Sediment Grain Size Analysis Lab 1

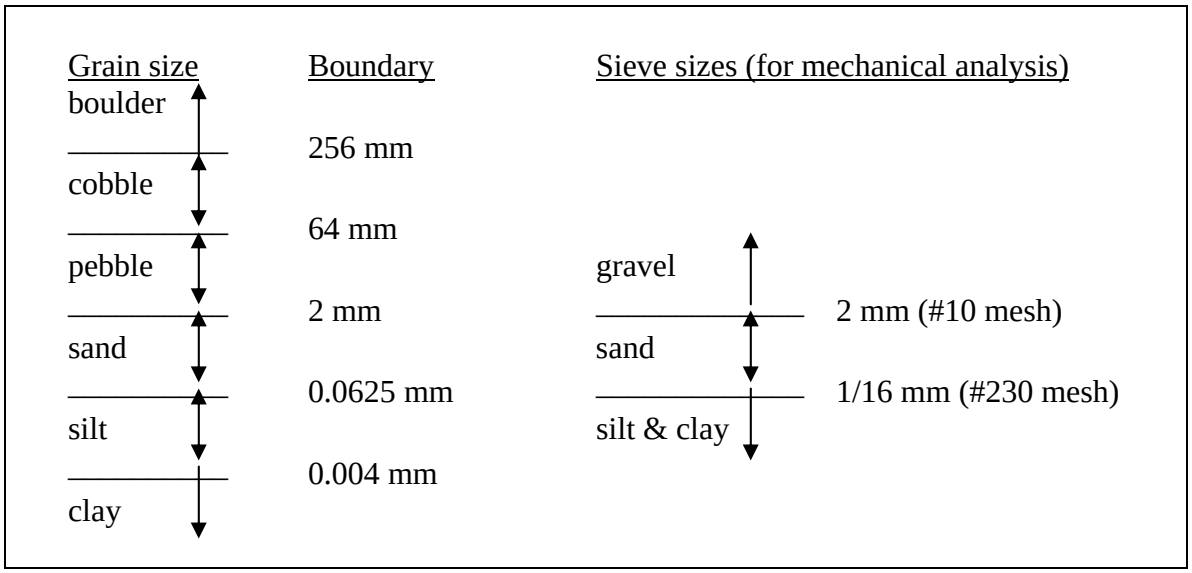
Grain size distribution is one of the most important characteristics of sediment. This is true because grain size is a powerful tool for describing a site's geomorphic setting, interpreting the geomorphic significance of fluid dynamics in the natural environment, and distinguishing local versus regional sediment transport mechanisms as well as because grain size is a dominant controlling factor in sediment geochemistry. Cations derived from mineral weathering and pollution sources are preferentially adsorbed onto clay, which has the highest surface area to volume ratio of any particle size class.

The grain size distribution of a sediment sample is determined by any one of a number of techniques or combination of techniques depending on the range of sizes present in a sample. For this procedure, "fines" are any particle smaller than 63.5 microns. Sand is 63.5 microns to 2 mm in diameter. Gravel is larger than 2 mm.

Characterizing the physical properties of sediment is important in determining its suitability for various uses as well as studying sedimentary environments and geologic history.

The physical properties of sediment can be described by several parameters. Grain size is the most important of these and is the main way in which sediment (and clastic sedimentary rocks) is classified. Other commonly used properties of sediment are sorting and shape (roundness and sphericity). All of these properties are important in describing sediment and determining its suitability for various uses, such as a construction aggregate or fill for a beach volleyball court.

Standard grain size terms of sedimentary particles and the arbitrary boundaries between them are as follows:



Grain size analysis procedure:

The following steps were already conducted at **LDEO**

1. Sub-samples of the sediment grab samples were put into 60ml centrifuge vials and freeze dried at LDEO over 4 days.
2. After completion of freeze drying process, tops were screwed back on.

The following steps will be conduced by the students and in the BC laboratory on **Tuesday**

3. For each sample stick a piece of tape on a small beaker, label it by sample number and weigh it eempty.
4. Using a clean micro-spatula, gently break up the sediments in the vials and transfer them into the beakers and obtain the gross weight; *this is the grain size sample.*
5. Squirt enough water into the beaker to cover the sample.
6. Place samples in the sonicator for ~10 minutes.
7. After sonifying, wash sample with distilled water thru a 63µm sieve. Be sure to rinse the small beaker well and get all of the material into the sieve. Collect fine fraction in the bottom of the sieve assembly. Gently break up the sediments with the squirt bottle and soft brush provided.
8. Weigh a small plastic tray and label it by sample number.
9. Using minimal water, rinse the material retained in the 63µm sieve and put it into the plastic tray; *this is the coarse fraction*.
10. Place the plastic trays into the oven.
11. Clean the beakers & sieves etc. with tap and distilled water and let them dry on the rack above the sink.

The following steps will be conduced by the students and in the BC laboratory on **Thursday**

12. Once the fractions are dry, obtain the dry weights of the trays.
13. Weight the empty bottom trays of the sieve assemblies.
14. Poor the material from the tray onto the 2mm sieve, shake the sieve, and collect the (<2mm) material in the bottom tray.
15. Weigh the bottom tray after sieving is completed.
16. Enter the weight of the fraction <2mm (but >63um) in the table.
17. Clean sieves etc.
18. Transfer data into spreadsheet and determine relative weight fractions of clays and silt (<63um), sand (<2mm, >63um), and gravel (>2mm).