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National Weather Service


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RADAP II

RAadar DATA Processor II, attached to some WSR-57 and WSR-74 radar units. It automatically controls the tilt sequence and computes several radar-derived quantities at regular intervals, including VIL, storm tops, accumulated rainfall, etc.

RADAR

Acronym for **RA**dio **D**etection **A**nd **R**anging; a radio device or system for locating an object by means of ultrahigh-frequency radio waves reflected from the object and received, observed, and analyzed by the receiving part of the device in such a way that characteristics (as distance and direction) of the object may be determined.

Radar Beam

The straight line that a radar pulse travels along. As the radar beam gets further away from the radar, it gets wider and wider. In order for a precipitation target to be detected by the radar, it must fill the entire radar beam; therefore, the radar will have a difficult time detecting small showers and thunderstorms at a great distance from the radar.

Radar Coded Message

This is an alphanumeric coded message which will be used in preparation of a national radar summary chart. It is automatically produced by the WSR-88D's Radar Product Generator (RPG) in 3 parts (reflectivities, storm motion, and echo tops).

Radar Cross Section

The area of a fictitious, perfect reflector of electromagnetic waves (e.g., metal sphere) that would reflect the same amount of energy back to the radar as the actual target (e.g., lumpy snowflake).

Radar Data Acquisition

An acronym for Radar Data Acquisition. The RDA is the hardware component of the NEXRAD system that consists of the radar antenna, transmitter, receiver, tower, and controlling computer. The RDA collects the unprocessed, analog voltages from the radar antenna and converts the signal to base reflectivity, base velocity, and spectrum width (in polar coordinate form). These "wide-band" products are transmitted to the RPG, which creates and disseminates end-user products. Also: The RDA is the origination point of the WSR-88D radar data that will be eventually used by the radar operator. This WSR-88D component group is made up of several subcomponents which generate and radiate radio frequency (RF) pulses, receive reflected energy from those pulses, and process this received energy into digital base data. The RDA is also the site of the first two of four data recording levels used by the WSR-88D to record and store radar data.

Radar Meteorology

Branch of meteorology that uses radars for weather observations and forecasts.

Radar Mosaic

A radar product that combines information from multiple radars to give a regional or national view of reflectivity or precipitation. An individual NEXRAD radar is limited to a range of about 200 miles. Typically, a mosaic product is produced for regions spanning several hundreds to several thousands of miles. Mosaic products are produced by vendors external to the NEXRAD system.

Radar Product Generator (RPG)

The RPG is the computer in the NEXRAD system that receives polar-coordinate base radar data from the RDA and processes these data into end-user products. Algorithms are utilized for pattern-recognition, rainfall estimation, computation of VIL and other products. The RPG communicates these products to end-users. A specific subset of available products is always generated for the NIDS vendors for distribution outside of the NWS, DoD, and FAA. Other products are generated by the RPG upon request from a PUP.

Radar Range

Distance from the radar antenna. The WSR-88D radar has a range for velocity products

out to 124 nautical miles and reflectivity products out to 248 nautical miles.

Radar Reflectivity

The sum of all backscattering cross-sections (e.g., precipitation particles) in a pulse resolution volume divided by that volume. The radar reflectivity can be related to the radar reflectivity factor through the dielectric constant term $|K|^2$, and the radar wavelength.

Radar Reflectivity Factor (z)

$z =$ the sum (over i) of $(N_i * D_i^6)$, where N_i is the number of drops of diameter D_i in a pulse resolution volume. Note that z may be expressed in linear or logarithmic units. The radar reflectivity factor is simply a more meteorologically meaningful way of expressing the radar reflectivity.

Radial Velocity

Component of motion toward or away from a given location. As "seen" by Doppler radar, it is the component of motion parallel to the radar beam. (The component of motion perpendicular to the beam cannot be seen by the radar. Therefore, strong winds blowing strictly from left to right or from right to left, relative to the radar, can not be detected.)

