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Paleosols study on the Stolenberg Plateau (NW-Italy)

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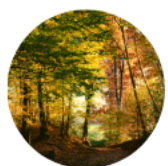
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(Article begins on next page)



Session 1

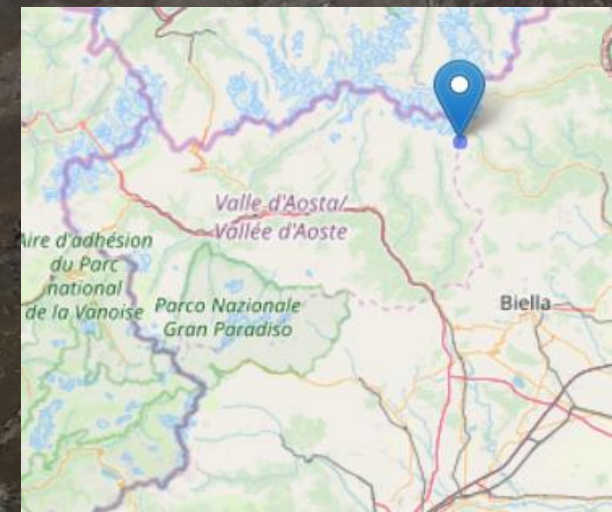
**SOIL AND PLANT SCIENCES IN FOREST AND
SEMI-NATURAL ECOSYSTEMS**

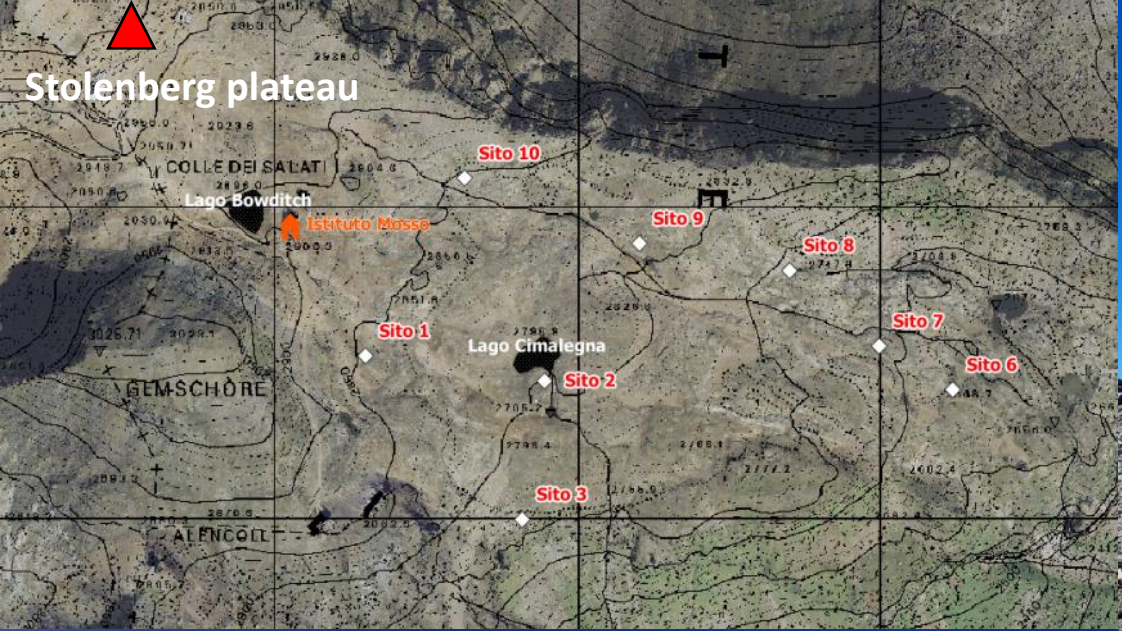
FOLLOWING WATER: FROM ALPINE GLACIERS TO RICE PADDIES

**Paleosols study on the Stolenberg
Plateau (NW-Italy)**

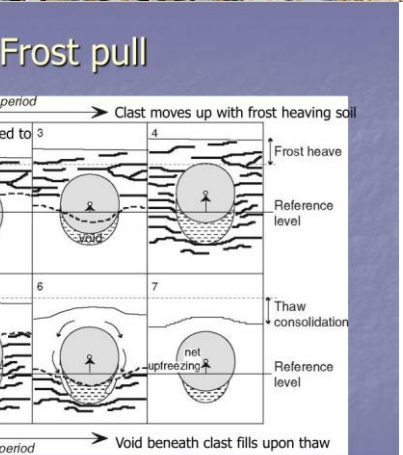
SPSS2021 







The periglacial environments



Requires frost susceptible soil with scattered large stones

- Extreme environmental conditions
- Relict surfaces
- Cryogenic processes
- Periglacial features (blockstreams, blockfields, tilted stones, sorted circles, etc..)

