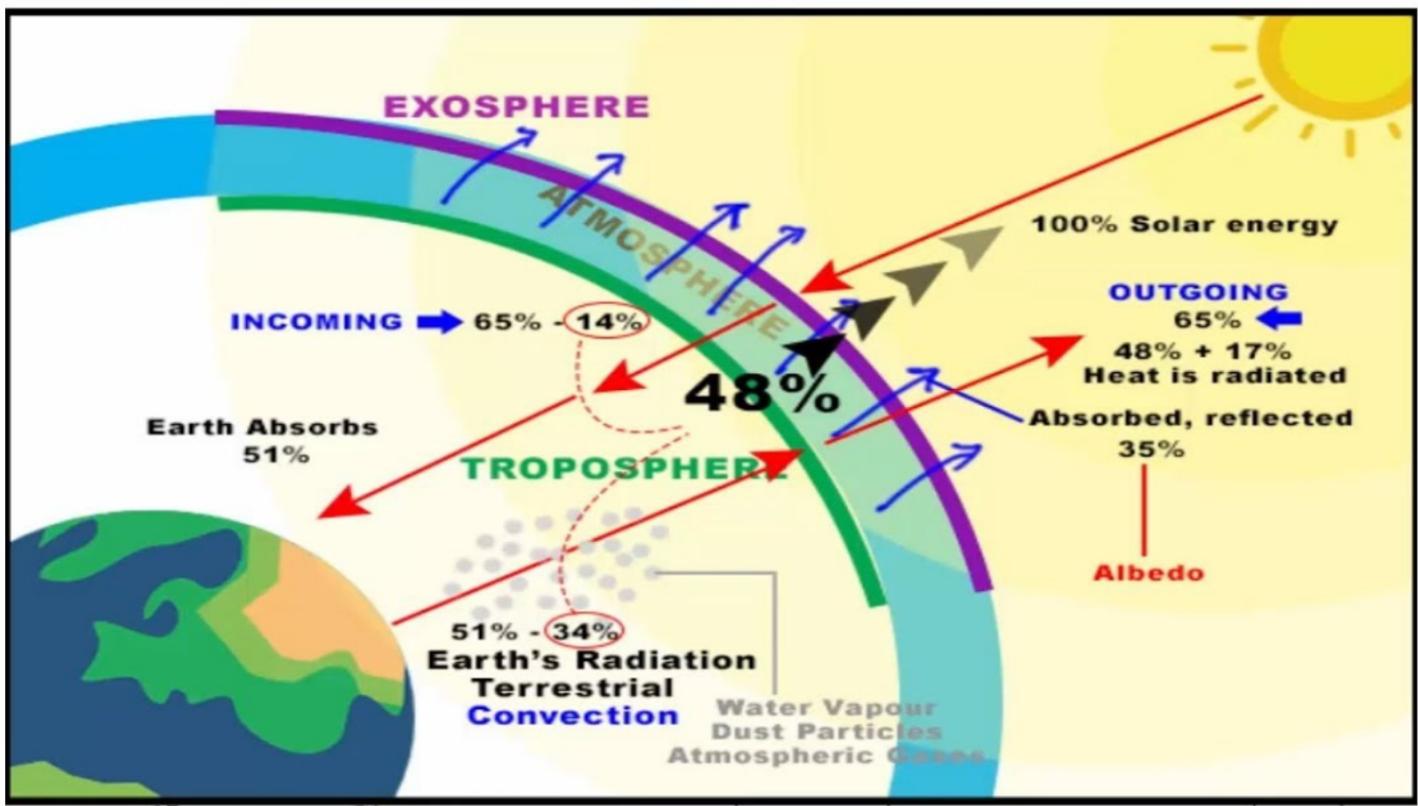
