



NCERT GEOGRAPHY

DIAGRAMS , TABLES , CHARTS
& CONCEPTS

**FOR UPSC
PRELIMS**

PREPARED BY :
TEAM X IAS



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GEOGRAPHY BY DIAGRAMS & CHARTS OF NCERT BOOKS

PURPOSE TO TRACK DOWN UPSC EXAMINER MIND SET AS IN PAST –
MANY OF GEO QUESTIONS HAVE BEEN ASKED DIRECTLY FROM THESE
CHARTS/DIAGRAMS

कश्ती चलाने वालों ने जब हार के दी पतवार हमें ।
लहर-लहर तूफान मिले और संग-संग मझधार हमें ।
फिर भी दिखलाया है हमने और आगे दिखा भी देंगे ।
इन हालातों में आता है दरिया करना पार हमें ॥

All charts / diagrams & related information are explained IN below
must watch video.

<https://www.youtube.com/watch?v=dR9cWi9B93g>

PHYSICAL GEOGRAPHY

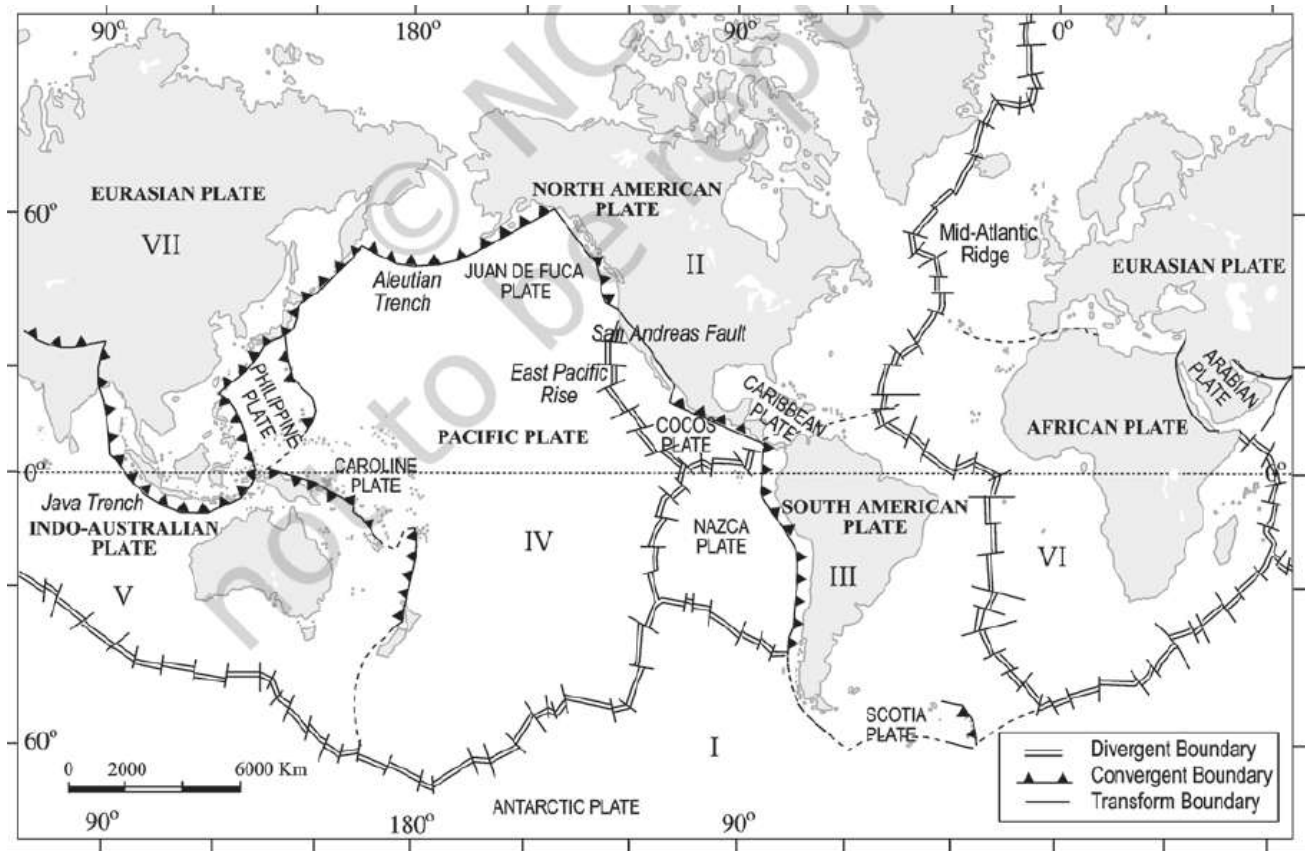


Figure 4.5 : Major and minor plates of the world

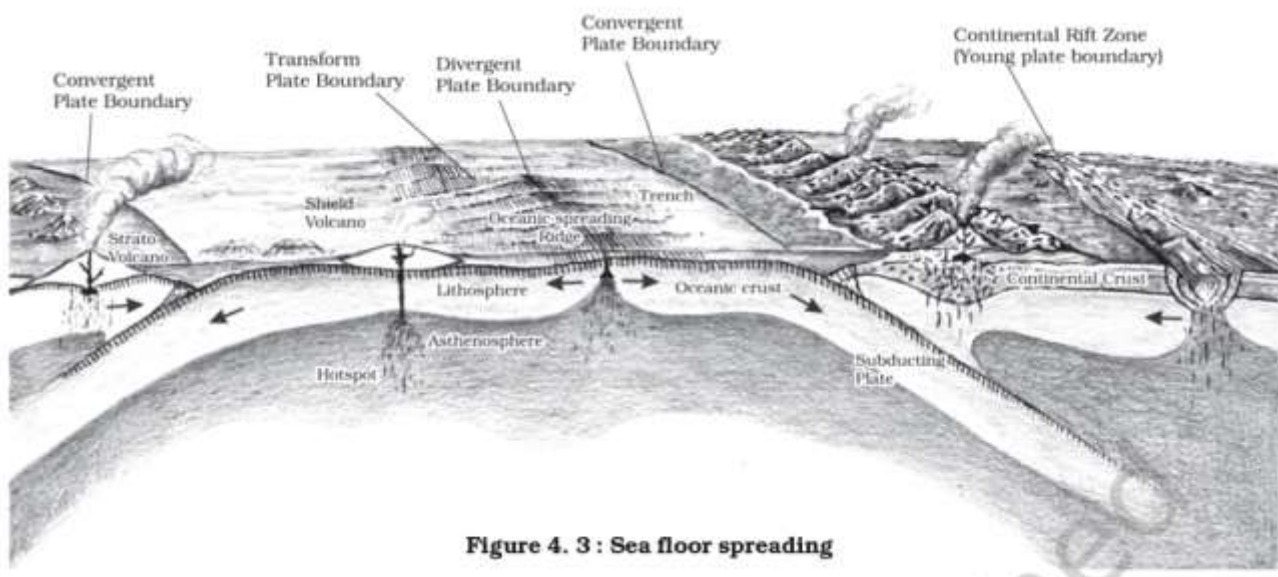


