

Glossary

A A acclimatization – the gradual adjustment of the body to new climatic or other environmental conditions, for example, the adjustment to low levels of oxygen at high altitudes.

aerosols – a suspension of solid or liquid particles in a gas, for example sulfate molecules (SO₄⁻) found in the earth atmosphere.

air pressure – the cumulative force exerted on any surface by the molecules composing air

albedo – the percentage of solar radiation that is reflected relative to the total incoming radiation.

altimeter – an instrument that indicates the altitude of an object above a fixed level. Pressure altimeters use an aneroid barometer with a scale graduated in altitude instead of pressure

anemometer – an instrument designed to measure wind speed

anomalies – departures of temperature, precipitation, or other weather elements from long-term averages at a given location.

atmosphere – entire mass of gases surrounding the earth or other celestial bodies. Today's atmosphere is made up primarily of nitrogen (78%), free oxygen (21%) and greenhouse gases which can capture solar radiation: water vapor, which ranges from less than 1% in arid regions to over 3% in moist areas, carbon dioxide (0.035%) and methane (0.00018%).

B baseline – measurable quantities from which an alternative outcome can be measured.

C climate – the prevailing or normal pattern of weather at a place, or in a region, averaged over a long period of time; in contrast to weather, which is the state of the atmosphere at a particular time.

climate change – refers to the variation in the Earth's global climate or in regional climates over time. It describes changes in the variability or average state of the atmosphere (or average weather) over time scales ranging from decades to millions of years.

climatic feedback mechanisms – an enhancement (positive feedback) or a damping (negative feedback) of an initial change, in this case in the climate system. For example, when less energy reaches the earth, temperature decreases and the area covered by snow increases. The albedo of the planet increases, reflecting more solar energy back into space. Consequently less energy is absorbed at the surface, and temperature further decreases. The whole "cycle" from the initial cooling to the further cooling is a feedback. It is a positive feedback in this example.

climatology – quantitative description of climate showing the characteristic values of climate variables over a region. Climate refers to the statistical collection of weather conditions over a specified period of time. Note that the climate taken over different periods of time (30 years, 1000 years) may be different.

Glossary

cloud cover – amount of the sky obscured by clouds when observed at a particular location.

condensation – process by which water changes phase from a vapor to a liquid.

convection – motions in a fluid that result in the transport and mixing of the fluid's properties. In meteorology, convection usually refers to atmospheric motions that are predominantly vertical, such as rising air currents due to surface heating.

D density – is the quantity of something per unit measure, especially per unit length, area, or volume; the mass per unit volume of a substance under specified conditions of pressure and temperature.

E earth's energy budget – A measure of all the inputs and outputs of radiative energy to and from the Earth's system. <http://earthobservatory.nasa.gov/Features/EnergyBalance/>

eddy – small volume of air (or any fluid) that behaves differently from the larger flow in which it exists.

El Niño – is the condition when the warm mass of water in the western equatorial Pacific Ocean travels to the central and eastern Pacific Ocean. The warm water replaces the cold, nutrient rich upwelled waters along the west coasts of North and South America that are present during non-El Niño conditions. An El Niño event typically last about 12 months, but can last up to 18 months.

El Niño Southern Oscillation (ENSO) – the interaction between the movement of Pacific Ocean water (El Niño / La Niña) and the see-sawing atmospheric pressure between the eastern and western equatorial Pacific (southern oscillation). ENSO occurs when the easterly equatorial surface winds weaken, or reverse, and the warm water in the western equatorial Pacific Ocean moves to the central and eastern Pacific Ocean. This flow of water is accompanied by heavy rainfall along the coast of Peru, Mexico, and California.

evaporation – process by which a liquid changes into a gas.

evapotranspiration – vaporization of water through direct evaporation from wet surfaces and the release of water vapor by vegetation.

F ferrel cell – the middle atmospheric circulation cell in each hemisphere. Air in these cells rises at 60 degrees latitude and sinks back toward the earth at 30 degrees latitude.

G global warming – an increase in the average temperature of the Earth's atmosphere, especially a sustained increase great enough to cause changes in the global climate. The Earth has experienced numerous episodes of global warming through its history, and currently appears to be undergoing such warming. The present warming is generally attributed to an increased *greenhouse effect*, brought about by increased levels of greenhouse gases, largely due to effects of human industry and agriculture. Expected long-term effects are rising sea levels, flooding,

Glossary

melting of polar ice caps and glaciers, fluctuations in temperature and precipitation, more frequent and stronger El Niños and La Niñas, drought, heat waves, and forest fires. "global warming." *The American Heritage® Science Dictionary*

H hadley cells – the atmospheric circulation cell nearest the equator in each hemisphere. Air in these cells rises near the equator because of strong solar heating there and sinks back towards the earth because of cooling at about 30 degrees latitude.

haze – fine dry or wet dust or salt particles dispersed through a portion of the atmosphere. Individually these are not visible but cumulatively they will diminish visibility.

hydrologic cycle – movement of water between the oceans, ground surface and atmosphere by evaporation, precipitation and the activity of living organisms, as one of the mayor biogeochemical cycles.