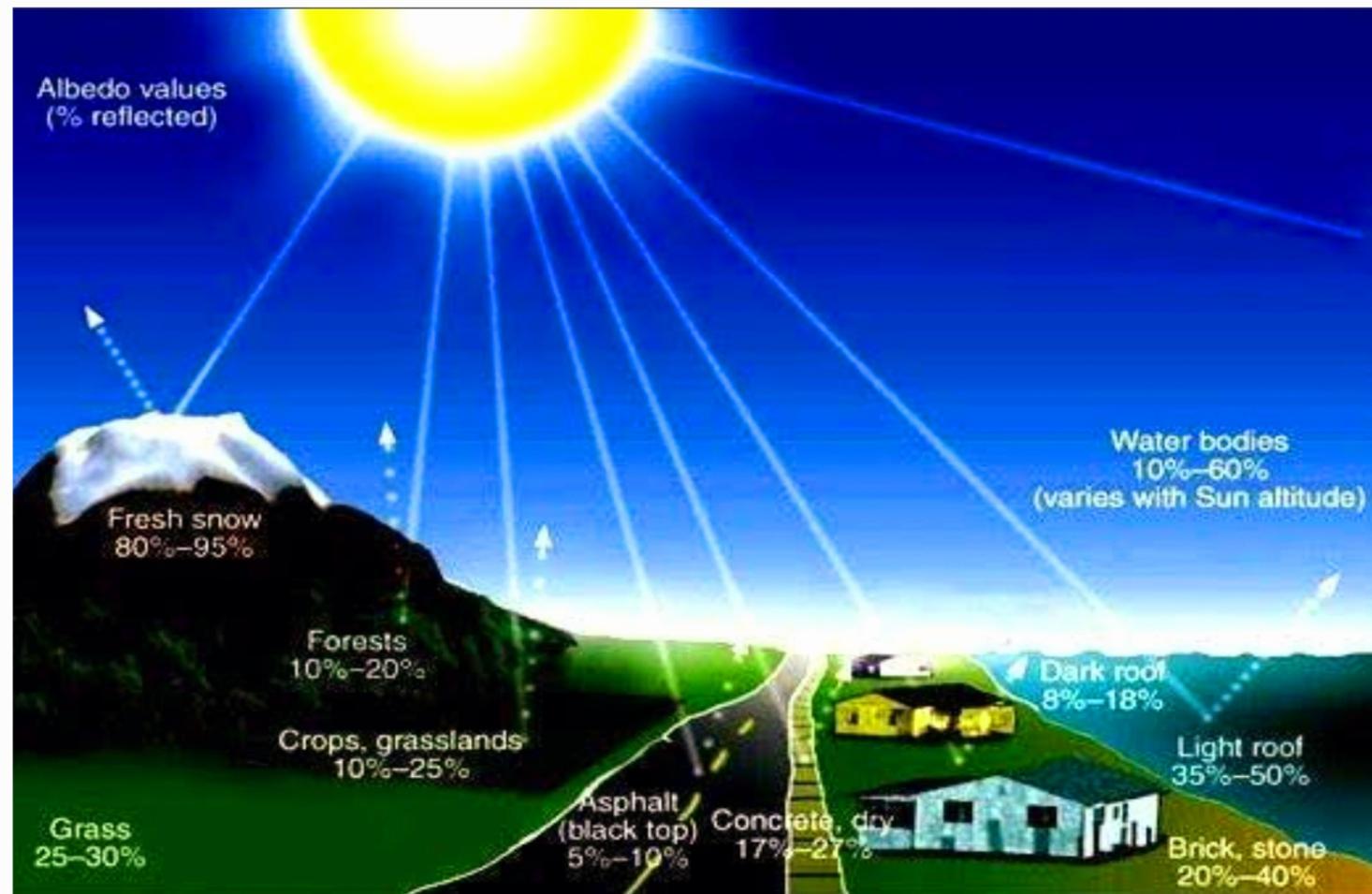