Figure 4.3 : Sea floor spreading

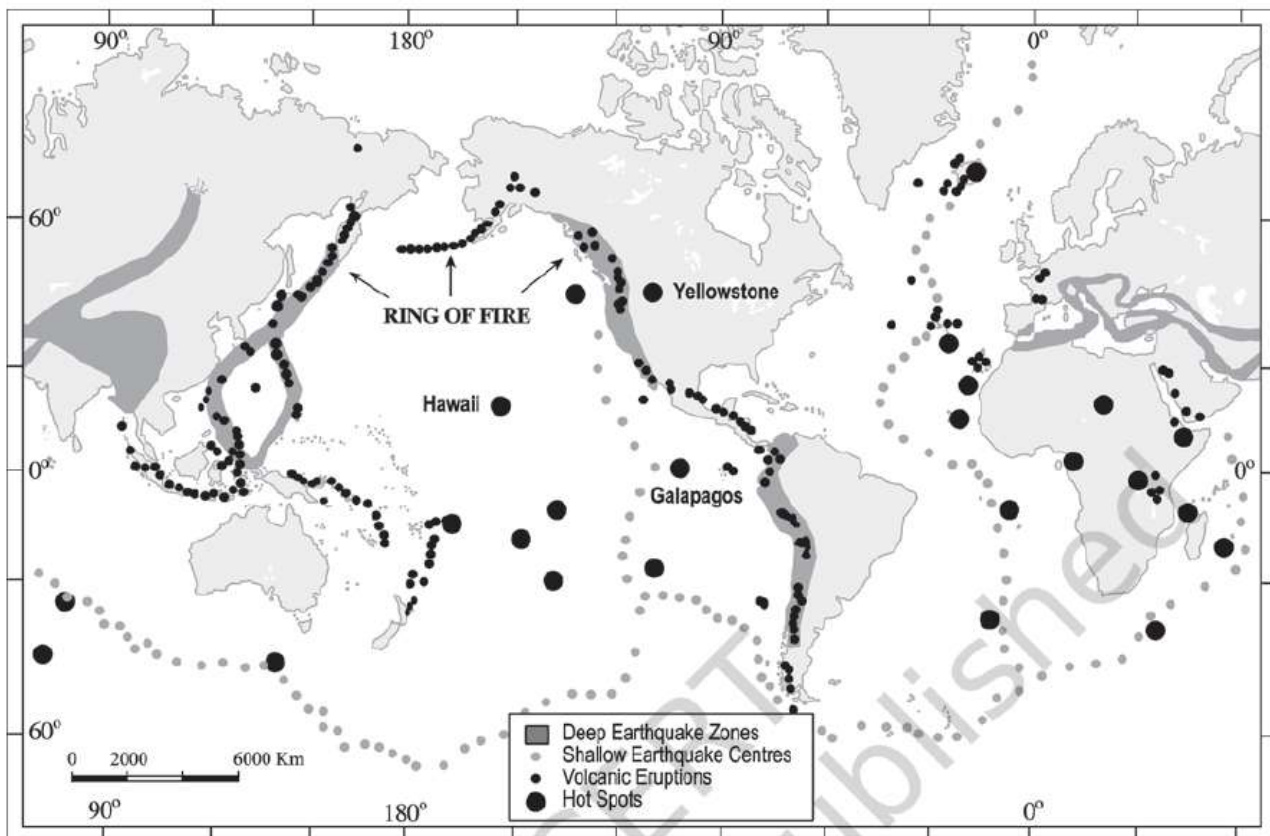


Figure 4. 2 : Distribution of earthquakes and volcanoes

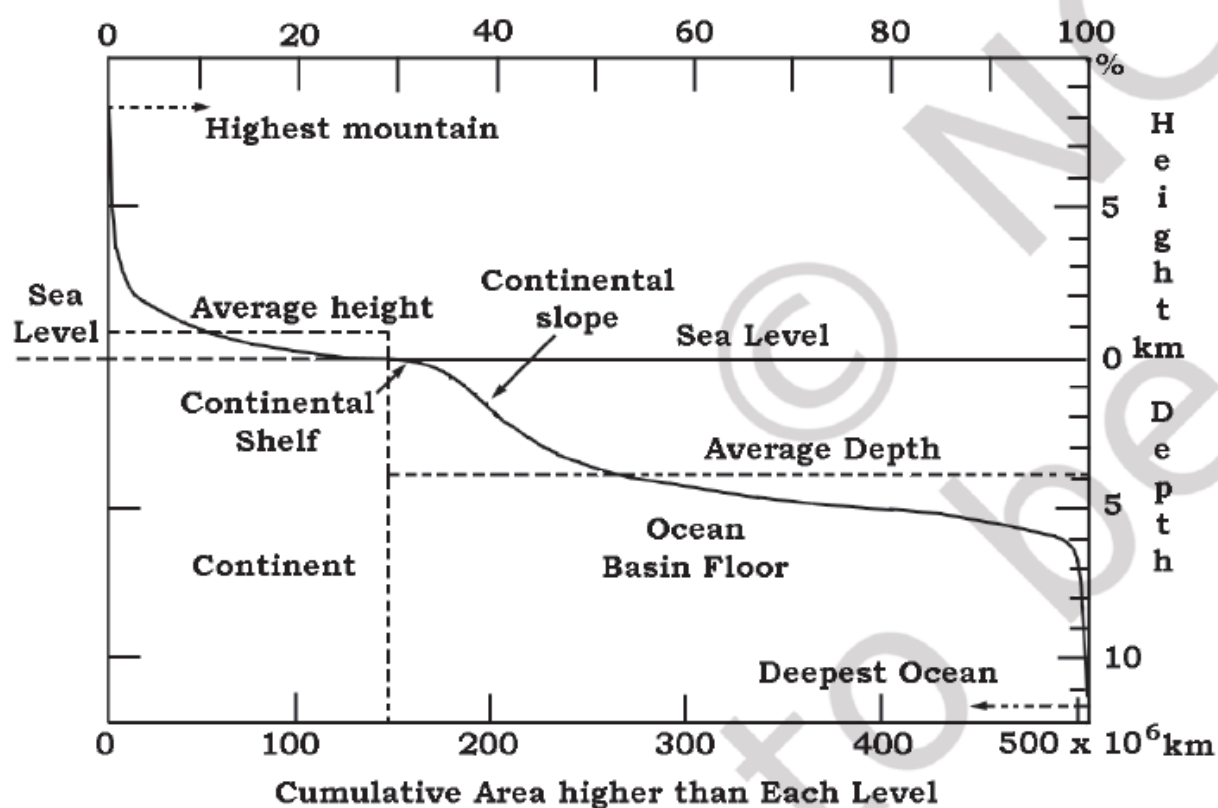
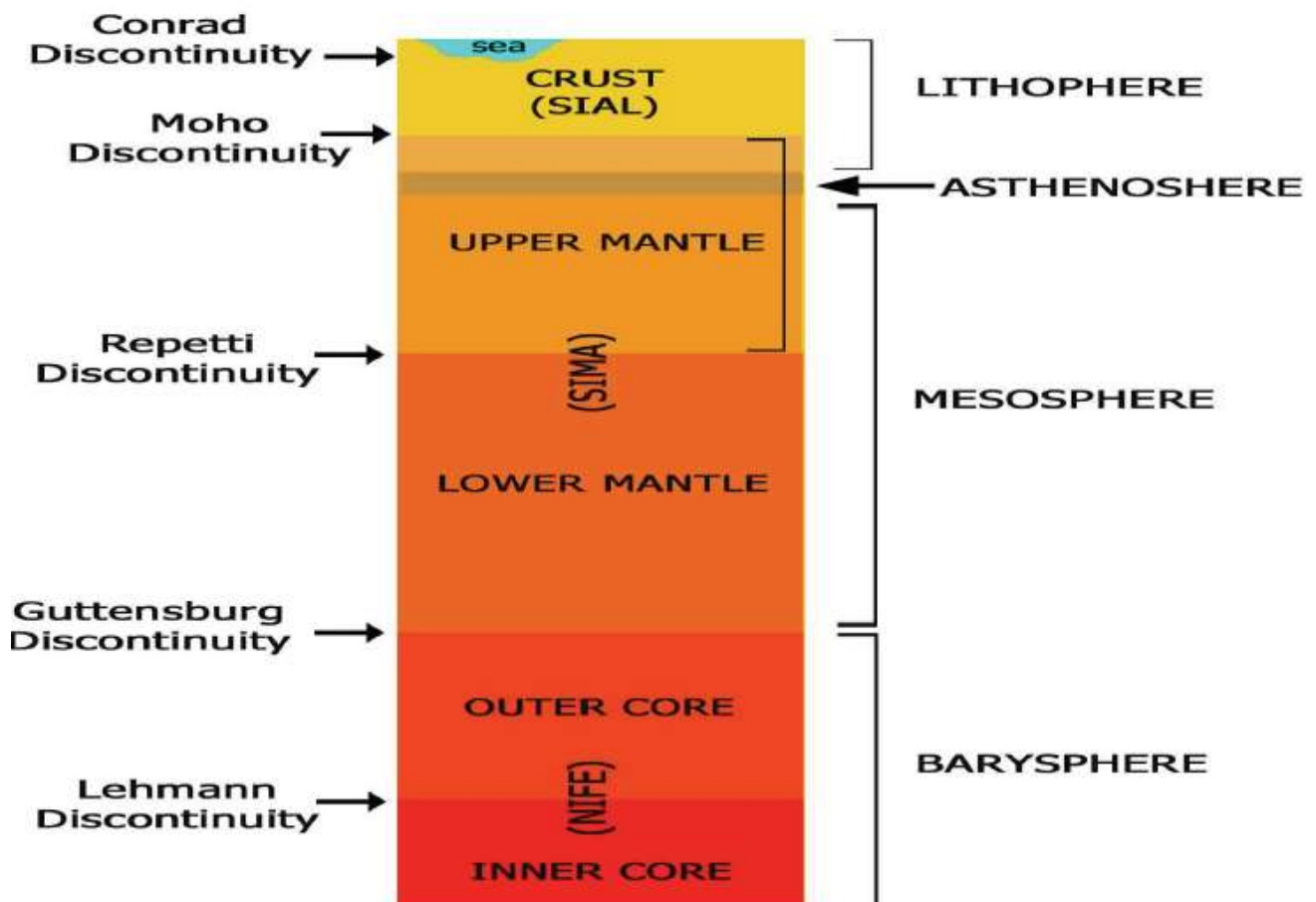
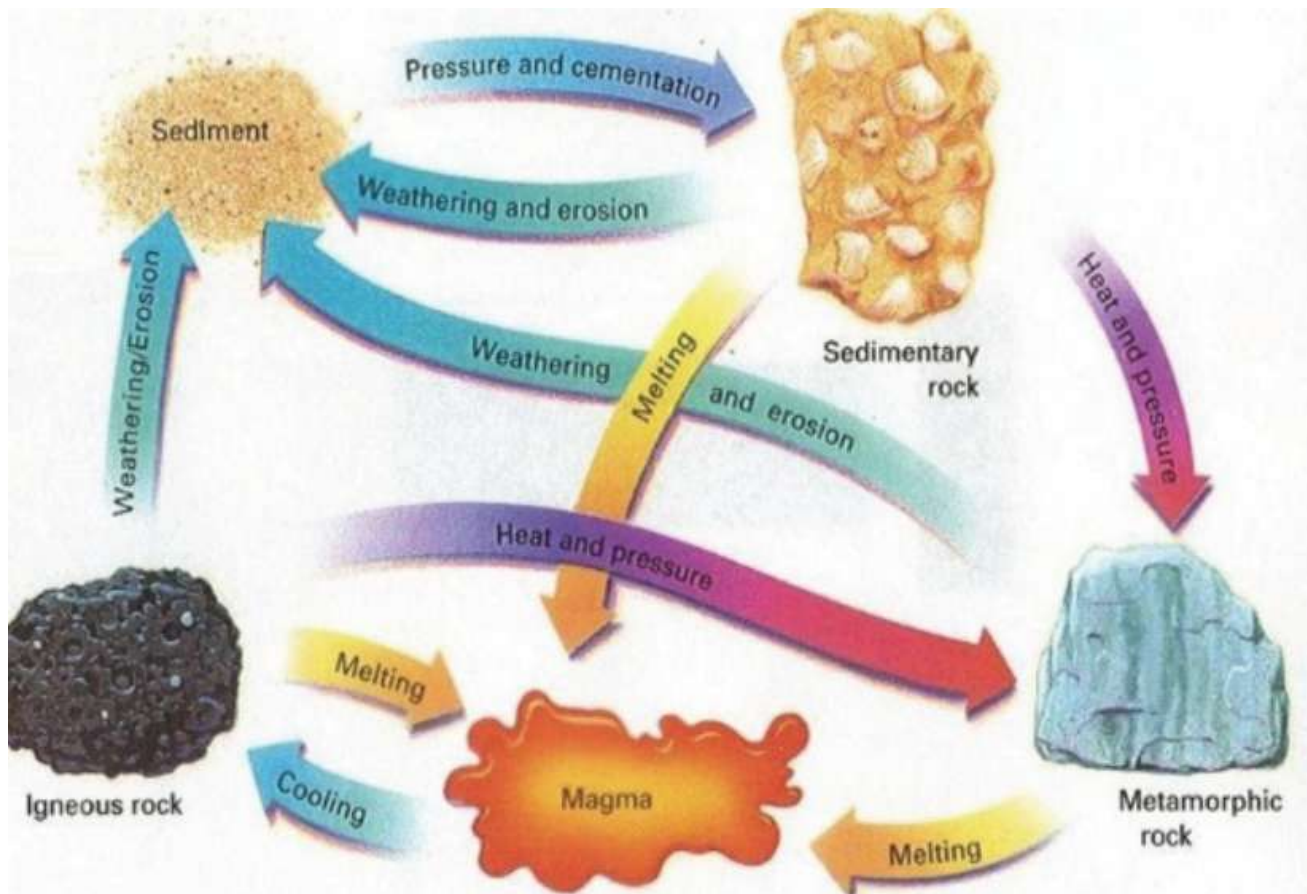
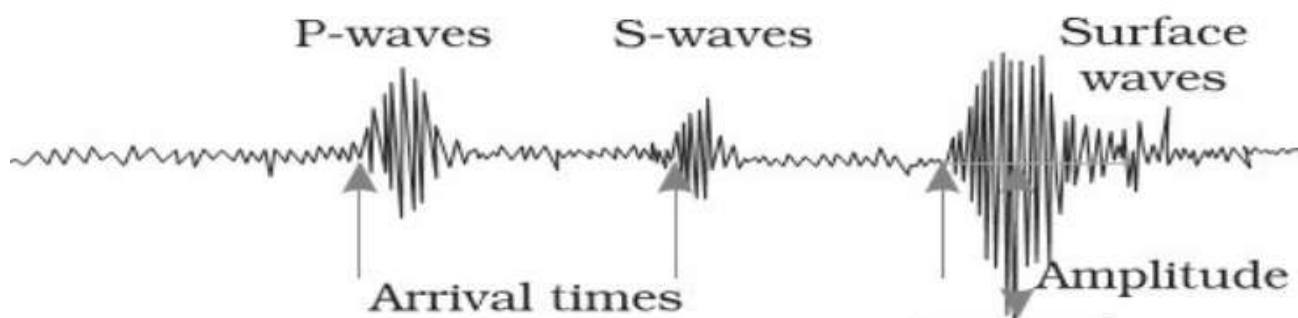
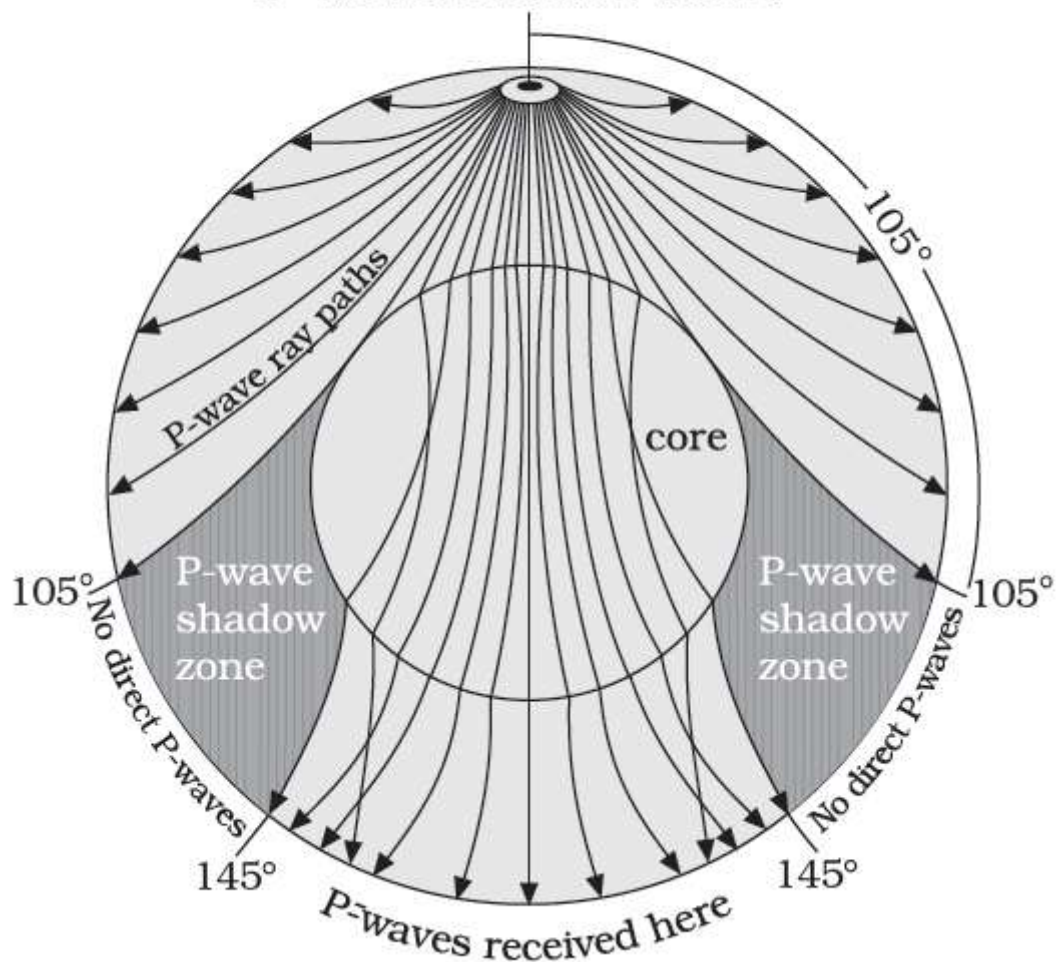
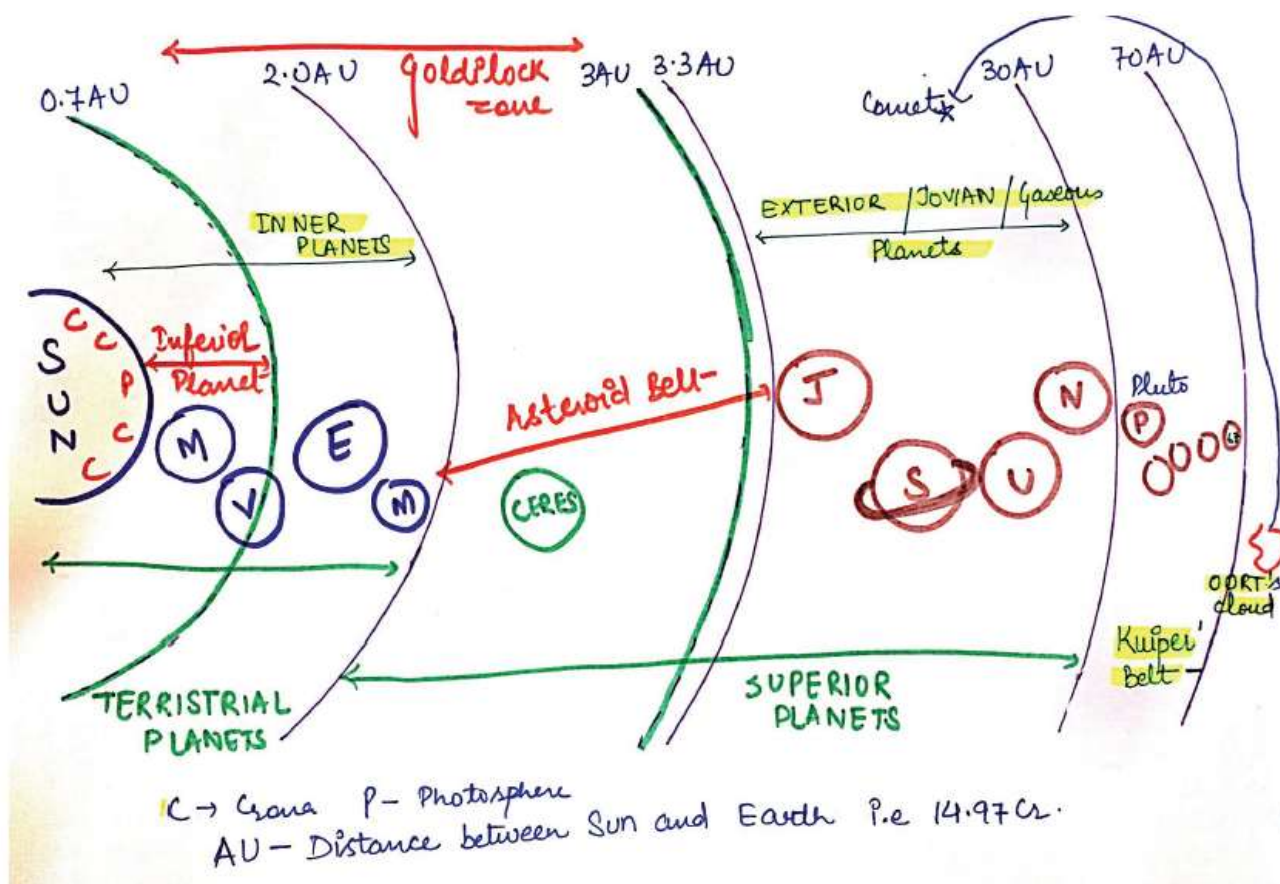


