# Basic soil sampling protocol

## Authorship

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## Collecting soil

### Equipment

#### Required

* Soil corers
* Butter knife (or similar)
* Ruler
* Ziplock bags
* Cooler
* Ice (for cooler)
* GPS device
* All-weather paper
* Clipboard
* Soil moisture probe
* Temperature probe
* Back-up batteries

#### Optional

* Map of field(s)
* Rain poncho(s)
* Sunscreen

### Method

* Soil cores can be taken along transects or random locations.
* Depends on sampling scheme.
* Standard core depth: 5 cm
* Taking a soil core:
* Push corer into ground.
  + Make sure to sample deeper than needed.
* Pack topsoil down with corer.
* Pull out core, with first twisting to ensure core separation.
* Measure core length needed.
* Use butter knife to remove excess core .
* Place remaining core in ziplock bag.
* Store ziplock bags of soil cores in cooler for transport back to the lab.
* Sieving may be done in the field depending on the distance to travel back to the lab.

## Soil sieving

Goal: break down soil structure (homogenize) and combine samples from the same sample point.

### Equipment

* 2mm sieves (clean)
* Gloves
* Soil!

### Method

* Place soil on sieve.
* Sift and mash soil through sieve.
* The sieve may need to be washed **and thoroughly dried** periodically to prevent cloggin.
* Store soil in ziplock bags in the fridge until further processing.

## Downstream sampling processing

### Freezing

* Aliquote soil into centrifuge tubes and freeze at -20oC or -80oC

### Geochemical analyses

* [Cornell Nutrient Analysis Laboratory](http://cnal.cals.cornell.edu/)

### Stable isotope analysis

* [Cornell Stable Isotope Laboratory](http://www.cobsil.com/)

### Microcosm incubations

* See 'SIP\_microcosm' protocol for detailed instructions.
* Place soil into Erlenmeyer flasks.
* The amount of soil and size of flask is dependant on the experimental design.
* Cover flasks with sterile foam stoppers.
* Allow to de-gas for ~14 days.
* Basically, just wait for the CO2 respiration rate to level off.
* Stopper flasks with rubber stoppers.
* **Make sure:** the seals are air tight.
* SIP incubations & gas sampling:
* See 'SIP\_microcosm' protocol