# Basic soil sampling protocol

## 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, 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

## 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 clogging
* Store soil in sterile containers

## 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/)

### Determine soil dry weight (and water content)

* Place 10-30 g of soil on a weigh boat
* Make sure to recore the weight
* Dry in drying oven for ~24 hrs
* Re-weigh the soil
* dry weight = original weight - dried weight

### Microcosm incubations

* Place soil into Erlenmeyer flasks
* 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
* Stopper flasks with rubber stoppers
* **Make sure:** the seals are air tight
* SIP incubations & gas sampling:
* See 'SIP\_microcosm' protocol