**STATE OF WATER**

About three-fourth of the Earth’s surface is covered with water. That is why it is also called the water planet. Most of the water (about 97%) is in the seas and oceans as salt water. This water is too salty to be used for drinking and irrigation. Thus, only a tiny fraction (about 3%) of the Earth’s water is available as freshwater. Out of this, 2.997% is locked up in the mountains or glaciers or is buried so deep under that it costs too much to extract. So, only about 0.003% of the fresh water is easily available in the form of groundwater, river, lake, stream, soil moisture, and water vapour.

Pure water is tasteless, odorless and colorless. Water can occur in three states: solid (ice), liquid (e.g., rain, river, sea), or gas (vapor). All the three states of water are also present in our natural environment at any given time.

Solid water – ice is frozen water. When water freezes, its molecules move farther apart, making ice less dense than water. This means that ice will be lighter than the same volume of water and so ice will float in water. Water freezes at 0° Celsius, 32° Fahrenheit. Glaciers, icebergs, snow, hail, frost, and ice crystals in the clouds are solid forms of water.

Liquid water is wet and fluid. This is the form of water with which we are most familiar. it is the most widely used form of water and abundent in earths surface. Rain, dew, and clouds are water droplets or liquid forms of water. Liquid water also covers three-quarters of the surface of the Earth in the form of lakes, rivers, and oceans.

Water as a gas – vapor is always present in the air. When water get boiled, the water changes from a liquid to a gas or water vapor. As some of the water vapor cools, a small cloud called steam can be seen. This cloud of steam is a mini version of the clouds formed in the sky. At sea level, steam is formed at 100° Celsius, 212° Fahrenheit. Water vapour, fog, steam, and clouds are gaseous forms of water.

The water vapor attaches to small bits of dust in the air. It forms raindrops in warm temperatures. In cold temperatures, it freezes and forms snow or hail.

Precipitation

Precipitation is the falling of water from the sky in different forms. They all form from the clouds which are raised about 8 to 16 kilometers (4 to 11 miles) above the ground in the earth’s troposphere. Precipitation takes place whenever any or all forms of water particles fall from these high levels of the atmosphere and reach the earth’s surface. The drop to the ground is caused by frictional drag and gravity. When one falling particle drops from the cloud, it leaves behind a turbulent wake, causing faster and continued drops.

The (clouds) crystallized ice may reach the ground as ice pellets or snow or may melt and change into raindrops before reaching the surface of the earth depending on the atmospheric temperatures. For this reason, there are many different types of precipitation namely rain, snow, sleet, freezing rain, hail, snow grains, and diamond dust. They are forms of water that fall from the sky’s frozen clouds.

1. Rain

Rain is any liquid that drops from the clouds in the sky. Rain is described as water droplets of 0.5 mm or larger. Droplets less than half a millimeter are defined as a drizzle. Raindrops frequently fall when small cloud particles strike and bind together, creating bigger drops. As this process continues, the drops get bigger and bigger to an extent where they become too heavy to suspend on the air. As a result, the gravity pulls then down to the earth.

2. Snow

Snow occurs almost every time there is rain. However, snow often melts before it reaches the earth’s surface. It is precipitation in the form of virga or flakes of ice water falling from the clouds. Snow is normally seen together with high, thin, and weak cirrus clouds. Snow can at times fall when the atmospheric temperatures are above freezing, but it mostly occurs in sub-freezing air. When the temperatures are above freezing, the snowflakes can partially melt but because of relatively warm temperatures, the evaporation of the particles occurs almost immediately.

This evaporation leads to cooling just around the snowflake and makes it to reach to the ground as snow. Snow has a fluffy, white, and soft structure and its formation is in different shapes and ways, namely flat plates, and thin needles. Each type of snow forms under specific combinations of atmospheric humidity and temperatures. The process of snow precipitation is called snowfall.

3. Hail

Hailstones are big balls and irregular lumps of ice that fall from large thunderstorms. Hail is purely solid precipitation. As opposed to sleets that can form in any weather when there are thunderstorms, hailstones are predominately experienced in the winter or cold weather. Hailstones are mostly made up of water ice and measure between 0.2 inches (5 millimeters) and 6 inches (15 centimeters) in diameter. This ranges in size of a pea’s diameter to that larger than a grapefruit.

For this reason, they are highly damaging to crops, tearing leaves apart and reducing their value. Violent thunderstorms with very strong updrafts usually have the capability to hold ice against the gravitational pull, which brings about the hailstones when they eventually escape and fall to the ground. So, hailstones are formed from super-cooled droplets that slowly freeze and result in a sheet of clear ice.

4. Precipitation Fog:

This is fog that forms when rain is falling through cold air. This is common with a warm fronts but it can occur with cold fronts as well only if it's not moving too fast. Cold air, dry at the surface while rain is falling through it evaporates and causes the dew point to rise. This saturation forms fog.

5. Dew

It is a type of precipitation where water droplets form on the ground, or on objects near the ground in a process called condensation of moisture. Dew forms during calm, clear nights, when the ground surface and other exposed objects, such as tips of grass or leaves, lose heat by radiation to the sky.