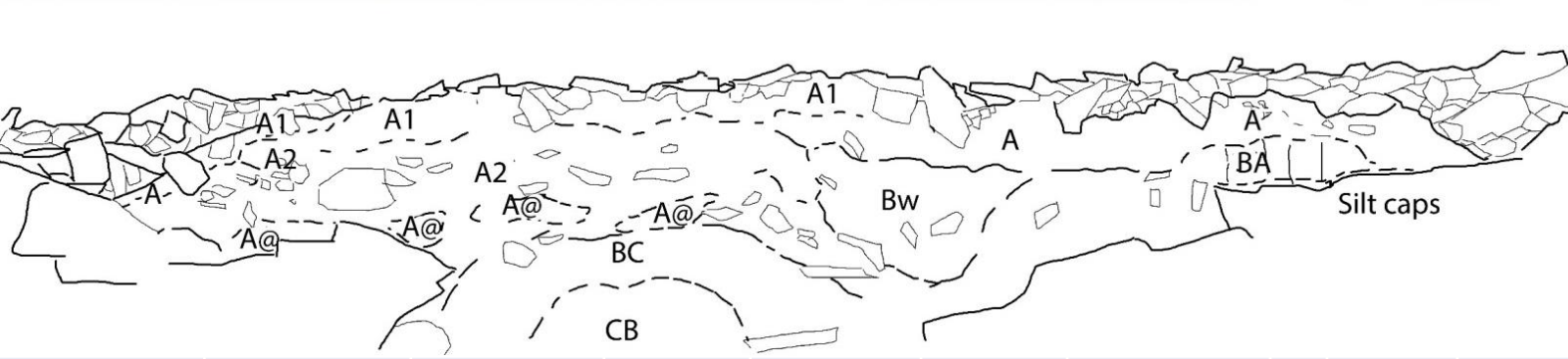
The Stolenberg Plateau



Preliminary investigation

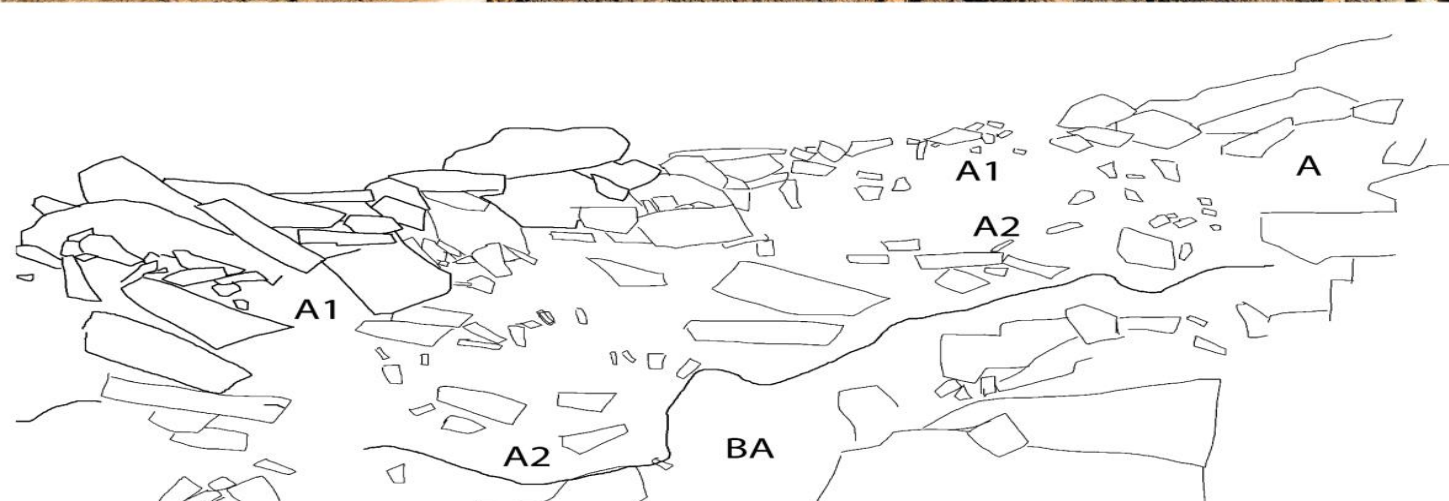
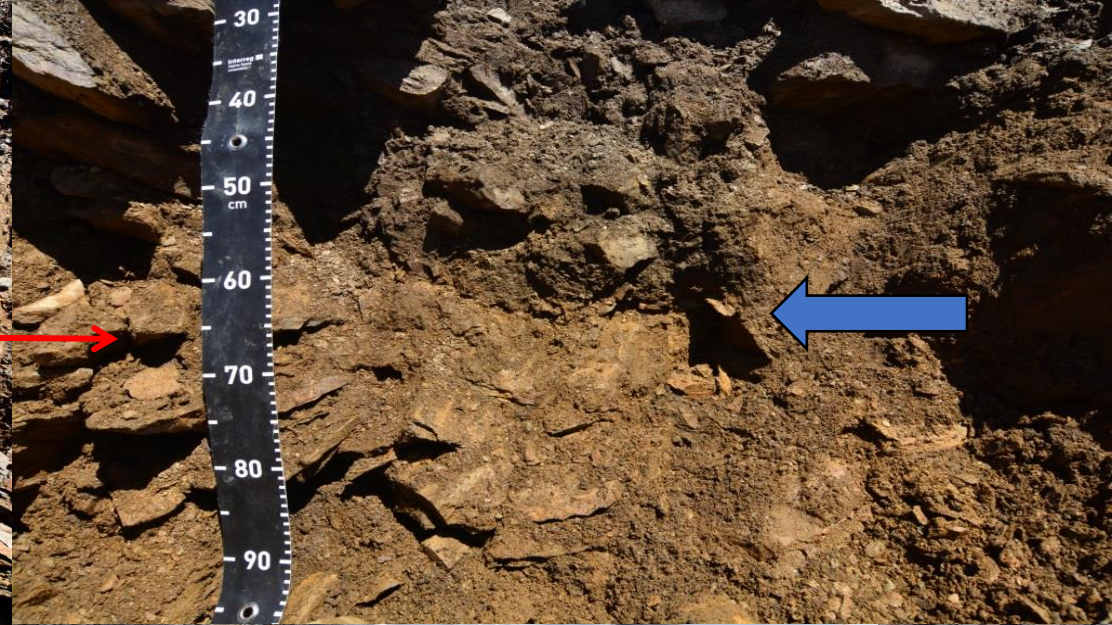
- 2017: cableway construction
- Geosite delimitation and preservation
- Periglacial features description
- Soil trenches (2-10 m)