Radiance

A measure of the intensity of the radiant energy flux emitted by a body in a given direction.

Radiation

Energy transport through electromagnetic waves. See shortwave radiation and longwave radiation.

Radiation Fog

A fog that forms when outgoing longwave radiation cools the near-surface air below its dew point temperature.

Radiation Laws

The four physical laws which fundamentally describe the behavior of blackbody radiation: Kirchhoff's law, Planck's law, Stefan-Boltzmann law and Wien's displacement law.

Radiational Cooling

The cooling of the Earth's surface. At night, the Earth suffers a net heat loss to space due to terrestrial cooling. This is more pronounced when you have a clear sky.

Radiational Inversion

Used interchangeably with **Nocturnal Inversion**; a temperature inversion that develops during the night as a result of radiational cooling of the surface. Because the immediate surface (lower Boundary Layer) cools much more rapidly during these conditions than the air just above (upper Boundary Layer), a temperature inversion can be created overnight, but typically erodes quickly after sunrise.

Radio Emission

Emissions of the sun in radio wavelengths from centimeters to dekameters, under both quiet and disturbed conditions. Type I. A noise storm composed of many short, narrow-band bursts in the metric range (300 - 50 MHz). Type II. Narrow-band emission that begins in the meter range (300 MHz) and sweeps slowly (tens of minutes) toward dekameter wavelengths (10 MHz). Type II emissions occur in loose association with major FLAREs and are indicative of a shock wave moving through the solar atmosphere. Type III. Narrow-band bursts that sweep rapidly (seconds) from decimeter to dekameter wavelengths (500 - 0.5 MHz). They often occur in groups and are an occasional feature of complex solar ACTIVE REGIONS. Type IV. A smooth continuum of broad-band bursts primarily in the meter range (300 - 30 MHz). These bursts are associated with some major flare events beginning 10 to 20 minutes after the flare maximum, and can last for hours

Radio Event

Flares with Centimetric Bursts and/or definite Ionospheric Event (SID)

Radiofacsimile

Also known as HF FAX, radiofax or weatherfax, is a means of broadcasting graphic weather maps and other graphic images via HF radio. HF radiofax is also known as WEFAX, although this term is generally used to refer to the reception of weather charts and imagery via satellite. Maps are received using a dedicated radiofax receiver or a single sideband shortwave receiver connected to an external facsimile recorder or PC equipped with a radiofax interface and application software.

Radiofax

Abbreviation for radiofacsimile

Radioisotope Snow Gage

A snow water equivalent gage based on the absorption of gamma radiation by snow; this gage can measure up to 55 inches water equivalent with a 2 to 5 percent error.

Radiosonde

An instrument that is carried aloft by a balloon to send back information on atmospheric temperature, pressure and humidity by means of a small, expendable radio transmitter. Radiosondes can be tracked by radar, radio direction finding, or navigation systems (such as the satellite Global Positioning System) to obtain wind data. See also