- Heat budget of earth

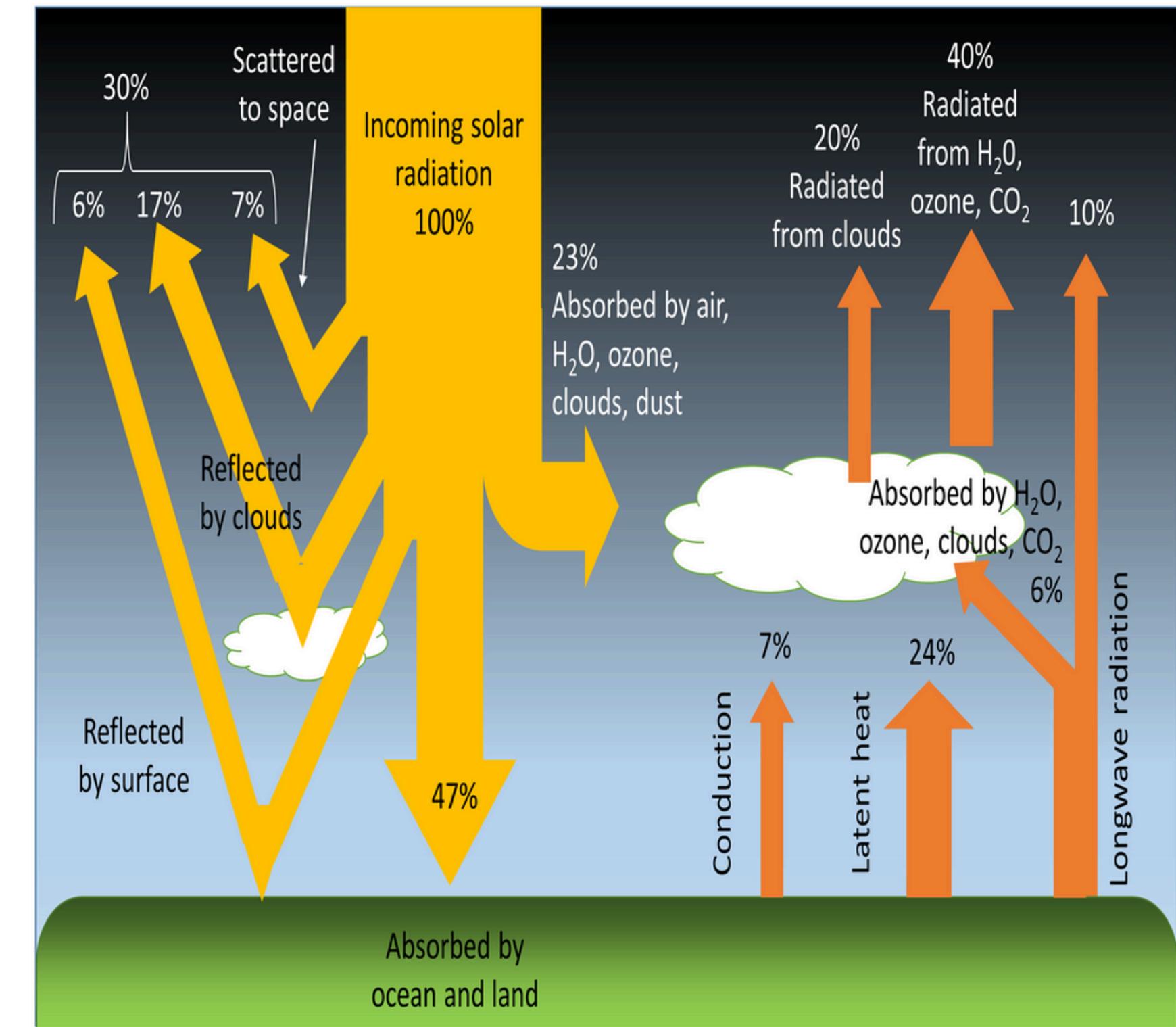
- A heat budget is a perfect balance between incoming heat (insolation) absorbed by the earth and outgoing heat (terrestrial radiation) escaping it in the form of radiation.
- If the incoming heat and the outgoing heat are not balanced, then Earth would be getting either too warmer or cooler. Since these are perfectly balanced the earth is neither too warm nor too cold.
- The equilibrium that exists between the insolation (short waves) and the terrestrial radiation (long waves) is called the **heat budget of the earth**.

