

Subsampling lake sediment cores

Sediment subsamples may be taken at various intervals, from continuous samples at sub-centimeter resolution to as few as one individual sample per core section. Subsamples are put into glass vials, Whirl-Paks, plastic Poly-Cons, or other sample containers labeled with lab tape or small printed adhesive labels. Containers should be pre-labeled to avoid confusion. Labels may be printed using MS Word or Avery label software, either from a spreadsheet list of samples (if sample depths are known in advance) or in sheets of identical labels (where sample depths are written in later).

Cores are always lain on the bench with the “up” or top end to the *left*. They are placed in cradles with meter tape along the side so that accurate depth measurements can be taken. Always avoid the outside layer (few mm) of core material, as this region is subject to both deformation and contamination from overlying layers as a result of coring.

Standard (discrete, non-volumetric) subsampling uses small stainless steel spatulas to cut and lift out pieces of sediment.

Volumetric subsampling is done with 3- to 5-mL plastic syringes with the tips cut off to make a sort of mini-piston corer. The syringe is inserted into the core at the desired location (with the plunger remaining at the cut core surface) and then removed (with the plunger in place). The sample volume is recorded. Volumetric samples can be used to determine water content and bulk density, among other things. Pollen and diatom sampling are typically volumetric, and special syringes have been built to take samples of sizes specific to those preparations.

Continuous, or edge-wedge, subsampling may be done simply with a spatula, but it is more easily accomplished with the aid of one of the guillotines (thin metal blades) used for splitting high-water-content cores, or a miniature version of the same. The blade is inserted into the core lengthwise at a given angle ($<90^\circ$ from the core surface) and then rotated/lifted out with a wedge of sediment on it. The guillotine may be laid back directly on top of the core, or on another meter-tape. Then samples may be simply cut off one end of the wedge at the desired intervals.

Certain analytical procedures require sampling procedures that generate samples free of contamination with respect to certain materials. For example, for analysis of specific organic compounds (e.g., leaf waxes, lipids), samples must not come into contact with any organic material, including plastic containers, skin oils, and plastic wrap. Magnetics studies disallow the use of iron-bearing tools, and soil input tracer studies disallow aluminum. Before initial subsampling the researcher should give some thought to the types of analyses that will be carried out on the samples.

Whichever procedure is used, holes left by removal of samples must be plugged or filled so that the core does not desiccate or deform around them. The Core Facility has several diameters of “elephant gut” (cylindrical gray foam) that can be cut to fill any size or shape of hole.

Materials:

core cradle

spatulas, syringes

guillotines

sample containers (glass vials, Poly-Cons, Whirl-Paks)

labels, lab tape

dishpan with water for used tools

wipes or damp sponge