

Supplementary Material

Tab. S1 - Covariances between humus chemical properties in compared forest stand types. CEC – cation exchange capacity; BS – base saturation; C_{org} – organic carbon content; C_{mic} – microbial carbon; N_{tot} – total nitrogen; UA – urease activity; APMEA - acid phosphomonoesterase activity; CA – catalase activity.

Stand type	Property	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA
Broadleaved	CEC	22.26							
	BS	19.36	357.93						
	C _{org}	-1.55	3.41	-36.31					
	C _{mic}	-1037.50	-31470.63	-5580.44	8037.35				
	N _{tot}	-0.10	1.55	-3.49	1.39	134.17			
	UA	25.33	-30.53	459.88	-184.45	-452178.36	-5.17		
	APMEA	-38.08	-2102.96	-355.15	-285.51	-1029172.28	-17.01	22645.77	
	CA	49.43	1177.98	1292.42	-129.43	-164074.16	-13.19	-1308.49	-13218.15
Mixed	CEC	16.30							
	BS	29.91	304.81						
	C _{org}	-1.92	-0.26	-34.32					
	C _{mic}	-597.24	16397.78	-24200.59	7049.31				
	N _{tot}	-0.13	0.79	-2.90	1.12	378.68			
	UA	16.91	-296.16	832.88	43.64	-129545.20	3.24		
	APMEA	4.38	-725.13	1278.14	140.87	-410951.03	15.64	21823.83	
	CA	71.63	891.23	1985.94	-13.41	24646.14	-4.48	-696.33	-2860.72
Spruce	CEC	32.49							
	BS	25.98	612.12						
	C _{org}	-1.49	26.20	-34.93					
	C _{mic}	-815.26	30447.26	-8359.12	5368.44				
	N _{tot}	-0.01	6.84	-1.64	1.24	274.06			
	UA	42.66	966.37	502.11	-18.50	-210389.16	8.95		
	APMEA	-4.25	-162.52	-1574.19	87.87	-670344.64	26.36	11630.24	
	CA	58.99	1385.15	1744.36	-259.13	51199.10	-13.62	-1172.79	21892.91

Tab. S2 - Covariances between top-soil properties in compared forest stand types. D_d – bulk density; D_s – specific density; WHC – water-holding capacity; CEC – cation exchange capacity; BS – base saturation; C_{org} – organic carbon content; C_{mic} – microbial carbon; N_{tot} – total nitrogen; UA – urease activity; APMEA - acid phosphomonoesterase activity; CA – catalase activity.

Stand type	Property	Altitude	Slope	Sand	Silt	Clay	D _d	D _s	WHC	P	A	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA
Broadleaved	Slope	312.47																	
	Sand	171.15	-10.88																
	Silt	-128.12	8.21	-112.11															
	Clay	-16.72	2.52	-18.88	10.26														
	D _d	7.00	-0.02	0.02	0.10	-0.13													
	D _s	6.09	-0.23	0.03	-0.05	-0.02	0.03												
	WHC	-158.34	3.46	3.59	-7.89	-2.36	-0.07	-0.08											
	Porosity	-200.19	-4.86	1.12	-7.77	4.35	-1.63	-0.63	3.80										
	Aeration	21.00	-21.34	15.06	-26.65	0.95	-2.34	-0.41	-0.91	97.55									
	pH	-36.58	3.39	-4.70	2.37	1.14	0.00	0.02	1.68	0.29	-0.50								
	CEC	-390.64	60.20	-60.18	31.38	19.35	-0.41	-0.36	14.70	10.43	-9.43	12.26							
	BS	-1117.76	54.21	-105.85	58.41	25.64	-0.23	0.79	57.01	18.13	7.62	23.95	277.63						
	C _{org}	-178.63	1.44	7.06	-7.10	3.77	-0.44	-0.51	-0.11	9.22	-2.59	-0.70	9.70	-23.34					
	C _{mic}	-16398.81	-2453.70	6181.38	-7236.33	-603.04	-287.88	-86.64	-2613.61	11572.31	30795.54	-400.91	-3113.12	-3742.59	2392.51				
N _{tot}	-8.32	0.28	0.03	-0.29	0.33	-0.02	-0.03	0.11	0.43	-0.48	0.00	1.21	-0.25	1.14	97.23				
UA	-2176.07	178.60	-270.77	176.22	107.80	-1.74	-1.96	74.95	32.86	-375.37	39.73	582.19	937.33	55.97	-62008.67	4.89			
APMEA	-5497.42	209.55	-41.84	152.57	-46.78	-2.94	-6.61	12.11	8.46	-592.09	-4.25	53.69	-41.92	149.90	-41383.54	8.75	2555.38		
CA	-809.25	36.42	-138.56	67.54	84.66	-1.04	0.36	85.55	31.90	-15.95	18.29	299.09	876.21	48.39	-810.78	4.89	941.10	-349.94	
Mixed	Slope	191.86																	
	Sand	205.10	-0.77																
	Silt	-86.77	-11.30	-158.47															
	Clay	-68.57	2.08	-62.97	20.81														
	D _d	5.03	-0.10	0.55	-0.39	-0.01													
	D _s	8.18	-0.50	0.32	-0.38	0.03	0.03												
	WHC	-63.32	7.86	-56.56	34.56	4.27	0.55	0.19											
	Porosity	-40.74	-8.05	-16.76	13.75	-2.24	-2.02	-0.77	-5.39										
	Aeration	40.25	-13.22	62.54	-23.45	-32.08	-1.91	-0.43	-30.95	72.11									
	pH	-41.75	2.27	-8.31	2.11	2.89	0.01	0.01	2.07	-0.93	-3.20								