- rawinsonde.
- Radius of Maximum Winds**
The distance from the center of a tropical cyclone to the location of the cyclone's maximum winds. In well-developed hurricanes, the radius of maximum winds is generally found at the inner edge of the eyewall.
- RAFC**
Regional Area Forecast Center
- RAFS**
Regional Analysis and Forecasting System
- Rain**
Precipitation that falls to earth in drops more than 0.5 mm in diameter.
- Rain Foot**
Slang for a horizontal bulging near the surface in a precipitation shaft, forming a foot-shaped prominence. It is a visual indication of a wet microburst.
- Rain Forest**
A forest which grows in a region of heavy annual precipitation. There are two major types, tropical and temperate.
- Rain Gauge**
An instrument for measuring the quantity of rain that has fallen.
- Rain Induced Fog**
When warm rain falls through cooler air, water evaporates from the warm rain. It subsequently condenses in the cool air forming fog. Such fog can be quite dense. It generally will persist as long as the rain continues. Since temperature rises little during the day, there is little diurnal variation in rain induced fog. Improvement in visibility cannot be expected until the rain stops or moves out of the affected area.
- Rain Shadow**
An area of reduced precipitation on the lee side of a mountain barrier caused by warming of air and dissipation of cloudiness as air descends the barrier.
- Rain Shield**
In a hurricane, a solid or nearly solid area of rain that typically becomes heavier as one approaches the eye. The outer edge is well defined and its distance from the eye varies greatly from storm to storm. The wind, both sustained and peak gusts, keeps increasing as much as one moves through the rain shield toward the storm's eye.
- Rain-free Base**
A dark, horizontal cloud base with no visible precipitation beneath it. It typically marks the location of the thunderstorm updraft. Tornadoes may develop from wall clouds attached to the rain-free base, or from the rain-free base itself - especially when the rain-free base is on the south or southwest side of the main precipitation area. Note that the rain-free base may not actually be rain free; hail or large rain drops may be falling. For this reason, updraft base is more accurate.
- Rainbow**
A luminous arc featuring all colors of the visible light spectrum (red, orange, yellow, green, blue, indigo, and violet). It is created by refraction, total reflection, and the dispersion of light. It is visible when the sun is shining through air containing water spray or raindrops, which occurs during or immediately after a rain shower. The bow is always observed in the opposite side of the sky from the sun.
- Rainfall**
The amount of precipitation of any type, primarily liquid. It is usually the amount that is measured by a rain gauge. Refer to rain for rates of intensity and the quantitative precipitation for forecasting.
- Rainfall Estimates**
A series of NEXRAD products that employ a Z-R relationship to produce accumulations of surface rainfall from observed reflectivity.
- Range**
Distance from the radar antenna. The WSR-88D radar has a range for velocity products out to 124 nm and reflectivity products out to 248 nm.
- Range Folding**
This occurs when the radar receives a signal return from a pulse other than the most recent pulse. In this case, the radar sends out a pulse (a short burst of energy). This pulse will continue to go in a straight line until it strikes a target. When it strikes the target, a portion of the pulse will be back scattered towards the radar. If the target it strikes is well beyond the normal range of the radar, it will take longer for the back scattered energy to arrive back at the radar. As a result, the radar will most likely have sent out another pulse in the same direction before the back scattered energy arrives back at the radar. Therefore, when the radar receives the back scattered energy, it will assume that it came from an object much closer to the radar and it will improperly locate the echo. A multiple-trip return appears at the difference of the true range and a multiple of the unambiguous range, i.e., $R_{\text{displayed}} = R_{\text{true}} - n * R_{\text{max}}$, where $n = 0, 1, 2, \dots$
- Range Gate**
The discrete point in range along a single radial of radar data at which the received

