

MARINE SEDIMENT

(made by student Randy Holloway)

- PARTICLES OF INORGANIC AND ORGANIC MATERIAL
- TRANSPORTED TO OR DEPOSITED ON OCEAN FLOOR
- ALSO MAY FORM, "INSITU" ON THE OCEAN FLOOR
- TEXTBOOK USES NERITIC=NEAR SHORE/SHELF SEDIMENT AND PELAGIC=DEEP SEA/BASIN SEDIMENT, TERRIGENOUS IS A GENERAL TERM FOR "LAND-DERIVED" SEDIMENT

CONTINENTAL SHELF SEDIMENTS:

- ◆MAINLY TERRIGENOUS OR FROM LAND, THICKER AND COARSER THAN IN DEEP SEA
- ◆QUICKER DEPOSITION RATE THAN IN DEEP SEA
- ◆SEVERAL DIFFERENT TYPES

CLASTIC/DETRITAL

- MADE FROM BROKEN TRANSPORTED PARTICLES FROM "PRE-EXISTING" ROCKS AND SOILS
- CLASSED BY SIZE WHERE GRAVEL>SAND>SILT>CLAY
- UNDERGOES FINING SEAWARD SEQUENCE (F.S.S) SO IS COARSEST NEAR SHORE

THE FOLLOWING ARE EXCEPTIONS TO THE FINING SEAWARD SEQUENCE:

AUTHIGENIC

- INORGANIC CHEMICAL PRECIPITATES THAT FORM SUCH AS PHOSPHORITES AND LIMESTONES

ORGANIC

- DEAD CORALS, MOLLUSKS, PLANKTON, ALGAE & ANIMALS

RESIDUAL

- NON TRANSPORTED ROCK FRAGMENTS BROKEN OFF FROM THE BEDROCK BELOW

RELICT

- ANCIENT DEPOSITS FROM PREVIOUS CONDITIONS SUCH AS SEA LEVEL CHANGE / LOW STANDS OF SEA LEVEL DURING GLACIAL MAXIMUMS. SINCE THESE SEDIMENTS ARE DERIVED FROM BROKEN TRANSPORTED PARTICLES FROM "PRE-EXISTING" ROCKS AND SOILS, THEY ARE ALSO CLASTIC / DETRITAL

CONTINENTAL SLOPE SEDIMENTS:

- ◆GENERALLY THINNER THAN SHELF OR BASIN
- ◆THIN DUE TO FREQUENT TURBIDITY CURRENTS OR "AVALANCHES"
- ◆FORM TURBIDITE LAYERS DOWNSLOPE
- ◆BECOME GRADED OR FINED DURING SLIDES
- ◆CANYON FORMATION IS COMMON ON CONTINENTAL SLOPES

DEEP SEA SEDIMENTS:

- ◆ DEPOSITED MUCH SLOWER THAN ON SHELF 1 – 10mm/1,000 YRS
- ◆ DISTRIBUTION IS AFFECTED BY SEA FLOOR SPREADING (SFS)
 - THINNEST NEAR MID OCEAN RIDGES, THICKER TOWARDS PLATE BOUNDARY OR CONTINENTAL MARGINS
 - CAN HAVE PAST OLDER ENVIRONS COVERED BY YOUNGER ENVIRONS
- ◆ CLASSIFICATION BASED ON FOUR MAIN PARTICLE TYPES

COSMOGENOUS

- MADE OF "MICRO METEORITE DIST" PARTICLES THAT SURVIVE ATMOSPHERE
- LARGE PIECES FORM IRON RICH TEKTITES
- MUCH LESS PLENTIFUL THAN LITHOGENOUS AND BIOGENOUS, OCCUR IN PARTS PER MILLION OR LESS

HYDROGENOUS

- MADE FROM INORGANIC CHEMICAL PRECIPITATES OF SEAWATER
- COMMON TYPES ARE CARBONATES, PHOSPHORITES & MANGANESE NODULES
- LESS PLENTIFUL THAN LITHOGENOUS AND BIOGENOUS

LITHOGENOUS/TERRIGENOUS

- MADE OF ERODED ROCK FROM LAND AND OCEANIC VOLCANIC ASH
- FINE QUARTZ COMMON DUE TO ITS CHEMICAL STABILITY
- PRIMARILY OCEANIC MUD WHICH IS CLAY PLUS SILT
- CLAYS ARE PRIMARILY SILICON AND ALUMINUM OXIDES
- SOMETIMES CALLED "THE LAYERED SILICATES"
- RED AND BROWN CLAYS ARE COMMON NAMES, COLOR DUE IRON OXIDES
- CHLORITE CLAY COMMON IN HIGH LATITUDE WEATHERING
- KAOLINITE CLAY COMMON FROM LOW LATITUDE WEATHERING
- ILLITE CLAY THE MOST COMMON AND NOT LATITUDE DEPENDENT
- MONTMORILLONITE CLAY ALTERED FROM VOLCANIC ASH

BIOGENOUS

- MUST CONTAIN OVER 30% ORGANIC PARTICLES AND IS THEN CALLED "**OOZE**"
 - TWO MAIN TYPES OF OOZE ARE CALCAREOUS AND SILICIOUS
 - * **CALCAREOUS OOZE**
 - CALCIUM CARBONATE BASED (CaCO_3) AND DISSOLVES EASILY

- DISAPPEARS ON SURFACE BELOW CALCIUM CARBONATE COMPENSATION DEPTH (CCD) ALSO KNOWN AS "SNOW LINE" OR THE CALCAREOUS COMPENSATION DEPTH
- CONTAINS COCCOLITHS, FORAMS, PTEROPODS
- PTEROPODS ARE ARAGONITIC AND DISSOLVE BELOW THE ACD
- THE ACD IS ALWAYS SHALLOWER THAN THE CCD
- DISTRIBUTION IS BASED ON BOTH PRODUCTION AND WATER DEPTH

***SILICIOUS OOZE**

- SILICON DIOXIDE BASED (SiO₂)** AND NOT EASILY DISSOLVED
- CONTAINS DIATOMS (ALGAE) AND RADIOLARIA (PROTEROZOA)
- DISTRIBUTION IS BASED ON PRODUCTION ONLY

	CALCITIC	ARAGONITIC	SILICIOUS	PROTOZOAN OR MOLLUSC	ALGAE (PLANTS)
COCCOLITHS	YES				YES
FORAMS	YES			PROTOZOAN	
PTEROPODS		YES		MOLLUSC	
DIATOMS			YES		YES
RADIOLARIA			YES	PROTOZOAN	