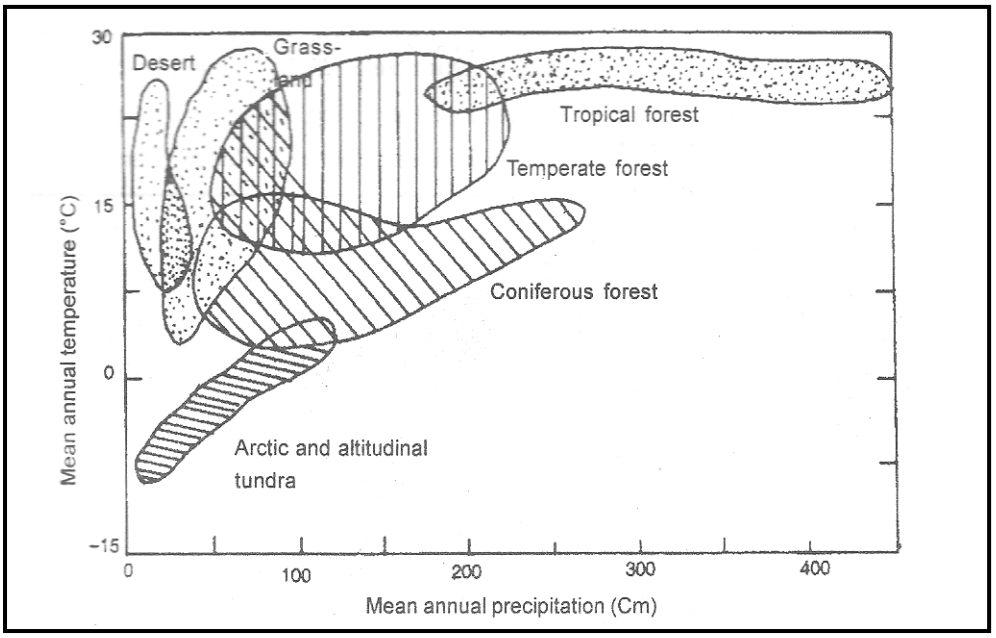
TERRESTRIAL BIOMES

Large ecosystem is called biome, mainly large aquatic and terrestrial ecosystem is called biomes.
Altitude and latitude determine the boundary of biome.



1. **Tundra Biome :**

this region leis above 60^0 North latitude (or North of timber line or tree line) is known as Tundra. **(Timber line - Line beyond which trees are not found)**. In this region soil is covered by snow and ice **(perma frost)** almost whole of the year.

- At 3600 m height of Himalayas called Alpine tundra.
- The annual rain fall is low and generally below 25 cm / year.

This biome is without trees so it is called **trees less biome**. The trees and shrubs are absent in this biome so is it si also known as Arctic desert. It is most **dedicated** and fragile biome

Vegetation :- Lichens, Moses, Grasses etc.

Animals :- Foxes, Reindeer, Migratory birds, Polar bear etc.

2. **The northern coniferous or Needle - leaf forest -**

The northern or temperature coniferous forest is also known as **Taiga** or **North wood.** it is situated immediately south of the Tundra.

- Distributed over 1700 to 300 m altitude in Himalaya.
- Annual rain fall is **50 - 170 m/year.**
- The average winter temperature is 6^0 C and 20^0 C in summer.
- The evergreen temperature forests are found on Himalaya.

Vegetation - Pines, Silver fir, Maple, Hemolock, Spruce, Deodar, Cypress

Animals - Deer, Rabbit, Squirrels, Elks, Insects, Snakes, Lizards

3. The Temperature Deciduous Forest :-

- The deciduous forest lies in temperature zone about 40^0 - 60^0 N latitude and 1500 - 2400 m altitude central location.
- The annual rainfall about **100-250 c.m.**

Vegetation :- Broad leaved forest which includes **oak (Quercus)**, Birch, Maple, Hickory Beech etc.

Note :- The trees shed their leaves in autumn and bear again in spring.

Animals :-The animals include frog, salamander, Turtle, Lizard, Squirrel, Rabbit, Deer and Foxes etc.

4. The Tropical Rain forest-

The tropical rain forest biome lies on the **equatorial region** around the earth. In India tropical rain forest in found in Eastern Himalaya and Western Ghats. Tropical rain forest are present in Assam, W. Bengal, Kerela and Andaman in India. The main feature of this biome is the large amount of annual rainfall which is more than at least **200-300 cm per** year. The tropical rain forest are **richest in flora and fauna.** The highest species of plants and animals are found here.