Samec P, Volánek J, Holík L, Rychtecka P, Balkova M, Vranova V (2023). **The effect of soil conditions on submountain site suitability for Norway spruce (*Picea abies* Karst.) in Central Europe**

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Stand type	Property	Altitude	Slope	Sand	Silt	Clay	D _d	D _s	WHC	P	A	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA	
Spruce	CEC	-365.64	42.03	-76.91	33.03	18.64	-0.75	-0.93	24.55	18.27	7.70	9.26								
	BS	-1409.18	12.93	-168.71	27.99	85.78	0.24	0.31	33.54	-29.64	-100.85	26.42	219.37							
	C _{org}	-169.90	11.92	-8.08	8.34	0.80	-0.69	-0.67	0.92	17.53	13.95	0.06	20.17	9.86						
	C _{mic}	-129522.48	3090.03	9220.48	-4062.76	-3577.91	-81.09	-67.24	6404.52	2031.84	16181.86	128.38	5606.95	6671.13	3188.73					
	N _{tot}	-8.04	0.82	-1.36	0.88	0.28	-0.04	-0.04	0.03	1.01	0.44	0.06	1.77	1.78	0.86	98.97				
	UA	-1889.41	63.08	-396.98	85.70	186.10	-0.17	-0.23	-8.61	-15.22	-448.43	28.04	145.32	751.54	10.73	-38832.76	2.21			
	APMEA	-5490.95	-118.83	-250.75	172.53	68.85	-6.92	-6.68	191.59	153.51	-243.61	4.03	86.78	501.43	187.53	23874.50	8.48	2459.97		
	CA	-1420.10	-15.57	-282.45	125.89	79.62	-2.08	-1.87	35.24	42.87	-62.33	25.10	308.24	872.94	40.97	5400.27	3.87	614.55	557.50	
	Slope	-27.34																		
	Sand	521.18	-53.48																	
	Silt	-651.64	31.32	-237.99																
	Clay	111.49	5.36	-92.98	26.53															
	D _d	0.69	-0.53	0.60	-0.41	-0.02														
	D _s	1.02	-1.31	-1.03	0.20	0.44	0.03													
	WHC	23.06	-20.46	4.64	-17.81	10.29	0.37	0.68												
	Porosity	-21.41	-2.78	-53.30	24.91	9.01	-2.00	-0.24	-3.61											
	Aeration	-101.45	-0.36	-44.66	33.90	-5.65	-1.91	-0.29	-47.15	101.60										
	pH	-26.86	5.87	-3.91	3.49	0.53	-0.03	-0.10	-1.20	-1.18	-0.47									
	CEC	-609.78	332.19	-16.98	59.27	-27.57	-2.62	-6.94	-91.71	-18.98	41.92	35.36								
	BS	-578.28	135.03	-80.63	91.02	-4.34	-1.23	-2.52	-52.33	-13.01	9.56	25.96	779.30							
C _{org}	-11.15	15.85	19.33	-5.43	-5.78	-0.44	-0.71	-10.16	6.07	2.88	1.94	109.45	47.14							
C _{mic}	1231.01	4430.70	15373.15	-5620.58	-5620.53	-287.80	-270.21	-9992.13	9941.56	26799.40	752.36	56454.15	23344.94	7669.88						
N _{tot}	-2.60	2.47	0.50	0.18	-0.26	-0.03	-0.07	-1.26	-0.03	0.09	0.27	13.59	6.48	1.37	581.97					
UA	-794.88	279.48	16.17	32.14	25.49	1.60	-6.18	-98.43	-270.00	-405.98	43.49	1255.32	951.95	109.84	-10921.21	15.78				
APMEA	161.35	75.79	53.14	8.83	-41.13	2.44	-1.19	17.85	-147.74	-306.70	11.55	537.90	307.75	20.07	1568.68	5.84	1962.22			
CA	-158.87	232.88	-299.73	164.19	47.82	-2.60	-1.69	-24.25	85.47	130.83	30.13	1077.42	728.48	35.78	25545.47	6.24	524.07	-164.76		

