

Characteristics of insolation

Having understood what is insolation, let's know more about its fundamental characteristics:

Most of the energy obtained by the earth's surface is in short wavelengths. The energy that the earth gets from the sun is known as insolation or incoming solar radiation. The sun's rays fall at the top of the atmosphere obliquely because the planet is a geoid, and the earth captures only a little part of the sun's energy. At the top of its atmosphere, the planet receives an average of 1.94 calories per sq. cm each minute.

In simple terms, insolation can be defined as the incoming solar radiation from the sun, which is received on earth in short waves. As the size of the earth and its distance from the sun are both relatively small, it receives significantly less quantity of insolation.

Only two billionths of a percent of total solar radiation reach the earth's surface, which is two units of energy out of 1,000,00,000 units of energy radiated by the sun! This small part of solar radiation is critical, since it is the primary source of energy on the planet for most physical and biological processes. Furthermore, a small amount of insolation is also absorbed by dust particles, ozone, water vapour, and other gases in the atmosphere.

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1) Only 51% of the sun's insolation reaches the earth's surface.

Earth's surface does not receive the amount of insolation uniformly. It varies across locations on the planet. Annual insolation is highest in the tropical zone. It steadily decreases from the tropics to the poles. Moreover, insolation is lesser in winters than in summers.

The amount of insolation received is influenced by the following factors:

Because the Earth is spherical, the rays of the sun fall on the surface at various angles in different locations. The angle of incidence is the angle formed at a place by the rays of the sun and the tangent of the earth's circle. It has two effects on insolation-

The day varies depending on where you are and the ongoing season. It determines how much sunlight reaches the earth's surface. The amount of insolation received is proportional to the length of the day.

The amount of insolation reaching the earth's surface is also determined by the atmosphere's transparency. The atmosphere's transparency is affected by the cloud cover, dust particles, water vapour, and

cloud thickness. For example, thick clouds in the sky prevent sunlight from reaching the earth, while a clear sky allows the sunlight to reach the surface easily.

Four different heating processes cause the heating of the atmosphere, viz--Radiation, Conduction, Convection and Advection.

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