



Toward development of a national digital soil and spectroscopy library framework in Canada

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Centre for Sustainable Soil Management



DALHOUSIE
UNIVERSITY

7th Meeting of the
**Global Soil
Laboratory
Network**
(GLOSOLAN)



GLOSOLAN
GLOBAL SOIL LABORATORY NETWORK



Bringing Soil to Life

The Centre's academic and research objectives align with two of Dalhousie's core signature research clusters: **Food Security** and **Clean Tech, Energy**, the **Environment**, with broad applications through and towards the cross-cutting theme of **Big Data Science**.

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Increasing the impact of
soil science research

Photo credit: NRCS Soil Health

CSSM Mission <https://www.sustainablesoils.ca/>

- Established in 2020, the Centre is focused on the study of soils in managed landscapes.
- The Centre will:
 - i) advance scholarship and research;
 - ii) provide a focal point for education and training in the region; and
 - iii) serve as a national data hub for data intensive mapping, understanding, and use of soil-landscape information and the impact of management on those landscapes

The Goal is to ***connect*** researchers internal and external to Dalhousie (including graduate students), ***partner*** with government and industry partners and increase the ***impact*** of our research.



CSSM Outputs

- Hub for the study of soil science and soil management in *agriculture, forestry, urban land uses*;
- Graduate studies in soil science for Atlantic Canada;
- Undergraduate certificates in *Sustainable Soil Management* and non-credit certificates in *Nutrient Management Planning*;
- Short courses for Certified Educational Units for Professional Agrologists and Certified Crop Advisors;
- Data hub for soils information in Canada and lead national initiatives on digital soil mapping (DSM), regional/national soil spectroscopy, and the application of spatial analysis and modelling techniques (machine learning) to the development of value-added, soil information products and tools.



2022 – 2023 Accomplishments

- The Centre has attracted \$900,000 in operational support through collaborative agreements with NS Department of Natural Resources and Renewables and NS Department of Agriculture.
- The Centre hosted the Annual Meeting of the Canadian Society Soil Science. The theme was “Soils Go Digital”. There were 257 attendees from across Canada, presented 157 oral presentations, 67 poster presentations, attended 3 workshops and 2 tours.
- The Centre has supported project proposals totalling over \$6 million in research funding from the Weston Family Foundation, NS Forest Innovation Transition Trust, Net-Zero Atlantic, Natural Resources Canada Forest Innovation Fund, and NSERC Sustainable Agriculture Alliance Grant.

7th Meeting of the **Global Soil Laboratory Network (GLOSOLAN)** | 21-23 November 2023

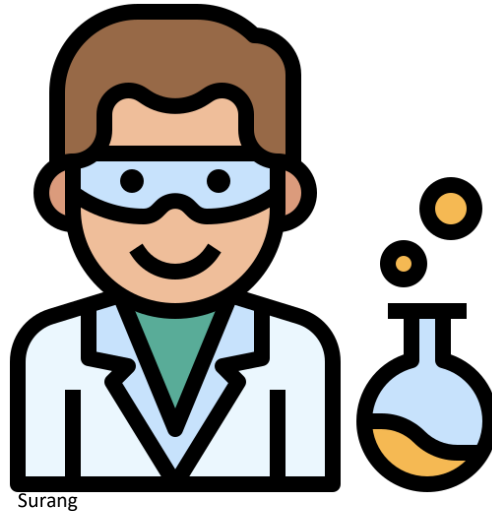
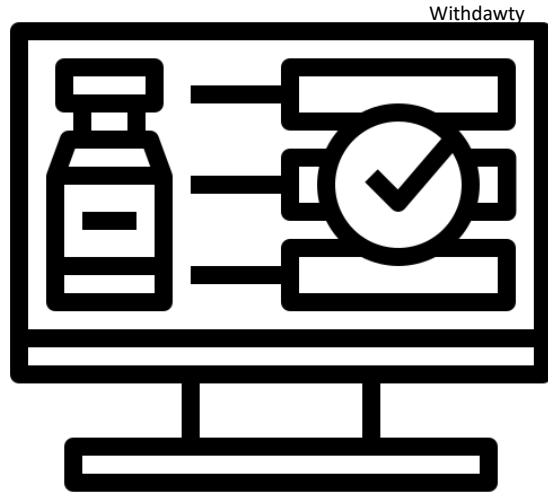


Key Challenges in Data Management

- Samples and data are dispersed across many different stakeholders (provincial/federal govts; academia; commercial);
- Data are housed in different software systems and/or are not uniformly organized in a way that enables easy sharing;
- Lack of standardization in requirement for LIMS and/or inadequate resources-training for data/sample storage;
- Sharing data may be constrained by need for confidentiality, anonymizing, or aggregation;
- Lack of legal structure in government requiring sharing of data acquired with public funds

Sample and Data Management

- Laboratory Information Management Systems (LIMS) are effective tools for large, established, and commercial labs;
- LIMS purchase or building will depend on complexity and quantity of samples and analyses;
- Academic labs may not have funding or scale to purchase LIMS, leading to more ad hoc building of different sample and data analysis tracking and storage;
- Provide some examples of individual academic laboratory and larger project based Excel templates.



Academic Laboratories

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- Biosolids study (composted, alkaline, anaerobic digested) (2017 to present)
- 60 plots
- Sampling 5 to 6 times each year
- Measuring for:
 - Total & Organic C
 - Inorganic N
 - Mehlich-3: P, K, Ca, Mg, Na, etc.
 - pH
 - Electrical conductivity
 - Trace elements
 - Genomic sequencing
 - Ecological/biological indicators
 - Soil health properties
 - Crop yield



- 15 year alkaline treated biosolids study (2008 to present)
- 48 plots
- Sampling 5 to 6 times each year
- Measuring for:
 - Total & Organic C
 - Inorganic N
 - Mehlich-3: P, K, Ca, Mg, Na, etc.
 - pH
 - Electrical conductivity
 - Pharmaceuticals
 - Trace elements
 - Genomic sequencing
 - Ecological/biological indicators
 - Soil health properties
 - Crop yield