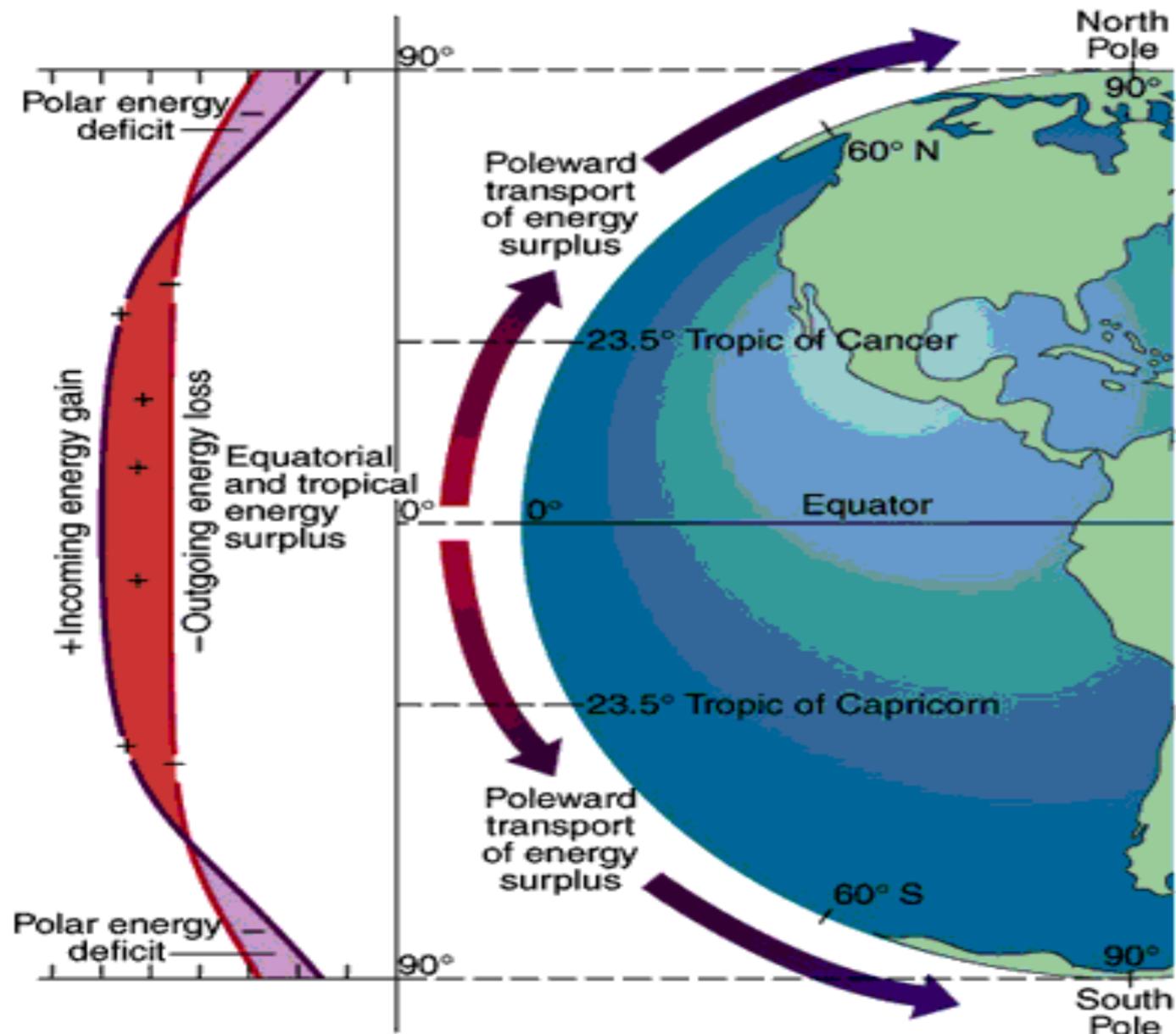




VARIATION IN THE NET HEAT BUDGET AT THE SURFACE OF THE EARTH

- The insolation received at the surface varies from place to place, some part of the earth has surplus radiation balance while the other part is deficit.
- There is a surplus of net radiation balance between 40°N and 40°S and the regions near the poles are in deficit. The extra heat energy from the tropics gets redistributed towards the poles, and as a result, the tropics don't get progressively heated up due to the accumulation of excess heat nor do the high altitudes get permanently frozen due to excess deficit.





