

Appendix C

Weather Terminology

ADVECTION

The horizontal movement of an air mass that causes changes in the physical properties of the air such as temperature and moisture.

AIR MASS

A large body of air that has nearly uniform conditions of temperature and humidity.

ALBERTA CLIPPER

A low pressure system that moves out of southwest Canada and mainly affects the Plains, Midwest, and Great Lakes region. Usually accompanied by light snow, strong winds, and colder temperatures. Another term for the same system is called a Saskatchewan Screamer.

BLOWING SNOW

Wind-driven snow that significantly reduces surface visibility to less than seven miles.

CIRRUS CLOUD

A wispy, cloud that is composed of ice crystals and is formed at altitudes of 20,000 to 40,000 feet above the ground.

COASTAL WATERS

The waters of the ocean extending from the coast out to 60 nautical miles.

COMBINED SEAS

Used to describe the combination or intersection of wind waves and swell in which the separate components are not distinguished.

CUMULONIMBUS CLOUD

A cumulus cloud that is vertically developed and often has an anvil shaped top. Generally associated with lightning, thunder, heavy showers, and occasionally hail and strong winds.

CUMULUS CLOUD

A cloud that has a flat base with an upper portion that is billowy or heaping.

CYCLONE

An area of low atmospheric pressure that has a closed circulation. Cyclones (or more commonly called "low pressures") usually bring about marked changes in the weather.

DEGREE-DAY (Heating/Cooling)

Gauges the amount of heating or cooling needed for a building using 65 degrees as a baseline. To compute heating/cooling degree-days, the average temperature is taken and referenced to a base line of 65 degrees. An average temperature of 50 yields 15 heating degree-days while an average of 75 would yield 10 cooling degree-days. Electrical, natural gas, power, heating, and air conditioning industries utilize heating and cooling degree information to calculate their needs.

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DEW

Water droplets that form upon surfaces on or near the ground when air is cooled to its dew point.

DEW POINT

The temperature to which air must be cooled, at constant pressure and moisture content, in order for saturation to occur. The higher the dew point, the greater the amount of water vapor in that vicinity. Dew points beginning in the 70's generally make people feel uncomfortable.

DOMINANT PERIOD

The period of the waves with the maximum wave energy.

DOPPLER WEATHER RADAR

A Weather Surveillance Radar (WSR-88D) system developed in 1988. About 121 systems have been installed at Weather Forecast Offices, with an additional 24 systems at Department of Defense (Air Force Bases) sites. This powerful and sensitive Doppler system generates many useful products for meteorologists, among them: standard reflectivity 'echoes', wind 'velocity' or atmospheric air motion pictures, and areal 1-hour, 3-hour, or storm-total precipitation images.

DOWNBURST

A strong downdraft initiated by a thunderstorm that includes an outburst of damaging winds on or near the ground. Downbursts may last for anywhere from a few minutes in small-scale microbursts on up to 20 minutes in larger, longer-lived macrobursts. One example of a downburst, called straight-line winds, can reach speeds of 110-150 mph, or squarely in the range of a strong tornado. Downbursts are further detailed as either: **Microburst:** a convective downdraft with an affected outflow area of less than 2.5 miles wide and peak winds lasting less than 5 minutes. They can create dangerous vertical/horizontal wind shears, which can adversely affect aircraft performance and cause property damage. **Macroburst:** a convective downdraft with an affected outflow area of at least 2.5 miles wide and peak winds lasting between 5 and 20 minutes. Intense macrobursts may cause tornado-force damage.

DOWNSLOPE / UPSLOPE FLOW

Downslope flow: Air that descends down a mountain chain or over sloping terrain (pressurized air moving from high pressure to low pressure), resulting in subsequent drying, and in some cases, dramatic warming of air that can quickly melt a snow cover. Local names for downslope winds, or "foehn" winds, in the western USA are Chinook Wind, East Winds and Santa Anna Winds. Usually associated with little or no clouds. Upslope flow: representative of air being lifted by rising terrain and is normally associated with extensive clouds and/or precipitation.

DRIZZLE

Water drops that are very small and fine. For the most part, drizzle falls from stratus clouds and is often accompanied by low visibility and fog.

EL NINO

Significant warming of the waters in the eastern Pacific Ocean, usually off the coast of South America, which results in shifts of world-wide weather patterns. Can cause prolonged periods of drought or floods.