- The temperature is high and uniform throughout the year. Climate warm and humid.

Vegetation :- Dipterocarpus and Hopea.
Generally parasitic plants are found in these places such as - Cuscuta, Viscum, Loranthus, Orobanche, Raffflesia, Striga and Santalum (Chandan).
In addition of these saprophytic plants also found like Monotrapa

5. Tropical Deciduous Forest -

Occurs widely in the northern and southern part of our country in plain and low hilly area.

- **Annual Rain fall : - 90 - 160 cm/year**
- Leaves of most of the trees fall before the summer

Vegetation : - Sal (*Shorea robusta*), *Teak (Tectona grandis),* Tendu, Chiraungi, Khair.

6. The Chaparral (Mediterranean Scrub forest) Biome -

The Mediterranean forests occur along the pacific coast of North America and South coast of Australia.

- It is also called temperature evergreen forest.
- There is **limited rain during the winter** and remaining time it is dry.
- The **drought resistant** species of plants and animals are found in this biome.

Vegetation - Broad, leaved, **fire resistant** evergreen plants, small trees and shrub like sage etc.
Animals - Mule, deer, brush rabbit and wood rates etc.

7. The Tropical Savanna Biome -

The Tropical Savanna biome is located in South America and Australia.

- It si also called tropical grassland.
- The rain falls is seasonal and very high.
- In this biome grass are found with few **scattered** tree.

Vegetation -

- **Coarse grass -** *Dichanthium, Sechima, Phragmites*
- **Trees -** *Acacia, Eucalyptus, Zizyphus, Prosopis*

Animals - The biome supports the hoofed mammals in large number. They include the herbivores like zebra, Giraffe, Elephant and several antelope and kangaroo which are confined to Australia.

8. The Grass land Biome -

- Annual rainfall between 25 - 75 cm
- inter and summer have longer duration and the **maximum rain fall is in summer.**

Name of Grass lands		Place
Prairies	→	North America
Pampas	→	South America
Steppes	→	Europe and Asia (Russia)
Tussocks	→	New Zealand
Veldts	→	Africa

9. The Desert Biome -

The desert biome stretches in the dry regions of the world there is very little rainfall.

- the deserts are located around the tropic of cancer and tropic of capricorn, between latitude 15^0 to 35^0 north and south.
- The annual rainfall is very less (less than 25 cm).
- Flora and fauna are found very less.

The main deserts sare the Sahara desert of North Africa, the Thar, Gobi and Tibet desert of Asia.

Sahara - North Africa
Tibet, Gobi, Thar - Asia

Note : (1) Gobi desert is cold desert.
(2) Sahara and Thar and hot desert.

Note : (1) The basal region of the tropical mountain range is called Terai.
(2) In temperate forest soils, the top horizon of soil is a rich mixture of humus and inorganic components but top soil of tropical rain forest is nutrient poor and shallow due to heavy rainfall and high temperature.
(3) Sub - soil of tropical rain forest is dense and thick.