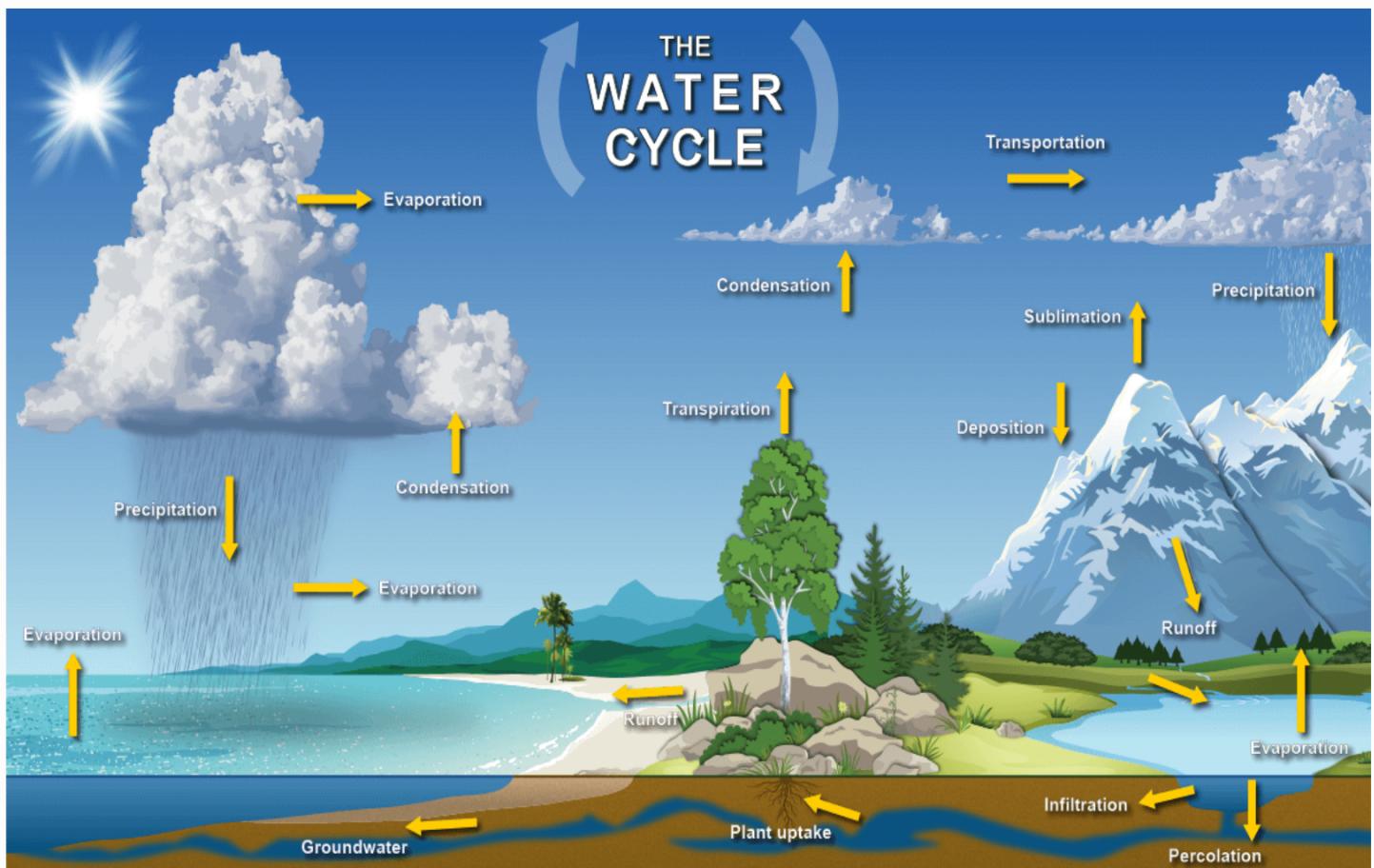
Humidity and Condensation

What is Humidity?

Humidity is a measurement of air quality. The humid measure indicates the amount of water vapour or moisture the air contains. In simple words, the humid index tells us how much moisture is present in the air.

The amount of humid presence of water vapour in the air depends on the temperature. Therefore, as the temperature increases, the rate of humidity or moisture also increases simultaneously. Also, humidity is created through two main processes 1) transpiration and 2) evaporation.

THE WATER CYCLE



Types of Humidity

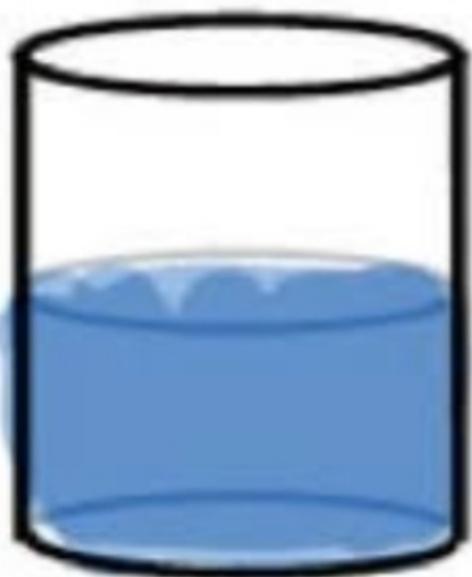
Humidity can be divided into two parts. One is relative humidity, and the other is absolute humidity.