Figure 4.1 : Ocean Floor



P-wave shadow zone





Geological Time Scale

Eons	Era	Period	Epoch	Age/ Years Before Present	Life/ Major Events
	Cainozoic (From 65 million years to the present times)	Quaternary	Holocene Pleistocene	0 - 10,000 10,000 - 2 million	Modern Man Homo Sapiens
		Tertiary	Pliocene	2 - 5 million	Early Human Ancestor
			Miocene	5 - 24 million	Ape: Flowering Plants and Trees
			Oligocene	24 - 37 million	Anthropoid Ape
			Eocene	37 - 58 Million	Rabbits and Hare
	Palaeozoic 245 - 570 Million	Mesozoic 65 - 245 Million Mammals	Palaeocene	57 - 65 Million	Small Mammals : Rats - Mice
			Cretaceous	65 - 144 Million	Extinction of Dinosaurs
			Jurassic	144 - 208 Million	Age of Dinosaurs
			Triassic	208 - 245 Million	Frogs and turtles
		Permian		245 - 286 Million	Reptile dominate-replace amphibians

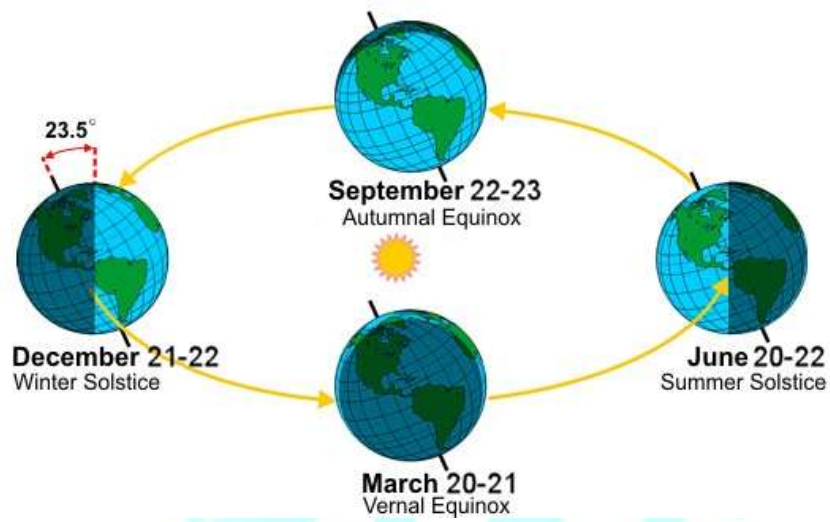
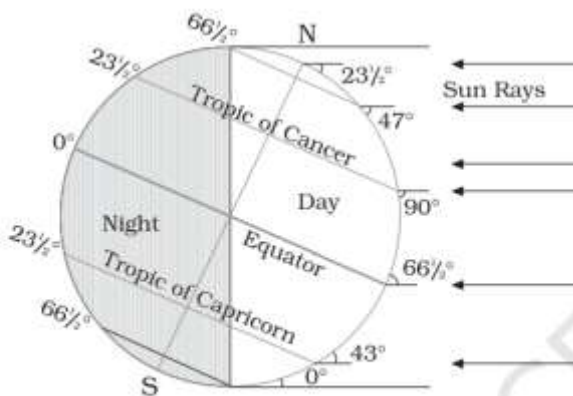
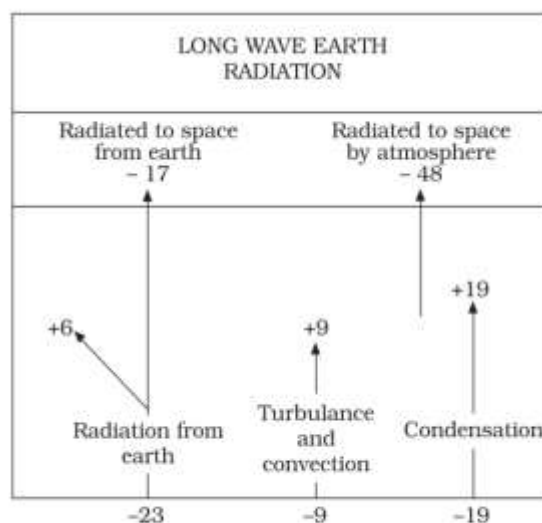
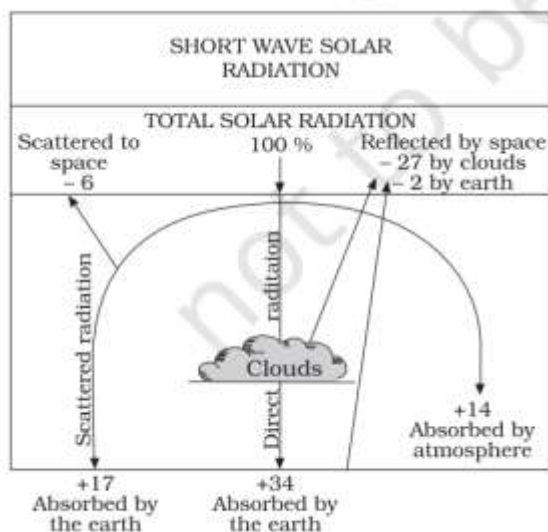


Table 9.1 : Length of the Day in Hours and Minutes on Winter and Summer Solstices in the Northern Hemisphere

Latitude	0°	20°	40°	60°	90°
December 22	12h 00m	10h 48m	9h 8m	5h 33m	0
June 21	12 h	13h 12m	14h 52m	18h 27m	6 months

**Figure 9.1 : Summer Solstice****Figure 9.2 : Heat budget of the earth**

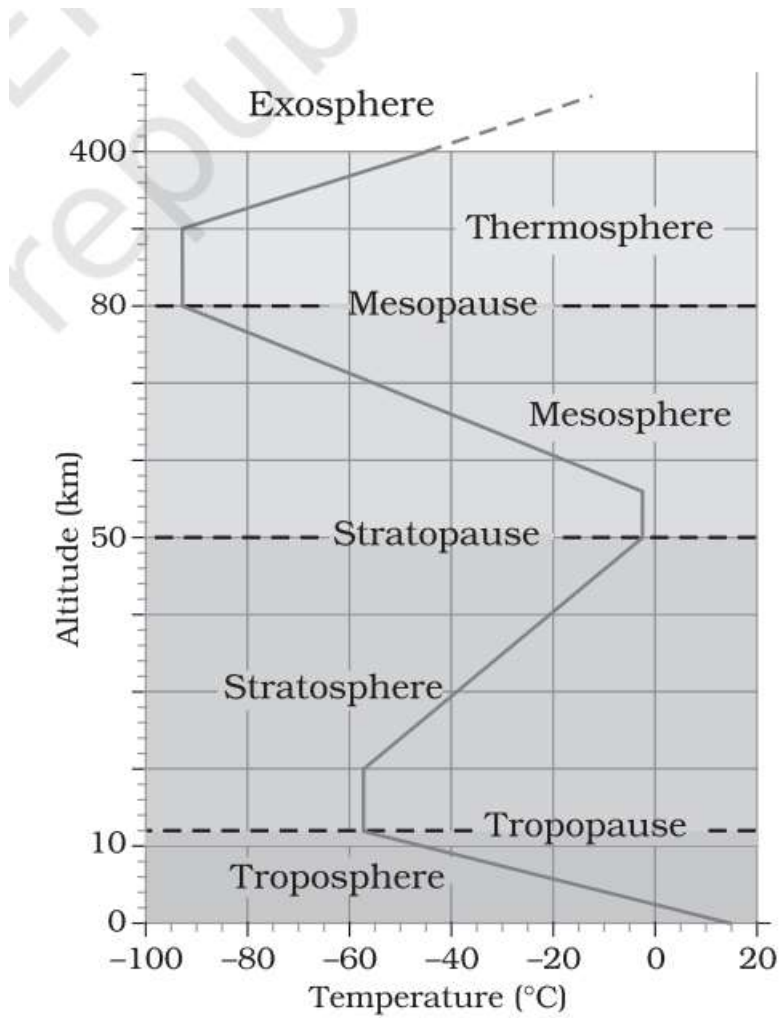


Figure 8.1 : Structure of atmosphere

to excess deficit.

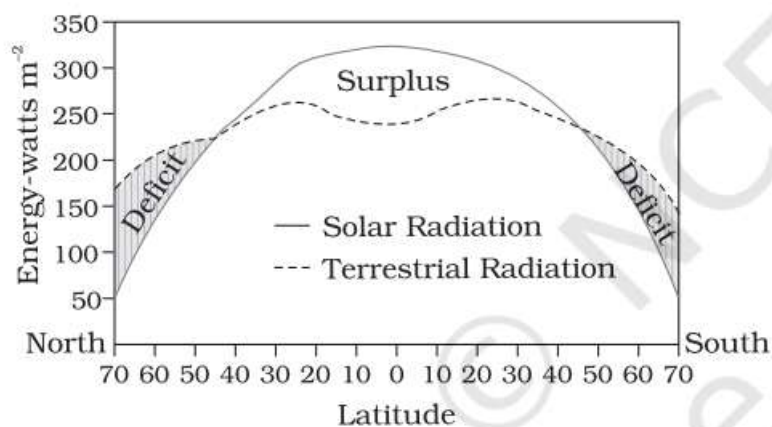


Figure 9.3 : Latitudinal variation in net radiation balance

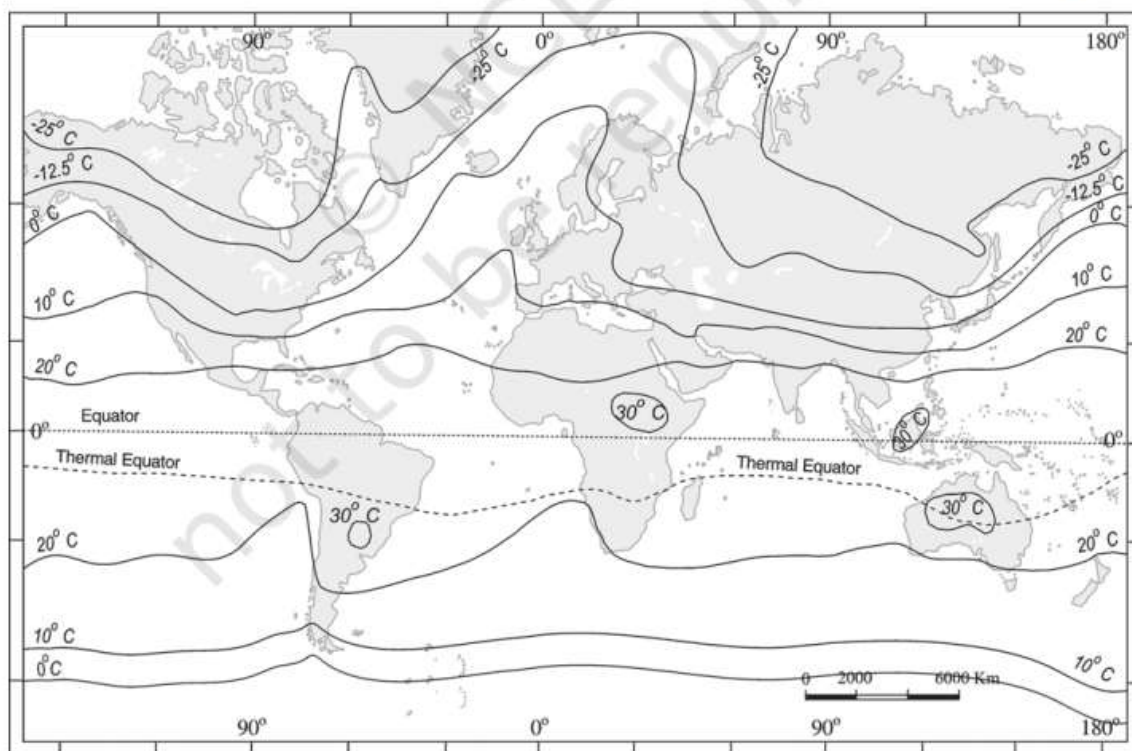


Figure 9.4 (a) : The distribution of surface air temperature in the month of January

Table 10.1 : Standard Pressure and Temperature at Selected Levels

<i>Level</i>	<i>Pressure in mb</i>	<i>Temperature °C</i>
Sea Level	1,013.25	15.2
1 km	898.76	8.7
5 km	540.48	-17.3
10 km	265.00	-49.7