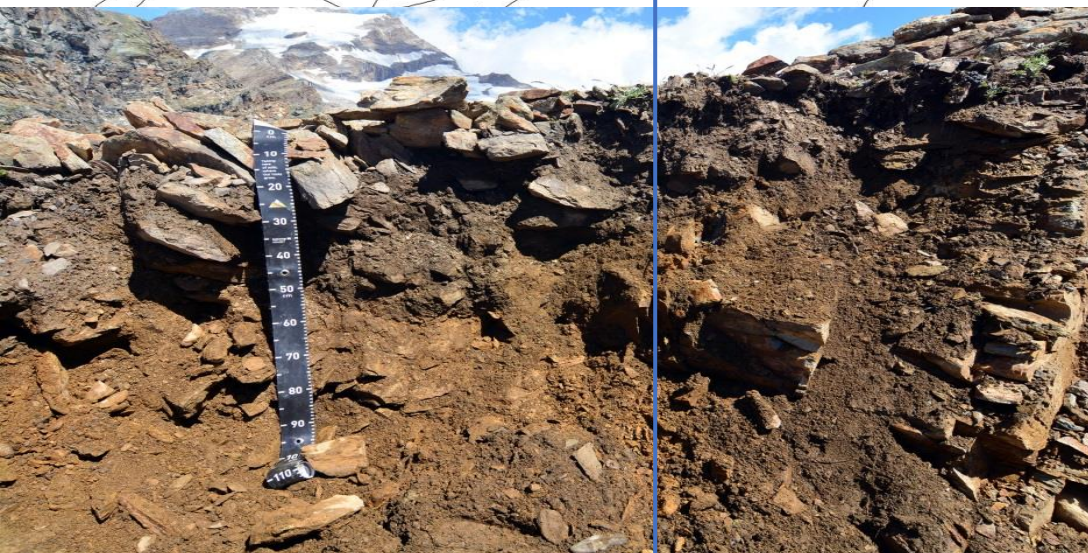
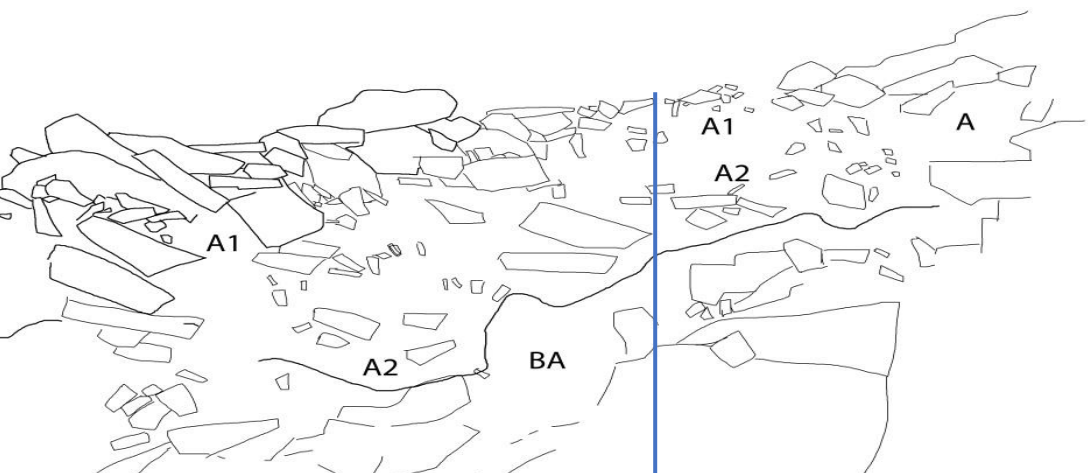
Horizon	Munsell colour, moist	Stone fragments (%)	Clay (%)	Silt (%)	Sand (%)	Structure	pH	TOC (%)	TN (%)
A	10YR 2/1	30	2.6	20.8	76.5	SB	4.3	0.80	0.08
A@	10YR 3/2	10	2.3	23.2	74.5	PL/SB	5.6	2.05	0.11
A2	10YR 3/3	30	1.9	18.3	79.8	SB	4.7	1.10	0.08
A1	10YR 3/2	70	2.5	12.1	85.4	GR	4.4	1.13	0.11
BC	10YR 4/4	70	1.4	27.6	71.0	PL/SB	5.3	0.14	0.00
CB	10YR 5/2	70	1.0	26.3	72.7	SB	5.9	0.00	0.00
Bw	10YR 3/4	60	0.9	25.7	73.4	SB	5.2	0.26	0.03
A	10YR 3/2	30	4.3	24.1	71.6	BL	4.8	1.09	0.08
BA	10YR 3/3	50	2.8	29.3	67.9	CO/PR	4.9	1.10	0.07
A	10YR 3/2	10	3.9	14.0	82.1	GR	4.5	0.71	0.09
Silt caps	10YR 6/4	10	6.2	41.9	51.9	PL	5.0	0.28	0.03





