MARINE SEDIMENTS
(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/DETритAL
   - MADE FROM BROKEN TRANSPORTED PARTICLES FROM “PRE-EXISTING” ROCKS AND SOILS
   - CLASSSED 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 GALCIAL MAXIMUMS. SINCE THESE SEDIMENTS ARE DERIVED FROM BROKEN TRANSPORTED PARTICLES FROM “PRE-EXISTING” ROCKS AND SOILS, THEY ARE ALSO CLASTIC / DETритAL

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 ENVIRON COVERED BY YOUNGER ENVIRON
♦ CLASSIFICATION BASED ON FOUR MAIN PARTICLE TYPES
  COSMOGENOUS
    - MADE OF “MICRO METERORITE 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

<table>
<thead>
<tr>
<th></th>
<th>CALCITIC</th>
<th>ARAGONITIC</th>
<th>SILICIOUS</th>
<th>PROTOZOAN OR MOLLUSC</th>
<th>ALGAE (PLANTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COCCOLITHS</td>
<td>YES</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
</tr>
<tr>
<td>FORAMS</td>
<td>YES</td>
<td></td>
<td></td>
<td></td>
<td>PROTOZOAN</td>
</tr>
<tr>
<td>PTEROPODS</td>
<td></td>
<td>YES</td>
<td></td>
<td>MOLLUSC</td>
<td></td>
</tr>
<tr>
<td>DIATOMS</td>
<td></td>
<td></td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RADIOLARIA</td>
<td></td>
<td></td>
<td>YES</td>
<td></td>
<td>PROTOZOAN</td>
</tr>
</tbody>
</table>