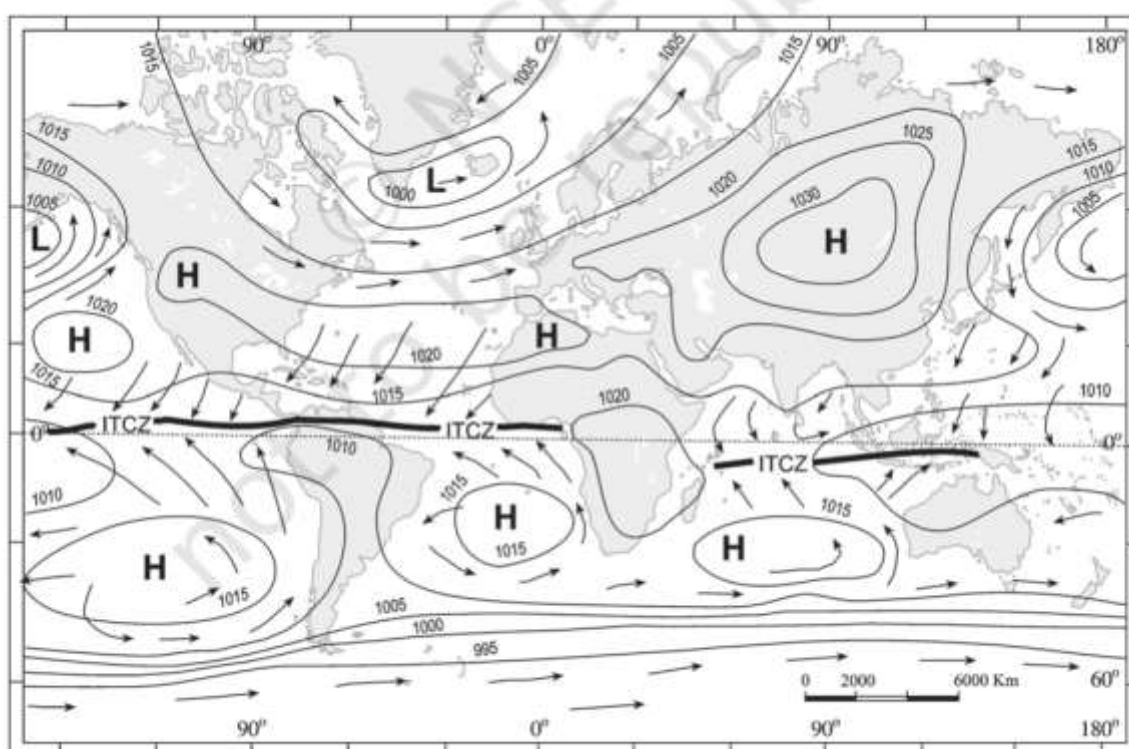


Figure 10.2 : Distribution of pressure (in millibars) — January

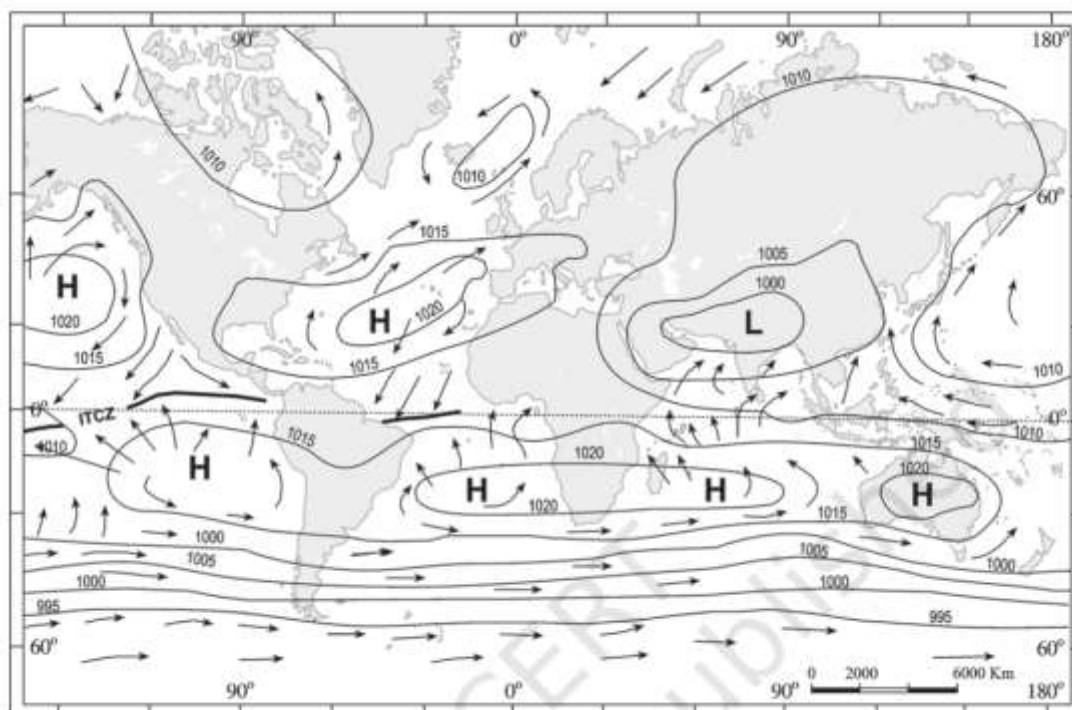


Figure 10.3 : Distribution of pressure (in millibars) — July

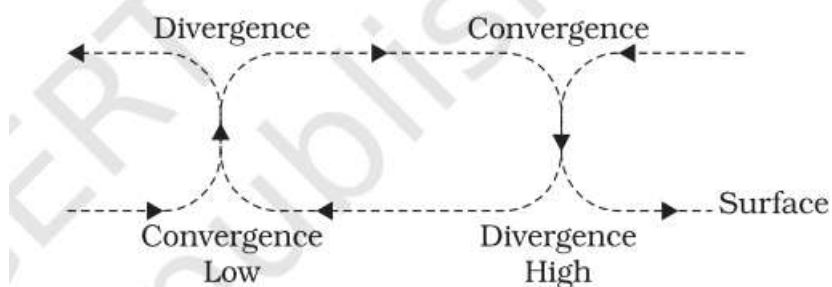


Figure 10.5 : Convergence and divergence of winds

Table 10.2 : Pattern of Wind Direction in Cyclones and Anticyclones

Pressure System	Pressure Condition at the Centre	Pattern of Wind Direction	
		Northern Hemisphere	Southern Hemisphere
Cyclone	Low	Anticlockwise	Clockwise
Anticyclone	High	Clockwise	Anticlockwise

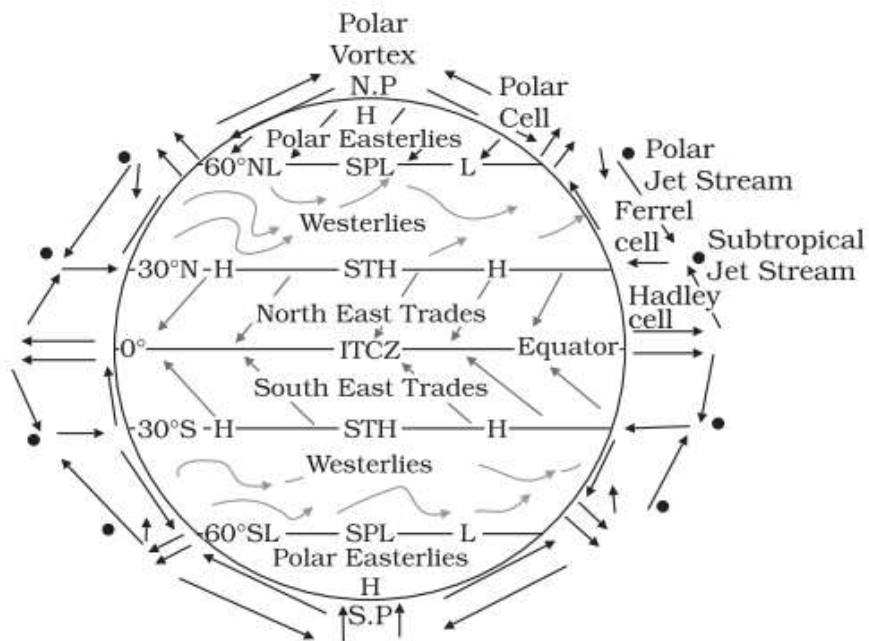


Figure 10. 6 : Simplified general circulation of the atmosphere



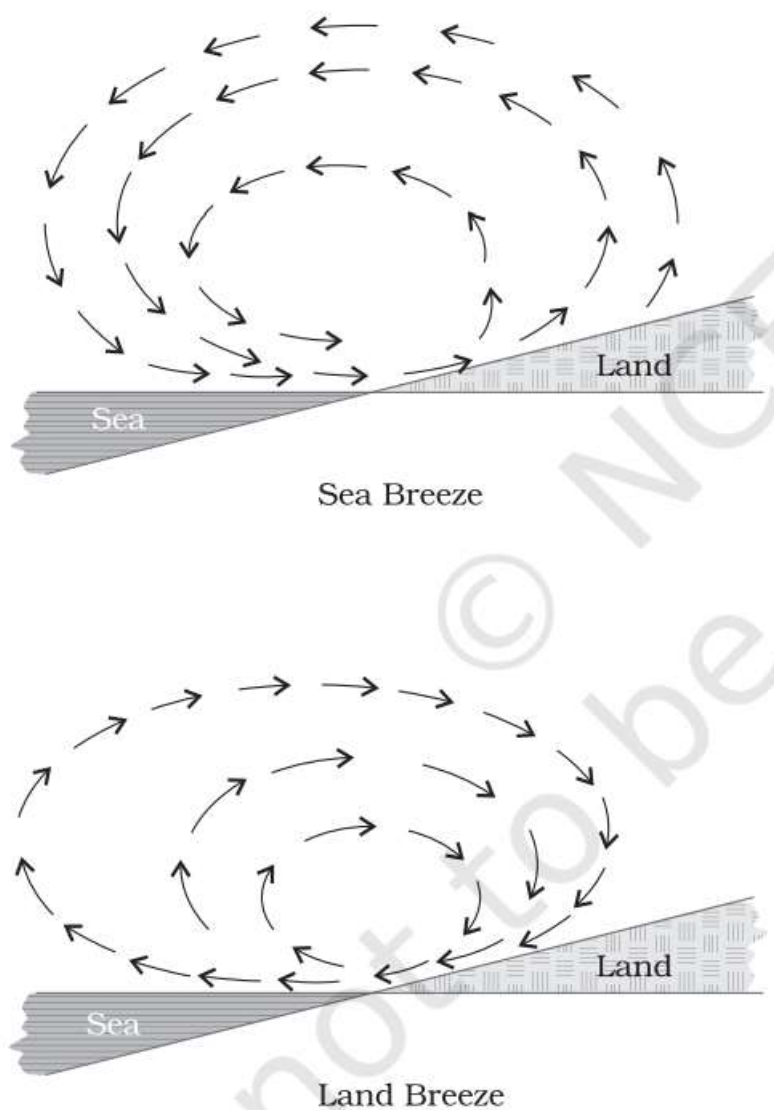


Figure 10.7 : Land and sea breezes

Table 12.1 : Climatic Groups According to Koeppen

Group	Characteristics
A - Tropical	Average temperature of the coldest month is 18° C or higher
B - Dry Climates	Potential evaporation exceeds precipitation
C - Warm Temperate	The average temperature of the coldest month of the (Mid-latitude) climates years is higher than minus 3°C but below 18°C
D - Cold Snow Forest Climates	The average temperature of the coldest month is minus 3° C or below
E - Cold Climates	Average temperature for all months is below 10° C
H - High Land	Cold due to elevation