<table>
<tr><th>Biome</th><th>Latitude</th><th>Altitude</th><th>Vegetation</th></tr>
<tr><td>1. Tundra</td><td>Above 60^0 North</td><td>3600 meter height Himalaya</td><td>Lichen, Moss, Grass
Note: • This biome is tree less and also known as arctic desert or alphine tundra
• Timer line-line beyond which trees are not found.
• Perma frost – In this region soil is covered by snow or ice.</td></tr>
<tr><td>2.Northern coniferous or Needle leaf or temperate forest</td><td>40^0 - 60^0</td><td>1700 to 3000 meter</td><td>Pine (Pinus), Deodar (Cedrus), Cypress (Cupressus torulosa), Spruce (Picea smithiana), Silverfir (Albies pindrow)
Note: • Coniferous forest posses needle like leaves
• This forest also known as taiga</td></tr>
<tr><td>3. Temperate deciduous or broad leaf forest</td><td>40^0 - 60^0</td><td>1500 to 2400 meter</td><td>Oak (Quercus)
Note: • Trees shed their leaves in autumn and bear again in spring.</td></tr>
<tr><td>4. Tropical rain forest</td><td colspan="2">Tropical rain forest are found at equatorial region around the earth. In India tropical rain forest and distributed mainly along western Ghats and Eastern Himalaya (Assam, W. Bengal, Andaman, Manipur)</td><td>Dipterocarpus and Hopea are most common tree species in India. Lianas are also found.</td></tr>
<tr><td>5. Tropical deciduous forest</td><td colspan="2">Occurs widely in the Northern and Southern part of our country in plain and low hilly area.</td><td>Sal (Shorea robusta), Teak (Tectona grandis), Tendu, Chirungi, Khair
Note : • Leaves of most of the tree falls before summer.</td></tr>
<tr><td>6. Chaparral (Mediterranean)</td><td colspan="2">These forest are found pacific coast of North America and South coast of Australia</td><td>Draught resistant and fire resistant plant species are found e.g. Small tree, Shrub (sage)</td></tr>
<tr><td>7. Tropical Savanna biome</td><td colspan="2">Tropical Savana biome are found in South America and Australia.</td><td>Coarse grass – Dichanthuimm Sechima, Phyragmits
Trees – Acacia, Eucalyptus, Zizyphus, Capparis
Note: • In this biome grass are found with scattered trees.
• This biome also known as tropical grass land</td></tr>
<tr><td>8. Grass land biome</td><td colspan="2"></td><td><table><tr><th>Name of Grass lands</th><th>Place</th></tr><tr><td>Prairies →</td><td>North America</td></tr><tr><td>Pampas →</td><td>South America</td></tr><tr><td>Steppes →</td><td>EuropeandAsia (Russia)</td></tr><tr><td>Tussocks →</td><td>New Zealand</td></tr><tr><td>Veldts →</td><td>Africa</td></tr></table></td></tr>
<tr><td>9. Desert Biome</td><td colspan="2"></td><td><table><tr><th>Name of desert</th><th>Place/Area</th></tr><tr><td>Sahara Tibbet, Gobi, Thar</td><td>North Africa Asia</td></tr></table>Note : • Gobi desert in cold desert
• Sahara and Thar are hot desert</td></tr>
</table>

Atmosphere

Atmosphere may be defined as a transparent gaseous envelope surrounding the earth. The vertical profile of the atmosphere shows several concentric layers. These layers vary in density, temperature, composition and properties. the density is highest near the earth's surface and decreases with altitude.

The main layers from the surface of the earth upwards are :

(i) Troposphere :

This is the region up to **8-16 km.** height from the earth surface. Therefore wind's, clouds, dust particles, spores and pollen and more than 90% of gases of atmosphere are present here.

(ii) Stratosphere :

The region lies up to **16-50 km.** from the earth above the troposphere. There is absence of large conventional current's (wind) so it is excellent region for air travel.

Ozone layer is present in the stratosphere which protects us from the harmful U.V. radiations from the earth.

(iii) Mesosphere :