Tab. S3 - Covariances between humus chemical properties in compared spruce populations. CEC – cation exchange capacity; BS – base saturation; C_{org} – organic carbon content; C_{mic} – microbial carbon; N_{tot} – total nitrogen; UA – urease activity; APMEA - acid phosphomonoesterase activity; CA – catalase activity.

Population	Property	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA
North-Bohemian	CEC	-0.79							
	BS	8.35	-30.19						
	C _{org}	-1.24	5.48	-74.03					
	C _{mic}	-744.11	545.56	-39621.83	8141.09				
	N _{tot}	-0.08	0.22	-6.15	1.01	413.01			
	UA	20.12	-112.00	697.19	-111.95	-10779.72	-3.29		
	APMEA	101.95	-446.45	4422.87	-831.26	-349023.00	-40.26	17134.29	
	CA	5.81	1.95	39.47	-16.62	-153809.87	4.03	1352.25	1858.62
West-Sudeten	CEC	-0.40							
	BS	6.97	-29.86						
	C _{org}	-0.81	7.21	-3.37					
	C _{mic}	1749.50	-3181.92	80978.09	-298.47				
	N _{tot}	-0.06	0.47	-1.22	0.88	-16.16			
	UA	24.90	-234.53	836.30	-223.99	220007.57	-10.72		
	APMEA	92.78	-642.56	2831.32	-714.31	894031.60	-37.29	36321.92	
	CA	-0.51	7.17	-22.81	4.91	660.70	0.37	-123.17	-344.43
Křivoklát	CEC	19.82							
	BS	21.28	233.72						
	C _{org}	-5.00	-51.07	-60.34					
	C _{mic}	-1653.88	-49835.08	-555.42	6378.07				
	N _{tot}	-0.45	-4.30	-5.94	1.67	-46.32			
	UA	12.79	-217.08	531.75	-66.67	121726.47	-1.41		
	APMEA	-116.87	-2041.73	-877.03	324.21	917084.35	27.88	14079.97	
	CA	172.13	1719.23	2636.62	-518.97	260068.78	-66.43	-14193.19	-29865.02
Sázava	CEC	0.00							
	BS	5.13	13.71						
	C _{org}	-0.28	-0.80	-20.17					
	C _{mic}	-0.88	-5294.51	-42964.35	10819.22				
	N _{tot}	-0.03	0.00	-2.68	0.25	373.29			
	UA	7.83	23.69	53.30	-78.36	-410502.60	5.24		
	APMEA	9.32	11.40	1022.06	-193.74	-1092307.26	-7.56	7576.82	
	CA	6.39	203.89	1125.27	-40.65	-99773.42	-10.60	-721.11	-643.17
Javoříce	CEC	-1.38							
	BS	7.74	-42.61						
	C _{org}	-0.64	10.11	-14.82					
	C _{mic}	1999.39	-22016.89	82083.40	-16755.41				
	N _{tot}	-0.05	0.96	-2.79	0.34	-1284.44			
	UA	-0.20	-4.26	-10.91	1.95	-16254.78	-0.01		
	APMEA	1.39	17.46	61.50	27.82	-81135.33	0.36	-10.87	
	CA	-0.05	-0.51	-4.39	-0.89	450.68	0.01	0.64	-10.86

