EVAPORATION

Solar energy determines the change of state from liquid to gaseous water.
The most consistent component of evatranspiration is that of the oceans and the sea, but other contributions are provided by evaporation, which is the sum of the evaporation of surface water, of that contained on the surface by the soils and by the transpiration of the plants.
We must also consider the passage from solid to gaseous water in the phenomenon of the sublimation of ice and, finally, the water expelled in volcanic phenomena.

CONDENSATION

Condensation is the process by which water vapour is transformed into liquid water. It is a process that releases heat.
Clouds form in the atmosphere because the air containing water vapor rises and cools. Sun heats the air near the earth's surface; Air becomes lighter and rises to areas where the temperature is lower. As the air cools, further condensation takes place and clouds form.

A cloud is a mass of water vapour in which drops of water or ice crystals are suspended if the temperature is below zero. There are three families of clouds: low clouds, medium clouds and high clouds.

PRECIPITATION

Precipitation is all liquid or solid forms that take water vapor and that fall to the ground, such as rain, snow and hail.

Raindrops are formed by aggregating more droplets.
The same procedure is done with ice crystals which, by joining, give rise to snowflakes. When snow is deposited in the mountains or glaciers, an important form of fresh water storage takes place, which is released when temperatures rise.
Hail consists of ice grains with an overlapping concentric layer structure that forms as a result of violent convective air motions within the cumulonimbus.
Fog is formed by the set of microscopic drops of water near the ground.

RUN-OFF

It is the phenomenon of water flowing on the surface of the ground. Thanks to the force of gravity, this water feeds streams, torrents, rivers and lakes to the sea.
During run-off, water changes the surrounding landscape: when the slopes are as high as on the mountains the energy of water erodes and transports the soil particles digging valleys and canyons; When the slopes decrease also its energy decreases and the particles transported meet deposition phenomena, going to form floodplains, conoids and beaches.

INFILTRATION

Infiltration means the movement of water underground.
During this movement water becomes available to plant organisms and feeds underground streams, but partly goes to feed underground groundwater which is an important reservoir for human uses.

WATER AND POLLUTION

Disturbances in the hydrological cycle caused by pollution and exacerbated by extreme climatic events may be identified as follows:
In a semi-arid area, water tends to evaporate before reaching the groundwater.

Long drought periods make the soil less permeable with increased runoff and lack of water for vegetation.
Heavy rain, not distributed, creates large flows of water that cause landslides and flooding.
Rising temperatures cause glaciers to melt and sea level to rise.
The solid or liquid particles suspended in air (atmospheric aerosol) can behave as condensation nuclei for water, favoring the formation of fog.
For this reason, in urban areas, where pollutant emissions are higher, fogs are more frequent.