- Relative humidity - Relative humidity measures the amount of water vapour present in the air. But it measures only relative to the temperature. In simple words, relative humidity measures the maximum percentage of air moisture in a given temperature.
- Absolute humidity- Absolute humidity is a static measurement of water vapour present in the air. It does not consider variable measures caused by temperature. Rather, it counts as grams per cubic metre of air (g/m^3).

Effects of Humidity on weather

- It helps in cloud formation and mild precipitation.
- High levels of humidity can cause tropical storms and even hurricanes.
- It also helps in torrential rainfalls in monsoon in Southeast Asian countries.

21°C
50% RH

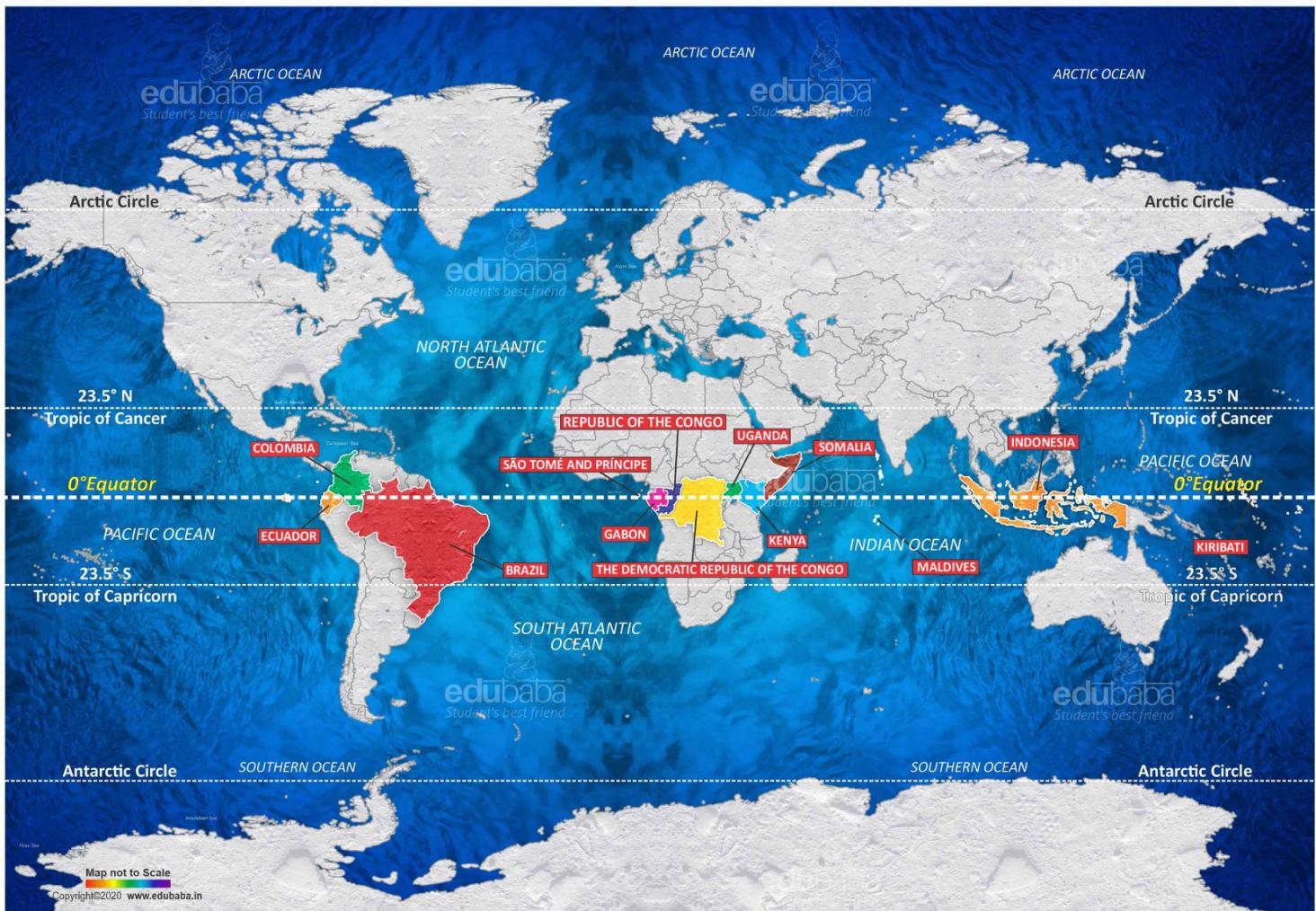


10°C
100% RH



heat removed





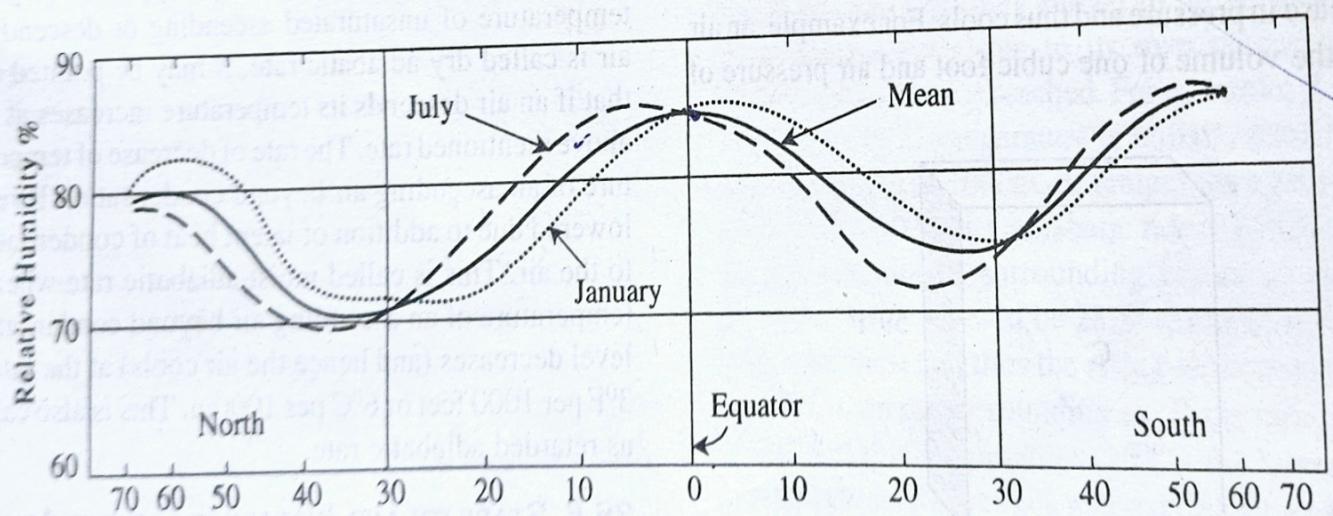


Fig. 36.1 : Zonal distribution of relative humidity.

What is Condensation?

Condensation is a process by which the vapoured water again becomes liquid. So in simple words, it is a process that makes the gaseous form of water into liquids.

It is a reversal process of evaporation. And this happens in two ways: the air cooled down and the vapour within the air reaches its dew point, or it becomes saturated and cannot hold more vapour within.

What causes condensation?

Generally, condensation happens for two reasons: one is dew point, and the other is saturation.

- Dew point is a particular point of temperature where condensation occurs. Dew naturally means condensed water present in the environment or atmosphere. Generally, the air temperature can reach or fall from the dew point at different times (day and night), and therefore we can see water droplets on grass and windows in the morning. It can also happen on the surface of a cold container when the hot air passes through it.
- Saturation - A mass of water vapour Conjugated with dust creates clouds. When a pocket of air reaches its highest moisture forms a cloud. In vapour form, molecules of water stay far apart from one another. But when they form a cloud, it crosses its ability to hold more vapour. Naturally, the cloud saturates, and water molecules begin to cool down. Also, the density of those molecules increases, and finally, the vapour condenses and becomes water droplets (rain).

