

MARINE DEPOSITS

DR. SANJAY KUMAR

MAHARAJA COLLEGE, ARA, BIHAR, INDIA

Deposits found on the ocean floor are known as ocean /marine deposits. According to R.C.Sharma -“The unconsolidated layer of sediments found on the ocean floor is known as Ocean Deposits.”

These deposits are unconsolidated and come from different sources. Some deposit comes from continental part through weathering and erosion. Some deposits receive through volcanic and earthquake action .Some deposits brought by ice/snow while some deposit comes from ocean itself. This is the reason for the variation of marine deposits from one part to another part.

Murrey has divided ocean deposits on the basis of depth:

- a- **Terrigenous deposits**– found up to 100 fathoms/200m.
- b- **Pelagic deposits** – found beyond 100 fathoms/>200m.

Johnson and Jenkins have classified ocean deposits into three categories:

- a- **Littoral** - 9.1% (sand, clay, soil)
- b- **Terrigenous** - 15.4 % (up to 100 fathom)
- c- **Pelagic** - 75.5 % (beyond 100 fathom)

Monckhouse has classified marine deposits into 4 categories:

a- The Deposit of sands on continental shelf.

b- The deposits of sand, soil and coral on continental - shelf towards ocean.

c- The deposit of soil and coral reefs on continental slope.

d- The Pelagic deposits in deep sea.

The common classification of ocean deposits is based on the source of deposited materials.

Ocean Deposits:

1. Terrigenous Materials- Source- continents

Depth - up to 200m - Location – shallow sea

2. Volcanic Deposits- Source- volcanoes of island and sea

Location – regions of mid oceanic ridge

3. Extra-Terrestrial Materials – Source-universe

Location – Deep oceanic bed of Pacific Ocean

4. Inorganic Materials – Source – atmosphere

Location – here & there, highly scattered

5. Organic Materials - Source – marine environment

Location – Deep oceans Depth->200m.

6. Red Clay – Source – organic/inorganic

Location – deep oceanic area

SOURCES OF MARINE DEPOSITS

1. **Terrigenous Materials** - Terrigenous rocks mostly consists of igneous and sedimentary are disintegrated into smaller fragments and are carried down to the sea or ocean floor by rivers as mud, clay and sand ;are called Terrigenous deposits. Terrigenous deposits are broadly classified into Gravel, Mud and Sand.

Size of Terrigenous sediments

Sediments	Diameter (in mm)
<i>Boulder</i>	256
<i>Cobble</i>	64
<i>Pebble</i>	4
<i>Granule</i>	2
<i>Very coarse sand</i>	1
<i>Coarse sand</i>	1/2
<i>Medium sand</i>	1/4
<i>Fine sand</i>	1/6
<i>Very fine sand</i>	1/8
<i>Silt</i>	1/32 - 1/256
<i>Clay</i>	1/512 - 1/8192
<i>Mud</i>	>1/8192

Classification of Mud (By Murray)

Blue mud - Disintegration of sulphide and organic matter containing rocks results into Blue mud. Blue mud is generally found along the Atlantic, the Mediterranean, Arctic and Indian Ocean.