FATHOM A unit of length equal to six feet, which is used to measure the depth of water.

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FETCH

An area from which waves are generated by a wind that is nearly constant in direction and speed.

FLASH FLOOD

A dangerous and sudden flood that threatens lives and property and usually occurs after heavy rain. May also occur after an ice jam breaks up or after a dam fails.

FOG BOW

A nebulous arc or circle of white or yellowish light sometimes seen in fog.

FLURRIES

Light snowfall that generally does not produce measurable accumulation.

FREEZING DRIZZLE or RAIN

Describes the effect of drizzle or rain freezing upon impact on objects that have a temperature of 32°F or below.

FREEZING LEVEL

The point in the atmosphere where temperatures are at 32°F.

FRONT

The boundary between two different air masses, i.e. cold front, warm front, stationary front.

FROST

A covering of small ice crystals that forms on or near the ground when temperatures approach or drop below 32°F.

FUNNEL CLOUD

A rotating, visible extension of cloud, pendant to a cumulus or cumulonimbus with circulation not reaching the ground.

FUJITA SCALE

A scale used to classify tornadoes based on wind damage and was developed by Theodore Fujita (University of Chicago).

<u>F Scale</u>	<u>Wind Speed (mph)</u>	<u>Damage</u>
F0	40-72	Light
F1	73-112	Moderate
F2	113-157	Major
F3	158-206	Severe
F4	207-260	Devastating
F5	261-318	Incredible
F6	319 or greater	Catastrophic

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GROUND FOG

Fog of little vertical extent, usually 20 feet or less.

GUST FRONT

The leading edge of a downdraft associated with a thunderstorm, which is marked by a sudden wind shift, sharply falling temperatures, and possibly heavy downpours and/or hail.

GUSTNADO

A small tornado, usually weak and short-lived, that occurs along the gust front of a thunderstorm. Often it is visible only as a debris cloud or dust whirl near the ground. It is not associated with the storm-scale rotation found in severe thunderstorms.

HAIL

Precipitation in the form of balls or lumps usually consisting of concentric layers of ice. A thunderstorm is classified as severe when it produces hail 3/4 of an inch or larger in diameter.

HALOS

Rings or arcs that encircle the sun or moon which are caused by refraction of light through ice crystals that make up cirrus clouds.

HAZE

Fine particles of dust, smoke, or water droplets suspended in the air that reduces visibility.

HEAT INDEX

The apparent temperature that describes the combined effect of moderate to high temperatures and high levels of humidity.

HEAVY SNOW

In the Cascade Range, defined as snowfall accumulations of 12 inches or more in 12 hours, or 18 inches or more in 24 hours; in the Coast Range, defined as snowfall accumulations of 6 inches or more in 12 hours, or 10 inches or more in 24 hours; in the valleys, river gorge, and at the coast, defined as snowfall accumulations of 4 inches or more in 12 hours, or 6 inches or more in 24 hours.

HUMIDITY

Amount of water vapor in the atmosphere.

HURRICANE

A dangerous tropical cyclone with wind speeds greater than or equal to of 64 knots (74 mph). In the western Pacific, they are called Typhoons.

ICE STORM

A freezing rain event that produces damaging ice accumulations of 1/4 inch or greater.

INVERSION

A situation where the temperature increases with height instead of decreasing.

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INSTABILITY (UNSTABLE AIR)

A state of atmosphere in which the vertical distribution of temperature allows warm, rising air to continue to rise and accelerate. This kind of motion is conducive for thunderstorm development.

ISOBARS

Lines of equal barometric pressure as shown on a weather map.

JET STREAK

A concentrated region within the jet stream where the wind speeds are the strongest. The jet streak sets up unique wind currents in its vicinity, which either enhance or diminish the likelihood of clouds and precipitation. The jet streak will propagate downstream along the jet stream axis.

JET STREAM

A narrow band of strong winds in the atmosphere that controls the movement of high and low pressure systems and associated fronts. Jet streams meander from time to time. Wind speeds can reach 200 mph or higher in certain cases. It is usually found at 30,000 to 40,000 feet above the earth's surface. The jet stream owes its existence to the large temperature contrast between the polar and equatorial regions.

KNOT

Unit of speed used in aviation and marine activities, equal to about 1.15 statute miles per hour.

