

Encyclopedic Entry

fog

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<http://education.nationalgeographic.com/encyclopedia/fog/>

Fog is a **cloud** that touches the ground. Fog can be thin or thick, meaning people have difficulty seeing through it. In some conditions, fog can be so thick that it makes passing cars. Even monuments like **London Bridge**, in London, England, or the **Golden Gate Bridge**, in San Francisco, California, are almost impossible to see in thick fog.

Fog shows up when water **vapor**, or water in its **gaseous** form, **condenses**. During **condensation**, **molecules** of water vapor combine to make tiny liquid water droplets that hang in the air. You can see fog because of these tiny water droplets. Water vapor, a gas, is invisible.

Fog happens when it's very, very **humid**. There has to be a lot of water vapor in the air for fog to form.

In order for fog to form, **dust** or some kind of **air pollution** needs to be in the air. Water vapor condenses around these **microscopic** solid particles. **Sea fog**, which shows up near bodies of salty water, is formed as water vapor condenses around bits of **salt**.

Depending on the humidity and temperature, fog can form very suddenly and then disappear just as quickly. This is called **flash fog**.

Fog is not the same thing as **mist**. Fog is **denser** than mist. This means fog is more massive and thicker than mist. There are more water molecules in the same amount of space in a fog. Fog cuts visibility down to one kilometer, meaning it will prevent you from seeing further away than one kilometer from where you're standing. Mist can reduce visibility to between one and two kilometers.

Types of Fog

There are several different types of fog, including radiation fog, advection fog, valley fog, and freezing fog.

Radiation fog forms in the evening when heat absorbed by the Earth's surface during the day is radiated into the air. As heat is transferred from the ground to the air, water droplets form. Sometimes people use the term "**ground fog**" to refer to radiation fog. Ground fog does not reach as high as any of the clouds overhead. It usually forms at night. Fog that is said to "burn off" in the morning sun is radiation fog.

Advection fog forms when warm, moist air passes over a cool surface. This process is called **advection**, a scientific name describing the movement of fluid. In the atmosphere, the fluid is **wind**. When the **moist**, warm air makes contact with the cooler surface air, water vapor condenses to create fog. Advection fog shows up mostly in places where warm, **tropical** air meets cooler ocean water. The Pacific coast of the United States, from Washington to California, is often covered in advection fog. The cold **California Current**, which runs along the western coast of

North America, is much cooler than the warm air along the coast.

Valley fog forms in mountain valleys, usually during winter. Valley fog develops when mountains prevent the dense air from escaping. The fog is trapped in the bowl of the valley. In 1930, vapor condensed around particles of air pollution in the Meuse Valley, Belgium. More than 60 people died as a result of this deadly valley fog.

Freezing fog happens when the liquid fog droplets freeze to solid surfaces. Mountaintops that are covered by clouds are often covered in freezing fog. As the freezing fog lifts, the ground, the trees, and even objects like spider webs, are blanketed by a layer of **frost**. The white landscapes of freezing fog are common in places with cold, moist climates, such as **Scandinavia** or Antarctica.

Fog Catchers

Many ancient cultures collected water from fog by placing large pots under trees and shrubs. As the water from fog collected on these objects, the pots collected the water. This method of water collection was effective, but not as effective as collecting **rainwater** or other liquid water.

Today, **engineers** are working on more **sophisticated** ways to collect water from fog. The most effective way has been the development of “**fog catchers**.” Fog catchers are very large screens constructed in arid areas. As fog glides in, water droplets form around the thin screens and drip to the collection pools below. In one day, a single screen can collect more than a hundred gallons of water.

The village of Bellavista, Peru, relies on fog catchers. Bellavista is an area that has little access to liquid water—no rivers, lakes, or glaciers are nearby. Wells dry up quickly. Water for **irrigation** and human consumption is threatened. Every year, however, huge fogs blow in from the Pacific Ocean. In 2006, the community invested in a series of fog catchers outside of town. Now, the residents of Bellavista have enough water to irrigate trees and gardens, as well as provide for their own drinking and **hygiene** needs.

Engineers warn that fog catchers will only work in small areas. Still, engineers and politicians are working on ways to make more powerful fog catchers that will perhaps reduce the need for people to rely so much on **groundwater**.