- signal is sampled. Range gates are typically spaced at 100-1000 meter intervals. A "radial" of radar data is composed of successive range gates, out to the maximum unambiguous range.
- Range Height Indicator**
The RHI is a radar display in which the radar scans vertically, with the antenna pointing at a specific azimuth or radial. NEXRAD does not support RHI, but the PUP software allows the NEXRAD operator to construct a vertical cross-section using data from multiple scans of the radar.
- Range Normalization**
A receiver gain function in the radar which compensates for the effect of range (distance) on the received power for an equivalent reflectivity.
- Range Resolution**
The ability of the radar to distinguish two targets along the same radial but at different ranges. It is approximately $\frac{1}{2}$ the pulse length.
- Range Unfolding**
Process of removing range ambiguity in apparent range of a multirip target on the radar.
- Rankine Vortex**
Velocity profile for a symmetric circulation in which the inner core is in solid rotation and tangential winds outside the core vary inversely with radial distance from the center.
- RAOB**
Radiosonde Observation (Upper-Air Observation)
- Rapid Deepening**
A decrease in the minimum sea-level pressure of a tropical cyclone of 1.75 mb/hr or 42 mb for 24 hours
- Rapidly Intensifying**
Any maritime cyclone whose central pressure is dropping, or is expected to drop, at a rate of 1 MB per hour for 24 hours.
- Rawinsonde**
A radiosonde that is tracked to measure winds.
- Rawinsonde Observation**
A radiosonde observation which includes wind data.
- RAWS**
Remote Automated Weather Stations
- Rayleigh Scattering**
Changes in directions of electromagnetic energy by particles whose diameters are $\frac{1}{16}$ wavelength or less. This type of scattering is responsible for the sky being blue.
- RCKY**
Rocky Mountains
- RCMD**
Recommend
- RCV**
Receive
- RDG**
ridge
- RDS**
Radius
- Reach**
In hydrologic terms, the distance between two specific points outlining that portion of the stream, or river for which the forecast applies. This generally applies to the distance above and below the forecast point for which the forecast is valid.
- Reach**
A section of river or stream between an upstream and downstream location, for which the stage or flow measured at a point somewhere along the section (e.g., gaging station or forecast point) is representative of conditions in that section of river or stream.
- Real-Time**
Refers to the rapid retrieval, processing and transmission of data.
- Rear Flank Downdraft**
A region of dry air subsiding on the back side of, and wrapping around, a mesocyclone. It often is visible as a clear slot wrapping around the wall cloud. Scattered large precipitation particles (rain and hail) at the interface between the clear slot and wall cloud may show up on radar as a hook or pendant; thus the presence of a hook or pendant may indicate the presence of an RFD.
- Receiver**
The electronic device which detects the backscattered radiation, amplifies it and converts it to a low-frequency signal which is related to the properties of the target.
- Recharge**
The replenishment of groundwater through infiltration of precipitation or snowmelt into the soil and gravity flow of streams into valley alluvium, sinkholes, or other large openings.
- Reconnaissance Code**

An aircraft weather reconnaissance code that has come to refer primarily to in-flight tropical weather observations, but actually signifies any detailed weather observation or investigation from an aircraft in flight.

Record Event Report

This non-routine narrative product is issued by the National Weather Service to report meteorological and hydrological events that equal or exceed existing records.

Recreation Report

This National Weather Service product is used to relay reports on conditions for resorts and recreational areas and/or events. This report may also contain forecast information. Reports for recreational areas and resorts are often routine products, typically for a season, but possibly year-round.

Recurrence

Used especially in reference to the recurrence of physical parameters every 27 days (the rotation period of the sun)

Red Flag

This a fire weather program which highlights the onset of critical weather conditions conducive to extensive wildfire occurrences.

Red Flag Warning

A term used by fire-weather forecasters to call attention to limited weather conditions of particular importance that may result in extreme burning conditions. It is issued when it is an on-going event or the fire weather forecaster has a high degree of confidence that Red Flag criteria will occur within 24 hours of issuance. Red Flag criteria occurs whenever a geographical area has been in a dry spell for a week or two, or for a shorter period, if before spring green-up or after fall color, and the National Fire Danger Rating System (NFDRS) is high to extreme and the following forecast weather parameters are forecasted to be met:

- 1) a sustained wind average 15 mph or greater
- 2) relative humidity less than or equal to 25 percent and
- 3) a temperature of greater than 75 degrees F.

In some states, dry lightning and unstable air are criteria. A Fire Weather Watch may be issued prior to the Red Flag Warning.

Red Watch or Red Box

Slang for Tornado Watch.

REF

Reference

Reference Mark

A relatively permanent point of known elevation which is tied to a benchmark.

Reflection

The process whereby radiation (or other waves) incident upon a surface is directed back into the medium through which it traveled.

Reflectivity

Usually a reference to **Radar Reflectivity**; the sum of all backscattering cross-sections (e.g., precipitation particles) in a pulse resolution volume divided by that volume. The radar reflectivity can be related to the radar reflectivity factor through the dielectric constant term $|K|^2$, and the radar wavelength.