Population	Property	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA
Karstic	CEC	39.26							
	BS	11.98	410.16						
	C _{org}	0.15	155.63	7.28					
	C _{mic}	-2478.17	66282.78	-27514.57	28609.32				
	N _{tot}	0.04	17.78	0.41	1.57	1442.98			
	UA	44.68	-764.44	660.79	-164.44	-692371.81	-3.67		
	APMEA	9.29	-5271.09	341.70	-534.44	-1373816.60	-33.30	16649.43	
	CA	11.87	1662.69	182.39	317.27	744125.84	15.13	-3774.30	-12066.66
Below-Beskidian	CEC	3.26							
	BS	16.33	113.71						
	C _{org}	-2.22	-3.88	-22.09					
	C _{mic}	212.06	529.80	-13383.77	-7741.91				
	N _{tot}	-0.08	0.27	-0.59	1.90	58.24			
	UA	7.64	119.54	733.60	439.61	-231229.98	18.46		
	APMEA	-41.15	1.14	-540.09	1061.66	-746199.77	43.46	24692.96	
	CA	-10.72	-31.42	-195.54	213.72	-137736.03	7.98	4477.22	13933.37
Beskidian	CEC	0.08							
	BS	2.59	36.25						
	C _{org}	-0.05	4.78	16.87					
	C _{mic}	950.17	12352.58	72751.90	-3676.19				
	N _{tot}	-0.02	0.83	1.41	1.81	267.85			
	UA	-3.99	-73.23	-403.05	-5.09	-140844.97	1.76		
	APMEA	-26.19	45.92	-523.73	774.96	-665982.67	51.38	6418.45	
	CA	5.57	125.62	1418.08	-488.06	377346.66	-20.71	-3333.85	-22597.15

Tab. S4 - Covariances between top-soil properties in compared forest stand types. D_d – bulk density; D_s – specific density; WHC – water-holding capacity; CEC – cation exchange capacity; BS – base saturation; C_{org} – organic carbon content; C_{mic} – microbial carbon; N_{tot} – total nitrogen; UA – urease activity; APMEA - acid phosphomonoesterase activity; CA – catalase activity.

