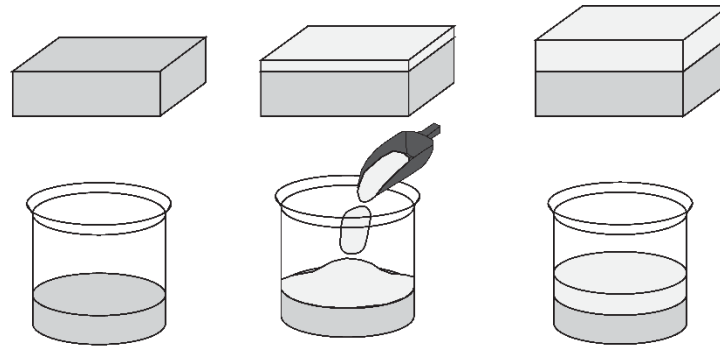


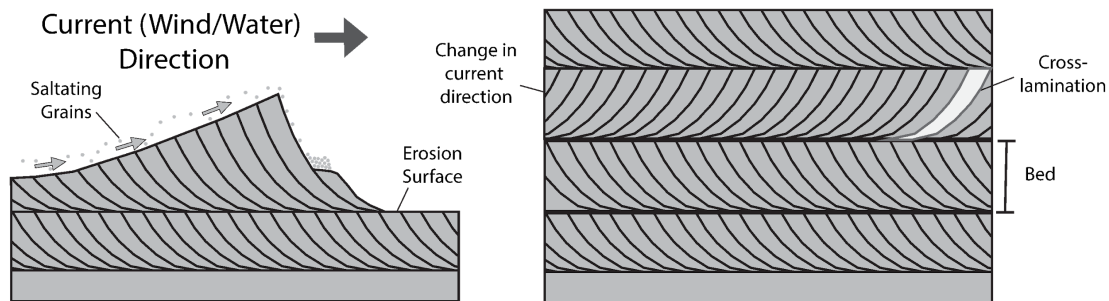
First some review of Sedimentary Structures and Interpretations:

Bedding



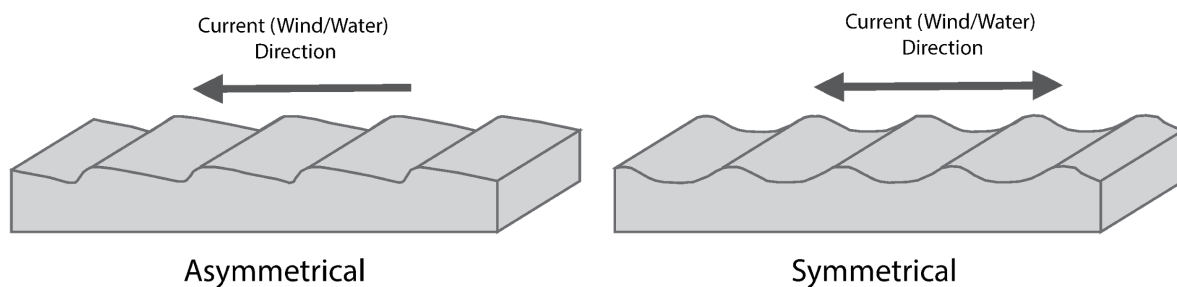
Bedding is a common sedimentary structure. Sediment is deposited in large basins, and as conditions change, the changing sediment character is visible in variable beds.

Cross-Bedding



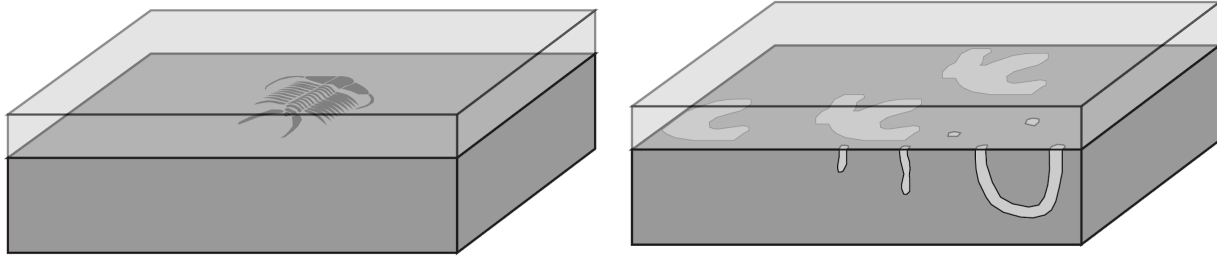
Saltating grains travel up the shallow slope side of a migrating dune. The grains pile up on the current protected steep side of the dune forming individual cross-laminations. Subsequent migrations will pile on top of each other forming a package of cross-bedded sedimentary beds.