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
	Site	Year	Sampling	Plot	Sub Plot	Depth	Mass Air Dried Soil (g)	Volume of 2.0M KCl (ml)	NH4 in diluted soil extract (mg/l)	Sample Dilution Rate	Average NH4 in blank (mg/l)	NH4 in undiluted soil extract (mg/l)	NH4-N (mg/kg)	NO3 in diluted soil extract (mg/l)	Sample Dilution Rate	Average NO3 in blank (mg/l)	NO3 in undiluted soil extract (mg/l)	NO3-N (mg/kg)		
11	1	8	1	10		A	10.0845	30	1.85	1.00	0.00	1.85	4.27	26.86	1.00	0.00	26.86	18.04		
12	1	8	1	11		A	10.0876	30	1.82	1.00	0.00	1.82	4.20	20.10	1.00	0.00	20.10	13.50		
13	1	8	1	12		A	10.0463	30	1.99	1.00	0.00	1.99	4.61	26.86	1.00	0.00	26.86	18.11		
14	1	8	1	13		A	10.0860	30	1.82	1.00	0.00	1.82	4.20	29.20	1.00	0.00	29.20	19.61		
15	1	8	1	14		A	10.0115	30	1.71	1.00	0.00	1.71	3.98	25.99	1.00	0.00	25.99	17.59		
16	1	8	1	15		A	10.0052	30	2.02	1.00	0.00	2.02	4.70	26.32	1.00	0.00	26.32	17.82		
17	1	8	1	16		A	10.0986	30	1.84	1.00	0.00	1.84	4.24	26.66	1.00	0.00	26.66	17.88		
18	1	8	1	17		A	10.0739	30	1.84	1.00	0.00	1.84	4.25	24.93	1.00	0.00	24.93	16.76		
19	1	8	1	18		A	10.0103	30	1.17	1.00	0.00	1.17	2.72	54.87	1.00	0.00	54.87	37.13		
20	1	8	1	19		A	10.0028	30	1.95	1.00	0.00	1.95	4.54	30.00	1.00	0.00	30.00	20.32		
21	1	8	1	20		A	10.0346	30	2.29	1.00	0.00	2.29	5.31	29.60	1.00	0.00	29.60	19.98		
22	1	8	1	21		A	10.0420	30	1.81	1.00	0.00	1.81	4.20	28.41	1.00	0.00	28.41	19.16		
23	1	8	1	22		A	10.0007	30	2.06	1.00	0.00	2.06	4.80	28.08	1.00	0.00	28.08	19.02		
24	1	8	1	23		A	10.0506	30	2.12	1.00	0.00	2.12	4.91	24.30	1.00	0.00	24.30	16.38		
25	1	8	1	24		A	10.0794	30	1.83	1.00	0.00	1.83	4.23	23.99	1.00	0.00	23.99	16.12		
26	1	8	1	25		A	10.0332	30	1.70	1.00	0.00	1.70	3.95	30.14	1.00	0.00	30.14	20.35		
27	1	8	1	26		A	10.0628	30	1.81	1.00	0.00	1.81	4.19	24.41	1.00	0.00	24.41	16.43		
28	1	8	1	27		A	10.0203	30	1.88	1.00	0.00	1.88	4.37	29.44	1.00	0.00	29.44	19.90		
29	1	8	1	28		A	10.0812	30	1.78	1.00	0.00	1.78	4.11	35.16	1.00	0.00	35.16	23.63		
30	1	8	1	29		A	10.0828	30	1.48	1.00	0.00	1.48	3.42	19.20	1.00	0.00	19.20	12.90		
31	1	8	1	30		A	10.0174	30	1.79	1.00	0.00	1.79	4.16	22.50	1.00	0.00	22.50	15.21		
32	1	8	1	31		A	10.0131	30	1.87	1.00	0.00	1.87	4.35	23.13	1.00	0.00	23.13	15.65		
33	1	8	1	32		A	10.2370	30	2.84	1.00	0.00	2.84	6.46	19.59	1.00	0.00	19.59	12.96		
34	1	8	1	33		A	10.5020	30	2.82	1.00	0.00	2.82	6.25	31.58	1.00	0.00	31.58	20.37		
35	1	8	1	34		A	10.0906	30	1.33	1.00	0.00	1.33	3.07	39.32	1.00	0.00	39.32	26.40		
36	1	8	1	35		A	10.0209	30	2.12	1.00	0.00	2.12	4.93	15.61	1.00	0.00	15.61	10.55		
37	1	8	1	36		A	10.0800	30	2.99	1.00	0.00	2.99	6.91	19.91	1.00	0.00	19.91	13.38		
38	1	8	1	37		A	10.0360	30	2.00	1.00	0.00	2.00	4.64	25.31	1.00	0.00	25.31	17.08		
39	1	8	1	38		A	10.1040	30	5.36	1.00	0.00	5.36	12.35	21.26	1.00	0.00	21.26	14.25		
40	1	8	1	39		A	10.0183	30	2.55	1.00	0.00	2.55	5.93	28.51	1.00	0.00	28.51	19.28		
41	1	8	1	40		A	10.0448	30	1.65	1.00	0.00	1.65	3.82	24.76	1.00	0.00	24.76	16.70		
42	1	8	1	41		A	10.0210	30	3.29	1.00	0.00	3.29	7.64	32.51	1.00	0.00	32.51	21.98		
43	1	8	1	42		A	10.0666	30	1.82	1.00	0.00	1.82	4.21	21.58	1.00	0.00	21.58	14.52		
44	1	8	1	43		A	10.0864	30	2.21	1.00	0.00	2.21	5.10	22.92	1.00	0.00	22.92	15.39		
45	1	8	1	44		A	10.0337	30	1.78	1.00	0.00	1.78	4.13	42.48	1.00	0.00	42.48	28.68		
46	1	8	1	45		A	10.0495	30	2.21	1.00	0.00	2.21	5.12	18.81	1.00	0.00	18.81	12.68		
47	1	8	1	46		A	10.0149	30	1.73	1.00	0.00	1.73	4.02	20.83	1.00	0.00	20.83	14.09		
48	1	8	1	47		A	10.0147	30	2.19	1.00	0.00	2.19	5.09	23.06	1.00	0.00	23.06	15.60		