Popula- tion	Property	Altitude	Slope	Sand	Silt	Clay	D_d	D_s	WHC	P	A	pH	CEC	BS	C_{org}	C_{mic}	N_{tot}	UA	APMEA	CA	
North-Bohemian	Slope	-247.24																			
	Sand	240.30	-106.59																		
	Silt	-271.74	81.87	-199.63																	
	Clay	62.03	-1.48	-17.04	9.38																
	D_d	2.49	-0.95	1.57	-1.29	0.06															
	D_s	-5.88	-0.70	1.45	-1.10	-0.07	0.10														
	WHC	-17.50	-45.53	78.90	-65.76	-3.23	0.33	1.38													
	Porosity	-174.62	35.38	-58.84	49.51	-3.09	-4.62	-3.15	-5.38												
	Aeration	-757.96	80.47	-97.05	100.06	-13.44	-6.71	-4.01	-18.75	250.89											
	pH	6.77	-1.85	2.52	-1.96	0.08	0.08	0.05	0.31	-2.94	-5.39										
	CEC	142.05	6.41	-22.19	13.14	2.97	-1.83	-1.82	-6.97	60.11	63.80	-0.90									
	BS	-102.69	-11.27	38.57	-18.76	-9.37	2.89	2.01	-21.14	-104.06	-150.08	2.15	-47.66								
	C_{org}	130.71	4.50	-16.23	6.81	3.88	-1.52	-1.28	4.46	51.33	50.80	-0.83	31.25	-51.30							
	C_{mic}	-100607.35	8315.09	2367.58	1626.46	-3133.09	-651.67	-185.16	4887.96	26064.08	51480.68	-527.21	4105.26	-11763.04	5330.99						
	N_{tot}	13.93	0.33	-1.40	0.61	0.34	-0.09	-0.11	-0.34	2.79	2.17	-0.04	2.40	-2.84	2.10	44.67					
	UA	613.98	-40.29	-7.80	3.10	1.12	-2.94	-4.48	-53.22	77.34	-5.28	0.70	82.98	37.70	62.77	3976.03	5.96				
APMEA	-83.90	-200.89	36.06	-6.97	-63.25	-28.12	-17.13	278.42	1009.02	1085.69	-10.62	454.78	-169.50	424.67	202376.44	26.84	2678.10				
CA	1118.46	-47.78	-66.32	25.96	29.07	-0.98	-4.02	-71.17	-2.66	-163.84	1.61	89.29	-13.34	65.17	-35051.40	7.66	384.23	776.47			
West-Sudeten	Slope	-44.10																			
	Sand	25.01	-41.00																		
	Silt	-60.44	28.20	-169.08																	
	Clay	27.12	-0.05	-2.66	-3.32																
	D_d	-0.28	-0.25	-0.02	0.38	-0.19															
	D_s	1.50	-0.19	-0.01	0.29	-0.15	0.05														
	WHC	-38.71	5.63	-107.92	85.36	-3.84	1.14	0.96													
	Porosity	16.35	7.05	5.10	-16.05	6.33	-3.05	-1.83	-40.11												
	Aeration	16.99	6.81	5.82	-16.60	6.34	-3.05	-1.83	-40.54	112.15											
	pH	1.99	0.41	-2.29	1.57	0.09	-0.01	0.01	1.14	0.54	0.54										
	CEC	-0.10	8.02	-20.70	2.90	7.12	-1.11	-1.11	-11.77	36.62	36.58	0.06									
	BS	-0.09	-38.25	69.50	-30.86	-9.55	0.05	0.75	-7.59	6.83	7.13	0.63	-37.07								
	C_{org}	17.27	3.65	-5.90	-6.68	6.72	-1.10	-0.95	-16.94	36.89	36.91	0.06	25.75	-22.10							
	C_{mic}	7626.04	3302.05	3914.03	-10232.16	4520.31	-649.03	-573.28	-13701.09	22411.53	22431.42	16.91	15781.63	-14234.95	13897.65						