VOCABULARY

Term	Part of Speech	Definition
advection	<i>noun</i>	process of an air mass moving horizontally.
advection fog	<i>noun</i>	water vapor that condenses as warm, moist air passes over a cool surface.
air pollution	<i>noun</i>	harmful chemicals in the atmosphere.
arid	<i>adjective</i>	dry.
blanket	<i>verb</i>	to cover entirely.
California Current	<i>noun</i>	cold ocean current that flows south in the Pacific Ocean from British Columbia, Canada, to Baja California, Mexico.
climate	<i>noun</i>	all weather conditions for a given location over a period of time.
cloud	<i>noun</i>	visible mass of tiny water droplets or ice crystals in Earth's atmosphere.
coal	<i>noun</i>	dark, solid fossil fuel mined from the earth.
condensation	<i>noun</i>	process by which water vapor becomes liquid.

condense	<i>verb</i>	to turn from gas to liquid.
dense	<i>adjective</i>	having parts or molecules that are packed closely together.
dust	<i>noun</i>	tiny, dry particles of material solid enough for wind to carry.
engineer	<i>noun</i>	person who plans the building of things, such as structures (construction engineer) or substances (chemical engineer).
flash fog	<i>noun</i>	water vapor that condenses and evaporates very quickly.
fog	<i>noun</i>	clouds at ground level.
fog catcher	<i>noun</i>	device that collects water from fog.
freezing fog	<i>noun</i>	water vapor that freezes to solid surfaces.
frost	<i>noun</i>	thin coat of ice covering objects when the dew point is below freezing.
gas	<i>noun</i>	state of matter with no fixed shape that will fill any container uniformly. Gas molecules are in constant, random motion.
glacier	<i>noun</i>	mass of ice that moves slowly over land.
Golden Gate Bridge	<i>noun</i>	(1937) suspension bridge connecting the strait between the San Francisco Bay and the Pacific Ocean.
ground fog	<i>noun</i>	water vapor that condenses above land as the air cools following sunset. Also called radiation fog.
groundwater	<i>noun</i>	water found in an aquifer.
Gulf Stream	<i>noun</i>	warm current that starts in the Gulf of Mexico and travels along the eastern coast of the U.S. and Canada before crossing the North Atlantic Ocean.
humid	<i>adjective</i>	air containing a large amount of water vapor.
hygiene	<i>noun</i>	science and methods of keeping clean and healthy.
industry	<i>noun</i>	activity that produces goods and services.
irrigation	<i>noun</i>	watering land, usually for agriculture, by artificial means.
island	<i>noun</i>	body of land surrounded by water.
Labrador Current	<i>noun</i>	cold ocean current that flows south from the Arctic Ocean along the eastern coast of Canada. Also called the Arctic Current.
landscape	<i>noun</i>	the geographic features of a region.
London Bridge	<i>noun</i>	bridge crossing the Thames River in London, England. There has been a bridge on the site for more than 2,000 years.
microscopic	<i>adjective</i>	very small.
mist	<i>noun</i>	clouds at ground-level, but with greater visibility than fog.
moist	<i>adjective</i>	damp or slightly wet.
molecule	<i>noun</i>	smallest physical unit of a substance, consisting of two or more atoms linked together.
particle	<i>noun</i>	small piece of material.
pea souper	<i>noun</i>	fog that forms as water condenses around microscopic particles of coal.

prime	<i>adjective</i>	ideal or very good.
radiation fog	<i>noun</i>	water vapor that condenses above land as the air cools following sunset. Also called ground fog.
rainwater	<i>noun</i>	precipitation that falls as liquid water.
reduce	<i>verb</i>	to lower or lessen.
salt	<i>noun</i>	(sodium chloride, NaCl) crystalline mineral often used as a seasoning or preservative for food.
Scandinavia	<i>noun</i>	region and name for some countries in Northern Europe: Iceland, Norway, Sweden, Finland, and Denmark.
sea fog	<i>noun</i>	water vapor that condenses around particles of sea salt.
sophisticated	<i>adjective</i>	knowledgeable or complex.
sunset	<i>noun</i>	time when the sun descends behind the horizon.
tropical	<i>adjective</i>	existing in the tropics, the latitudes between the Tropic of Cancer in the north and the Tropic of Capricorn in the south.
urban center	<i>noun</i>	densely populated area, usually a city and its surrounding suburbs.
valley fog	<i>noun</i>	cloud that is trapped in a valley at ground level.
vapor	<i>noun</i>	visible liquid suspended in the air, such as fog.
wind	<i>noun</i>	movement of air (from a high pressure zone to a low pressure zone) caused by the uneven heating of the Earth by the sun.

For Further Exploration

Articles & Profiles

- National Geographic News: Fog Catchers Bring Water to Parched Villages
- National Weather Service: Types of Fog

Audio & Video

- National Geographic Channel: Killer Fog



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