

Marine Sediment Outline

1. Continental Margin Sediment

Clastic / Detrital: Particles from land, ie. rivers, dunes, wind. Display fining seaward sequence. The following **FIVE** examples below are exceptions to the fining seaward sequence. This is important!

Organic- shells, skeletal parts/fragments from corals, mollusks, algae, plants, & other animals

Authigenic- AKA “**Chemical Inorganic Precipitates**”- chemical deposits that grow directly out of water such as carbonates and glauconites

Relic- sediment that has built up on shelves near river mouths before the transgression of the sea level, in other words "old beach deposits" found way out on continental shelves. *They are clastic or detrital in origin just like the first example listed.*

Residual- gravels, sand and other rocks that get worked up from below by folding or faulting.

Ice Rafting- large rock particles carried out to sea by glaciers, the glaciers melt and large rocks are dropped off tens to hundreds of miles from the present shore.

2. Oceanic Basin Province Sediment

Cosmogenous- Sometimes called “micro-meteorite” dust. Tiny space particles that passed through the atmosphere and reached the surface of Earth, but will never dominate in sediment. They are easier to find where the rates of accumulation of other sediments are extremely slow.

Hydrogenous- Sediment produced in the water from chemical reactions such as manganese nodules. AKA "inorganic chemical precipitates". *It's important to note that on the continental shelf we call these precipitates "Authigenic".* Formed by either precipitation of minerals on the sea floor (ie. Calcium Carbonate or Silicon Dioxide) or precipitation of minerals in water column.

Lithogenous- Fine grain sediment derived from other rocks; arrive to the ocean by rivers, cliff line & dune erosion, and wind. AKA “The Layered Silicates”. Examples include

Chlorite- forms in higher, colder latitudes and **Kaolinite**- produced by mineral weathering in warm wet conditions, and therefore they are more common on the surface of the ocean at lower latitudes. **Montmorillonite** forms from the alteration of volcanic ash.

Biogenous- Mostly sediment formed from Plankton, small algae and single celled organisms that make “shells” of calcium carbonate (lime) or silica. AKA as Biogenous Oozes. Marine sediment only needs to be composed of 30% Biogenous or organic to be called an “Ooze”. Important examples include:

1. Calcareous- composed of CaCO_3 Calcium Carbonate—dissolves in deeper, cold water. There are two varieties:

Calcitic: have a structure similar to the mineral Calcite. **Foraminifera** are an amoeba-like single celled organism that belong in the Kingdom Protista. AKA “**Forams**”.

Coccolithophorids are a photosynthetic algae. AKA “**Coccoliths**”. Both will not accumulate on the seafloor below the CCD.

Aragonitic: have a structure similar to the mineral Aragonite, are created by phytoplankton: **Pteropods** are mollusks, animals related to clams and snails. They will not accumulate on the ocean floor below the ACD.

2. Siliceous- composed of SiO_2 Silicon Dioxide. AKA Siliceous Oozes. Dissolve more rapidly in shallow warm water, very stable in deep cold water. They do not dissolve at any compensation depth.

Siliceous oozes are formed from **Diatoms**, a photosynthetic algae, and **Radiolarians**, an amoeba-like single celled organism that belong in the Kingdom Protista, AKA “**Rads**”.