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Popula- tion	Property	Altitude	Slope	Sand	Silt	Clay	D _a	D _s	WHC	P	A	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA	
Křivoklát	N _{tot}	1.24	0.06	-0.53	-0.36	0.46	-0.07	-0.06	-1.01	2.46	2.47	0.01	1.68	-1.10	1.55	942.87				
	UA	-120.11	17.36	-66.78	60.51	-8.33	2.37	1.57	62.71	-84.79	-85.07	-0.03	-36.20	3.77	-38.34	-18072.01	-2.18			
	APMEA	-418.11	-276.43	8.85	53.39	-29.47	22.02	10.43	500.57	-779.96	-780.60	-14.29	-192.11	-381.03	-256.72	-105348.86	-15.32	650.14		
	CA	-26.88	1.78	0.57	-4.45	2.22	-0.51	-0.61	-9.22	17.30	17.31	-0.20	13.97	-13.40	10.28	8159.29	0.74	-9.33	7.84	
	Slope	2.40																		
	Sand	191.95	-13.69																	
	Silt	-83.64	9.98	-203.34																
	Clay	-56.00	-0.35	-69.34	45.33															
	D _a	0.84	-0.20	-0.58	0.39	0.23														
	D _s	-1.96	-0.21	-0.42	0.28	0.13	0.01													
	WHC	-26.48	-0.98	79.14	-53.35	-13.89	-0.27	-0.26												
	Porosity	-57.64	6.30	19.64	-12.87	-8.34	-0.33	-0.26	7.86											
	Aeration	218.54	-8.08	151.04	-99.04	-44.81	-0.27	-0.07	23.34	11.35										
	pH	-69.15	1.50	-5.47	3.03	1.47	-0.03	0.01	0.69	1.25	-5.39									
	CEC	-891.45	26.94	-88.93	50.44	24.38	-0.62	-0.44	9.58	19.83	-90.70	17.52								
	BS	-2514.62	21.80	-141.02	72.37	27.13	-0.65	1.03	12.93	40.17	-116.74	42.12	519.46							
	C _{org}	-20.14	0.75	3.47	-3.02	1.67	-0.10	-0.18	6.03	1.63	-6.00	0.49	17.03	7.65						
	C _{mic}	-45598.21	-797.28	16675.57	-11467.47	-5594.83	-35.45	50.72	3035.55	2313.44	12356.05	464.24	1649.17	29033.76	-967.97					
	N _{tot}	-5.41	0.20	-1.34	0.84	0.34	0.00	-0.01	-0.10	0.09	-0.98	0.11	2.10	3.19	0.18	-41.95				
UA	-1497.84	194.32	-721.01	472.25	168.18	-2.58	-3.91	-46.50	58.24	-545.30	53.33	1029.27	1160.16	73.81	-50340.95	9.06				
APMEA	-162.56	72.75	-14.51	5.62	-137.23	-3.38	-4.85	-70.07	77.01	96.57	-3.88	89.71	89.55	-26.32	-744.28	-1.22	926.74			
CA	-4640.38	-5.46	91.14	-92.15	-83.88	-0.88	5.00	33.63	105.40	190.71	68.77	763.00	3003.30	-23.06	123143.88	4.08	251.90	-1656.71		
Sázava	Slope	-121.97																		
	Sand	-289.88	17.73																	
	Silt	128.58	-8.80	-59.63																
	Clay	55.87	-2.96	-12.92	8.09															
	D _a	-4.19	0.40	0.67	-0.53	-0.12														
	D _s	3.06	-0.31	-0.29	0.09	0.11	-0.01													
	WHC	-43.23	17.43	26.44	-21.48	-5.39	0.95	-0.27												
	Porosity	239.44	-23.20	-34.42	24.65	7.48	-2.25	0.61	-45.78											
	Aeration	151.20	-6.68	-11.77	12.30	1.72	-2.13	0.49	-21.85	103.18										
	pH	-1.68	0.01	-0.34	0.36	0.21	0.00	0.01	-0.66	0.12	-0.20									
	CEC	-2.79	2.16	-1.85	2.02	1.59	0.06	0.01	-0.58	-2.31	-1.72	0.21								
	BS	220.45	-11.58	-41.76	24.04	5.59	-0.50	0.28	-0.51	27.74	28.52	-0.31	0.12							
	C _{org}	-22.53	1.99	5.59	-4.88	-0.37	0.29	-0.06	6.11	-13.75	-20.46	-0.01	0.19	-6.32						
	C _{mic}	-35558.61	5315.50	7856.38	-4182.24	-1864.98	23.33	-80.47	9539.53	-2221.24	7846.20	-162.58	-395.33	462.68	-702.59					
	N _{tot}	0.62	0.01	-0.25	0.12	0.08	0.00	0.00	0.10	-0.15	-0.47	0.00	0.03	0.08	0.16	-33.35				
	UA	326.46	-78.12	-61.43	24.71	18.88	-0.64	1.49	-63.88	55.51	-86.03	1.44	-8.32	-14.00	25.10	-31407.76	1.53			