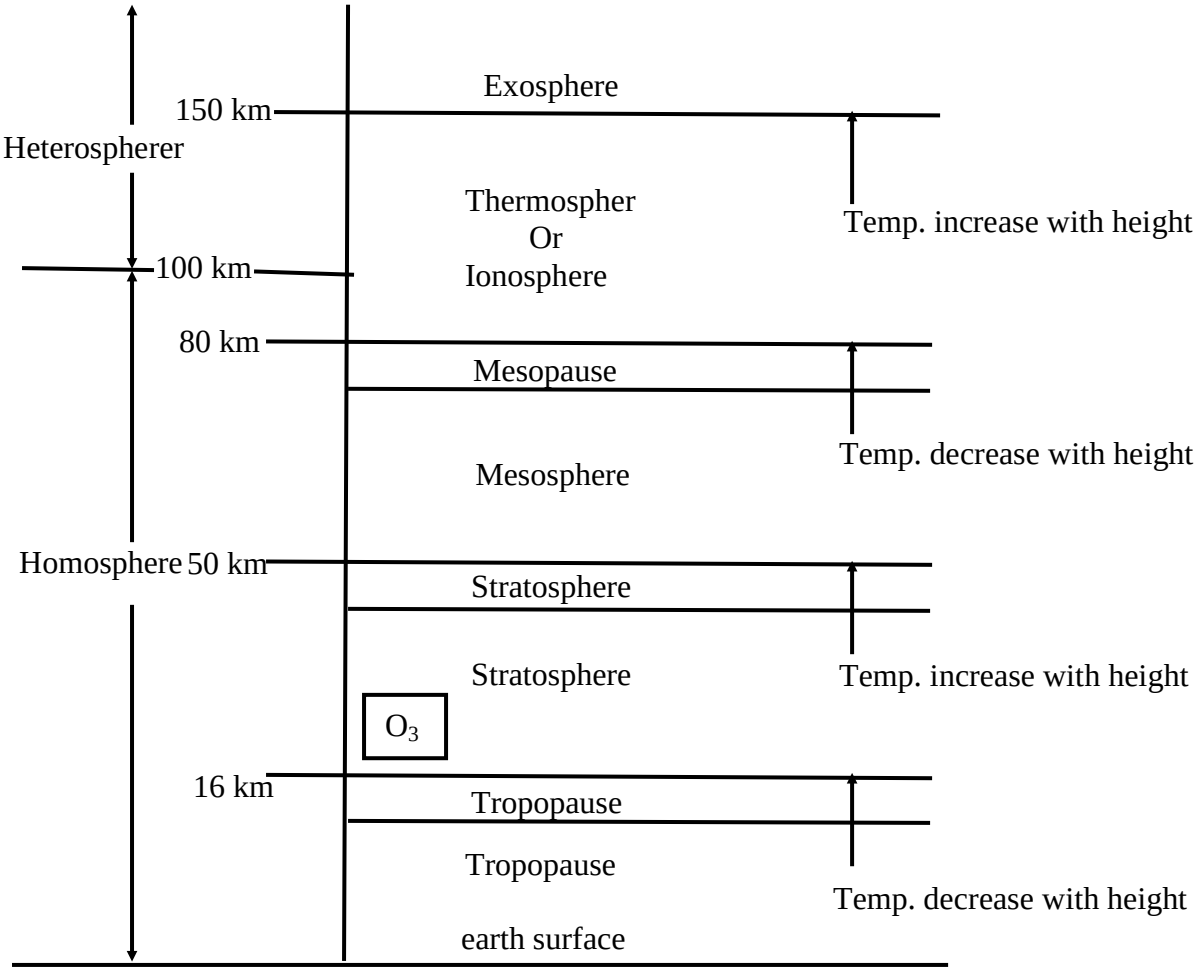
The region lies up to **50-80 km.** from the earth above the stratosphere.

(iv) Thermosphere :

This regions lies up to **80-150 km.** from the earth above the mesosphere. Ionosphere is found in thermosphere, which contains free electrons and ions. All the communication. Satellites are launched only in this layer, because ions and electrons transmit or reflect radio waves (Signals) from the surface of earth.'

