

Soil sample processing

This will be my template for this round of soil sample processing.

A few notes:

- We forgot to pack the scale, so ours is being sent. In the meantime, I've borrowed one (generously loaned by John H) with a resolution of 1g. When our scale arrives, I'll make a few parallel measurements to compare the two scales.
- We couldn't find any good foil cups at the store today to bake the dirt in, so I've made some by bending aluminum foil. Obviously, they won't tare as consistently as store-bought.
- The coring tool was set up with two 3cm rings on the top (used) followed by two 1cm rings on the bottom (ignored). Thus, each 3cm sample volume was $3\pi(5.31/2)^2=66.4\text{cm}^3$.

Site /Time	Depth	ID	Tare (g)	Wet (g)	Dry (g)	Rho-dry (g /cm^3)	Qsoil (% mass)	Volume fraction (%)	Comments
							(wet-dry)/wet	(wet-dry)*rho_water/vol	
1	0-3	2-0	3.5	73	47.9	0.67	36	37	
5Jan 0950	3-6	2-6	3.7	123	101.9	1.48	18	32	
2	0-3	3-0	3.3	90	74	1.06	18	24	Soil damp&sticky
4Jan1410	3-6	3-6	3.6	129	121	1.77	6	12	Piece of brick
3	0-2.5	1-0	3.4	89#	68	1.17	25	38	Only ~2.5cm thick
3Jan1500	2.5-5.5	1-6	3.4	148#	124	1.82	17	36	
4	0-3	2-0	3.5	152#	122	1.78	20	45	
3Jan1636	3-6	2-6	3.7	137#	115	1.68	17	33	
5	0-3	1-0	3.4	103	87.2	1.26	16	24	
5Jan 1445	3-6	1-6	3.4	99	89.9	1.30	10	14	
6	0-4	1-0	3.4	97.4*	61.4	0.66	38	41	Soil was frozen,
6Jan 1012	4-6	1-6	3.4	72.2	58.0	1.23	21	32	so odd depths (approx)
7	0-3	2-0	3.5	40.9*	23.75	0.30	46	26	
6Jan 1140	3-6	2-6	3.7	77.4	59.4	0.84	24	27	

= weighed wet a day later (but kept cold to reduce water loss)

* = weight after a bit of time in the oven :([forgot to write down first reading], water content will be a bit low, but dry density will be okay

Here is a quick comparison of the weights of various objects with the borrowed scale and ours. The borrowed scale read within 1g, so I wouldn't change any of the above readings.

Ours (g)	Borrowed (g)
3.6	3
3.3	3
48.5	49
85.1	85
116.3	117
145.2	146

ROUND TWO:

Warmer temperatures have both melted snow (and there has been rain) to increase moisture and liquified existing moisture to allow the EC-5s to measure it.

Site /Time	Depth	ID	Tare (g)	Wet (g)	Dry (g)	Rho-dry	Qsoil	Volume Fraction	Comments
1	0-3	1-0	3.4	135.6	107.3	1.57	21	43	
17 Jan 0835	3-6	1-6	3.5	163.3	138.4	2.03	16	37	May have been compressed
2	0-3	4-0	3.6	92.0	73.3	1.05	21	28	a bit frozen
18 Jan 0828	3-6	4-6	3.8	96.3	86.8	1.25	10	14	
3	0-3	2-0	3.6	69.5	38.5	0.53	47	47	grass
17 Jan 1010	3-6	2-6	3.7	138.3	111.1	1.62	20	41	
4	0-3	1-0	3.5	131.1	108.9	1.59	17	33	
19 Jan 1140	3-6	1-6	3.5	132.1	111.3	1.62	16	31	

5 main	0-3	3-0	3.3	113.1	82.8	1.20	28	46	water (frozen)
17 Jan 1120	3-6	3-6	3.6	112.1	89.5	1.29	21	34	
5 aux	0-3	4-0	3.6	124.8	105.2	1.53	16	30	
17 Jan 1132	3-6	4-6	3.8	120.1	104.8	1.52	13	23	
6	0-3	5-0	3.8	110.2	86.8	1.25	21	35	
19 Jan 1420	3-6	5-6	3.4	131.7	112.0	1.63	15	30	
6 aux	0-3	3-0	3.4	139.5	113.5	1.66	19	39	
19 Jan 1425	3-6	3-6	3.6	129.0	104.6	1.52	19	37	
7	0-3	5-0	3.8	90.9	48.7	0.68	48	64	water (frozen)
17 Jan 1221	3-6	5-6	3.4	112.4	82.6	1.19	27	45	water

ROUND THREE:

John, Tom, and Steve S

We tared the scale prior to weighing the wet soil (net), weighed the dry soil + pan (total), then subtracted the pan wt to get the dry soil (net).

I mistakenly started weighing the soil in ounces, so we continued this in order to make a consistent table.

Ring diameter = $2 \frac{3}{32}'' = 2.094'' = 5.319 \text{ cm}$; volume = 66.66 cm^3 ; 1 oz = 28.35 gm

$Q_{\text{soil}} = 1 - \text{dry/wet}$; $h_2o \text{ volume fraction} = (\text{wet-dry}) / (1 \text{ gm per cm}^3) / \text{sample-volume}$

Site	Time	Depth (cm)	Tray ID	Tare (oz)	Wet Wt net (oz)	Dry Wt total (oz)	Dry Wt net (oz)	rho-dry (gm /cm ³)	Qsoil (% mass)	h2o vol fraction (% volume)
1	Jan 30 10: 45	0-3	4-0	0.130	2.845	1.575	1.445	0.615	47	54
		3-6	4-6	0.135	4.700	3.900	3.765	1.601	18	34
2	Jan 29 14: 30	0-3	4-0	0.130	3.825	3.440	3.310	1.408	10	16
		3-6	4-6	0.135	4.400	4.185	4.050	1.722	5	9
3	Jan 28 14: 30	0-3	3-0	0.120	3.195	3.120	3.000	1.276	2	3
		3-6	3-6	0.125	4.810	4.100	3.975	1.691	15	30
4	Jan 28 11: 15	0-3	2-0	0.120	2.365	2.045	1.925	0.819	14	14
		3-6	2-6	0.130	4.875	4.335	4.205	1.788	11	23
5 main	Jan 27 14: 31	0-3	4-0	0.130	3.060	2.525	2.395	1.019	18	23
		3-6	4-6	0.135	3.790	3.395	3.260	1.386	11	17
5 aux	Jan 27 14: 55	0-3	5-0	0.140	3.625	3.130	2.990	1.272	14	21
		3-6	5-6	0.120	2.495	2.390	2.270	0.965	4	4
6 main	Jan 24 11: 45	0-3	4-0	0.135	4.415	3.305	3.170	1.348	26	47
		3-6	4-6	0.125	5.705	4.890	4.765	2.027	15	35
6 aux	Jan 24 12: 15	0-3	2-0	0.135	3.420	2.715	2.580	1.097	21	30
		3-6	2-6	0.130	4.775	4.094	3.964	1.686	15	29
7	Jan 27 16: 18	0-3	1-0	0.125	3.115	2.200	2.075	0.882	31	39
		3-6	1-6	0.125	3.635	2.785	2.660	1.131	24	36

P.S. (18 Apr 2011): All calculations seemed off in Round 3, reran and edited above entries.