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Popula- tion	Property	Altitude	Slope	Sand	Silt	Clay	D _a	D _s	WHC	P	A	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA	
Javořice	APMEA	-52.96	-79.02	-3.33	9.72	-1.24	-2.87	1.12	-102.51	145.29	43.14	1.33	-19.18	-18.25	0.10	-18384.47	0.09	552.59		
	CA	1453.06	-48.72	-97.32	8.44	-4.75	-2.12	2.05	57.52	134.42	249.90	-3.55	-15.14	189.43	-38.77	4134.31	-1.00	-277.90	-208.04	
	Slope	-8.65																		
	Sand	-38.51	-4.51																	
	Silt	29.01	2.11	-81.46																
	Clay	0.21	0.21	-5.80	2.79															
	D _a	0.20	-0.29	-0.79	0.34	0.05														
	D _s	-0.02	0.02	-0.36	0.08	0.02	0.01													
	WHC	56.92	-8.16	-92.06	55.60	2.74	1.08	0.12												
	Porosity	0.13	11.82	-24.54	17.63	-0.66	-1.95	0.03	14.28											
	Aeration	-61.86	17.75	-6.01	-0.02	0.42	-2.50	0.11	-47.72	113.99										
	pH	-0.18	-0.11	-0.62	0.04	0.03	0.01	0.01	1.16	0.17	0.20									
	CEC	-14.26	-1.77	2.27	-0.55	-0.33	0.08	0.15	3.21	10.46	9.59	-0.09								
	BS	10.52	-2.63	60.97	-36.36	-3.91	-1.56	-0.50	-33.33	32.60	-1.91	0.41	-4.94							
	C _{org}	-16.05	-1.36	32.71	-17.24	-1.54	-0.43	-0.06	-23.66	4.06	6.45	-0.19	7.23	23.77						
	C _{mic}	-23894.38	-929.54	18634.03	-10356.18	-818.43	-223.34	33.04	-10044.48	8175.51	15756.87	1.08	9115.64	7515.17	10631.72					
	N _{tot}	-0.55	-0.09	1.22	-0.61	-0.06	-0.02	0.00	-0.76	0.21	0.20	-0.01	0.34	1.01	0.65	453.97				
UA	-6.57	-2.72	24.12	-15.18	-0.82	-0.31	-0.11	-15.17	-0.13	16.71	0.26	-0.49	21.02	6.69	4894.53	0.28				
APMEA	-156.00	-13.88	181.87	-94.09	-9.48	-4.42	-0.74	-110.47	109.56	172.08	0.29	59.90	195.60	112.81	89845.35	4.95	73.85			
CA	6.74	-1.19	-2.85	1.02	0.12	0.21	0.04	8.05	-6.28	-14.12	0.11	-0.52	-1.37	-1.58	-1381.27	-0.06	-1.49	-18.72		
Slope	-668.24																			
Sand	-51.02	28.16																		
Silt	147.87	-33.53	-131.62																	
Clay	-42.78	-1.32	-46.07	-6.97																
D _a	3.96	-0.81	0.08	0.19	-0.02															
D _s	6.19	-2.13	-2.55	0.79	0.68	0.02														
WHC	-171.62	10.46	-43.31	7.42	14.82	-0.31	1.04													
Porosity	-42.13	-9.66	-72.49	17.99	14.02	-1.51	0.85	39.33												
Aeration	-63.01	5.29	67.10	-38.87	-37.01	-2.42	-0.67	16.57	122.28											
pH	-78.60	20.15	1.72	-4.46	0.77	-0.04	-0.15	3.64	-1.72	-2.55										
CEC	-1805.94	685.88	347.08	-96.04	-139.79	-4.54	-14.98	-145.77	-90.67	170.25	60.57									
BS	-1494.40	316.29	49.86	-106.46	40.35	-1.94	-2.97	123.50	20.27	-24.19	41.04	956.01								
C _{org}	-99.35	28.49	53.96	-22.19	-10.50	-0.41	-1.25	-6.96	-9.15	20.47	1.90	223.48	64.48							
C _{mic}	-1828.00	3463.92	20504.47	-6210.38	-9274.32	-325.91	-419.39	-1351.50	9152.50	37086.48	-235.05	101397.70	5167.37	10471.86						
N _{tot}	-13.58	4.29	5.04	-2.11	-0.97	-0.02	-0.13	-1.14	-2.16	-0.16	0.38	26.88	8.00	2.42	755.23					
UA	-2628.20	697.24	212.25	-436.51	277.35	7.52	-5.17	33.03	-632.54	-1489.89	96.29	1143.93	1856.61	101.05	-168598.46	23.02				
APMEA	1020.05	-278.21	-382.06	349.07	168.09	5.55	1.84	26.03	-291.41	-1135.36	-32.75	-1412.21	-197.76	-17.78	-139308.26	-0.90	5614.61			
CA	-1351.24	413.25	-78.30	55.37	-13.29	-3.93	-5.87	72.30	86.88	74.21	41.14	2147.75	800.35	106.44	59509.37	12.33	888.51	-290.56		