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1	Header: Meaning		id	g_p_date	fcanc	sanc	slit	clay	bt	sr	c_srl	subsr	c_n	subsr	c_aws	awc	c_wsa	act	c_s	c_act	om	c_om	c_ace	resp	c_res	c_p	c_k	ph	c_ph	mg	refe	res	mn	res	zn	res	c_micr	cc	score	c_rank	na_res	p2o5	re	k2o	res	b	res	cu	res	res	ca	res	buf	ph	cec	per	k	per	mg	ca	per	h	per	ntot	per	al	res
2	id	Sample ID	NB01C	29-Aug	14.2	78.7	7.2	M	235	20	264	60	###	100	76.6	90	443.97	25	3.8	60	8.7	70	####	95	58.9	5	52.3	75	5	5	174	348	84	3.2	11	51	Low	40	135	63	0.7	3.8	22	1017	6.9	8	1.7	18	63.2	14.9	2.2	82.9	919														
3	g_p	Good or Poor soil	NB01FG	29-Aug	10.0	78.8	###	M	255	20	267	60	###	100	45.7	55	358.02	15	3.3	45	7.2	60	####	90	48.9	10	103.8	100	5	0	107	409	74	2.7	11	49	Low	26	112	125	0.5	3.2	23	690	6.6	10	2.8	9.4	36.2	50.4	1.2	48.4	979														
4	fcanc	F. candida bioassay	NB02C	30-Aug	53.8	39.0	7.2	C	300	5	300	55	###	100	77.4	75	887.07	95	7.5	100	14.6	85	####	80	21.0	###	48.1	75	6	100	344	193	30	1.3	56	77	High	25	48	58	0.5	1.3	17	1872	6.9	14	0.9	21	68.5	8.8	0.8	90.4	1388														
5	sand	Percent sand	NB02FP	30-Aug	61.0	33.9	5.1	C	300	5	300	55	###	95	95.1	95	827.36	90	8.8	100	17.6	95	####	90	33.6	30	46.5	70	6	65	207	130	28	1.4	56	71	High	22	77	56	0.5	1.4	19	1513	6.9	11	1.1	16.1	70.7	11.2	0.9	87.9	1369														
6	silt	Percent silt	NB03C	30-Aug	54.6	35.1	###	C	131	75	300	55	###	95	73.4	70	####	100	10	100	21.8	100	####	100	####	0	232.4	100	7	90	302	216	128	14.2	11	75	High	276	661	280	1.9	3.2	58	4443	7.4	27	2.3	9.5	83.7	0	4.5	95.5	565														
7	clay	Percent clay	NB03FP	30-Aug	57.4	32.4	###	C	271	10	300	55	###	80	41.7	25	124.72	5	1.6	15	4.2	10	####	5	22.3	95	24.9	10	5	0	35	124	14	0.7	56	31	Very low	28	51	30	0.2	0.4	24	213	6.6	6	1	4.6	16.8	75.7	1.9	22.4	2205														
8	bt	Texture class (medium, coarse)	NB04C	31-Aug	31.4	58.2	###	M	255	20	293	45	###	85	75.9	90	503.86	35	3.3	40	8.5	70	####	40	46.3	10	66.4	90	6	40	195	188	89	1.5	11	48	Low	23	106	80	0.6	1.7	19	1844	6.9	12	1.4	13.2	74.9	9.7	0.8	89.5	1092														
9	c	denotes Cornell score	NB04FP	31-Aug	30.4	59.2	###	M	300	5	300	45	###	100	42.0	55	480.17	30	3.5	45	6.6	40	####	75	###	0	91.3	100	6	65	237	234	28	7.8	56	51	Low	21	233	110	0.4	3.8	15	1804	7	11	2.1	17.4	79.7	0	0.8	99.2	953														
10	sr	Surface Hardness	NB05C	31-Aug	49.9	41.9	8.2	C	193	40	297	55	###	60	48.6	55	679.53	75	4	70	9.2	55	####	65	33.6	25	47.3	70	6	75	123	311	49	1.2	56	58	Medium	24	77	57	0.6	0.9	19	1863	7.1	11	1.2	9.7	88.2	0	1	99.1	873														
11	subsr	Subsurface Hardness	NB05FP	31-Aug	57.9	35.9	8.2	C	273	10	300	55	###	75	90.2	90	703.87	85	4.8	85	10.5	65	####	85	27.5	35	42.3	45	6	95	150	241	111	1.3	11	61	Medium	28	63	51	0.6	1.2	17	1958	7.1	11	1.1	11.1	86.9	0	1.1	99	1142														
12	awc	Avail. Water capacity	NB06C	01-Sep	46.7	44.1	9.2	M	282	5	300	45	###	50	40.5	45	510.23	35	3.7	55	8.1	65	####	65	###	0	109.6	100	6	100	208	326	45	4.1	56	52	Low	24	447	132	1.2	7.3	21	2421	7.2	14	2	12.2	85.1	0	0.7	99.3	984														
13	wsa	Water-stable aggregates	NB06FP	01-Sep	47.7	44.0	8.4	M	290	5	300	45	###	80	63.3	75	531.21	40	4.6	80	9.1	75	####	100	25.8	45	66.4	85	5	0	154	383	43	1.2	56	57	Medium	46	59	80	0.4	1.9	19	1019	6.7	10	1.7	12.4	49.2	34.8	1.9	63.3	1192														
14	act_c	Active carbon	NB07C	01-Sep	47.2	46.7	6.1	C	153	55	298	55	###	85	57.7	45	722.41	80	4.7	85	10.7	65	####	65	23.6	50	48.1	70	7	100	143	168	33	0.8	56	68	Medium	22	54	58	0.5	0.8	16	2338	7.3	15	0.8	7.9	77.6	0	0.6	86.3	963														
15	om	Organic matter	NB07FP	01-Sep	42.9	45.8	###	M	167	50	298	45	###	70	58.9	75	422.96	20	4.4	75	7.1	50	####	100	8.7	##	41.5	55	6	10	72	285	24	0.8	56	59	Medium	21	50	50	0.4	0.7	13	1473	6.8	11	1	5.7	69.7	22.7	0.9	76.6	959														
16	ace	ACE soil protein	NB08C	02-Sep	49.0	45.9	5.1	C	275	10	300	55	###	70	58.4	45	533.08	55	2.8	40	7.5	35	####	65	45.4	10	48.1	70	7	100	88	238	99	2.7	11	47	Low	27	104	58	0.6	1.7	19	2385	7.3	16	0.8	4.5	74	0	0.7	79.3	760														
17	resp	Soil respiration	NB08FP	02-Sep	79.6	16.3	4.1	C	295	5	300	55	###	65	76.0	75	598.98	65	5.3	90	12.3	75	####	95	###	0	60.6	85	6	80	212	199	52	19.3	11	58	Medium	37	419	73	0.5	4.2	23	1227	7	8	1.9	21.5	74.6	0	2	98	1367														
18	p	Phosphorus	NB09C	02-Sep	58.1	37.8	4.1	C	218	25	292	55	###	70	75.2	75	568.60	60	4.2	75	8.7	45	####	65	56.7	10	49.0	70	6	50	102	203	64	1.8	11	51	Low	27	130	59	0.4	1	17	1399	7	8	1.6	10.5	86.5	0	1.5	98.6	1072														
19	k	Potassium	NB09FP	02-Sep	49.6	42.2	8.2	M	160	50	285	55	###	80	78.0	90	593.05	50	4.3	70	10.2	85	####	100	39.7	15	43.2	60	6	50	95	320	92	1.9	11	60	Medium	39	91	52	0.5	1.3	19	1530	7	9	1.3	9.1	87.7	0	1.9	98.1	1014														
20	ph	pH	NS01C	11-Aug	57.0	38.9	4.1	C	208	25	300	55	###	100	96.0	85	870.96	95	6.4	95	16.8	90	####	95	###	0	130.3	100	6	65	150	308	195	8.9	11	68	Medium	38	334	157	1	3	29	1850	7	11	3	11.4	84.1	0	1.5	98.5	867														
21	mg_res	Magnesium	NS01FP	11-Aug	56.0	41.0	3.1	C	285	10	300	55	###	100	93.0	85	825.03	90	6.4	95	17.8	95	####	95	62.9	5	180.1	100	6	75	136	303	101	6.9	11	68	Medium	39	144	217	1.4	3.2	26	1695	6.9	11	4.1	9.9	74.1	10.5	1.5	88.1	1075														
22	fe_res	Iron	NS02C	23-Aug	25.8	62.0	###	M	246	20	300	45	###	100	26.8	25	420.13	20	2.8	30	5.4	35	####	65	51.5	10	98.0	100	7	100	463	465	99	2.5	11	47	Low	191	118	118	2.1	2.4	24	1718	7.4	16	1.6	24.8	55.2	0	5.3	81.6	443														
23	mn_res	Manganese	NS02FP	23-Aug	20.3	61.9	###	M	224	25	294	45	###	100	57.7	70	####	100	19	100	26.4	100	####	100	25.8	45	160.2	100	6	15	882	474	30	4.7	56	71	High	337	59	193	2.2	2	144	1935	6.6	24	1.7	31	40.8	20.3	6.2	73.5	785														
24	zn_res	Zinc	NS03C	23-Aug	68.4	29.6	2.0	C	173	45	283	60	###	50	52.2	40	798.83	90	4.6	85	12.9	80	####	95	###	0	94.6	100	7	100	235	121	84	3.4	11	63	Medium	31	540	114	0.9	1.5	28	3132	7.4	19	1.3	10.4	82.9	0	0.7	94.6	1240														
25	c_micro	Cornell micronutrients ranking	NS03FP	23-Aug	69.6	29.4	1.0	C	226	25	300	55	###	50	62.1	55	621.01	70	4	70	11.2	65	####	70	29.7	35	54.8	60	6	80	71	157	65	1.6	11	54	Low	17	68	66	0.5	1.4	23	1245	7	7	2	8.4	88.5	0	1.1	98.9	1394														
26	c_score	Cornell score	NS04C																																																																

