

Weather Terms

Air Mass: A homogenous mass of air, the properties of which can be identified as having been established while the air was situated over a particular region of the earth's surface.

Anticyclone: A closed circulation of the atmosphere, of relative high pressure. (clockwise flow in the northern hemisphere).

Atmospheric Pressure: The pressure exerted by the air as a result of gravity. It is measured by the barometer, and expressed in millibars or inches of mercury.

CAPE- (Convective Available Potential Energy), is the integrated amount of work that the upward (positive) buoyancy force would perform on a given mass of air (called an air parcel) if it rose vertically through the entire atmosphere. Positive CAPE will cause the air parcel to rise, while negative CAPE will cause the air parcel to sink. Nonzero CAPE is an indicator of atmospheric instability in any given atmospheric sounding, a necessary condition for the development of cumulus and cumulonimbus clouds with attendant severe weather hazards.

Cold Front: The leading edge of a relatively cold air mass.

Convection: In meteorology, atmospheric motions that are predominantly vertical, i.e. usually means upward as opposed to subsidence (downward).

Cumulus: A principal cloud type in the form of individual detached elements, sharp non-fibrous outlines, and vertical development.

Cumulonimbus: The ultimate growth of a cumulus cloud into a mushroom shape, with considerable vertical growth, usually fibrous ice crystal tops, and probably accompanied by lightning, thunder, hail and strong winds.

Cut off Low: A cold low which has become displaced to south, out of the basic westerly flow.

Cyclonic: Having a sense of counter-clockwise rotation about the local vertical.

Cyclone: A closed isobaric circulation in the atmosphere, with counter-clockwise rotation in the northern hemisphere.

Deepening: A decrease in the central pressure of a cyclonic, or low pressure system.

Dew Point: The dew point is the temperature the air needs to be cooled to (at constant pressure) in order to achieve a relative humidity (RH) of 100%. At this point the air cannot hold more water in the gas form. When the air is cooled below the dew point, its moisture capacity is reduced and airborne water vapor will condense to form liquid water known as dew. When this occurs through the air's contact with a colder surface, dew will form on that surface.

Free Air: That portion of the atmosphere that is not modified by local influence.

Free Air Wind: The wind at the bottom layer of the atmosphere called free air, or just above the portion that is modified by local influences and friction approximately 1,000 feet above the earth's surface.

Friction Layer: The layer of air from the earth's surface to the geostrophic wind level or level of free wind.

Gale: An extratropical low or an area of sustained surface winds of 34 (39 mph) to 47 knots (54 mph).

Geostrophic Wind: A horizontal wind resultant of the balance of the Coriolis acceleration and the horizontal pressure force.

Gradient Wind: A horizontal wind velocity tangent to the contour line or isobaric surface resulting in a balance of the coriolis, pressure and centrifugal force.

Gravity Wind: A wind directed down a slope caused by greater air density near the slope than at the same height at a distance from the slope. (Also called drainage or downslope wind).

Heat Index: The heat index (HI) is an index that combines air temperature and relative humidity, in shaded areas, to posit a human-perceived equivalent temperature, as how hot it would feel if the humidity were some other value in the shade.

High Pressure: An anticyclone. An area of atmospheric pressure with closed isobars and relative high pressure at its center. Air flows clockwise around a high.

Homogenous: In reference to an airmass having similar horizontal properties or elements.

Instability: A property of the steady state of a system such that certain disturbances introduced into the steady state will increase in magnitude.

Instability Line: A band of convective activity in the atmosphere, i.e. squall line, a line of active thunderstorms.

Inversion: An increase in temperature with height, i.e. a departure from the usual decrease of temperature with increase of altitude.

Jet Stream: A narrow band of strong winds usually found at elevations from 20000 to 50000 feet.

K Index - The K-Index or George's Index is a measure of thunderstorm potential in meteorology. According to the National Weather Service, the index harnesses measurements such as "vertical temperature lapse rate, moisture content of the lower atmosphere, and the vertical extent of the moist layer." It was developed by the American meteorologist Joseph J. George and published in the 1960 book Weather Forecasting for Aeronautics.

Low: An area of low atmospheric pressure having closed isobars. Used interchangeably with cyclone.

Mesoscale: A scale that ranges in size from a few kilometers to about 100 kilometers.

Microscale: A scale that covers phenomena smaller than those in the mesoscale range.

Negative-tilt Trough - An upper level system which is tilted to the west with increasing latitude (i.e., with an axis from southeast to northwest). A negative-tilt trough often is a sign of a developing or intensifying system.

Nor'easter: A cyclonic storm occurring off the east coast of North America. These winter weather events are notorious for producing heavy snow, rain, and tremendous waves that crash onto Atlantic beaches, often causing beach erosion and structural damage. Wind gusts associated with these storms can exceed hurricane force in intensity. A nor'easter gets its name from the continuously strong northeasterly winds blowing in from the ocean ahead of the storm and over the coastal areas.

Omega Block

Omega blocks get their name because the upper air pattern looks like the Greek letter omega (Ω). Omega blocks are a combination of two cutoff lows with one blocking high sandwiched between them.

Because of their size, Omega blocks are often quite persistent and can lead to flooding and drought conditions, depending upon the location under the pattern. Cooler temperatures and precipitation accompany the lows, while warm and clear conditions prevail under the high.

Positive-tilt Trough - An upper level system which is tilted to the east with increasing latitude (i.e., from southwest to northeast). A positive-tilt trough often is a sign of a weakening weather system, and generally is less likely to result in severe weather than a negative-tilt trough if all other factors are equal.

Prevailing Wind: A wind that blows from one direction more frequently than any other during a given period, such as a day, month, season, or year.

Relative Humidity: (Humidity) - The ratio of the actual amount of water vapor in the air to the possible amount at that temperature.

Retrograde: Usually used to denote the movement of a weather system in a direction opposite to that of the normal flow in which the system is embedded.

Ridge: An elongated area of relatively high atmospheric pressure.

Squall: A strong wind characterized by a sudden onset, of longer duration than gusts, and a rather sudden decrease in speed.

Stability Factor: This is determined by temperature differences between two atmospheric layers.

Surface CAPE - SBCAPE (Surface-Based Convective Available Potential Energy) is a measure of instability in the troposphere. This value represents the total amount of potential energy available to a parcel of air originating at the surface and being lifted to its level of free convection (LFC). No parcel entrainment is considered.

Surface Pressure: The atmospheric pressure at a given location on the earth's surface.

Thermal Belts: An area along the middle of a mountain slope that typically experiences the least diurnal variation in temperature and humidity, thus has the highest daily average temperature and the lowest relative humidity.

Thermal Low: (Heat Low) - An area of low atmospheric pressure due to high temperatures and intensive heating at earth's surface, usually stationary and have weak cyclonic circulation.

Trough: An elongated area of relatively low atmospheric pressure, the axis of which is called a trough line.

Warm Front: A front that moves in such a way that warmer air replaces colder air.

Wave: A disturbance propagated by virtue of periodic motions in the atmosphere.

Zonal Flow: The flow of air along a latitude circle.