

**S.S. COLLEGE, JEHANABAD
(GEOGRAPHY DEPARTMENT)**

B.A. PART - 1 (PHYSICAL GEOGRAPHY : PAPER - 1)

TOPIC : SALINITY OF OCEAN WATER

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The salinity of ocean water is a measure of the concentration of dissolved salts, which are mostly – sodium chloride but also include salts containing magnesium, sulfur, calcium, and potassium. The average salinity of seawater is about 35 parts per thousand, or 3.5 percent of total mass.

The geographic distribution of surface salinity varies. At any given location on the ocean surface, the salinity depends on how much evaporation is taking place and how much freshwater (primarily from rainfall and stream discharge) is being added. The salinity of Ocean water in the surface layer of oceans depend mainly on evaporation and precipitation.

FACTORS AFFECTING OCEAN SALINITY

- Salinity, temperature, and density of water are interconnected. The salinity of water in the surface layer of oceans is influenced by:
 - Evaporation
 - Precipitation
- In the coastal regions, the surface salinity is influenced by the freshwater flow from rivers.
- In the Polar region, the surface salinity is influenced by the processes of freezing and melting of ice.

- The wind also influences the salinity of an area by moving water to other areas.
- The ocean currents contribute to the salinity variations.
- The change in the density or temperature influences the salinity of water in an area.

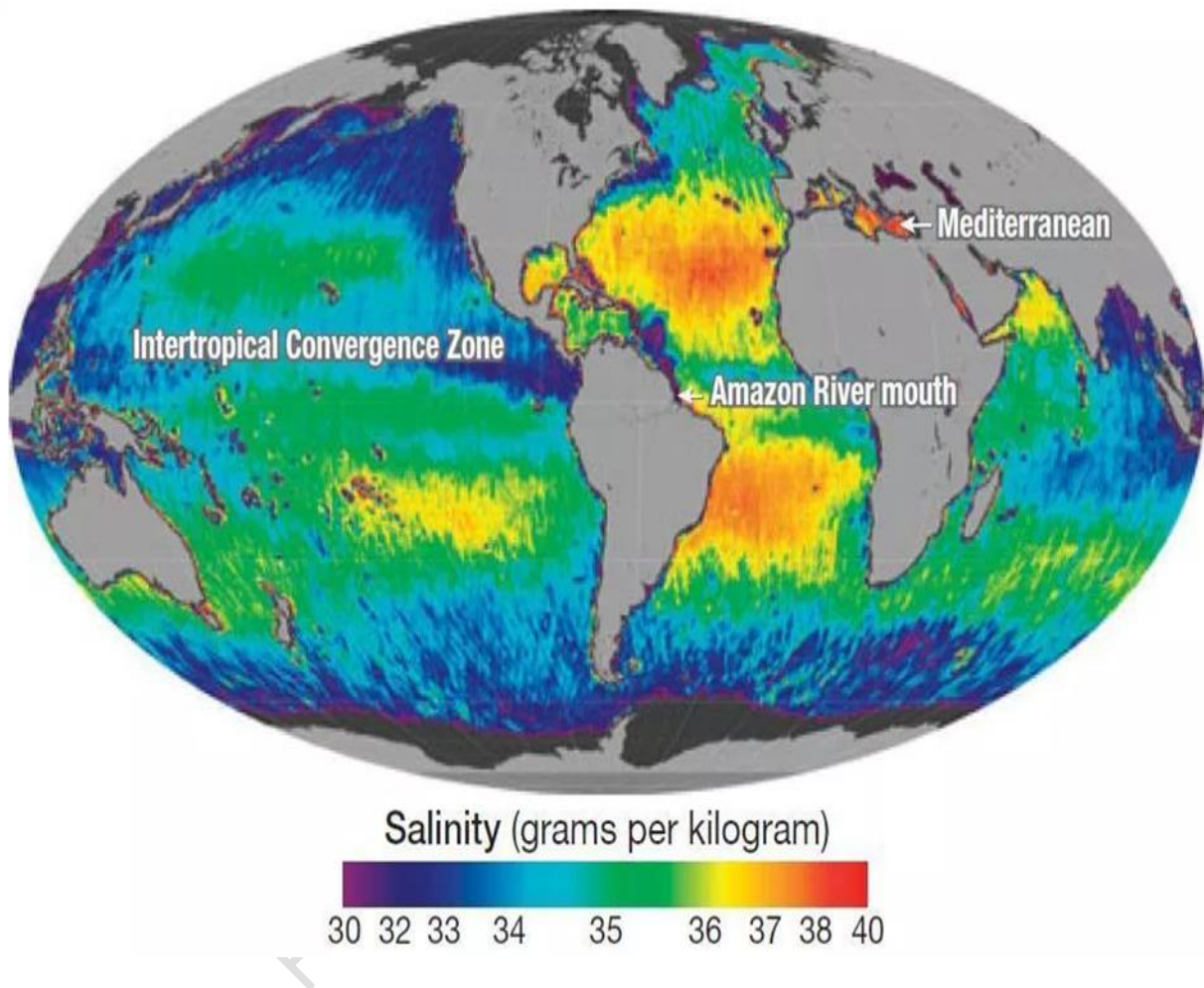
Dissolved Salts in Sea Water (gm of Salt per kg of Water)

