

Perception of Heat

High humidity inhibits perspiration and hence inhibits cooling
High humidity can lead to many heat related ailments

How to reach Saturation

Add water vapor
Lower temperature to dew point
Mix cold air with warm humid air

Condensation on surfaces

Dew point: the temperature at which condensation occurs
Dew: condensation when dew point is above freezing
Frost: condensation when dew point is below freezing
Frozen dew: Dew appears and then freezes
Needs calm clear nights
Clear: allows ground to cool faster than with clouds
Calm: coldest air not moved away; stays near ground

Condensation nuclei

Dew and frost condense on surfaces
Condensation nuclei – small particles in the air
Size
Small 0.1 μ 1 μ
Number
More small nuclei make greater haze than larger
Material
Homogeneous nuclei (water condenses on water)
Rare needs RH > 200%
Heterogeneous nuclei (non water nuclei)
Hygroscopic: cause water to condense on them salt, etc.
Hydrophobic: reject water, oil, gasoline etc.

Haze: Layer of dust or salt particles – block vision

FOG: Many kinds. To be fog, visibility must be restricted to less than 1 kilometer (0.62 Mile)

Fog requires Condensation nuclei
More smaller ones over cities makes denser fog
Fewer larger ones over ocean makes less dense fog
Fog forms by cooling air below dew point or evaporation and mixing

Processes:

Diabatic: heat is added
Adiabatic: heat is NOT added
Dew, frost and some fogs (radiation and advection) are formed DIABATICALLY

Radiation Fog

Air cooled from cool ground as a result of radiation
Best chance for formation is long clear night – late fall and winter

Light breeze is helpful
Cold air tends to settle into valleys so fog does as well
As Earth warms in the morning, fog dissipated.

Advection fog

Warm air moves horizontally over cool area, temperature drops to dew point
Can occur between 2 land sections. One land one water, or two water.

Upslope Fog

Moist air moves up a slope, cooling as it rises and condenses and fog forms

Evaporation or mixing fog

Cold air moves over warm water. Lower level of air warms and absorbs water vapor (evaporation) and cool air reaches dew point

Precipitation or frontal fogs

Precipitation falls from above a warm front into a colder air mass. Atmosphere cools slightly as a result of giving up heat to evaporate rain.. These frequently occur as a front is coming.

Different fogs occur in different parts of the country (and the world.