Reflectivity Cross Section

This WSR-88D radar product displays a vertical cross section of reflectivity on a grid with heights up to 70,000 feet on the vertical axis and distance up to 124 nm on the horizontal axis. Cross Section is similar to the Range Height Indicator (RHI) slices observed on conventional radar, but it is not limited to alignments along the radar radials. Instead the 2 end points are operator selected anywhere within 124 nm of the radar that are less than 124 nm apart. It is used to:

- 1) Examine storm structure features such as overhang, tilt, Weak Echo Regions (WER), and Bounded Weak Echo Regions (BWER);
- 2) Estimate height of higher dBZ's and echo tops; and
- 3) Locate the bright band (where snow is melting and becoming rain).

Reflectivity Factor

The result of a mathematical equation (called the Weather Radar Equation) that converts the analog power (in Watts) received by the radar antenna into a more usable quantity. The reflectivity factor (denoted by Z) takes into account several factors, including the distance of a target from the radar, the wavelength of the transmitted radiation, and certain assumptions about the kind and size of targets detected by the radar. The reflectivity factor ranges over several orders of magnitudes, so it is usually expressed on a logarithmic scale called dBZ (decibels of reflectivity).

Refraction

Changes in the direction of energy propagation as a result of density changes within the propagating medium. In weather terms, this is important on determining how a radar beam reacts in the atmosphere.

Refractive Index

A measure of the amount of refraction. Numerically equal to the ratio of wave velocity in

a vacuum to a wave speed in the medium, i.e., $n = c / v$ where: v is actual speed, and c is speed of light in a vacuum.

Refractivity

Expressed as N ; $N = (n-1) \times 10^6$, where n is refractive index and N is a function of temperature, pressure and vapor pressure (in the atmosphere).

Regional Haze

Haze that is mixed uniformly between the surface and the top of a convective boundary layer.

Relative Humidity

A dimensionless ratio, expressed in percent, of the amount of atmospheric moisture present relative to the amount that would be present if the air were saturated. Since the latter amount is dependent on temperature, relative humidity is a function of both moisture content and temperature. As such, relative humidity by itself does not directly indicate the actual amount of atmospheric moisture present. See dew point.

Relative Vorticity

The sum of the rotation of an air parcel about the axis of the pressure system and the rotation of the parcel about its own axis.

Relative Wind

The wind with reference to a moving point. Sometimes called APPARENT WIND. See also APPARENT WIND, TRUE WIND.

RELBL

Reliable

Relocated

A term used in an advisory to indicate that a vector drawn from the preceding advisory position to the latest known position is not necessarily a reasonable representation of the cyclone's movement.

Remote Observing System Automation

A type of automated data transmitter used by NWS Cooperative Program observers.

REP

Represent/Representative

Report

A weather report is a statement of the actual weather conditions observed at a specific time at a specific site.

Reservoir

In hydrologic terms, a manmade facility for the storage, regulation and controlled release of water.

Residual Layer

the elevated portion of a convective boundary layer that remains after a stable boundary layer develops at the ground (usually in late afternoon or early evening) and cuts off convection.

Residual Moisture

Atmospheric moisture which lingers over an area after the main weather system has departed.

Resonance

The state of a system in which an abnormally large vibration is produced in response to an external stimulus, occurring when the frequency of the stimulus is the same, or nearly the same, as the natural vibration frequency of the system.

Response Time

In hydrologic terms, the amount of time in which it will take a watershed to react to a given rainfall event

Retrogression

(or Retrograde Motion) - Movement of a weather system in a direction opposite to that of the basic flow in which it is embedded, usually referring to a closed low or a longwave trough which moves westward.

Return Flow

South winds on the back (west) side of an eastward-moving surface high pressure system. Return flow over the central and eastern United States typically results in a return of moist air from the Gulf of Mexico (or the Atlantic Ocean).

Return Stroke

An electrical discharge that propagates upward along a lightning channel from the ground to the cloud.

