Earth 333 Sedimentology
Lab 4
Coarse Clastic Sedimentary Rocks

In this lab you will learn how to identify and classify conglomerates and breccias. This will help you determine their depositional environments. You will work with both hand samples and thin sections focusing on characteristics of the framework (clasts), matrix and cement.

- You will be handing in **individual reports**.
- **Read Chap. 2 (esp. Sect. 2.2) of Nichols; Sect. 4.5.1, Sect. 7.3.3, 9.2.1, 9.5,**

Question 1

a) Examine the three hand samples (A, B, C, as well as G and H).

b) Complete hand sample worksheets (included) by describing each sample in terms of clast and matrix composition (including percentages), percent clasts and matrix, grain size, overall sorting, fabric (open or closed, preferred orientation, imbrication, chaotic disarray, grading, etc.), clast roundness and sphericity.

c) Apply informative lithologic-textural descriptive names to the sample (e.g. quartz pebble paraconglomerate). Use the classifications provided in this lab.

d) Suggest a depositional environment for each sample. Briefly outline your supporting evidence.

Question 2

a) Complete a worksheet for either L-6 (same as TS-176) or L-9 (same as TS-4309). Don't forget to look at the thin section AND hand sample.

Question 3 - Thin section TS-600

a) Identify two types of quartz and two kinds of feldspar, noting down your evidence. Sketch an example. Don't forget to label your diagrams.

b) What do the types of quartz present tell you about the history of this sample?

c) What is the composition of the cement?

Question 4 - Sample E

a) What causes the red colour in this sample?

b) Describe the fabric (two points), sorting, roundness and sphericity of the clasts.

c) Suggest a depositional environment based on a) and b).

Question 5 - Hand Sample and Thin Section 8051

a) For the clasts, identify the composition and percentages.

b) What minerals make up the matrix of this sample?

c) Is this sample an orthoconglomerate or a paraconglomerate?

Question 6 - Sample F

a) Suggest how the clasts in this sample may have formed.

b) Is this sample an oligomict or a petromict?

c) Name the sample.

Question 7

a) What does a high proportion of feldspar suggest to you in terms of time and distance of transportation? Explain

Question 8 – Thin section L-3 (TS 4929)

a) Identify the clasts and matrix.

b) Suggest a depositional environment for this sample

Conglomerate and Breccia Classification Table

Epiclastic	Extraformational	Orthoconglomerate (matrix <15%)
		Paraconglomerate (matrix >15%)
	Intraformational conglomerates and breccias	
Pyroclastic	Volcanic conglomerates and breccias	
Cataclastic	Landslide and slump breccias	
	Fault and fold breccias	
	Collapse and solution breccias	
Meteoric	Impact breccias	