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1	farm_id	prov_date	farm_type	org	fmr_age	fmr_sex	sole	dec	exper	course	wkshop	conf	sem	coll	uni	Field ID	q1_yield	q2_txt	q3_clr	q4_till	q5_comp	q6_drain	q7_wtr	q8_strctr	q9_npk	q10_micro	q11_ph	q12_om	q13_worm	q14_smell	q15_root	q16_bio	q17_crphlth	hthy	imprd	unhthy	prc_hthy	prc_imprd	prc_unhthy					
2	NB01	NB 29-Aug	dairy	n	52 m	y		35 n	n	n	n	n	n	n	NB01G	2	4	4	4	4	2	4	4	4	2	2	2	2	2	2	2	2	2	7	10	0	41	59	0					
3	NB01	NB 29-Aug	dairy	n	52 m	y		35 n	n	n	n	n	n	n	NB01P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	0	3	14	0	18	82					
4	NB02	NB 30-Aug	dairy	n	42 m	y		20 n	n	n	n	n	n	n	NB02G	4	0	2	4	2	4	4	4	4	4	4	4	4	2	2	4	12	4	1	71	24	6							
5	NB02	NB 30-Aug	dairy	n	42 m	y		20 n	n	n	n	n	n	n	NB02P	0	4	2	4	4	4	4	4	4	2	2	4	4	4	4	4	4	4	12	4	1	71	24	6					
6	NB03	NB 30-Aug	veg	y_u	38 f	y		2 n	y	n	n	n	n	n	NB03G	2	2	4	2	4	2	4	2	4	2	4	4	4	4	4	4	11	6	0	65	35	0							
7	NB03	NB 30-Aug	veg	y_u	38 f	y		2 n	y	n	n	n	n	n	NB03P	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2	0	0	4	13	0	24	76							
8	NB04	NB 31-Aug	field_crop	n	60 m	y		40 y	y	y	n	n	n	n	NB04G	4	4	4	4	4	4	4	4	4	4	4	2	2	2	4	4	4	12	4	0	75	25	0						
9	NB04	NB 31-Aug	field_crop	n	60 m	y		40 y	y	y	n	n	n	n	NB04P	0	0	4	2	2	2	4	2	4	2	4	2	2	2	2	2	0	2	3	10	3	19	63	19					
10	NB05	NB 31-Aug	dairy	n	35 m	y		35 n	n	y	y	n	n	n	NB05G	4	4	2	4	2	4	2	4	2	4	2	2	2	2	2	2	6	11	0	35	65	0							
11	NB05	NB 31-Aug	dairy	n	35 m	y		35 n	n	y	y	n	n	n	NB05P	0	2	2	4	2	4	2	2	0	0	0	2	2	2	2	2	2	11	4	12	65	24							
12	NB06	NB #####	dairy	n	39 m	y		9 n	y	y	n	n	n	n	NB06G	4	4	4	4	2	4	4	0	4	4	2	4	2	2	4	2	9	6	1	56	38	6							
13	NB06	NB #####	dairy	n	39 m	y		9 n	y	y	n	n	n	n	NB06P	0	4	4	4	4	2	2	2	0	2	2	2	2	2	4	2	5	10	2	29	59	12							
14	NB07	NB #####	veg	y_u	47 f	y		18 y	y	y	y	n	n	n	NB07G	2	4	4	4	4	4	4	4	4	4	4	2	2	2	4	11	6	0	65	35	0								
15	NB07	NB #####	veg	y_u	47 f	y		18 y	y	y	y	n	n	n	NB07P	0	0	2	4	4	0	4	0	0	0	0	2	0	2	2	4	2	3	5	7	20	33	47						
16	NB08	NB #####	dairy	n	34 m	y		13 n	n	n	n	n	n	n	NB08G	4	4	4	4	4	4	4	4	4	4	4	2	4	4	4	4	16	1	0	94	6	0							
17	NB08	NB #####	dairy	n	34 m	y		13 n	n	n	y	n	n	n	NB08P	2	0	2	2	2	2	2	4	4	2	0	4	2	4	2	5	10	2	29	59	12								
18	NB09	NB #####	dairy	n	66 m	n		48 n	y	y	n	n	n	n	NB09G	2	4	2	4	4	4	2	4	2	2	2	2	2	4	4	4	9	8	0	53	47	0							
19	NB09	NB #####	dairy	n	66 m	n		48 n	y	y	n	n	n	n	NB09P	0	2	2	2	2	2	0	0	0	0	2	2	2	2	2	2	0	13	4	0	76	24							
20	NS01	NS 11-Aug	veg	y_u	40 m	n		12 n	y	y	n	n	n	n	NS01G	2	4	4	4	4	4	4	4	4	4	2	2	2	4	4	2	10	6	0	63	38	0							
21	NS01	NS 11-Aug	veg	y_u	40 m	n		12 n	y	y	n	n	n	n	NS01P	0	4	2	2	4	4	2	2	2	2	2	2	0	2	4	2	0	4	9	3	25	56	19						
22	NS02	NS 23-Aug	dairy	n	70 m	y		55 n	n	y	n	n	n	n	NS02G	4	2	4	4	2	4	4	4	4	4	4	4	2	4	4	2	4	12	5	0	71	29	0						
23	NS02	NS 23-Aug	dairy	n	70 m	y		55 n	n	y	n	n	n	n	NS02P	2	2	2	2	2	0	4	0	0	2	2	2	2	2	0	0	4	3	8	6	18	47	35						
24	NS03	NS 23-Aug	veg	y_c	34 f	n		12 n	y	y	n	n	n	n	NS03G	2	2	2	4	2	4	0	4	2	2	2	2	2	2	2	4	2	5	11	1	29	65	6						
25	NS03	NS 23-Aug	veg	y_c	34 f	n		12 n	y	y	n	n	n	n	NS03P	0	2	2	4	2	4	2	4	2	2	2	2	2	2	4	4	2	2	5	11	1	29	65	6					
26	NS04	NS 25-Aug	beef_sheep	y_u	43 m	y		16 n	n	n	n	n	n	n	NS04G	2	0	2	2	2	2	4	0	2	2	2	2	2	4	4	4	6	8	3	35	47	18							
27	NS04	NS 25-Aug	beef_sheep	y_u	43 m	y		16 n	n	n	n	n	n	n	NS04P	0	0	0	4	4	0	0	0	0	0	2	0	0	2	2	0	2	2	5	10	12	29	59						
28	NS05	NS 25-Aug	veg	n	31 m	n		5 n	n	y	n	n	n	n	NS05G	4	2	2	4	4	4	2	4	2	4	4	4	2	2	4	2	9	8	0	53	47	0							
29	NS05	NS 25-Aug	veg	n	31 m	n		5 n	n	y	n	n	n	n	NS05P	0	2	4	2	0	2	4	2	2	2	2	2	2	2	2	2	13	2	12	76	12								
30	NS06	NS 25-Aug	veg	n	55 m	n		30 n	y	y	n	n	n	n	NS06G	2	4	2	4	4	4	2	4	4	4	4	4	2	4	4	4	10	7	0	59	41	0							
31	NS06	NS 25-Aug	veg	n	55 m	n		30 n	y	y	n	n	n	n	NS06P	0	1	0	1	1	0	0	1	4	2	2	2	2	2	2	2	1	8	4	8	62	31							
32	NS07	NS 26-Aug	veg	n	27 m	n		6 n	n	y	n	n	n	n	NS07G	4	4	4	4	2	4	4	4	4	2	4	4	4	2	2	4	11	6	0	65	35	0							
33	NS07	NS 26-Aug	veg	n	27 m	n		6 n	n	y	n	n	n	n	NS07P	0	0	0	4	2	4	0	4	0	0	2	2	2	2	2	3	7	7	18	41	41								
34	NS08	NS #####	beef_sheep	n	43 m	y		18 n	y	y	y	n	n	n	NS08G	4	2	2	2	2	2	4	4	2	2	2	2	2	4	4	4	9	8	0	53	47	0							
35	NS08	NS #####	beef_sheep	n	43 m	y		18 n	y	y	y	n	n	n	NS08P	0	2	2	2	2	0	4	4	0	0	0	2	4	2	4	2	3	9	5	18	53	29							
36	NS09	NS #####	veg	y_u	53 f	n		10 n	y	y	n	n	n	n	NS09G	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	16	1	0	94	6	0								
37	NS09	NS #####	veg	y_u	53 f	n		10 n	y	y	n	n	n	n	NS09P	0	2	2	2	4	2	4	2	2	2	2	2	2	4	4	4	6	8	2	38	50	13							
38	NS10	NS #####	veg	y_u	64 f	n		8 y	y	y	n	n	n	n	NS10G	2	2	2	2	2	4	2	0	2	2	2	2	2	4	2	2	3	13	1	18	76	6							
39	NS10	NS #####																																										



Provincial Laboratories

7th Meeting of the **Global Soil Laboratory Network (GLOSOLAN)** | 21-23 November 2023



