

Weather or not

FOG

Fog is a cloud of condensed water vapor in the form of water droplets or ice crystals, suspended in the atmosphere just over the surface of the earth. Fog and mist, like clouds, can form only in the presence of dust, smoke, or other air-borne particles.

There are four kinds of fog, classified according to the way the fog is formed: advection, radiation, upslope, and precipitation. Most of what we get around here is radiation fog.

1. Advection fog...

is formed whenever a current of relatively warm, moist air passes over a colder body of land or water. This kind of fog is frequent in the winter up north when snow is on the ground. It is also common over the ocean, as in the Atlantic when winds blow across the warm Gulf Stream and reach the cold Labrador Current (so the next time you watch *Titanic* or some other ship disaster film, you'll know that it's advection fog that contributes to the crash!).

2. Radiation fog...

is formed only over land and is caused by the cooling of the earth by radiation. At night, radiation lowers water temperature comparatively slowly, but land cools rapidly, becoming cooler than the air above it; consequently, a fog is formed. Such fog is seldom thick and usually "burns off" in the morning. This is mostly what we have around here, and is why there are "pockets" of dense fog interrupted by areas of bright sun. The denser fog forms over land, while the open areas usually have water nearby. Or it could just be really really dusty where the denser fog is.

3. Upslope fog...

is formed when air is evenly cooled by its rising and expanding, as when a wind flows up a mountain slope. Forget that around here, although maybe there might be a trace of it at the top of the roadside canals as the cool wind sweeps up the side of the ditch. Yeah, right!

4. Precipitation fog...

may form during a rainstorm if the rain passes through a layer of air that is cooler than the precipitation. Fog of this kind frequently occurs during the passage of warm fronts and cold fronts, when the surface air is markedly different in temperature from the upper air.

DEW

Air at a given temperature can contain only a certain amount of water vapor. This amount of water can vary depending on the air temperature – how much moisture the air can hold increases as the temperature rises, and it decreases as the temperature falls.

In the evening, air that is nearly saturated with vapor cools and drops below the temperature at which it would be fully saturated. It can't hold more water than the maximum, so that moisture has to go somewhere. **Dew** is tiny beads of water that condense on cool objects from the water vapor in warmer air. It is not a form of precipitation because it does not fall from the atmosphere.

As the air cools, the excess water vapor condenses on any surface whose temperature is below the air's **dew-point temperature**, such as a blade of grass, a windowpane, or a roof. **Dew point temperature** is the temperature at which dew begins to form. It is different than air temperature.

FROST

If the dew point temperature is below the freezing temperature of water, those tiny beads of water become white, delicate ice crystals, or frost. So **frost** is frozen dew.

Frost *can* form on objects like grass blades even though the air temperature isn't below freezing. But the dew-point temperature needs to be below freezing, and the objects frost forms on have to be cooler than the dew-point temperature.

That could happen after the air temperature has dropped below freezing and then begun to warm. Some solid objects will have dropped in temperature with the air, but they won't warm up as fast as the air, so there will be a brief period before warm up when they are likely candidates to gather frost. That's why frost rarely exists after the sun comes up.

WIND DIRECTION

When the weather man says there's an easterly wind, it means the wind is coming from the east (and blowing towards the west).