Rex Block

A blocking pattern where there is an upper level high located directly north of a closed low.

RFC

River Forecast Center. Centers that serve groups of Weather Service Forecast offices and Weather Forecast offices, in providing hydrologic guidance and is the first echelon office for the preparation of river and flood forecasts and warnings.

RGD

Ragged

- RGN**
Region
- RH**
Relative Humidity - a dimensionless ratio, expressed in percent, of the amount of atmospheric moisture present relative to the amount that would be present if the air were saturated. Since the latter amount is dependent on temperature, relative humidity is a function of both moisture content and temperature. As such, relative humidity by itself does not directly indicate the actual amount of atmospheric moisture present. See dew point.
- RHI**
Range-Height Indicator
- Ribbon Lightning**
Appears to be a broad stream of fire. A succession of strokes, each blown a bit to the side of the previous strokes by wind, but striking so fast that all the strokes are seen at once as a ribbon-like flash.
- Ridge**
1) An elongated area of relatively high atmospheric pressure; the opposite of trough.
or
2) In hydrologic terms, a line or wall of broken ice forced up by pressure. May be fresh or weathered
- Ridge Ice**
In hydrologic terms, ice piled haphazardly one piece over another in the form of ridges or walls.
- Right Ascension**
The celestial longitude of the sun. This value is 0 at the vernal equinox, 90 at the summer solstice, 180 at the autumnal equinox and 270 at the winter solstice.
- Right Entrance Region**
Used interchangeably with **Right Rear Quadrant**; the area upstream from and to the right of an upper-level jet max (as would be viewed looking along the direction of flow). Upward motion and severe thunderstorm potential sometimes are increased in this area relative to the wind speed maximum. See also exit region, left front quadrant.
- Right Mover**
A thunderstorm that moves appreciably to the right relative to the main steering winds and to other nearby thunderstorms. Right movers typically are associated with a high potential for severe weather. (Supercells often are right movers).
- Right Rear Quadrant**
(Abbrev. RRQ) - Used interchangeably with **Right Entrance Region**; the area upstream from and to the right of an upper-level jet max (as would be viewed looking along the direction of flow). Upward motion and severe thunderstorm potential sometimes are increased in this area relative to the wind speed maximum. See also exit region, left front quadrant.
- Rime Ice**
An opaque coating of tiny, white, granular ice particles caused by the rapid freezing of supercooled water droplets on impact with an object. See also clear ice.
- RIOGD**
Rio Grande
- Riometer**
(Relative Ionospheric Opacity meter). A specially designed radio receiver for continuous monitoring of cosmic noise. The absorption of cosmic noise in the polar regions is very sensitive to the solar low-energy cosmic ray flux
- Rip Current**
A relatively small-scale surf-zone current moving away from the beach. Rip currents form as waves disperse along the beach causing water to become trapped between the beach and a sandbar or other underwater feature. The water converges into a narrow, river-like channel moving away from the shore at high speed.
- Rip Tide**
See [RIP CURRENTS](#)
- Riparian Zone**
In hydrologic terms, a stream and all the vegetation on its banks.
- River Basin**
In hydrologic terms, drainage area of a river and its tributaries.
- River Flood Statement**
This product is used by the local National Weather Service Forecast Office (NWFO) to update and expand the information in the River Flood Warning. This statement may be used in lieu of a warning if flooding is forecasted, imminent, or existing and it presents no threat to life or property. The statement will also be used to terminate a River Flood Warning.
- River Flood Warning**
This product is issued by the local National Weather Service Forecast Office (NWFO) when forecast points (those that have formal gaging sites and established flood stages)

at specific communities or areas along rivers where flooding has been forecasted, is imminent, or is in progress. Flooding is defined as the inundation of normally dry areas as a result of increased water levels in an established water course. The flood warning is based on the RVF product from the River Forecast Center (RFC) in Minneapolis, Minnesota. The flood warning normally specifies crest information. It usually occurs 6 hours or later after the causative event and it is usually associated with widespread heavy rain and/or snow melt or ice jams.