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A1 U_SUBMISSIONID

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	
	U_SUBMISSIONID	S_SAMPLEID	HORIZON_ID	CLIENTSAMPLID	CEC	CalcI	Potassil	Magnesiil	Sodii	Grav	VCS	CS	MSd	FSd	VFSd	Sa	Sil	Cl	Texture	CASHPSA	TCI	IC	TOC	SOM	SOM_SHAP_SCOF	Pyro	PyroA	Nitrog	Oisd	pH_wa	pH_Cd	BD	PMN	PMN_SHAP_SCOF	Short Term C Mineralizati	CO2_S
1	19-056978	19-056978-004	TSOIL19_001_A_1	TSOIL19_001_A_1_AN	5.61	859.00	80.70	141.00	14.00	0.00	0.20	1.50	11.10	46.70	20.10	#####	#####	9.80	Fine sandy loam	Coarse	1.97	0.05	1.92	3.31	61	0.09	0.15	0.10	9.17	5.73	5.30	1.27	9.50	62	11.0	
2	19-056978	19-056978-004	TSOIL19_001_B_1	TSOIL19_001_B_1_AN	18.40	#####	110.00	376.00	19.00	0.00	0.20	0.60	4.30	15.10	9.80	#####	#####	Clay loam	Fine	1.91	0.08	1.83	3.15	19	0.09	0.10	0.12	5.74	5.59	4.99	1.55	7.74	29	16.0		
3	19-056978	19-056978-004	TSOIL19_001_C_1	TSOIL19_001_C_1_AN	19.20	#####	143.00	363.00	26.00	0.00	0.10	0.50	3.90	14.40	10.20	#####	#####	Clay loam	Fine	1.93	0.07	1.86	3.21	20	0.10	0.11	0.13	7.67	5.68	5.09	1.49	10.21	41	15.0		
4	19-056978	19-056978-002	TSOIL19_003_A_1	TSOIL19_003_A_1_AN	17.50	#####	186.00	288.00	15.00	2.10	1.60	4.30	7.20	12.80	11.80	#####	#####	Clay loam	Fine	1.66	0.06	1.60	2.76	11	0.06	0.04	0.09	42.90	7.27	6.74	1.57	8.45	32	19.0		
5	19-056978	19-056978-002	TSOIL19_003_B_1	TSOIL19_003_B_1_AN	13.20	#####	105.00	275.00	12.00	2.60	3.80	6.20	12.00	14.50	8.20	#####	#####	Clay loam	Medium	1.27	0.04	1.23	2.12	6	0.09	0.07	0.07	10.50	6.60	5.95	1.64	8.45	40	14.0		
6	19-056978	19-056978-002	TSOIL19_003_C_1	TSOIL19_003_C_1_AN	22.20	#####	126.00	341.00	15.00	0.60	1.10	2.20	4.90	9.40	10.10	#####	#####	Clay loam	Fine	1.67	0.12	1.55	2.67	9	0.07	0.06	0.11	15.60	7.65	7.12	1.58	7.74	29	18.0		
7	19-057500	19-057500-001	TSOIL19_004_A_1	TSOIL19_004_A_1_AN	19.20	#####	182.00	334.00	17.00	0.70	0.80	2.30	7.60	20.30	8.50	#####	#####	Clay loam	Fine	1.99	0.06	1.94	3.34	23	0.13	0.10	0.15	60.10	6.11	5.58	1.36	13.38	55	17.0		
8	19-057500	19-057500-001	TSOIL19_004_B_1	TSOIL19_004_B_1_AN	20.80	#####	269.00	377.00	16.00	1.00	0.80	2.60	7.20	16.80	7.60	#####	#####	Clay loam	Fine	2.40	0.07	2.33	4.02	45	0.11	0.08	0.18	67.50	6.46	5.96	1.50	17.60	71	17.0		
9	19-057500	19-057500-001	TSOIL19_004_C_1	TSOIL19_004_C_1_AN	24.00	#####	222.00	428.00	17.00	0.80	1.10	2.20	7.20	15.30	7.50	#####	#####	Clay loam	Fine	2.33	0.07	2.27	3.91	41	0.11	0.08	0.19	78.20	6.73	6.20	1.48	22.18	83	17.0		
10	19-057500	19-057500-003	TSOIL19_005_A_1	TSOIL19_005_A_1_AN	20.00	#####	166.00	470.00	19.00	4.60	5.10	5.00	8.90	12.40	6.50	#####	#####	Clay loam	Fine	1.53	0.04	1.49	2.57	8	0.08	0.07	0.16	18.60	6.59	5.99	1.55	6.69	24	18.0		
11	19-057500	19-057500-003	TSOIL19_005_B_1	TSOIL19_005_B_1_AN	22.70	#####	229.00	496.00	25.00	1.70	1.60	4.60	7.10	10.80	5.90	#####	#####	Clay loam	Fine	1.96	0.05	1.92	3.31	23	0.09	0.08	0.22	28.40	6.32	5.76	1.50	10.91	44	18.0		
12	19-057500	19-057500-003	TSOIL19_005_C_1	TSOIL19_005_C_1_AN	21.70	#####	231.00	485.00	30.00	1.00	0.90	3.50	7.00	11.00	6.50	#####	#####	Clay	Fine	2.14	0.05	2.08	3.59	30	0.08	0.07	0.23	29.70	6.39	5.91	1.51	13.38	55	18.0		
13	19-056978	19-056978-003	TSOIL19_006_A_1	TSOIL19_006_A_1_AN	21.90	#####	234.00	481.00	60.00	2.80	1.80	4.00	5.60	8.30	6.20	#####	#####	Clay	Fine	2.40	0.51	1.89	3.26	21	0.06	0.04	0.20	25.30	7.23	7.15	1.64	20.42	79	27.0		
14	19-056978	19-056978-003	TSOIL19_006_B_1	TSOIL19_006_B_1_AN	25.60	#####	164.00	549.00	39.00	3.70	1.40	3.00	4.90	7.70	6.10	#####	#####	Clay	Fine	2.70	0.23	2.46	4.24	52	0.09	0.06	0.14	20.00	7.32	7.20	1.39	14.78	61	28.0		
15	19-056978	19-056978-003	TSOIL19_006_C_1	TSOIL19_006_C_1_AN	22.40	#####	161.00	560.00	35.00	0.90	1.20	2.90	5.40	9.60	8.60	#####	#####	Clay loam	Fine	1.71	0.10	1.61	2.78	11	0.09	0.06	0.12	20.30	7.35	7.17	1.45	14.08	58	24.0		
16	19-056978	19-056978-002	TSOIL19_007_A_1	TSOIL19_007_A_1_AN	21.90	#####	167.00	518.00	30.00	2.10	1.80	3.20	6.20	9.60	5.70	#####	#####	Clay loam	Fine	1.79	0.42	1.36	2.34	5	0.08	0.05	0.09	13.10	7.86	7.41	1.63	5.63	19	14.0		
17	19-056978	19-056978-002	TSOIL19_007_B_1	TSOIL19_007_B_1_AN	24.70	#####	184.00	450.00	31.00	0.90	1.10	3.10	6.90	11.30	5.30	#####	#####	Clay loam	Fine	2.12	0.13	2.00	3.45	26	0.07	0.06	0.14	29.70	7.74	7.31	1.58	8.45	32	19.0		
18	19-056978	19-056978-003	TSOIL19_007_C_1	TSOIL19_007_C_1_AN	20.00	#####	215.00	442.00	18.00	1.20	0.60	2.40	6.90	11.90	6.10	#####	#####	Clay loam	Fine	1.99	0.05	1.84	3.17	19	0.09	0.07	0.12	16.70	6.61	6.06	1.54	7.39	27	17.0		
19	19-057500	19-057500-002	TSOIL19_008_A_1	TSOIL19_008_A_1_AN	17.60	#####	127.00	470.00	32.00	1.00	1.30	1.70	6.10	12.70	7.90	#####	#####	Clay loam	Fine	1.57	0.04	1.54	2.65	9	0.11	0.08	0.10	12.20	6.66	6.11	1.70	8.45	32	17.0		
20	19-057500	19-057500-002	TSOIL19_008_B_1	TSOIL19_008_B_1_AN	19.90	#####	137.00	473.00	25.00	1.20	1.00	1.40	5.10	11.50	7.20	#####	#####	Clay loam	Fine	1.63	0.04	1.59	2.74	10	0.10	0.08	0.11	11.70	6.69	5.92	1.47	8.45	32	17.0		
21	19-057500	19-057500-002	TSOIL19_008_C_1	TSOIL19_008_C_1_AN	20.60	#####	163.00	512.00	23.00	0.60	1.00	1.30	5.10	10.50	7.40	#####	#####	Clay	Fine	1.59	0.04	1.55	2.67	9	0.10	0.08	0.12	16.60	6.61	5.85	1.54	9.15	35	18.0		
22	19-056978	19-056978-003	TSOIL19_009_A_1	TSOIL19_009_A_1_AN	17.90	#####	159.00	510.00	19.00	1.00	1.20	2.50	8.50	14.90	5.90	#####	#####	Clay loam	Fine	1.73	0.04	1.69	2.91	13	0.13	0.08	0.12	12.20	6.85	5.40	1.25	13.02	54	18.0		
23	19-056978	19-056978-003	TSOIL19_009_B_1	TSOIL19_009_B_1_AN	18.70	#####	190.00	492.00	19.00	1.70	1.90	2.50	6.70	11.90	5.70	#####	#####	Clay loam	Fine	1.98	0.04	1.93	3.33	23	0.13	0.08	0.14	15.10	5.72	5.29	1.25	15.49	64	18.0		
24	19-056978	19-056978-003	TSOIL19_009_C_1	TSOIL19_009_C_1_AN	19.70	#####	166.00	427.00	21.00	1.20	2.30	3.20	10.60	18.40	5.10	#####	#####	Clay loam	Fine	2.22	0.04	2.18	3.76	36	0.11	0.08	0.16	9.96	6.18	5.82	1.11	17.60	71	21.0		
25	19-056978	19-056978-001	TSOIL19_011_A_1	TSOIL19_011_A_1_AN	19.90	#####	293.00	328.00	20.00	1.10	1.10	2.70	7.00	13.30	6.30	#####	#####	Clay loam	Fine	2.06	0.05	2.02	3.48	27	0.11	0.07	0.16	38.80	6.89	6.33	1.41	13.02	54	20.0		
26	19-056978	19-056978-002	TSOIL19_011_B_1	TSOIL19_011_B_1_AN	19.50	#####	215.00	313.00	24.00	1.00	1.30	2.00	7.10	14.90	6.90	#####	#####	Clay loam	Fine	1.93	0.04	1.89	3.26	21	0.10	0.08	0.13	20.90	6.43	5.80	1.43	8.45	32	16.0		
27	19-056978	19-056978-002	TSOIL19_011_C_1	TSOIL19_011_C_1_AN	20.10	#####	264.00	310.00	19.00	0.50	1.10	2.00	7.40	14.50	7.00	#####	#####	Clay loam	Fine	2.05	0.04	2.01	3.47	27	0.10	0.08	0.15	34.10	6.65	5.98	1.55	11.97	49	21.0		
28	19-056978	19-056978-001	TSOIL19_012_A_1	TSOIL19_012_A_1_AN	25.10	#####	181.00	585.00	21.00	0.80	1.20	2.30	7.00	13.50	5.70	#####	#####	Clay loam	Fine	2.08	0.05	2.03	3.50	28	0.06	0.05	0.15	3.85	7.18	6.62	1.55	11.62	47	22.0		
29	19-056978	19-056978-001	TSOIL19_012_B_1	TSOIL19_012_B_1_AN	23.10	#####	182.00	502.00	24.00	0.40	0.80	3.30	5.90	11.70	5.40	#####	#####	Clay	Fine	2.18	0.05	2.13	3.67	33	0.09	0.07	0.17	7.40	6.37	5.74	1.37	12.32	50	28.0		
30	19-056978	19-056978-001	TSOIL19_012_C_1	TSOIL19_012_C_1_AN	22.90	#####	192.00	503.00	21.00	0.60	0.80	2.10	5.70	10.10	5.40	#####	#####	Clay	Fine	2.02	0.04	1.97	3.40	25	0.08	0.06	0.16	6.41	6.90	6.24	1.43	10.21	41	22.0		
31	19-056978	19-056978-002	TSOIL19_013_A_1	TSOIL19_013_A_1_AN	24.50	#####	435.00	410.00	17.00	1.40	1.60	2.90	6.30	9.																						