J jet stream – strong winds concentrated within a narrow zone in the atmosphere. Often used in reference to the axis of maximum mid-latitude westerlies located in the high troposphere.

L La Niña – the counterpart to El Niño, recognized by colder than normal water temperatures in the eastern equatorial Pacific Ocean. It usually follows an El Niño event, but not always. La Niña typically lasts about 12 months, but can last up to 18 months.

longwave radiation – term most often used to describe the infrared energy emitted by the earth and the atmosphere.

M mesosphere - The layer of the [atmosphere](#) located between the [stratosphere](#) and the [ionosphere](#), where [temperatures](#) drop rapidly with increasing height. It extends between 31 and 50 miles (17 to 80 kilometers) above the earth's surface. (weather.com)

meteorology – the study of the atmosphere and atmospheric phenomena as well as the atmosphere's interaction with the earth's surface, oceans, and life in general.

P pH – measure of acidity of any solution. Water has a pH of 7. Acidic solutions <7, basic solutions >7. pH is measured in a logarithmic scale with a 10 fold increase for each unit.

precipitation – any form of water particles-liquid or solid-that falls from the atmosphere and reaches the ground.

prevailing wind – wind direction most frequently observed during a given period.

R reflection – process whereby a surface turns back a portion of the radiation that strikes it.

refraction - bending of light as it passes from one medium to another

Glossary

relative humidity – the ratio of the amount of water vapor actually in the air compared to the amount of water vapor the air can hold at the particular temperature and pressure. The ratio of the air's actual vapor pressure to its saturation vapor pressure.

S satellite – remote sensing is the collection of data on land use, industrial activity, weather, climate, geology and other processes through Earth observations from satellites in outer space.

sea surface temperature (sst) – temperature of the ocean's surface used in collaboration with other data to predict an El Nino occurrence.

smog – originally meant a mixture of smoke and fog. Today, smog means air that has restricted visibility due to pollution, or pollution formed in the presence of sunlight-photochemical smog.

solar variability – changes in the sun's radiation due to the sun's internal dynamics.

stratosphere - The layer of the atmosphere located between the troposphere and the mesosphere, characterized by a slight temperature increase and absence of clouds. It extends between 11 and 31 miles (17 to 50 kilometers) above the earth's surface. It is the location of the earth's ozone layer. (weather.com)

sublimation – process whereby ice changes directly into water vapor without melting. In meteorology, sublimation can also mean the transformation of water vapor into ice.

T thermal expansion – refers to the increase in volume that results from the warming of water.

Thermohaline Circulation – a term for the global density-driven circulation of the oceans. Seawater density depends on both temperature and salinity, hence the name *thermohaline*. The salinity and temperature differences arise from heating/cooling at the sea surface and from surface freshwater fluxes (evaporation and sea ice formation increase salinity; precipitation, runoff and ice-melt decrease salinity).

trade winds – winds that occupy most of the tropics and blow from the subtropical highs to the equatorial low; blow from the northeast to the equator in the Northern Hemisphere and from the southeast to the equator in the Southern Hemisphere.

tropopause - The boundary zone or transition layer between the troposphere and the stratosphere. This is characterized by little or no increase or decrease in temperature or change in lapse rate with increasing altitude. (weather.com)

troposphere - The lowest layer of the atmosphere located between the earth's surface to approximately 11 miles (17 kilometers) into the atmosphere. Characterized by clouds and weather, temperature generally decreases with increasing altitude. (weather.com)

U ultraviolet radiation – electromagnetic radiation with wave-lengths longer than X-rays but shorter than visible light.

COSEE-West

“Cloud Structure, Composition, and Feedbacks in the current climate and a warming world”,
February 3, 2010 & February 6, 2010

Glossary

V visibility – greatest distance an observer can see and identify prominent objects.

visible light – visible portion of the electromagnetic spectrum from 0.4 to 0.7 μm wavelengths.

W weather – the state of the atmosphere at a given time and place, with respect to variables such as temperature, moisture, wind velocity, and barometric pressure.

wind shear – difference in wind speed or direction between two wind currents in the atmosphere.

windsock – large, conical, open bag designed to indicate wind direction and relative speed; usually used at small airports.

Online Weather Glossaries:

Weather.com glossary:

<http://www.weather.com/glossary/a.html>

Weather and climate glossary:

<http://www.wrcc.dri.edu/ams/glossary.html>

Weather vocabulary in both English and Spanish:

<http://www.spanish-talk.co.uk/spanish-vocabulary/spanish-weather-vocabulary/>

<http://spanish.about.com/cs/vocabulary/a/weathervocab.htm>

Drawings of weather and the words:

http://labmat.com.pt/bri/wp-content/gallery/vocabulary-worksheets/the-weather-vocabulary_0.jpg

“Climate is what you expect; weather is what you get.”

“Climate helps you decide what clothes to buy and weather helps you decide what to wear.”