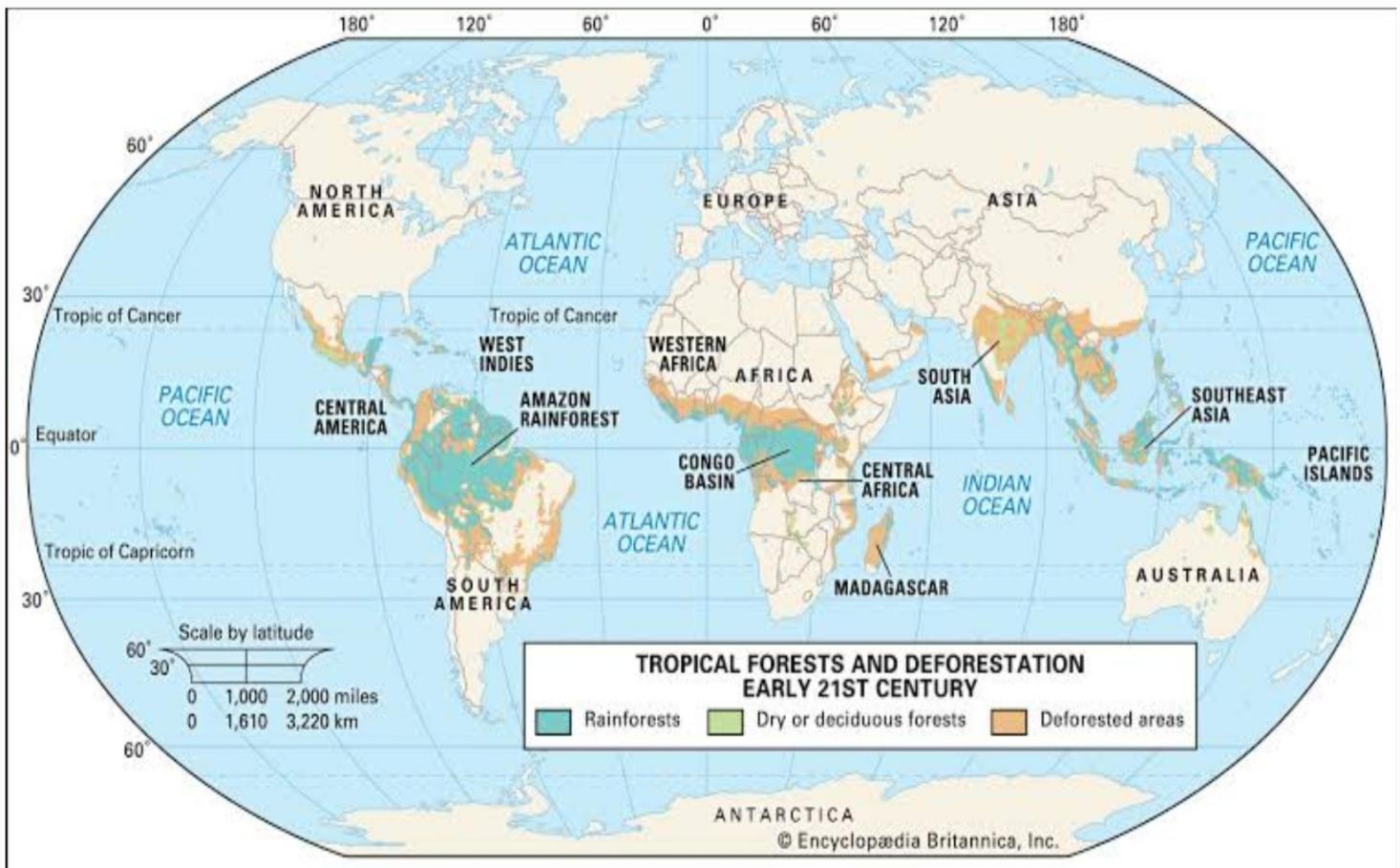
Difference Between Condensation and Evaporation

Evaporation and concentration are natural phenomena that occur in the natural atmosphere. Both of them are associated with the rise and fall of air temperature.

In evaporation, the liquid molecules gather energy from the atmosphere due to high temperature and become vapour. On the other hand, in condensation, the gaseous molecules release energy and become liquid due to low temperature.

And that is why condensation is considered a reversal process of evaporation.





- **Relation between Condensation and Humidity**
- The process of condensation is closely related to the levels of humidity. And there is a strong relation between humidity and concentration. As we know, a humid index indicates the amount of moisture or water vapour present in the air at any given time.
- On the other hand, condensation causes the liquidation of gaseous molecules of water present in the air.
- The high humidity rate helps to saturate the gaseous molecules of water within the air. As a result, it reached the dew point and could not hold more vapour molecules. Therefore, the vapour starts to condense and become droplets of water.

- Conclusion
- Humidity is a measurement of vapour or gaseous water molecules present in the air at any given time. The measurements of humidity can be relative and absolute.
- Here, in this article, we cover the basic idea of humidity and related topics like condensation, evaporation, the relationship between humidity and concentration, causes of humidity etc.