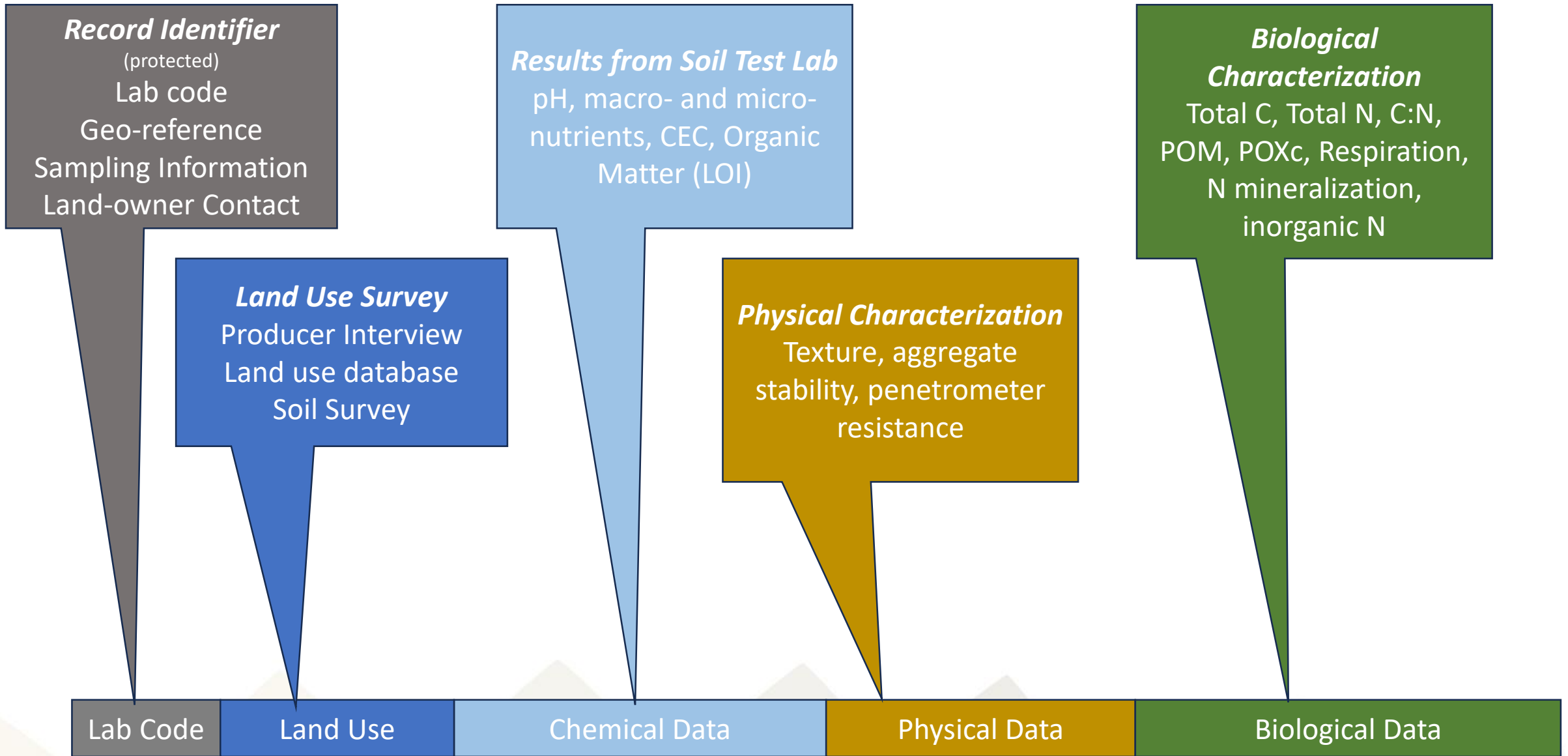
Atlantic Canada Soil Health Laboratory Initiative



Vector Tanks

7th Meeting of the **Global Soil Laboratory Network (GLOSOLAN)** | 21-23 November 2023





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Chemical - Soil Test Lab Results