It will contain the forecast point covered by the warning, the current stage (if it is available), and the established flood stage. It will also contain the forecasted crest from the River Forecast Center (RFC) in Minneapolis, Minnesota. From this forecasted crest, the NWFO will be able to determine which areas will be affected by the river flooding. This information will be included in the warning. Finally, the statement will include a site/event specific call to action.

River Flooding

The rise of a river to an elevation such that the river overflows its natural banks causing or threatening damage.

River Forecast

An internal product issued by RFCs to other NWS offices. An RVF contains stage and/or flow forecasts for specific locations based on existing, and forecasted hydrometeorologic conditions. The contents of these products are used by the HSA office to prepare Flood Warnings (FLW), Flood Statements (FLS), River Statements (RVS), as well as other products available to the public.

River Forecast Center

Centers that serve groups of Weather Service Forecast offices and Weather Forecast offices, in providing hydrologic guidance and is the first echelon office for the preparation of river and flood forecasts and warnings.

River Gage

A device for measuring the river stage.

River Gage Datum

The arbitrary zero datum elevation which all stage measurements are made from.

River Ice Statement

A public product issued by the RFC containing narrative and numeric information on river ice conditions.

River Observing Station

An established location along a river designated for observing and measuring properties of the river.

River Recreation Statement

A statement released by the NWS to inform river users of current and forecast river and lake conditions. These statements are especially useful for planning purposes.

River Statement

A NWS product issued to communicate notable hydrologic conditions which do not involve flooding, i.e., within river bank rises, minor ice jams, etc.

River System

In hydrologic terms, all of the streams and channels draining a river basin.

RLS

Release

RLTV

Relative

RMN

Remain

RMTN

Regional Meteorological Telecommunications Network

RMV

remove

RNFL

Rainfall

Rocketsonde

A type of radiosonde that is shot into the atmosphere by a rocket, allowing it to collect data during its parachute descent from a higher position in the atmosphere than a balloon could reach.

Rockfill Dam

In hydrologic terms, an embankment dam of earth or rock in which the material is placed in layers and compacted by using rollers or rolling equipment.

Rogue Wave

Commonly used term by mariners of a wave of an unexpected wave of much greater height or steepness than other waves in the prevailing sea or swell system. Rogue waves have been part of marine folklore for centuries. They are generally considered to be unexpectedly high waves which in some instances come from a direction different from the predominant waves in the local area. A single rogue wave has certainly been

known to spell disaster for the mariner. They have, over the past twenty or thirty years, come to be recognized as unique phenomena albeit with several possible causes.

(1) Constructive interference. Several different wave trains of differing speeds and directions meet at the same time. The heights of the crests are additive so that an extreme wave may result when very high waves are included in the wave trains. The effect is normally short lived since the wave trains continue to separate and move on.

(2) Focusing of wave energy. When storm forced waves are developed in a water current counter to the wave direction an interaction can take place which results in a shortening of the wave frequency. The result is the superimposing of the wave trains and the generation of extreme waves. Examples of currents where these are sometimes seen are the Gulf Stream and Agulhas current. Extreme wave developed in this regime tend to be longer lived.

(3) Normal part of the wave spectrum. The generation of waves on water results not in a single wave height but in a spectrum of waves distributed from the smallest capillary waves to large waves indeed. Within this spectrum there is a finite possibility of each of the wave heights to occur with the largest waves being the least likely. The wave height most commonly observed and forecast is the significant wave height. This is defined as the average of the one third highest waves. The probability of encountering such a wave is about 1 in 10 while 1 in 1000 waves will be nearly double the significant wave height or higher. This is thought to be the source of at least some reports of rogue waves.