LAKE-EFFECT SNOW SQUALL (LAKE SNOW)

A local intense, narrow band of moderate to heavy snow typically caused by very cold dry air moving over the warmer body of water. It can extend long distances inland, persist for many hours, and may be accompanied by strong, gusty surface winds and possibly lightning.

LEEWARD / WINDWARD

Leeward: The side of an object away from the direction in which the wind is blowing. Windward: The side of an object facing into the wind. Usually used to describe sides of mountain ranges.

LIGHTNING

A sudden visible flash of energy and light caused by electrical discharges from thunderstorms.

MILLIBAR / HECTOPASCAL

Unit of atmospheric pressure. A millibar and a hectopascal are equal in magnitude.

NAUTICAL MILE

A unit of distance used in marine navigation and forecasts, equal to about 1.15 statute miles.

NEXRAD

An acronym that stands for NEXt generation of weather RADar.

NOR'EASTER

A strong low pressure system that affects the Mid-Atlantic and New England States. It can form over land or over coastal waters. It usually produces heavy snows, flooding rains, strong northeast winds, coastal flooding, and beach erosion.

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OCEAN / LAND BREEZE

An ocean breeze occurs when prevailing winds blow off the water, while a land breeze indicates winds blowing from land over the water. Both are caused by the difference in surface temperature (due to heating) of the land and water. As a result, an ocean breeze occurs during the day while a land breeze occurs at night.

OFFSHORE / ONSHORE FLOW

Offshore flow occurs when air moves from land to sea, while onshore flow is when air over the water advances across land. Offshore flow is usually associated with dry weather, while onshore flow indicates an increase in moisture and resultant higher precipitation probabilities.

OFFSHORE WATERS

The waters of the ocean extending from 60 out to 250 nautical miles from the coastline. Further than 250 nautical miles is considered "High Seas".

OROGRAPHIC UPLIFT (UPSLOPE FLOW)

Occurs when air is forced to rise and cool due to terrain features such as hills or mountains. If the cooling is sufficient, water vapor condenses into clouds. Additional cooling results in rain or snow. It can cause extensive cloudiness and increased amounts of precipitation in higher terrain.

OZONE

A nearly colorless (but faintly blue) gaseous form of oxygen, with a characteristic odor like that of weak chlorine. Its chemical formula is O₃. It is usually found in trace amounts in the atmosphere, but is primarily found at 30,000 to 150,000 feet above the ground. Its production results from a photochemical process involving ultraviolet radiation. Because it absorbs harmful ultraviolet radiation at those heights, it is a beneficial gas. However, photochemical processes involving industrial/vehicle emissions can produce ozone near the ground, in which case it can be harmful to people with respiratory or heart problems.

PERIOD

Time, in seconds, between the passage of consecutive wave crests past a fixed location.

RADIATIONAL COOLING

The cooling of the earth's surface. At night, the earth suffers a net heat loss to space due to terrestrial cooling.

RAIN

Indicates a nearly steady and uniform fall of liquid precipitation (rain) over an area for several hours, as opposed to the term "showers", which implies intermittent and scattered precipitation of a more unstable, convective nature.

RAINBOW

An arc that exhibits, in concentric bands, the colors of the spectrum and is formed opposite the sun by refraction and reflection of the sun's rays in raindrops.

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RELATIVE HUMIDITY

The ratio of the amount of moisture in the air to the amount that could be present in the air at the same temperature and pressure if it were saturated; usually expressed in percent.

RIDGE

An elongated area of high pressure in the atmosphere; the opposite of trough.

RIP CURRENT

Rip currents are channelized currents of water flowing away from shore at surf beaches. They typically form at breaks in sandbars, and also near structures such as jetties and piers.

ROLL CLOUD

A turbulent cloud formation that resembles a roller. This cloud can be found in the lee of some mountains. The air in the cloud rotates around an axis parallel to range of mountains. It is also sometimes found along the leading edge of a thunderstorm cloud; formed by rolling action in the wind shear region between cool downdrafts and warm updrafts.

SEICHE

A standing wave oscillation in any enclosed lake that continues after the forcing mechanism has ceased. In the Great Lakes, this forcing mechanism may be either strong winds blowing along the axis of a lake, a pressure jump, or downdraft winds associated with fast moving squall lines over a lake. In either case, water is piled up at one end. The water then sloshes from one end of the lake to the other causing fluctuations of perhaps several feet before damping out.