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Popula- tion	Property	Altitude	Slope	Sand	Silt	Clay	D _a	D _s	WHC	P	A	pH	CEC	BS	C _{org}	C _{mic}	N _{tot}	UA	APMEA
Below-Beskidian	Slope	190.34																	
	Sand	102.09	14.40																
	Silt	-119.72	-5.45	-41.96															
	Clay	87.59	0.92	-37.33	11.93														
	D _a	0.73	-0.02	0.56	-0.25	-0.08													
	D _s	3.63	-0.12	-0.29	-0.03	0.26	0.01												
	WHC	-219.01	-5.77	-24.43	15.14	-2.17	-0.41	-0.32											
	Porosity	14.32	-1.62	-30.74	11.39	7.69	-0.61	-0.05	14.00										
	Aeration	423.08	-12.65	-20.30	-35.10	-14.01	0.42	1.18	-28.73	-0.68									
	pH	23.67	0.52	-1.29	-0.29	0.14	0.00	0.03	-0.17	0.56	5.86								
	CEC	139.41	8.06	-2.11	2.01	3.47	-0.15	-0.07	-0.37	5.42	-6.52	0.50							
	BS	1078.44	41.71	2.58	-20.59	-6.78	-0.11	0.29	-4.94	8.83	146.39	9.17	37.72						
	C _{org}	-80.26	4.97	10.32	0.12	-4.45	-0.21	-0.42	6.53	2.64	-38.99	-0.86	1.46	-20.76					
	C _{mic}	5033.50	-1596.68	-2136.31	-2906.43	-4023.69	19.36	40.55	1234.75	-145.41	27475.32	653.43	-1522.04	19747.68	-2498.63				
	N _{tot}	-1.85	0.30	0.12	0.04	-0.13	-0.01	-0.02	0.34	0.24	-1.42	-0.02	0.17	-0.11	0.62	-71.64			
	UA	228.04	16.21	18.53	36.62	45.94	-1.65	-0.13	10.70	72.80	-259.68	-3.28	11.01	-145.55	25.74	-34939.11	0.60		
APMEA	-931.05	56.69	19.70	113.08	16.45	-2.89	-3.75	150.24	73.09	-747.73	-7.45	24.31	-118.19	135.11	-49728.87	5.69	837.63		
CA	-448.57	14.89	-37.48	58.33	36.45	-1.59	-1.62	52.25	47.43	-334.54	-5.57	14.94	-156.62	56.85	-31348.29	2.46	475.98	1018.38	
Beskidian	Slope	186.24																	
	Sand	245.06	11.06																
	Silt	322.55	24.54	-101.06															
	Clay	-399.65	-26.12	-74.40	-11.80														
	D _a	-2.06	-0.32	-1.48	0.55	0.57													
	D _s	-2.56	-0.22	-1.95	0.65	0.65	0.02												
	WHC	-68.41	-6.54	29.78	-22.37	2.58	-0.23	-0.35											
	Porosity	42.15	10.37	34.49	-14.18	-14.41	-0.92	-0.41	4.87										
	Aeration	-88.78	18.18	-120.01	73.33	32.75	-0.46	0.74	-11.53	32.03									
	pH	0.90	0.15	-2.17	1.24	0.19	0.02	0.02	-0.67	-0.48	0.40								
	CEC	-22.24	-1.84	16.22	-12.69	-1.34	-0.25	-0.22	1.67	7.69	1.87	-0.32							
	BS	-76.57	7.08	-24.22	13.28	7.38	0.28	0.30	-3.67	-8.19	28.54	0.49	-16.89						
	C _{org}	59.57	5.42	14.56	-0.29	-8.45	-0.17	-0.14	0.76	5.35	-2.39	-0.12	0.23	-2.93					
	C _{mic}	16922.64	2207.65	-2449.15	3334.46	-337.98	-13.02	26.83	-1427.87	935.19	12422.20	31.69	-295.94	2633.83	173.51				
	N _{tot}	4.86	0.33	0.82	0.14	-0.58	-0.01	-0.01	-0.04	0.21	-0.08	0.00	0.03	-0.10	0.12	26.05			
	UA	333.74	-49.95	189.74	-130.68	-44.98	0.63	-0.48	18.93	-38.21	-404.83	0.53	-56.17	41.35	1.18	-15436.15	-0.22		
APMEA	1575.00	44.83	272.94	-122.38	-234.74	0.92	-2.64	-40.76	-82.27	-1033.20	0.88	19.20	-194.32	31.63	-43482.55	1.86	1129.32		
CA	-1289.71	35.14	-69.59	6.53	102.45	1.77	2.56	-26.62	-37.56	328.65	1.27	-76.16	213.71	-3.29	32015.10	-0.31	-397.66	-1860.82	