Ripple Marks



A current can create *ripple marks* on the surface of a bed. Asymmetrical ripples migrate and will form cross laminations as described above.

Fossils

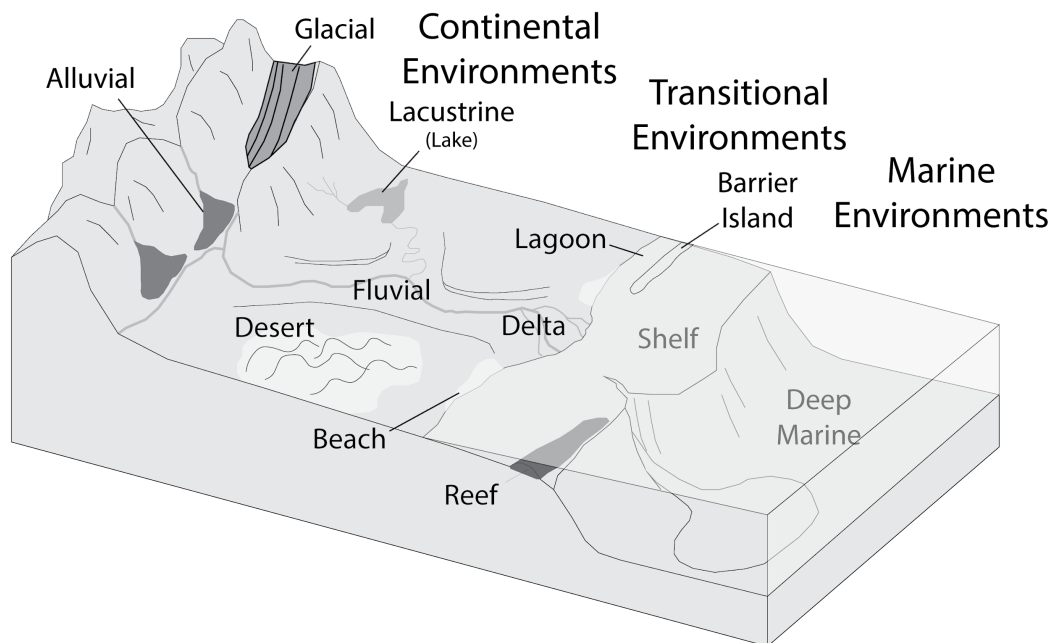


Preserved Remains

Trace Fossils

Fossils are a sedimentary structure indicating the presence of organisms during or after deposition of sediment. The hard parts of an organism can be preserved by being replaced by minerals, such as petrified wood. An indication of activity (e.g. footprints, worm burrows, etc.) by an organism is known as a *trace fossil*.

Depositional Environments



“The present is the key to the past”. By understanding process in modern environments, geologists are able to interpret the features of sedimentary rocks (i.e. composition, rounding, and sorting of grains, along with sedimentary structures, and fossils) and determine their depositional environment.

Now, test your knowledge:

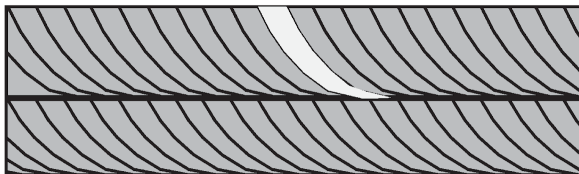


A



B

1. In the above image depicting a cross-section of sedimentary rocks, what are the individually colored horizontal layers known as?
 - A. Beds
 - B. Cross-beds
 - C. Ripple marks
 - D. Graded beds
 - E. Mud cracks
2. In the above image, which package of layers is more likely the product of repeated variation, such as the sediment deposited in a lake during winter and summer seasons?
 - A. A
 - B. B