Table 12.2 : Climatic Types According to Koeppen

Group	Type	Letter Code	Characteristics
A-Tropical Humid Climate	Tropical wet	Af	No dry season
	Tropical monsoon	Am	Monsoonal, short dry season
	Tropical wet and dry	Aw	Winter dry season
B-Dry Climate	Subtropical steppe	BSh	Low-latitude semi arid or dry
	Subtropical desert	BWh	Low-latitude arid or dry
	Mid-latitude steppe	BSk	Mid-latitude semi arid or dry
	Mid-latitude desert	BWk	Mid-latitude arid or dry
C-Warm temperate (Mid-latitude) Climates	Humid subtropical	Cfa	No dry season, warm summer
	Mediterranean	Cs	Dry hot summer
	Marine west coast	Cfb	No dry season, warm and cool summer
D-Cold Snow-forest Climates	Humid continental	Df	No dry season, severe winter
	Subarctic	Dw	Winter dry and very severe
E-Cold Climates	Tundra	ET	No true summer
	Polar ice cap	EF	Perennial ice
H-Highland	Highland	H	Highland with snow cover



Table 13.1 : Components and Processes of the Water Cycle

<i>Components</i>	<i>Processes</i>
Water storage in oceans	Evaporation Evapotranspiration Sublimation
Water in the atmosphere	Condensation Precipitation
Water storage in ice and snow	Snowmelt runoff to streams
Surface runoff	Stream flow freshwater storage infiltration
Groundwater storage	Groundwater discharge springs

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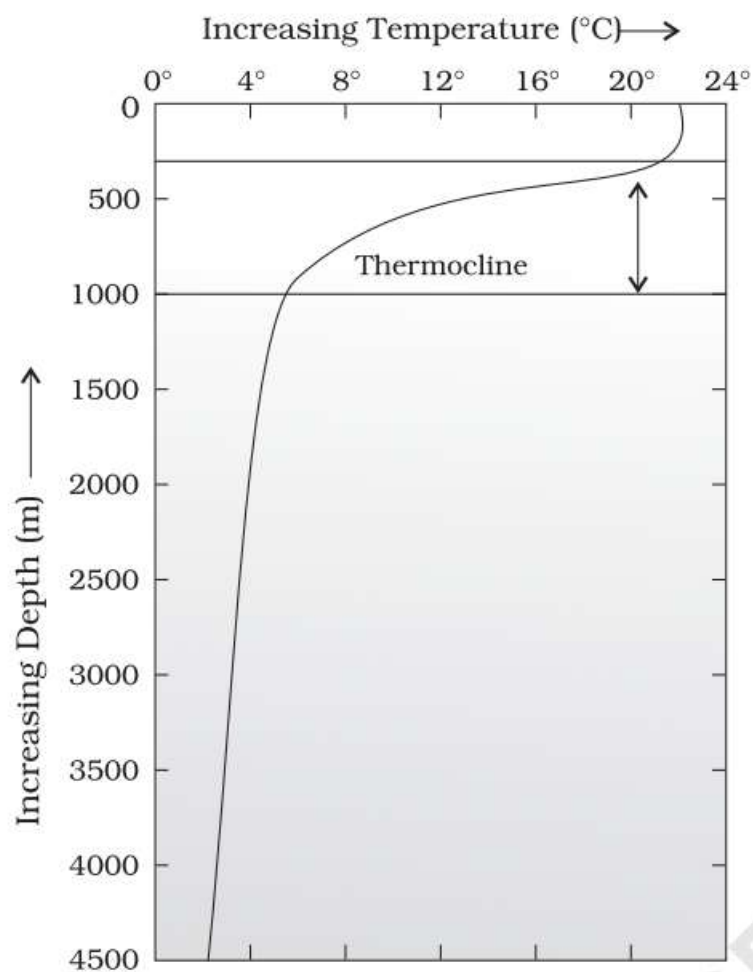


Figure 13.3 : Thermocline

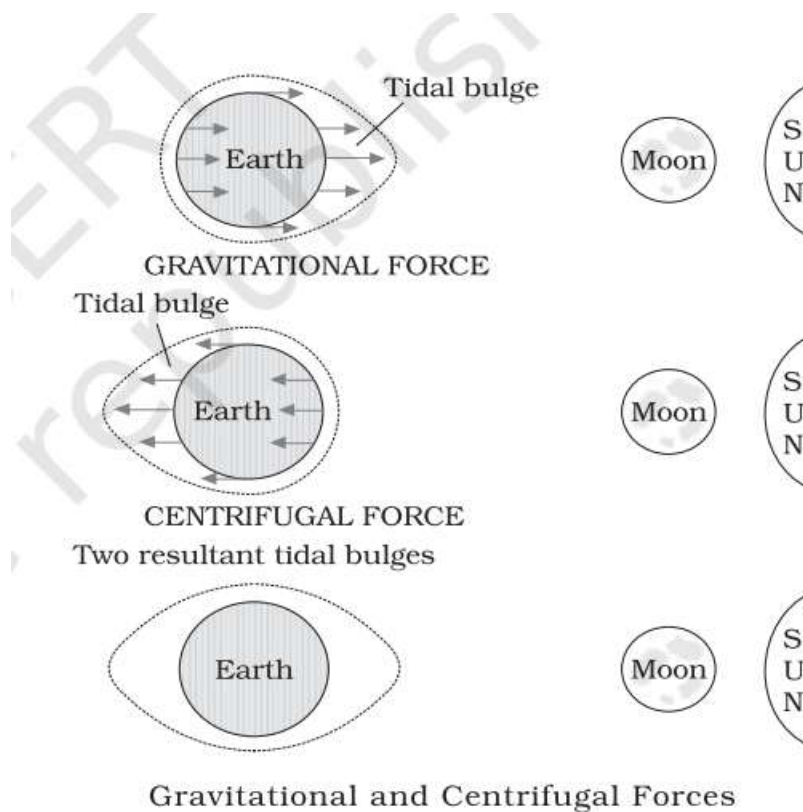


Figure 14.2 : Relation between gravitational forces and tides

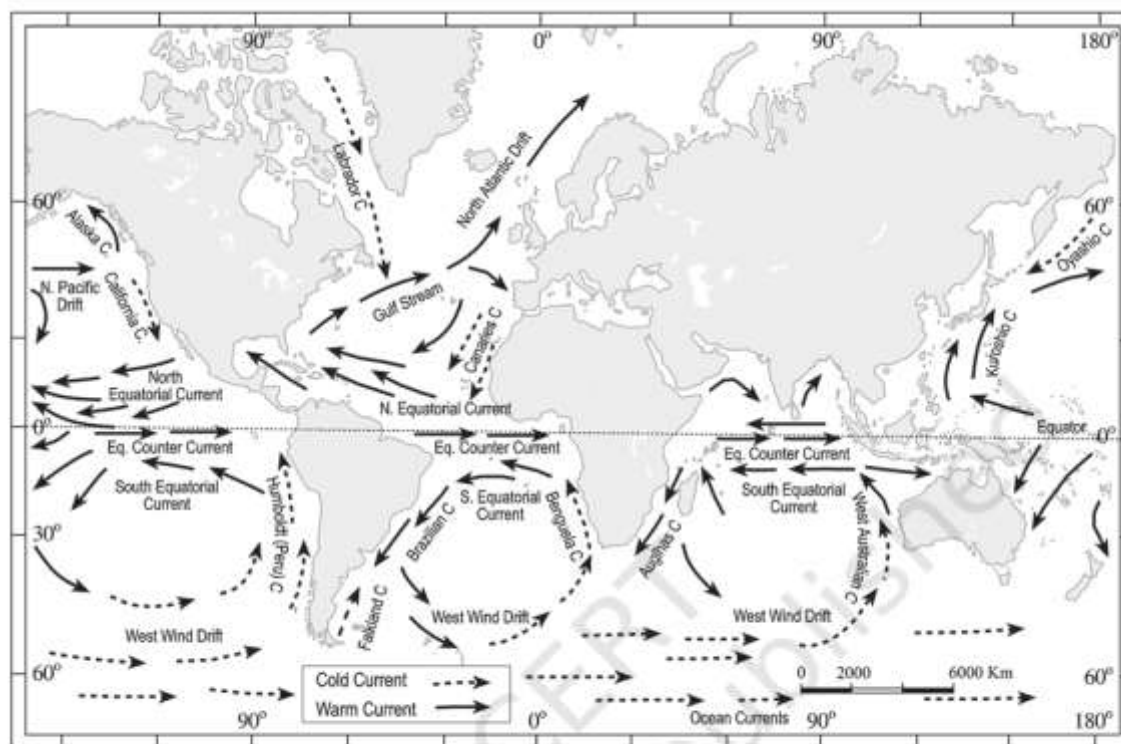


Fig. 14.3 : Major currents in the Pacific, Atlantic and Indian oceans

Table 15.1 : World Biomes

Biomes	Subtypes	Regions	Climatic Characteristics	Soil	Flora and Fauna
Forest	A. Tropical 1. Equatorial 2. Deciduous B. Temperate C. Boreal	A1. 10° N-S A2. 10° - 25° N-S B. Eastern North America, N.E. Asia, Western and Central Europe C. Broad belt of Eurasia and North America (parts of Siberia, Alaska, Canada and Scandinavia)	A1. Temp. 20-25°C, evenly distributed A2. Temp. 25-30°C, Rainfall, ave. ann. 1,000mm, seasonal B. Temp. 20-30° C, Rainfall evenly distributed 750-1,500mm, Well-defined seasons and distinct winter. C. Short moist moderately warm summers and long cold dry winter; very low temperatures. Precipitation mostly snowfall 400 - 1,000mm	A1. Acidic, poor in nutrients A2. Rich in nutrients B. Fertile, en-riched with decaying litter C. Acidic and poor in nutrients, thin soil cover	A1. Multi-layered canopy tall and large trees A2. Less dense, trees of medium height; many varieties co-exist. Insects, bats, birds and mammals are common species in both B. Moderately dense broad leaved trees. With less diversity of plant species. Oak, Beach, Maple etc. are some common species. Squirrels, rabbits, skunks, birds, black bears, mountain lions etc. C. Evergreen conifers like pine, fur and spruce etc. Wood peckers, hawks, bears, wolves, deer, hares and bats are common animals
Desert	A. Hot and Dry desert B. Semi arid desert C. Coastal desert D. Cold desert	A. S a h a r a , K a l a h a r i , M a r u s t h a l i , R u b - e l - K h a l i B. Marginal areas of hot deserts C. Atacama D. Tundra climatic regions	A. Temp. 20 - 45°C. B. 21 - 38°C. C. 15 - 35°C. D. 2 - 25°C A-D Rainfall is less than 50 mm	Rich in nutrients with little or no organic matter	A-C. Scanty vegetation; few large m a m m a l s , insects, reptiles and birds D. Rabbits, rats, antelopes and ground squirrels
Grassland	A. Tropical Savannah B. Temperate Steppe	A. Large areas of Africa, Australia, South America and India B. Parts of Eurasia and North America	A. Warm hot climates, Rainfall 500-1,250 mm B. Hot summers and cold winter. Rainfall 500 - 900 mm	A. Porous with thin layer of humus. B. Thin flocculated soil, rich in bases	A. Grasses; trees and large shrubs absent; giraffes zebras, buffalos, leopards, hyenas, elephants, mice, moles, snakes and worms etc., are common animals B. Grasses; occasional trees such as cottonwoods, oaks and willows; gazelles, zebras, rhin-

					oceros, wild horses, lions, varieties of birds, worms, snakes etc., are common animals
Aquatic	A. Freshwater B. Marine	A. Lakes, streams, rivers and wetlands B. Oceans, coral reefs, lagoons and estuaries	A-B Temperatures vary widely with cooler air temperatures and high humidity	A. Water, swamps and marshes B. Water, tidal swamps and marshes	Algal and other aquatic and marine plant communities with varieties of water dwelling animals
Altitudinal	—	Slopes of high mountain ranges like the Himalayas, the Andes and the Rockies	Temperature and precipitation vary depending upon latitudinal zone	Regolith over slopes	Deciduous to tundra vegetation, varying according to altitude

