



Introduction to Sedimentology

Useful for Module 4: Interpreting the past – Sedimentary Environments

Geology is often used to reconstruct how the Earth looked in the past. From deserts to deep seas, sedimentology allows us to paint a picture of these past landscapes

Sedimentology is the study of the processes of formation, transport, and deposition of material that accumulates as sediment in continental and marine environments.

When we examine a sediment there are key textures to look out for to help with our interpretation. N.B. This is a basic guide – remember that lots of factors can affect the texture of a sediment

Colour:

Black to Dark Grey

Indicates organic matter
Environment: Deep water



Green to Light Grey

Green suggests glauconite
Environment: Shallow water



Orange, Red, Purple

Indicates ferric iron staining
Environment: Terrestrial



Grainsize:

We use the Udden-Wentworth scale (measured in Φ) to describe grain size. It grades from clay to conglomerate.

Clay

Indicates: low energy



Sandstone

Indicates: Medium energy



Conglomerate

Indicates: High energy



Clast-Matrix Relationships:



Matrix-Supported Conglomerate

Clasts do not touch
Environment: E.g.,
debris flow

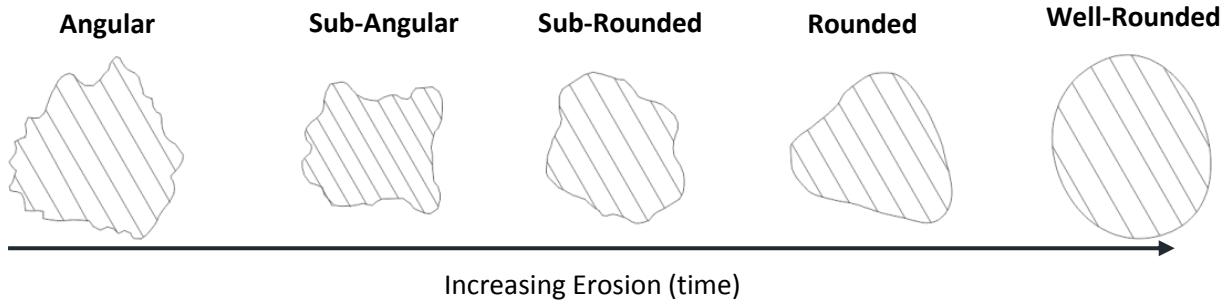


Clast-Supported Conglomerate

Clasts touch
Environment: E.g.,
River

Roundness:

Roundness looks at how smooth a clast is used as an indicator of transport distance. The more rounded a clast, the further it has travelled



Sphericity:

Sphericity looks at how close a clast is to a perfect sphere. It is a function of lithology and structure.



Sedimentary structures can also tell us a lot about the process of deposition. A few of these are outlined below:

Normal Grading:

Coarser sediment at the base fines upwards. Usually represents flow decreasing in energy over time



Grading:

Finer sediment at the base coarsens upwards. Usually represents granular convection



Planar Cross Stratification

Forms due to moving dunes or ripples



Cross Stratification:

Trough Cross Stratification
Moving sinuous bedforms



Herringbone Cross Stratification

Suggests a tidal environment



Want to Learn More? We recommend the book 'Sedimentology and Stratigraphy' Nichols. Wiley-Blackwell

Try your hand at using the above information to match the sedimentary rock to the depositional environment:

Draw tie-lines to connect the rock to the environment. The first one has been done for you as an example