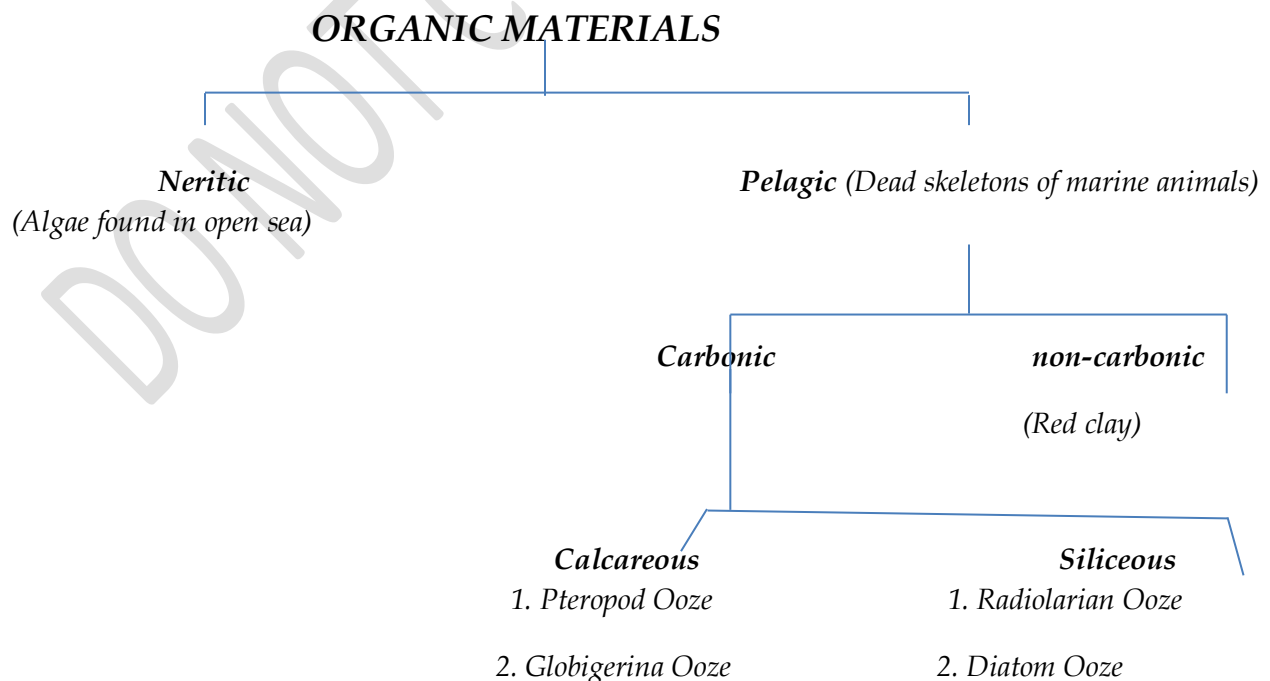
Red mud - Red mud mostly contains iron oxides. Occurrences are in Yellow sea, Atlantic Ocean and at the coast of Brazil.

Green mud- Green mud contains green silicate of potassium and iron (Glaucanitic). Green mud is found between 100-900 fathoms depth. Cape of Good Hope, the Pacific, the Atlantic coasts of North America (south of Cape Hatteras and California), Off the coast of Japan, Australia and South Africa.

2. **Volcanism**- Two types of volcanic materials are deposited on the ocean floor i.e. - sub-marine and sub-aerial. Sub -marine volcanic materials is derived from the basaltic oceanic rocks along the coasts by their disintegration. While Sub-aerial materials comes from the land after being thrown out from a volcano and later generally transported to the sea by the rivers. Volcanic products are normally found mixing with green mud and coral mud oceanic islands are important from this point of view.

3. **Organic Materials**- Calcareous and siliceous remains of the organism derived from the sea; are called organic materials.

•(Pelagic deposits are also known as Ooze.)



Pteropod Ooze:

This type of ooze is found in the areas with low annual rainfall and temperature where warm ocean current flows. It is found at the depth of 800-1000 fathom. Pteropod ooze is very soft because it is made from mollusk organism and is mostly found in the eastern and western Pacific Ocean between 0⁰-23⁰ latitudes.

Globigerina Ooze:

Globigerina ooze is made from the globigerina dominant calcium cells of foraminifera. It is mostly found in tropical and Temperate Zone Warm Ocean current areas. 1000-2000 fathom depth of up to 66.5⁰ latitude is famous for the ooze.

Diatom Ooze:

Diatom ooze is made from the organism or micro plants of its name. It is of red colour near the coast and of yellow and earthy far from the coast. Diatom becomes white colour powder after taken out from the ocean. The ooze is found at the depth of 4000 fathom between 45⁰-90⁰ latitudes. Coast of Antarctica continent, Greenland and Japan to Alaska region is famous for diatom ooze.

Radiolarian Ooze:

Radiolarian ooze is made from the cell of micro -organism called foraminifer's group .It is found at the depth of 4000-6000 fathom. The percentage of lime changes with the increasing depth. The ooze is found mostly in southern Pacific Ocean and in Atlantic Ocean.

4. **Inorganic Precipitates**- Inorganic precipitates include amorphous silica, dolomite, barite, phosphate, manganese oxide and iron etc.

Geographical Distribution of Marine Deposits

0	↓				P	P		
2000f		G	GG	G	GG	G	G	
4000f	D	DD						
6000f			RR	R	R	R		
8000f		R E	D	C L	A Y			
10000f		E.	TER	ESST	IALDE	POS ITS		
90°	66.5°	45°	23°	0°	23°	45°	66.5°	90°

5. **Red Clay**- Red clay mainly consists of hydrated silicate of aluminum and oxide of iron. It is soft, plastic and greasy by nature, but when dried; it becomes a powder of reddish-brown colour. Radioactive substances are found and recognized in the red -clay more than in any other deposits found in the oceans.

6. **Extra-Terrestrial Matters**- Extra -Terrestrial matter includes meteoric dust coming from the space. It usually consists of iron or magnetite of iron oxide of black or brown colour. It is found only in great depth.