A



B

3. In the above image depicting a cross-section of sedimentary rocks, what do we call the highlighted (lightened) units?
 - A. Beds
 - B. Cross-beds
 - C. Ripple marks
 - D. Graded beds
 - E. Mud cracks
4. In the previous image, what do we refer to the package of sedimentary rock identified as "YZ"?
 - A. Beds
 - B. Cross-beds
 - C. Ripple marks
 - D. Graded beds
 - E. Mud cracks

Physical Geology Lecture Tutorials
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5. In the previous image, which package of layers is likely the product of oscillating (repeated back and forth) flow, like water on a beach?
 - A. A
 - B. B

6. In the previous image, what type of ripple marks would you expect to have formed on the surface of package A?
 - A. Graded
 - B. Cross
 - C. Symmetrical
 - D. Asymmetrical
 - E. Fluvial-Deltaic

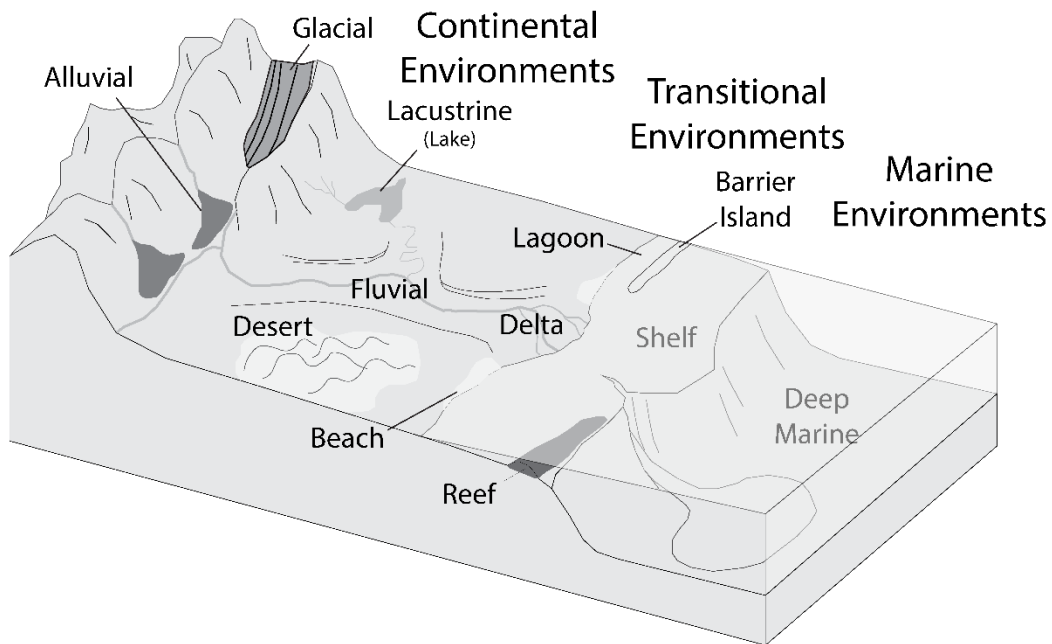
7. In a sedimentary sequence, a geologist notes the presence of microfossils known as planktonic foraminifera. These tiny plankton were once alive floating in the ocean. What depositional environment do you suppose these rocks formed in?
 - A. Glacial
 - B. Deep Marine
 - C. Delta
 - D. Desert
 - E. Lagoon

8. In a sedimentary sequence, a geologist notes very large-scale beds (2-5 meters high) of cross-stratified sandstone likely formed by the migration of very large sand dunes. What depositional environment do you suppose these rocks formed in?
 - A. Glacial
 - B. Deep Marine
 - C. Delta
 - D. Desert
 - E. Lagoon

9. In a sedimentary sequence, a geologist notes extremely poorly sorted sediment, with clast sizes ranging from finest clay all the way up to the size of small cars. The geologist gives this unit a name of "till", it likely was deposited in what environment?
 - A. Glacial
 - B. Deep Marine
 - C. Delta
 - D. Desert
 - E. Lagoon

Now, think deeper:

On your own:



10. Which of the depositional environments pictured above do you suspect may be now or in the past would have been present on other planets? Describe your reasoning.

Working in groups of 2 or 3

11. Compare your answers to question 13.