposition.

sensor

See also transducer, water level recorder
Device that responds to a physical or chemical stimulus.

sheet erosion

See also sheet flow

Removal of soil of a nearly uniform thickness from a ground surface by rain-drop splash and overland flow.

sheet flow

See also sheet erosion

Flow of water in a relatively thin sheet of nearly uniform depth, over the ground surface.

shower

See also heavy rain, storm

Short-lived and heavy rain falling usually from convective clouds.

shuga

A spongy, rather opaque, whitish chunk of ice that forms instead of pancake ice if the freezing takes place in considerably agitated sea water.

sleet

Precipitation of mixed rain and snow, mixed rain and hail, or snow melting as it falls.

snow

See also precipitation

(1) Atmospheric precipitation of ice crystals.

(2) Loose and porous aggregation of ice crystals or their fragments on any surface.

snow-melt flood

Significant flood rise in a river caused by the melting of snow pack accumulated during the winter.

snow pillow

Device filled with antifreeze solution and fitted with a pressure sensor which indicates the water equivalent of the snow cover.

soil moisture

See also soil water

Liquid or vapor water contained in the soil pores above the water table.

soil moisture content

Syn. water content of soil

Percentage of water in soil, expressed on a dry-weight basis or by volume.

soil moisture deficit

Syn. soil moisture deficiency; see also antecedent precipitation index, antecedent soil moisture

Difference between the field capacity of a soil and the actual soil moisture.

soil moisture profile

Curve representing the variation of soil moisture in relation to depth.

soil moisture retention

Part of soil moisture retained by surface tension and molecular forces against the influence of gravity.

soil water

See also soil moisture

Water suspended in the uppermost belt of soil or in the zone of aeration near the ground surface that can be discharged into the atmosphere by evapotranspiration.

staff gauge; staff gage

Syn. vertical gauge; vertical gage; see also stage gauge; stage gage

Graduated vertical scale, fixed to a staff or to a structure, against which a water level may be read.

stage-discharge relation

See also rating curve

Relation between water level and discharge at a river cross section, which may be expressed as a curve, table, or equation.

stage gauge; stage gage

See also staff gauge; staff gage

Instrument installed for measuring the surface water level relative to a gauge datum.

storm runoff

See also direct runoff

Direct runoff generated by a storm.

stream

See also river

(1) Flowing body of water in a natural surface channel.
(2) Water flowing in an open or closed conduit.
(3) Jet of water issuing from an orifice.
(4) Body of flowing groundwater in karst formation.

streamflow

General term for water flowing in a watercourse.

structural flood mitigation

Reduction of the effects of floods using physical solutions, such as reservoirs, levees, dredging, and diversions.

supercooled rain

Rain composed of drops at a temperature below freezing point.

surface flow

Syn. surface runoff; see also overland flow

Part of the precipitation which flows on the ground surface.

synthetic hydrograph

See also unit hydrograph

Hydrograph developed on the basis of estimation of coefficients related to various physical features of a drainage basin.

T

telemetry
Data or information acquisition system in which the measurement facility is sufficiently remote from the location of data presentation that a system of data transmission is necessary.

Thiessen method
Graphical method for estimating areal rainfall by forming polygons from the perpendicular bisectors of the straight lines joining adjacent rainfall station locations.

threshold runoff
The runoff needed to initiate flooding. It is a fixed value based on the geographic and hydrologic features of the stream channel and basin.

throughfall
Part of rainfall that reaches the ground directly through the vegetative canopy, through inter-shrub spaces in the canopy and as drip from the leaves, twigs, and stems.

torrent
Water flowing with high velocity and turbulence in a watercourse having a steep slope.

tortuosity
Ratio of the actual length of a channel, or winding groundwater path, measured between two points and along the center line or path, to the shortest distance between those points.

total sediment load
Total amount of sediment passing through a reach, either in suspension or along the bed, excluding any sediment deposited on the bed within the reach.

transpiration
See also evaporation, evapotranspiration
Process by which water from vegetation is transferred into the atmosphere in the form of vapor.

travel time
See also lag time
Time elapsing between the passage of a volume of water between a given point and another point downstream.

twin-gauge station; twin-gage station
Gauging station at which two water level gauges define a reach for measurement of water-surface slopes as an essential parameter for establishing a stage-discharge relation.

U

unit hydrograph
See also composite unit hydrograph, instantaneous unit hydrograph, synthetic hydrograph
Hydrograph of direct runoff resulting from a unit amount of effective rainfall generated uniformly over a drainage basin during a specified duration.

upper reach

See also lower reach, reach
Part of a stream channel in the upper region of a drainage basin.

upstream

See also downstream
Position from which a fluid is moving.

urban hydrology

Branch of hydrology which deals with the hydrology of urban and metropolitan areas, where substantial land portions consist of nearly impervious surfaces and artificial land relief, emphasizing the effect of urban developments.

W

wadi

Syn. oued, wed; see also ephemeral stream
(1) Channel in an arid region which is dry except during rain storms.
(2) Drainage catchment in an arid region comprising a main channel and tributaries, which may encompass flash floods in short periods of heavy rainfall.

water level

Syn. stage
Elevation of the free-water surface of a body of water relative to a datum level.

watershed divide

Syn. drainage divide, water parting
Summit or boundary line separating adjacent drainage basins.

weather radar

Syn. meteorological radar
System, including equipment, using beamed, repeated and timed electromagnetic radiation to detect, locate, and quantify hydrometeorological phenomena.

weir

Overflow structure which may be used for controlling upstream water level or for measuring discharge or for both.

wire weight-gauge; wire weight-gage

Manual stage gauge consisting of a fine cable or wire attached to a weight which is lowered to the water surface in order to determine its depth below a fixed point.