A	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Soil Order	pH		Buffer pH		Organic Matter (LOI NSDA) (%)		P ₂ O ₅ (kg / ha)		K ₂ O (kg / ha)		Calcium (kg / ha)		Magnesium (kg / ha)
<i>Min</i>		4.1		6.9		1.5		16.0		54.0		24.0		7.0
<i>Max</i>		7.9		8.0		13.6		4421.0		3467.0		10374.0		1485.0
<i>Mean</i>		6.1		7.7		3.4		768.7		323.6		2726.0		392.4
<i>25% Quartile</i>		5.7		7.6		2.6		302.0		190.0		1982.5		246.8
<i>75% Quartile</i>		6.5		7.8		4.0		1085.3		383.0		3338.0		517.5
NSSH - 1	PZ	6.71	H	7.78	H	2.7	L	2317	H	486	H	3745	H	549
NSSH - 2	PZ	6.57	H	7.8	H	2.7	L	3685	H	364	H	4652	H	520
NSSH - 3	PZ	6.59	H	7.77	M	2.4	L	2442	H	352	M	3086	M	816
NSSH - 4	PZ	6.47	H	7.76	M	2.6	L	2534	H	525	H	2858	M	510
NSSH - 5	PZ	6.37	M	7.72	M	2.5	L	2494	H	506	H	2369	M	467

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Physical Characterization

A	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM
		Sand Hygrometer	Sand Rapid	Silt Hygrometer	Rapid Silt	Clay Hygrometer	Rapid Clay	Drainage Class	Surface Compaction		Sub-surface Compaction		Water Stable Aggregates (Rainfall Simulator)		Water Stable Aggregates (Slaking Method)		Available Water Content	
		(% w/w)	(% w/w)	(% w/w)	(% w/w)	(% w/w)	(% w/w)						(% w/w)		(% w/w)		(%w/w)	
<i>Min</i>		39.3	6.2	6.6	6.7	0.8	1.3		0.0		0.0		0.1		0.2		-44.2	
<i>Max</i>		90.2	89.4	48.7	74.2	18.0	44.9		4.0		4.0		1.0		0.9		33.5	
<i>Mean</i>		71.6	59.5	21.4	28.5	7.0	12.0		0.4		1.2		0.5		0.8		11.2	
<i>25% Quartile</i>		64.6	50.8	14.9	18.6	5.0	8.8		0.0		0.0		0.3		0.7		6.9	
<i>75% Quartile</i>		79.9	71.4	27.1	34.7	9.2	13.9		0.0		2.0		0.7		0.9		15.1	
NSSH-1	H	72.8	68.8	21.0	19.6	6.2	11.6	W	0		1		55%	M	78%	M	14.0	H
NSSH-2	M	71.8	67.6	18.6	18.9	9.6	13.6	W	0		0		41%	M	77%	M	2.4	L
NSSH-3	M	73.3	69.3	17.0	19.4	9.8	11.3	R	0		4		60%	M	75%	M	12.8	H
NSSH-4	H	84.3	78.1	7.5	13.1	8.2	8.8	W	4		4		88%	H	75%	M	13.3	H
NSSH-5	H	80.5	78.5	12.9	13.7	6.6	7.8	R	0		1		61%	M	74%	M	11.8	M

Biological Characterization – Organic Matter

NSSH Sample #	Soil Sample Wt.	Tin Wt. (Sand)	Wt. of Sand + Tin	Wt. of dried Sand	% sand	Tin Wt. (Silt)	Wt. of Silt + Tin	Wt. of dried Silt	Wt. of Clay	Total Soil			POM			Elementar smp. wt. mg	N%	C%	CNRatio	Elementar smp. wt. mg Sand POM	N%	C%	CNRatio	Mass of C in POM (g)	Mass of C in soil (g)	POM-Cas % of Soil C
										Sand	Silt	Clay	N%	C%	CNRatio											
1	20.04	1.69	15.47	13.78	68.8	1.68	5.61	3.93	2.33	68.8	19.6	11.6	1005.7	0.12	1.40	11.40	1004.80	0.06	0.07	1.22	1.01	28.13	3.6			
2																	9.85	1037.20	0.09	0.43	4.74	5.93	27.86	21.3		
3																	10.68	1045.00	0.10	0.45	4.63	6.31	24.32	26.0		
4																	11.37	1049.50	0.08	0.49	6.27	7.91	31.07	25.4		
5																	10.87	1058.80	0.10	0.47	4.55	7.66	25.39	30.2		
6																	10.32	1012.00	0.08	0.44	5.25	7.20	22.74	31.7		
7																	11.73	1006.50	0.09	0.44	5.05	7.40	17.53	42.2		
8																	9.33	1051.80	0.09	0.34	3.96	5.60	21.67	25.8		
9																	11.04	1046.20	0.09	0.54	5.80	7.81	20.34	38.4		
10																	9.49	1010.70	0.09	0.32	3.60	4.57	14.29	32.0		
11																	9.75	1002.40	0.09	0.07	0.83	1.25	14.72	8.5		
12																	9.83	1006.40	0.09	0.31	3.42	5.13	17.27	29.7		
13																	9.90	1019.20	0.07	0.49	7.36	7.58	18.85	40.2		
14																	10.23	1042.60	0.09	0.37	4.16	5.25	17.56	29.9		

Biological Characterization

A	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM
	Respiration		Active Carbon		ACE Protein		Ammonium		Nitrate		Soluble Organic N		Residual Soil Nitrogen		Biological Nitrogen Availability (BNA)		Estimates	Nmin stable	Nmin labile	Nmin	Estimated N mineralization over 130 days	Soil Nitrogen Supply
	(mg/g)				(ug/mL)		(mg N/kg)		(mg N/kg)		(mg N/kg)		(mg N/kg)		(mg N/kg)			(mg N/kg)	(mg N/kg)	(mg N/kg)	(kg N/ha)	(mg N/kg)
<i>Min</i>	0.0		9.1		1.1		-0.1		-0.3		-1.7		-0.3		-4.8			0.2	-4.8	0.6	1.1	-3.1
<i>Max</i>	5.2		1328.5		70.7		34.1		107.8		2471.0		111.5		10538.7			4274.5	10538.0	14812.5	28884.4	11546.8
<i>Mean</i>	0.8		462.4		8.5		0.9		4.0		9.7		4.8		64.6			55.9	64.6	120.5	235.0	78.1
<i>25% Quartile</i>	0.4		323.0		6.0		0.2		0.5		0.5		1.1		9.1			26.1	9.1	37.3	72.8	12.1
<i>75% Quartile</i>	1.0		593.4		9.9		0.9		4.2		3.4		5.0		27.5			47.5	27.5	73.6	143.5	36.3
NSSH - 1	0.85	M	444	M	6.9	M	0.47	M	1.10	M	0.51	L	1.57	M	26.9	H	0.24	30.58	26.88	57.46	112.05	30.2
NSSH - 2	0.54	M	443	M	6.5	M	0.94	H	0.65	M	1.16	M	1.58	M	24.8	M	0.25	32.43	24.75	57.19	111.52	28.1
NSSH - 3	0.42	L	409	M	6.1	L	1.28	H	0.42	L	0.37	L	1.70	M	16.4	M	0.19	24.68	16.42	41.10	80.15	19.9
NSSH - 4	0.45	L	435	M	7.3	M	1.21	H	-0.09	L	0.08	L	1.12	L	11.2	M	0.20	25.81	11.24	37.05	72.24	14.1
NSSH - 5	0.24	L	424	M	6.3	L	0.84	H	9.70	H	1.37	M	10.53	H	13.1	M	0.18	23.44	13.06	36.50	71.18	25.3

State of Soil Information

- Dispersion of soil scientists and data across sectors results in fragmented datasets
 - Lack of common data structure
 - Metadata and documentation protocols are ad hoc
 - Lack of data harmonization (methodologies)
 - Overlapping work
- Lack of capacity to update soil information systems or develop integrated and harmonized information management systems

The Canadian Soil Data Portal - Transforming Canada's Soil Data Infrastructure to Facilitate GHG Reductions and Climate Change Mitigation

Theme 1 - National Soil Data Inventory:

- Consolidate national soil datasets and archived samples
- Mining publicly-available private sector data from environmental impact assessment reports

Theme 2 – Soil Analysis & Chemometrics:

- Development and application of soil spectroscopy to soil properties
- Development of national global soil spectral libraries

Theme 3 - Digital Soil Assessment:

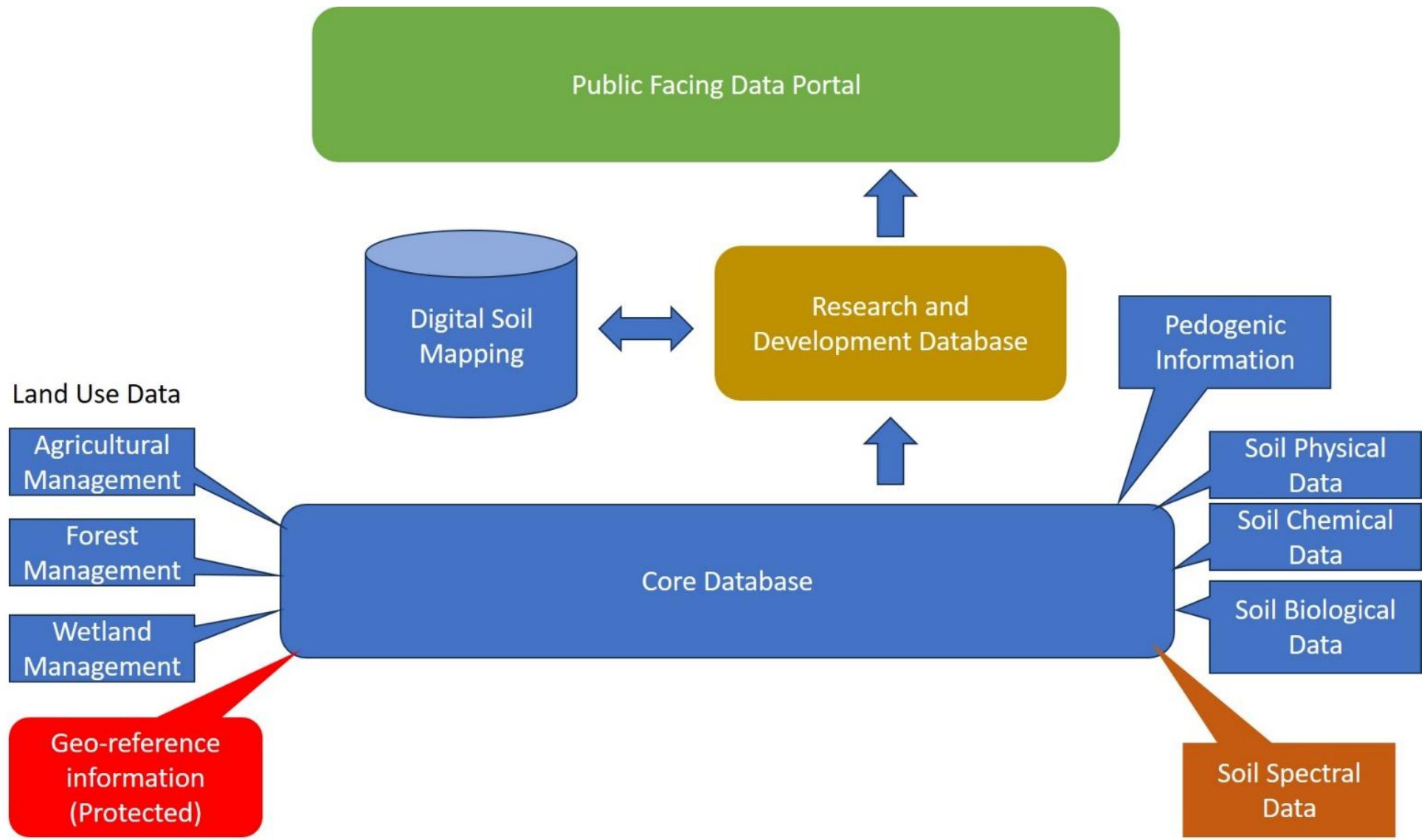
- Use pedometric techniques to develop high-resolution soil maps through statistical techniques, remote sensing, and machine learning

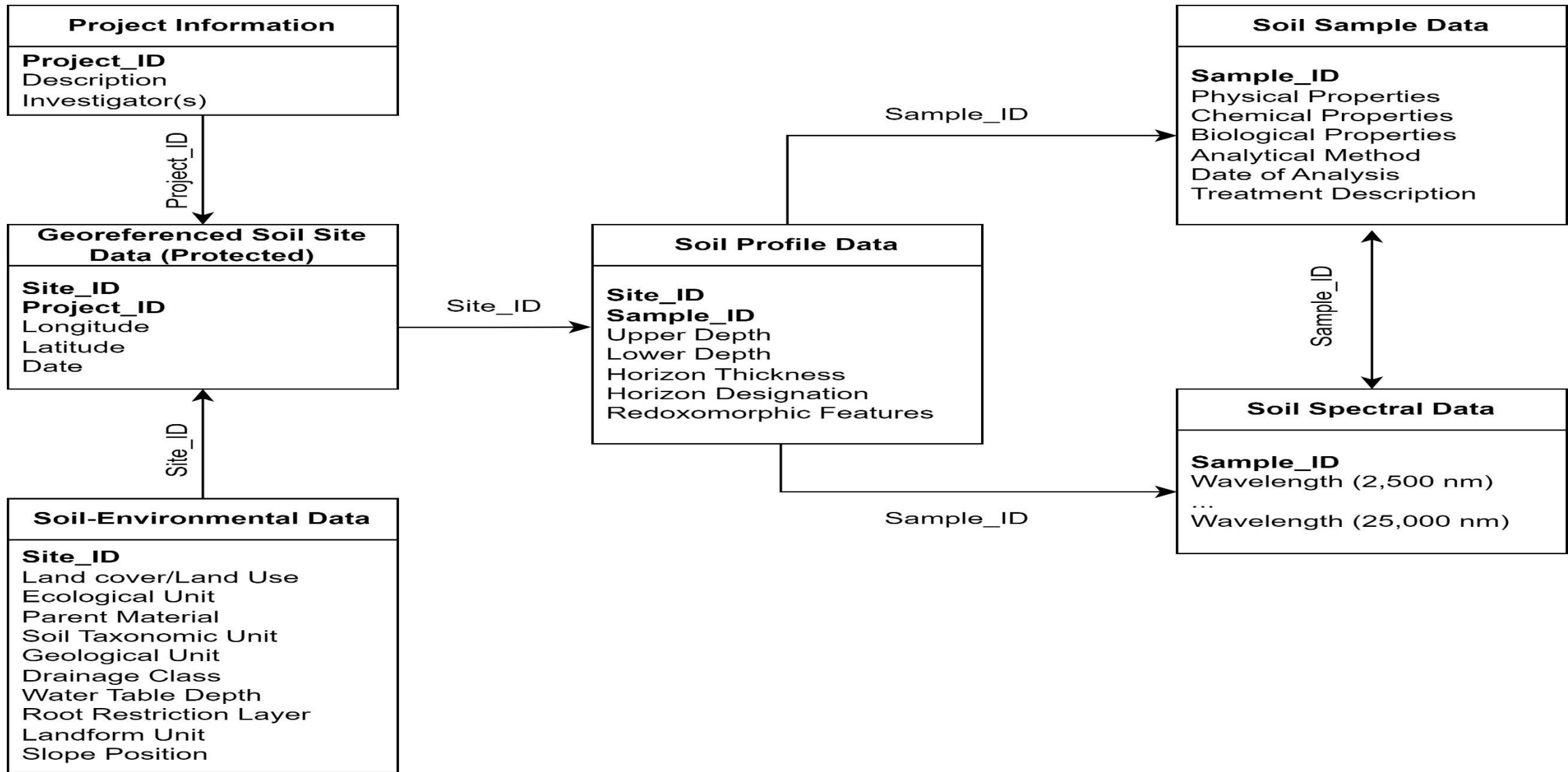
Theme 4 - Social Dimensions of Soil Data Sharing & Governance:

- Explore social aspects of soil data sharing and governance to understand the behavioural, legal motivations, and barriers to data sharing

Theme 5 - Economic Valuation and Cost-Benefit Analysis of a National Soils Database:

- Build a cost-benefit analysis for long-term investment in a national digital soil database and spectroscopy library





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