Process involved in Nitrogen Cycle:

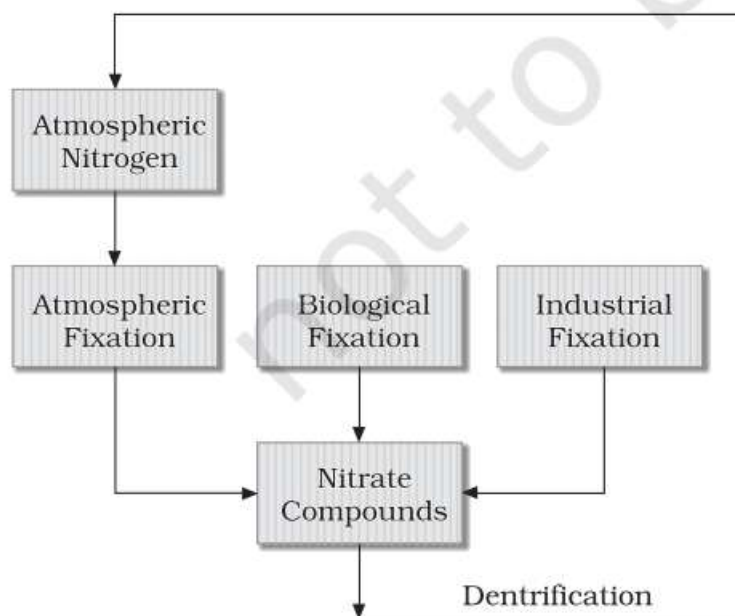


Figure 15.3 : Nitrogen Cycle

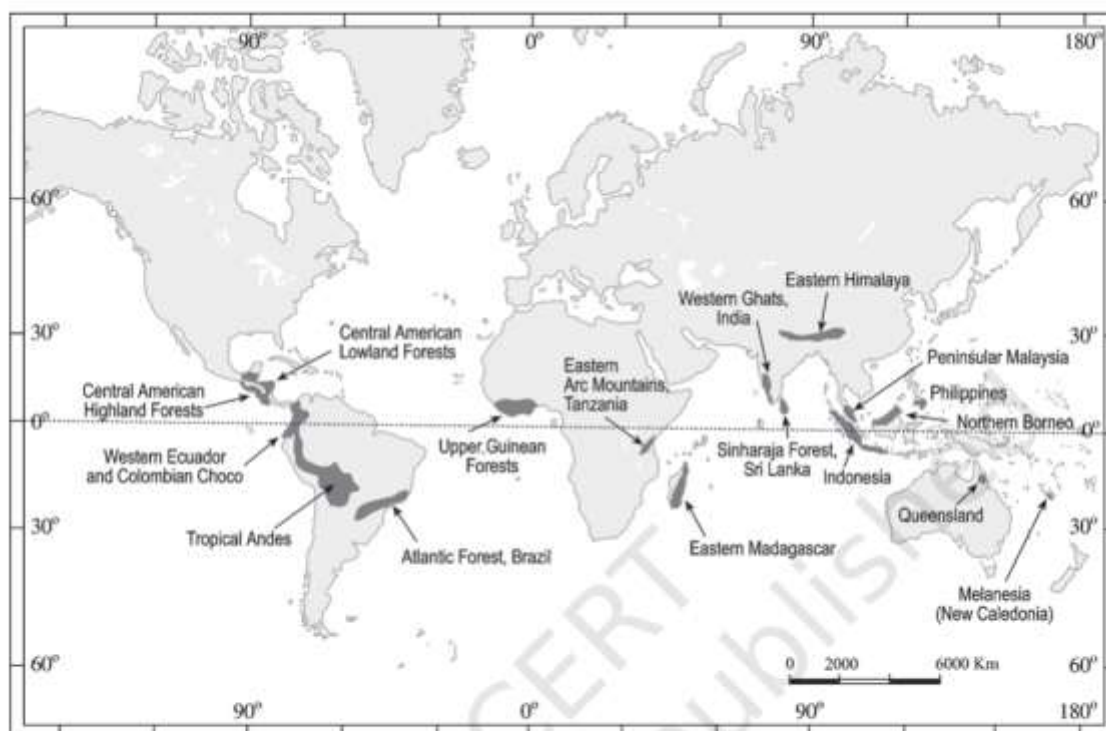


Figure 16.5 : Some ecological 'hotspots' in the world



The Solar System

	<i>Mercury</i>	<i>Venus</i>	<i>Earth</i>	<i>Mars</i>	<i>Jupiter</i>	<i>Saturn</i>	<i>Uranus</i>	<i>Neptune</i>
Distance*	0.387	0.723	1.000	1.524	5.203	9.539	19.182	30.058
Density@	5.44	5.245	5.517	3.945	1.33	0.70	1.17	1.66
Radius#	0.383	0.949	1.000	0.533	11.19	9.460	4.11	3.88
Satellites	0	0	1	2	about 53	about 53	about 27	13

* Distance from the sun in astronomical unit i.e. average mean distance of the earth is 149,598,000 km = 1 @ Density in gm/cm³

Radius: Equatorial radius 6378.137 km = 1

Source: <http://planetarynames.wr.usgs.gov/page/planets>

Geological Time Scale

<i>Eons</i>	<i>Era</i>	<i>Period</i>	<i>Epoch</i>	<i>Age/ Years Before Present</i>	<i>Life/ Major Events</i>
	Cainozoic (From 65 million years to the present times)	Quaternary	Holocene Pleistocene	0 - 10,000 10,000 - 2 million	Modern Man Homo Sapiens
		Tertiary	Pliocene Miocene	2 - 5 million 5 - 24 million	Early Human Ancestor Ape; Flowering Plants and Trees
			Oligocene Eocene Palaeocene	24 - 37 million 37 - 58 Million 57 - 65 Million	Anthropoid Ape Rabbits and Hare Small Mammals : Rats - Mice
		Mesozoic 65 - 245 Million Mammals	Cretaceous Jurassic Triassic	65 - 144 Million 144 - 208 Million 208 - 245 Million	Extinction of Dinosaurs Age of Dinosaurs Frogs and turtles
	Palaeozoic 245 - 570 Million	Permian		245 - 286 Million	Reptile dominate-replace amphibians
		Carboniferous		286 - 360 Million	First Reptiles:
		Devonian Silurian		360 - 408 Million 408 - 438 Million	Vertebrates: Coal beds Amphibians
		Ordovician Cambrian		438 - 505 Million 505 - 570 Million	First trace of life on land: Plants First Fish
					No terrestrial Life : Marine Invertebrate
Proterozoic Archean Hadean	Pre-Cambrian 570 Million - 4,800 Million			570 - 2,500 Million 2,500 - 3,800 Million 3,800 - 4,800 Million	Soft-bodied arthropods Blue green Algae: Unicellular bacteria Oceans and Continents form - Ocean and Atmosphere are rich in Carbon dioxide
Origin of Stars Supernova Big Bang	5,000 - 13,700 Million			5,000 Million 12,000 Million 13,700 Million	Origin of the sun Origin of the universe

Table 5.1 : The Major Elements of the Earth's Crust

<i>Sl. No.</i>	<i>Elements</i>	<i>By Weight(%)</i>
1.	Oxygen	46.60
2.	Silicon	27.72
3.	Aluminium	8.13
4.	Iron	5.00
5.	Calcium	3.63
6.	Sodium	2.83
7.	Potassium	2.59
8.	Magnesium	2.09
9.	Others	1.41

Table 8.1 : Permanent Gases of the Atmosphere

<i>Constituent</i>	<i>Formula</i>	<i>Percentage by Volume</i>
Nitrogen	N ₂	78.08
Oxygen	O ₂	20.95
Argon	Ar	0.93
Carbon dioxide	CO ₂	0.036
Neon	Ne	0.002
Helium	He	0.0005
Krypto	Kr	0.001
Xenon	Xe	0.00009
Hydrogen	H ₂	0.00005

