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GEOL 1404 HISTORICAL GEOLOGY LAB: SEDIMENTARY ROCK DEPOSITIONAL ENVIRONMENTS

Due in Lecture:

Of the 28 rock specimens in the Rock ID lab, 18 specimens are sedimentary rocks. In this exercise, you will list the number and name of the 18 sedimentary specimens you identified and interpret the rock's depositional environment by circling the most likely depositional environment listed in each column. The following characteristics should be considered for selecting an environment:

- **Texture:**
 - *Clastic (terrestrial, marine margin and marine)*
 - *Biogenic (marine, marine margin; rarely terrestrial)*
 - *Chemical (Terrestrial, marine margin; rarely marine)*
- **Clast size**
 - *Big grains = high-energy transport & deposition*
 - *Small grains = low-energy transport and deposition*
- *Textural maturity (not applicable to biogenic or chemical rocks)*
- *Compositional maturity*
- *Fossils*

The handout relating sedimentary rocks to environments and tectonic settings will be useful as well as the Sedimentary Rock Identification Addendum used during Rock ID lab. It is fine if more than one environment is selected; some sedimentary rocks can form in multiple environments (e.g., sand can be deposited in terrestrial and marine margin environments). The first one has been done for you as an example.

1 CHALK	4. ROCK SALT	6. Calcareous claystone	7. OOLITHIC limestone	9. Arkose	10. Bituminous COAL
TERRESTRIAL	TERRESTRIAL	TERRESTRIAL	TERRESTRIAL	TERRESTRIAL	TERRESTRIAL
Lacustrine	Lacustrine	Lacustrine	Lacustrine	Lacustrine	Lacustrine
Stream floodplain	Stream floodplain	Stream floodplain	Stream floodplain	Stream floodplain	Stream floodplain
Stream channel	Stream channel	Stream channel	Stream channel	Stream channel	Stream channel
Alluvial fan/ near source	Alluvial fan/ near source	Alluvial fan/ near source	Alluvial fan/ near source	Alluvial fan/ near source	Alluvial fan/ near source
Glacial	Glacial	Glacial	Glacial	Glacial ?	Glacial
Arid dunes	Arid dunes	Arid dunes	Arid dunes	Arid dunes	Arid dunes
Arid Evaporate Basin	Arid Evaporate Basin	Arid Evaporate Basin	Arid Evaporate Basin	Arid Evaporate Basin	Arid Evaporate Basin
MARINE MARGIN	MARINE MARGIN	MARINE MARGIN	MARINE MARGIN	MARINE MARGIN	MARINE MARGIN
Beach	Beach	Beach	Beach	Beach	Beach
Delta	Delta	Delta	Delta	Delta	Delta
Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon
MARINE	MARINE	MARINE	MARINE	MARINE	MARINE
Off-shore shelf	Off-shore shelf	Off-shore shelf	Off-shore shelf	Off-shore shelf	Off-shore shelf
Reef/carbonate platform	Reef/carbonate platform	Reef/carbonate platform	Reef/carbonate platform	Reef/carbonate platform	Reef/carbonate platform
Turbidity currents	Turbidity currents	Turbidity currents	Turbidity currents	Turbidity currents	Turbidity currents
Plankton oozes	Plankton oozes	Plankton oozes	Plankton oozes	Plankton oozes	Plankton oozes
ANOXIC (Lack of O ₂)	ANOXIC (Lack of O ₂)	ANOXIC (Lack of O ₂)	ANOXIC (Lack of O ₂)	ANOXIC (Lack of O ₂)	ANOXIC (Lack of O ₂)

high energy
comp
text
immature

• Turbidity currents
Text & comp immature
mix of sand in
clay rich matrix

Beaches - silt to pebble size clastic
sediment, Texturally mature
composition variable - quartz,
lithic fragments, carbonate
sediment. High energy

• Delta - medium energy
sand to clay sized clastic
sediment

• Continental shelf
Fine grained clastic
(silt & clay) Biogenic sediment
(carbonates)

• Lacustrine lake - Fine grained
clastic - calm low energy

• mt streams, alluvial fans, floodplain
mt streams, A braided stream
High energy medium to coarse grain
Texturally immature
Compositional immature
(feldspars, lithic clasts)

• Non-marine (terrestrial)
Desert / arid (dunes, loess)
sand size grains (eolian)
Texturally mature

• lagoon - Fine grained clastic (clay
silt)
Biogenic sediment
chemical sediment