Chlorine	18.97
Sodium	10.47
Sulphate	2.65
Magnesium	1.28
Calcium	0.41
Potassium	0.38
Bicarbonate	0.14
Bromine	0.06
Borate	0.02
Strontium	0.01

Share of Different Salts

- Sodium chloride—77.7%
- Magnesium chloride—10.9%
- Magnesium sulphate—.4.7%

- Calcium sulphate — 3.6%
- Potassium sulphate — 2.5%



Where the evaporation rate is high, so is salinity; where the inflow of freshwater is high, salinity is low

- Surface salinity is greatly influenced in coastal regions by the fresh water flow from rivers, and in polar regions by the processes of freezing and thawing of ice.
- Wind, also influences salinity of an area by transferring water to other areas.

- The ocean currents contribute to the salinity variations. Salinity, temperature and density of water are interrelated. Hence, any change in the temperature or density influences the salinity of an area.

Highest and Lowest Salinity of Ocean Water

Typically the lowest salinities are found where rainfall is heavy and near the mouths of major rivers. Salinity is highest in partly landlocked seas in dry, hot regions because here the evaporation rate is high and stream discharge is minimal. As a general pattern, salinity is low in equatorial regions because of heavy rainfall, cloudiness, and humidity, all of which inhibit evaporation, and also because of considerable river discharge. Salinity rises to a general maximum in the subtropics, where precipitation is low and evaporation extensive, and decreases to a general minimum in the polar regions, where evaporation is minimal and there is considerable inflow of freshwater from rivers and ice caps. Where the evaporation rate is high, so is salinity; where the inflow of freshwater is high, salinity is low

Salinity of Ocean water Affects Ocean Water Density

- Seawater density varies with temperature, degree of salinity, and depth. High temperature produces low density, and high salinity produces high density. Deep water has high density because of low temperature and because of the pressure of the overlying water.
- Surface layers of seawater tend to contract and sink in cold regions, whereas in warmer areas deeper waters tend to rise to the surface.
- Surface currents also affect this situation, particularly by producing an upwelling of colder, denser water in some localities. As we will see later in this chapter, differences in density are partially responsible for a vast, slow circulation of deep ocean water.

Salinity of freshwater

Salinity of freshwater is nearly equal to zero. The salinity of water in the ocean averages about 35 parts per thousand (ppt). The mixture of seawater and fresh water in estuaries is called brackish water and its salinity can range from 0.5 to 35 ppt.

Vertical distribution of salinity in oceans

Very cold and very salty water forms in polar regions every winter. This cold and salty water is denser, so it sinks toward the seafloor.

Pacific ocean salinity

Salinity also varies latitudinally, reaching a maximum of 37 parts per thousand in the southeastern area. The water near the equator, which can have a salinity as low as 34 parts per thousand, is less salty than that found in the mid-latitudes because of abundant equatorial precipitation throughout the year.

#Indian ocean salinity – The surface salinity in Indian ocean ranges from 32 to 37 parts per 1000.

*Enclosed Seas in the world (example)

- Enclosed Sea — black sea ,dead sea
- Partially enclosed Sea – Mediterranean sea, red sea

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