INDIAN GEOGRAPHY



Figure 1.1 : India : Administrative Divisions

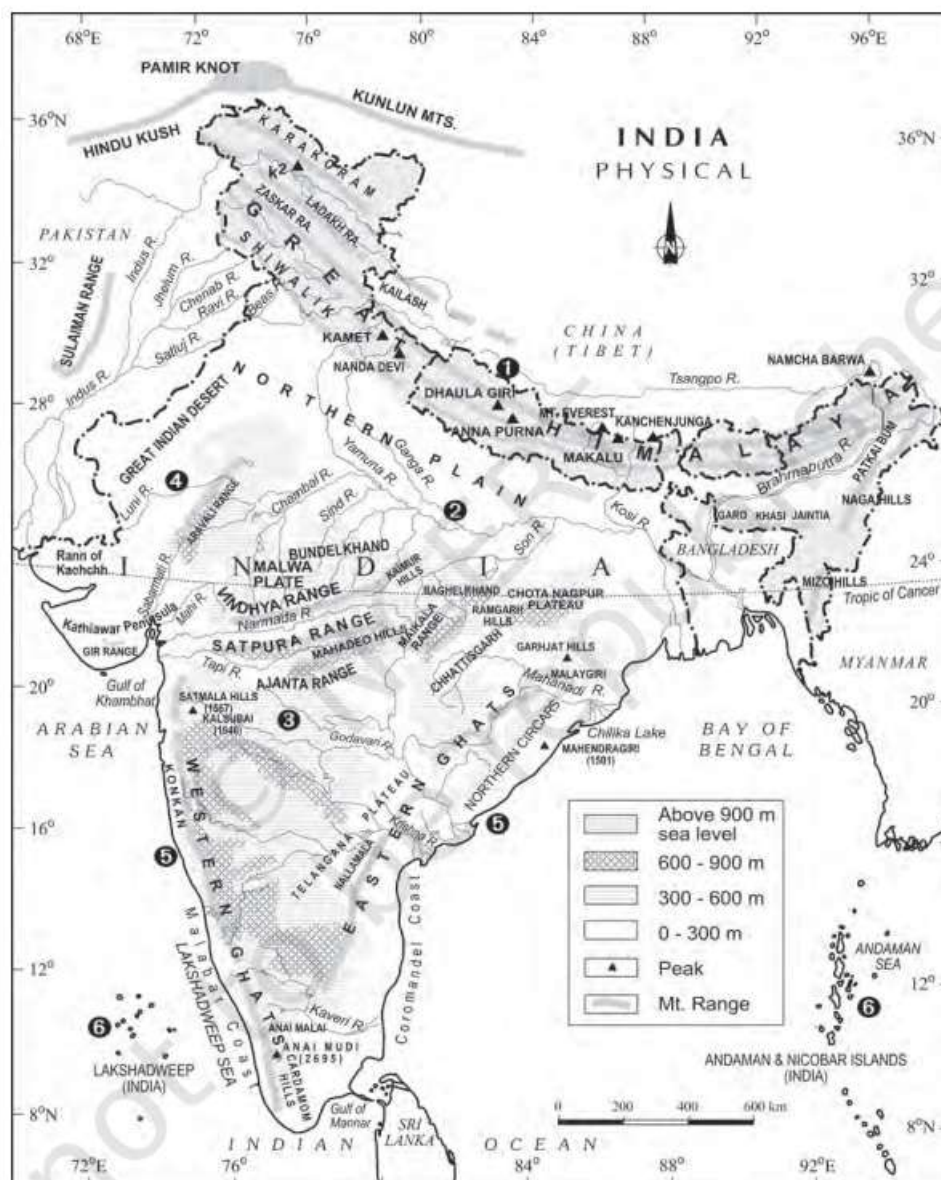


Figure 2.2 : India : Physical



Figure 2.6 : Himalayan Mountain Complex : Cross Sectional View from South to North

river of Kerala, Bharathapuzha rises near Annamalai hills. It is also known as Ponnani. It drains an area of 5,397 sq. km. Compare its catchment area with that of the Sharavati river of Karnataka.

The Periyar is the second largest river of Kerala. Its catchment area is 5,243 sq. km. You can see that there is a marginal difference in the catchment area of the Bharathapuzha and the Periyar rivers.

Another river of Kerala worth mentioning is the Pamba river which falls in the Vembanad lake after traversing a course of 177 km.

Teachers may explain the comparative importance of west flowing small rivers	
River	Catchment area sq. km
Sabarmati	21,674
Mahi	34,842
Dhandhar	2,770
Kalinadi	5,179
Sharavati	2,029
Bharathapuzha	5,397
Periyar	5,243

Small Rivers Flowing towards the East

There are a large number of rivers flowing towards the east along with their tributaries.

Among the Sabarmati, the Mahi, the Brahmani, the Vamsadhara, the Penner, the Palar and the Vaigai are important rivers. Find out these rivers from the atlas.

Teachers may explain the comparative importance of east flowing small rivers	
River	Catchment area sq. km
Subarnarekha	19,296
Baitarni	12,789
Brahmani	39,033
Penner	55,213
Palar	17,870

RIVER REGIMES

Do you know that the quantity of water flowing in a river channel is not the same throughout the year? It varies from season to season. In which season do you expect the maximum flow in Ganga and Kaveri? The pattern of flow of water in a river channel over a year is known as its regime. The north Indian rivers originating from the Himalayas are perennial as they are fed by glaciers through snow melt and also receive rainfall water during rainy season. The rivers of South India do not originate from glaciers and their flow pattern witnesses fluctuations. The flow increases

Table 3.1 : Comparison between the Himalayan and the Peninsular River

Sl. No.	Aspects	Himalayan River	Peninsular River
1.	Place of origin	Himalayan mountain covered with glaciers	Peninsular plateau and central highland
2.	Nature of flow	Perennial; receive water from glacier and rainfall	Seasonal; dependent on monsoon rainfall
3.	Type of drainage	Antecedent and consequent leading to dendritic pattern in plains	Super imposed, rejuvenated resulting in trellis, radial and rectangular patterns
4.	Nature of river	Long course, flowing through the rugged mountains experiencing headward erosion and river capturing; In plains meandering and shifting of course	Smaller, fixed course with well-adjusted valleys
5.	Catchment area	Very large basins	Relatively smaller basin
6.	Age of the river	Young and youthful, active and deepening in the valleys	Old rivers with graded profile, and have almost reached their base levels

Table 5.1 : List of Biosphere Reserves

Sl. No.	Name of the Biosphere Reserve and Total Geographical Area (km ²)	Date of Designation	Location in the States/UT
1.	Nilgiri (5520)	01.08.1986	Part of Wynad, Nagarhole, Bandipur and Madumalai, Nilambur, Silent Valley and Siruvani Hills (Tamil Nadu, Kerala and Karnataka).
2.	Nanda Devi (5860.69)	18.01.1988	Part of Chamoli, Pithoragarh and Almora Districts in Uttarakhand.
3.	Nokrek (820)	01.09.1988	Part of East, West and South Garo Hill Districts in Meghalaya.
4.	Manas (2837)	14.03.1989	Part of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darang Districts in Assam
5.	Sunderban (9630)	29.03.1989	Part of delta of Ganges and Brahmaputra river system in West Bengal.
6.	Gulf of Mannar (10500)	18.02.1989	Indian part of Gulf of Mannar extending from Rameswaram island in the North to Kanyakumari in the South of Tamil Nadu.
7.	Great Nicobar (885)	06.01.1989	Southern most island of Andaman and Nicobar Islands.
8.	Similipal (4374)	21.06.1994	Part of Mayurbhanj District in Odisha.
9.	Dibru-Saikhowa (765)	28.07.1997	Part of Dibrugarh and Tinsukia Districts in Assam
10.	Dehang Debang (5111.5)	02.09.1998	Part of Upper Siang, West Siang and Dibang Valley Districts in Arunachal Pradesh.
11.	Pachmarhi (4981.72)	03.03.1999	Part of Betul, Hoshangabad and Chhindwara Districts in Madhya Pradesh.
12.	Khangchendzonga (2619.92)	07.02.2000	Part of North and West Districts in Sikkim
13.	Agasthyamalai (3500.36)	12.11.2001	Part of Thirunelveli and Kanyakumari Districts in Tamil Nadu and Thiruvananthapuram, Kollam and Pathanamthitta districts in Kerala.
14.	Achanakmar-Amarkantak (3835.51)	30.03.2005	Part of Anuppur and Dindori Districts of Madhya Pradesh and Bilaspur district of Chhattisgarh
15.	Kachchh (12,454)	29.01.2008	Part of Kachchh, Rajkot, Surendranagar and Patan Districts in Gujarat.
16.	Cold Desert (7770)	28.08.2009	Pin Valley National Park and surroundings; Chandratal and Sarchu and Kibber Wildlife sanctuary in Himachal Pradesh.
17.	Seshachalam (4755.997)	20.09.2010	Seshachalam hill ranges in Eastern Ghats encompassing part of Chittoor and Kadapa Districts in Andhra Pradesh.
18.	Panna (2998.98)	25.08.2011	Part of Pann and Chhattarpur Districts in Madhya Pradesh.

* Sites with bold letters have been included in the World Network of BRs of UNESCO.

Source : Annual Report 2018-19, Ministry of Environment and Forests, Government of India

ICAR has classified the soils of India into the following order as per the USDA soil taxonomy

Sl. No.	Order	Area (in Thousand Hectares)	Percentage
(i)	Inceptisols	130372.90	39.74
(ii)	Entisols	92131.71	28.08
(iii)	Alfisols	44448.68	13.55
(iv)	Vertisols	27960.00	8.52
(v)	Aridisols	14069.00	4.28
(vi)	Ultisols	8250.00	2.51
(vi)	Mollisols	1320.00	0.40
(viii)	Others	9503.10	2.92
Total			100

Source : Soils of India, National Bureau of Soil Survey and Land Use Planning, Publication Number 94

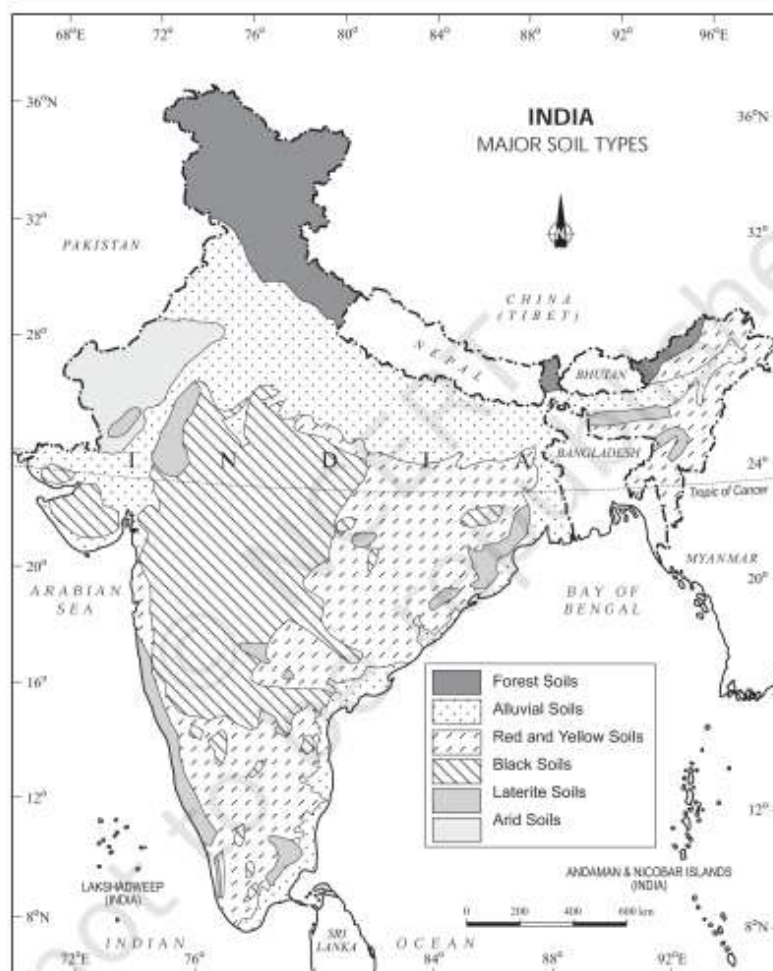


Figure 6.2 : Major Soil Types of India