SEVERE THUNDERSTORM

A thunderstorm that produces either of the following: damaging winds of 58 miles per hour or greater, hail 3/4 of an inch in diameter or larger, or a tornado. Severe thunderstorms can result in the loss of life and property.

SIGNIFICANT WAVE HEIGHT

The average height (trough to crest) of the one-third highest waves.

SLEET

Describes precipitation in the form of solid grains of ice. It is formed by the freezing of raindrops or the refreezing of largely melted snowflakes.

SNOW

A steady fall of snowflakes for several hours over the same area.

SNOWPACK

The combined layers of snow and ice on the ground at any one time. Also called the "snow cover".

SNOW SHOWERS

Snow that starts and stops suddenly and is characterized by rapid changes in both intensity and visibility. There is normally measurable accumulation.

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SOUTHERN OSCILLATION

A periodic, large-scale, atmospheric oscillation of the large scale distribution of sea level pressure, air temperature, and water temperature that originates over the southern hemisphere. Consequently, there is an associated change in the surface winds, and some storms become stronger than normal. This oscillation is on the scale of a year or a few years, and has global implications such as widespread drought or flooding. Oceanic fishing is also disrupted.

SQUALL LINE

A broken or solid line of thunderstorms that may extend across several hundred miles, ahead or along an advancing cold front.

STRATUS

Low clouds, which are flat and gray, usually covering most of the sky.

SUSTAINED WIND

Wind speed determined by averaging observed values over a 2-minute period.

SWELL

Wind-generated ocean waves that have traveled out of their generating area. A swell characteristically exhibits smoother crests, more regular and uniform crests, and longer periods than wind waves.

THERMAL

A relatively small-scale, rising air current produced when the earth's surface is heated. Thermals are a common source of low level turbulence for aircraft.

TORNADO

A violently rotating column of air, usually pendant to a cumulonimbus, with circulation reaching the ground. The visible condensation (cloud) may not reach the ground, but if the lower circulation, marked by dust, dirt, and/or debris, reaches the ground, it is classified as a tornado. Frequently, a tornado starts off as a funnel cloud and may be accompanied by a loud roaring noise. Tornadoes are classified into 3 main groups: weak—wind speeds up to 110 mph; strong—wind speeds 110 to 205 mph; and violent—wind speeds 205 to perhaps 320 mph. See Fujita Scale.

TROPICAL or SUBTROPICAL DEPRESSION

Cyclones that have maximum sustained winds of 33 knots (38 mph) or less. These are often referred to as low pressure systems in public advisories and statements.

TROPICAL STORM

Tropical cyclone that has maximum sustained winds from 34 to 63 knots (39 to 73 mph) inclusive.

TROUGH

An elongated area of low pressure in the atmosphere; the opposite of a ridge.

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UPPER-LEVEL DISTURBANCE

A disturbance of the flow pattern in the upper atmosphere, usually associated with clouds and precipitation. This disturbance is characterized by distinct cyclonic flow, a pocket of cold air, and sometimes, a jet streak. These features make the air aloft more unstable and conducive to clouds and precipitation.

VIRGA

Wisps or streaks of rain or snow falling out of a cloud, but evaporating before reaching the ground.

WALL CLOUD

A local, abrupt lowering of a rain-free cumulonimbus base forming a low hanging accessory cloud that is usually 1 to 4 miles in diameter. The wall cloud is usually situated in the right-rear quadrant of the cumulonimbus with respect to storm motion, below an intense updraft associated with a strong or severe thunderstorm. Rotating wall clouds often precede tornado development.

WARNING

Indicates that a hazardous weather element is imminent, has a very high probability of occurrence, or has already begun.

WATCH

Alerts the public to the possibility of severe weather, or some other hazardous weather element. It is intended to provide enough lead-time so those who need to set their plans in motion can do so.

WATERSPOUT

A violently rotating column of air, usually pendant to a cumulus or cumulonimbus cloud, over a body of water, with circulation reaching the water.

WET BULB TEMPERATURE

The temperature an air parcel would have if cooled to saturation at a constant pressure by evaporation of water into it.

WIND WAVES

Waves generated from the action of local wind on a water surface, as opposed to swell.

WIND CHILL

An apparent temperature that describes the combined effect of wind and low air temperatures on exposed skin.