

FIELD PROJECT GLOSSARY OF TERMS

Aerosols/Particles

Tiny particles in the atmosphere; they come from both natural sources (volcanic eruptions, sea salt, and wildfires) and human sources (burning fossil fuels like coal, oil, and gas); aerosols play an important part in the atmosphere – they help clouds form, they are part of air pollution, and they can impact climate change

Atmosphere

The protective layer around the Earth that allows animals and plants to live; it is made up of a mixture of gases, including nitrogen, oxygen, water vapor, argon, and carbon dioxide

Atmospheric (Air) Pressure

Air pressure is caused by the weight of the huge numbers of air molecules that make up the atmosphere; typically, when air pressure is high there skies are clear and blue. The high pressure causes air to flow down and fan out when it gets near the ground, preventing clouds from forming; when air pressure is low, air flows together and then upward where it converges, rising, cooling, and forming clouds; air pressure is highest at that ground level and decreases as altitude increases

Baseline Data

A measurement used as a basis for comparison

Chemical composition

The amount of different chemicals in the air

Convection

The way heat (energy) in liquids or gases is transferred; the warmer part rises and the cooler, denser part sinks; cumulus and cumulonimbus clouds are convective, which means they formed as a result of convection

Field Project

Scientists from many areas of research (e.g. - meteorology, oceanography, geography, social sciences) come together to conduct research on a particular weather or climate phenomenon; they use many types of research equipment to collect data; the data is then analyzed and used to help create weather and climate models; these atmospheric field research projects can last from a few weeks to several months

Greenhouse Gases

Gases in atmosphere such as water vapor, carbon dioxide, and methane, which trap heat around the Earth and warm the atmosphere

Hurricane

Hurricanes (also known as tropical cyclones or typhoons) form over the ocean in the tropics with the right mix of humidity, warm sea surface temperatures, and low atmospheric pressure; these storms can be very large and can produce torrential rain and damaging winds



Field Projects: Science in Action

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Model

Carefully designed computer programs that include equations that describe the atmosphere and are run on supercomputers, to help predict future weather and climate; weather models are used to forecast day-to-day changes in weather, or rather to predict what will happen at a specific place and point in time in the near future, typically no more than five to seven days out; climate models are used to determine how the average conditions will change in the future

Ocean Salinity

The amount of mineral salts dissolved in seawater; water with a high salinity is denser than water that contains less salt; salinity can impact ocean currents, which play a part in how heat is transferred around the Earth

Platform

An aircraft, ship, truck, etc. that can carry the instruments being used to collect measurements in a field project

Sink

Anything that absorbs and holds gases, liquids, or particles is considered a sink; plants take up CO_2 during photosynthesis, so an area with a large number of plants can be considered a CO_2 sink

Source

Anything that releases (or provides) gases, liquids, or particles is considered a source; plants and animals give off CO_2 during respiration, and CO_2 is released during volcanic eruptions and when organic matter burns (during forest fires, for example), each of which can be considered a source of CO_2

Stratosphere

The second layer of the Earth's atmosphere as you go upward from the surface of the Earth; temperatures are cooler in the lower part of the stratosphere and higher in the upper part of the stratosphere; this layer of the atmosphere contains a lot of naturally produced ozone, it doesn't have much water vapor, and the air is stable so commercial aircraft often fly in this layer to avoid turbulence.

Tropopause

The boundary between the troposphere and the stratosphere

Troposphere

The lowest layer of the Earth's atmosphere; almost all of the weather on Earth occurs in this layer; it begins at the surface of the Earth and extends about 10 km (6.2 miles) above sea level; air is warmest at the bottom of the troposphere near the Earth's surface, and air cools as it rises up in the troposphere

Water Vapor

Water in its gaseous state (instead of liquid or solid/ice); clouds, rain, and snow all require water vapor to form; water vapor is also the Earth's most important greenhouse gas, and it is responsible for a high percentage of the natural greenhouse effect, which helps keep the Earth warm enough to support life



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