

Kinds of Sediments: Lithogenous

- Pieces / particles of _____
 - eroded from the _____
 - carried out into the ocean by _____ and _____
 - larger = heavier = _____ = do not travel very far before reaching the bottom
- the largest sediments settle close to land: on the continental shelves or spill over the edges
- most of the smaller sediments settle near land, but a _____ make it out into the middle of the ocean (“abyssal clay” or “red clay”)

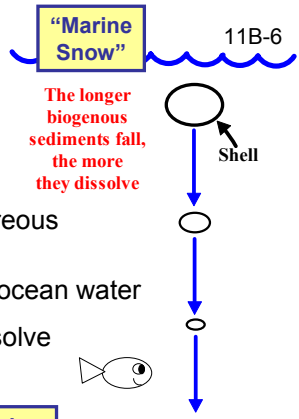
Deep-Sea Sediments 11B-4

- Kinds of Sediments & Where They Are Found
- Studying Sediments is Useful
- Copepods & Sediments

e.g., mainly sand (large) near the coast and mud (small) on the continental shelves

Kinds of Sediments: Biogenous

- Pieces / particles of the remains of _____ (e.g., _____, fecal matter, mucus)
 - Calcium carbonate shells (calcareous ooze) dissolve (“break down”) in _____, carbon dioxide-rich ocean water
 - Silica shells (siliceous ooze) dissolve faster in _____ water



Calcium Carbonate (CaCO₃) does not dissolve in warm water. Coral reefs are made of CaCO₃.

Most ocean sediments are a mixture of different kinds of sediments. They are classified by whichever sediment is most abundant (= whichever piles up fastest).

How does CO₂ affect the pH of ocean water?

Where Sediments Are Found

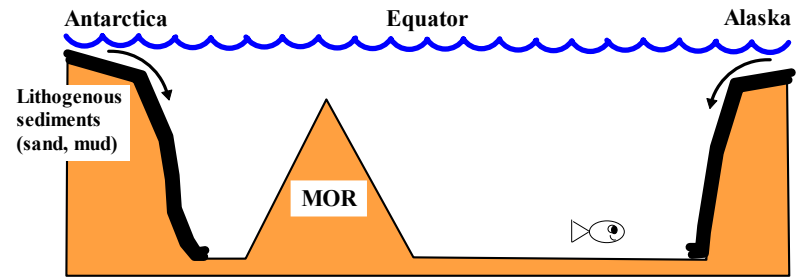
11B-7

	Warm Surface Water	Cold Surface Water
Continental Shelf	Continental (Sand, Mud)	
Not Too Deep (<1 mile)		
Deep (1-3 miles)		
Very Deep (3+ miles)		

Red clay is the only sediment that reaches the deep ocean floor, because all the biological sediments dissolve away and the larger “rock” sediments settle near the shoreline.

TTYN: Side-View Picture of Sediments

11B-8



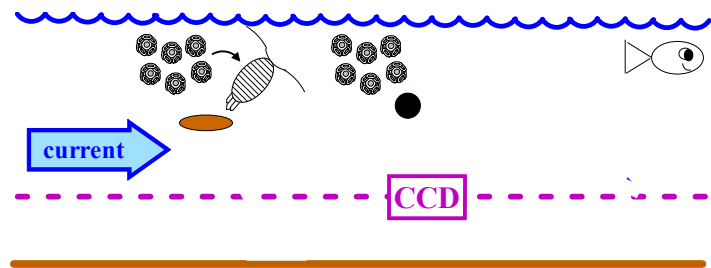
Color in where you would expect to find calcareous ooze (blue), siliceous ooze (green), and abyssal clay (red) on the ocean floor.

What kind of sediment (red clay, calcareous ooze, or siliceous ooze) piles up fastest on the ocean floor? Which piles up slowest? Why? 11B-13

- Siliceous ooze piles up _____:
 - _____ life in cold water and upwelling zones, so _____ shells sinking towards the bottom
- Red clay piles up _____:
 - very _____ sediments make it out into the ocean, most settle on the continental shelf (near land)

The Noble Copepod & Sediments I 11B-16

- the dead bodies of phytoplankton fall **very** _____ (it could take 10 years for them to reach the ocean bottom)
 - _____ before reaching the bottom
 - drift over 1000 miles: even if the remains did not dissolve, would not be found beneath where phytoplankton lived



Why Study Ocean Sediments? 11B-15

- finding & recovering mineral resources (e.g., _____ and _____)
- regulating _____ (e.g., stop overfishing: history of natural population ups & downs, conditions needed by seafloor animals)
- “_____”:
find organisms in sediments with useful properties (e.g., _____, make biofuels)
- tracking pollution
- learning about the Earth’s past (e.g., changes in _____)

What is in sediments that tells you about the fish population?

Give an example of how the kind of sediment could tell you something about the climate in the past.

The Noble Copepod & Sediments II 11B-18

- copepods are small, very common _____ plankton (crustaceans) that eat _____ plankton
 - undigested phytoplankton _____ are concentrated in the copepods’ _____ pellets.
 - pellets sink _____ (≈10 days) (shells are the densest part of the phytoplankton)
 - pellets (& the shells in them) reach the bottom **before** they _____ or drift away from where the phytoplankton lived

“Cows of the Sea”

99% of the particles that reach the deep-ocean floor are fecal pellets!

Sediments cannot tell us anything about the past unless they reach the bottom below the place where the organisms lived. Thanks, copepods!