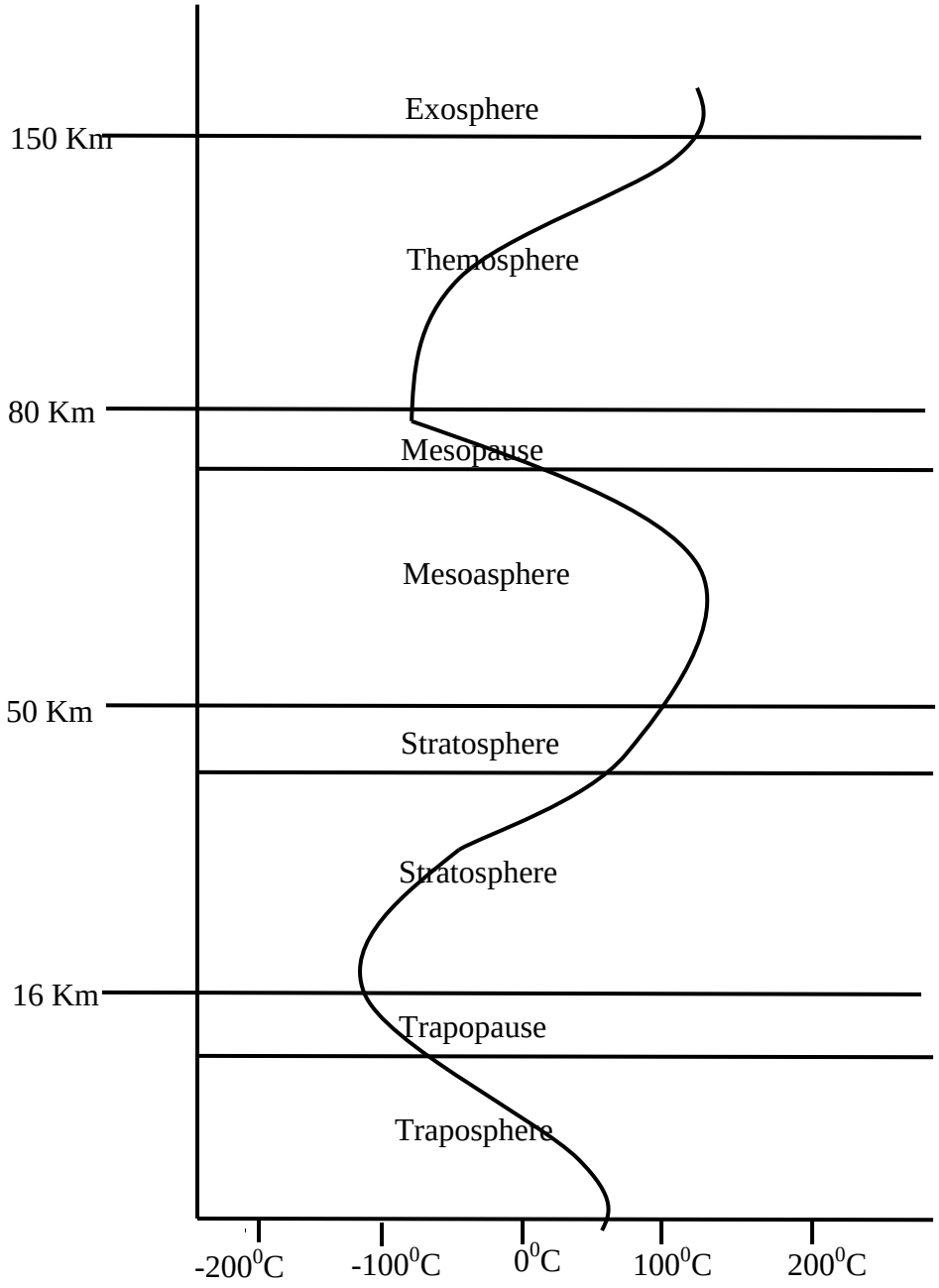
(v) Exosphere :

The outer fringe of the atmosphere known as the exosphere is extremely rarefied and gradually merges with the outer space. So above the thermosphere is **exosphere.**



Homosphere	**Heterosphere**
Inextends upto 100 km. from the earth surface.	Outer part of thermosphere above the homosphere

Lapse rate : - In troposphere, temperature decreases with increase in altitude. The vertical temperature gradient over earths surface is called lapse rate, it is 6.5^0 C per 1000 m.



Composition of air –

$N_2 \rightarrow$ 78.8% $O_2 \rightarrow$ 20.92% $Co_2 \rightarrow$ 0.033%

Argon $\rightarrow$ 0.93% Trace Components $\rightarrow$ 0.04%

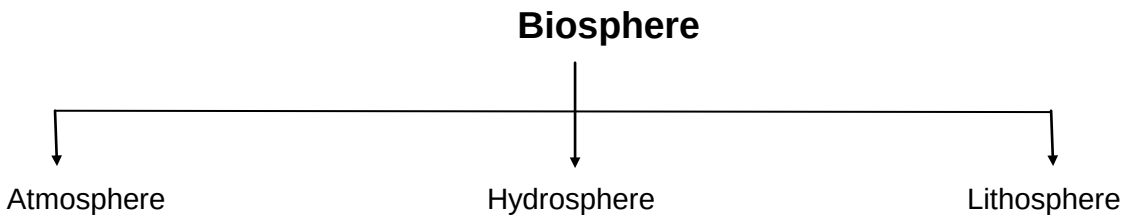
BIOSPHERE

All the living and non living thing (Biotic + Abiotic) of the earth (biomes) combine together to constitute a big ecosystem called Biosphere. Biosphere is also called Ecosphere. The term ecosphere for biosphere was used by Cok.

1. **Lithosphere -**
   The living components and non living components present on the earth surface constitutes the litho sphere.

2. **Hydrosphere -**
   All living components and non living components present in water constitutes the hydro sphere.

3. **Atmosphere -**
   All living components and non living components of air constitutes the atmosphere.



Note :

1. Biosphere (space ship or earth) is a closed system for minerals and biosphere is an open system in regards with the energy.

2. **Noo Sphere** (Noo-mind, sphere - domain) - Because of development of human civilisation biosphere is changed in to human dominating environment called noo sphere.