Roll Cloud

A low, horizontal tube-shaped arcus cloud associated with a thunderstorm gust front (or sometimes with a cold front). Roll clouds are relatively rare; they are completely detached from the thunderstorm base or other cloud features, thus differentiating them from the more familiar shelf clouds. Roll clouds usually appear to be "rolling" about a horizontal axis, but should not be confused with funnel clouds.

Rolled Filled Dam

In hydrologic terms, an embankment dam of earth or rock in which the material is placed in layers and compacted by using rollers or rolling equipment

Rope

(Also "Rope Funnel") - a narrow, often contorted condensation funnel usually associated with the decaying stage of a tornado. See rope stage.

Rope Cloud

In satellite meteorology, a narrow, rope-like band of clouds sometimes seen on satellite images along a front or other boundary. The term sometimes is used synonymously with rope or rope funnel.

Rope Stage

The dissipating stage of a tornado, characterized by thinning and shrinking of the condensation funnel into a rope (or rope funnel). Damage still is possible during this stage.

ROSA

Remote Observing System Automation. A type of automated data transmitter used by NWS Cooperative Program observers.

Rossby Waves

A series of troughs and ridges on quasi-horizontal surfaces in the major belt of upper tropospheric westerlies. The waves are thousands of kilometers long and have significant latitudinal amplitude.

Rotation

The spinning of a body, such as the earth, about its axis.

ROTG

Rotating

Rotor Cloud

A turbulent altocumulus cloud formation found in the lee of some mountain barriers when winds cross the barrier at high speed. The air in the cloud rotates around an axis parallel to the range. Also called a roll cloud.

Rotten Ice

In hydrologic terms, ice in an advanced stage of disintegration.

Rough Seas

Sea conditions associated with regionally defined wind thresholds over bays, inlets, harbors, inland waters, and estuaries where larger waves are forming with whitecaps and spray everywhere.

Routing

In hydrologic terms, the methods of predicting the attenuation of a flood wave as it moves down the course of a river.

RPD

Rapid

RPLC

Replace

RPRT

Report

RQR	Require
RRQ	Right Rear Quadrant - the area upstream from and to the right of an upper-level jet max (as would be viewed looking along the direction of flow). Upward motion and severe thunderstorm potential sometimes are increased in this area relative to the wind speed maximum. See also exit region, left front quadrant.
RSG	Rising
RSN	Reason
RTE	Route
RTRD	Retard
RTRN	Return
RTVS	Real Time Verification System
RUC	Rapid Update Cycle model, a numerical model run by NCEP that focuses on short-term forecasts out to 12 hours.
Runoff	In hydrologic terms, the part of precipitation that flows toward the streams on the surface of the ground or within the ground. Runoff is composed of baseflow and surface runoff.
Runway Visual Range	The maximum distance at which the runway, or the specified lights or markers delineating it, can be seen from a position above a specified point on its center line. This value is normally determined by visibility sensors located alongside and higher than the center line of the runway. RVR is calculated from visibility, ambient light level, and runway light intensity.
RVA	River Summary, a NWS summary of river and/or crest stages for selected forecast points along the river.
RVF	River Forecast. An internal product issued by RFCs to other NWS offices. An RVF contains stage and/ or flow forecasts for specific locations based on existing, and forecasted hydrometeorologic conditions. The contents of these products are used by the HSA office to prepare Flood Warnings (FLW), Flood Statements (FLS), River Statements (RVS), as well as other products available to the public.
RVI	River Ice Statement
RVR	<ol style="list-style-type: none">1. Runway Visual Range - the maximum distance at which the runway, or the specified lights or markers delineating it, can be seen from a position above a specified point on its center line. This value is normally determined by visibility sensors located alongside and higher than the center line of the runway. RVR is calculated from visibility, ambient light level, and runway light intensity.
RVS	<ol style="list-style-type: none">1. Abbreviation for "revise"2. River Statement, a product issued to communicate notable hydrologic conditions which do not involve flooding, i.e., within river bank rises, minor ice jams, etc.
RW	Rainshower

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