Sample handling protocol

1. Collect sampling point information

2. WhirlPak samples – place in -80C freezer

3. Litter samples –dry at 60C and store.

3. Bulk density samples – weigh, oven dry at 105C, and re-weigh. Equilibrate at room temp and reweigh (for gravimetric water content). Sieve to <2 mm and use for stable physical and chemical test – e.g., EC, pH, CEC, texture

4. Bulk samples – pass through a 4 mm sieve, remove roots and rocks and place 2\* 100 g subsamples in a -20C freezer for future incubations. Keep ~10 g for chloroform-K2SO4 extractions. Air dry 100 g (step 5). Freeze remaining soil in bulk at -20C.

5. Grind and sieve air dried bulk samples.

Analyses

1. WhirlPak samples – extract DNA and DOM (for ICR-MS)

2. Litter samples - ball-mill and determine C+N and natural abundance (COIL).

3. Bulk density samples –record VWC and db.

4. Bulk samples

Solution phase

* *1:2.5 water extraction for pH, EC (10 g each)*
* *1:10 0.5M K2SO4-chloroform extraction for DOC/MB (10 g each)*
* *O*ther (NH4, NO3, P, K etc.)

Solid phase

1. **SUVA 254 (and 120)**

* Mechanical composition (40 g each) If we are doing a HMP fractionation, do we also need mechanical? I’ll think about how we can combine the 2.
* CEC (2.5 g each)
* Total elemental content (TBD) Yes, this seems boring but important. HF? Aqua regia?

Fractionation and extractions

* POM, sand and silt+clay separation using SPT and HMP – (5 g each)
* C+N of POM and silt+clay (30 mg each).
* Hydroxylamine hydrochloride extraction of silt+clay (0.1 g each)
* Dithionite extractions of silt+clay (0.1 g each)
* *Other (microbial biomass, TFAA?)- Ideally 10-20 g for MB (chloroform fumigation)*

*Soil respiration- I would do 50 g here, then have 20 g T for post-incubation MB, if we want (but on frozen, not air dried samples)*

* Soil basal respiration and response to substrate (DOM) at Yavitt lab (20 g each)- what should we use as a substrate? Litter-derived DOC? What about for desert samples? Ideally I’d like to stay away from glucose or cellulose, but perhaps unavoidable. I agree.

Order of priorities after processing/storing the samples:

1. Extractions for DOC/TDN and total microbial biomass (+/- chloroform)- 0.5M K2SO4
2. Soil respiration: 5-day Picarro incubations (monitor so we reach peak respiration rate)
3. Soil C/N and 13C/15N (EA-IRMS)
4. **SUVA 254 (and 120)**