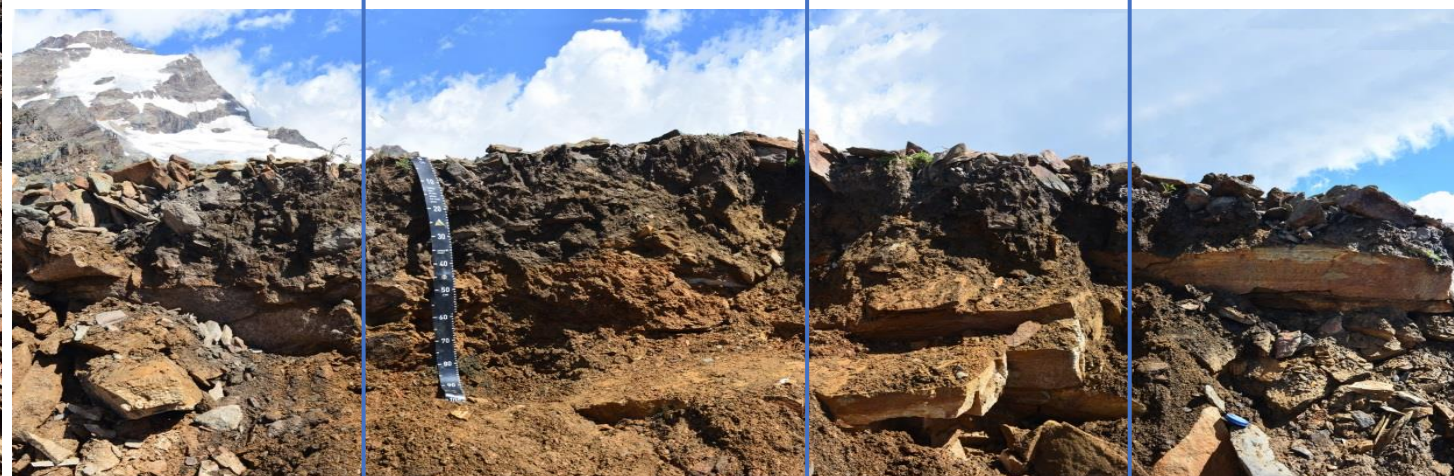
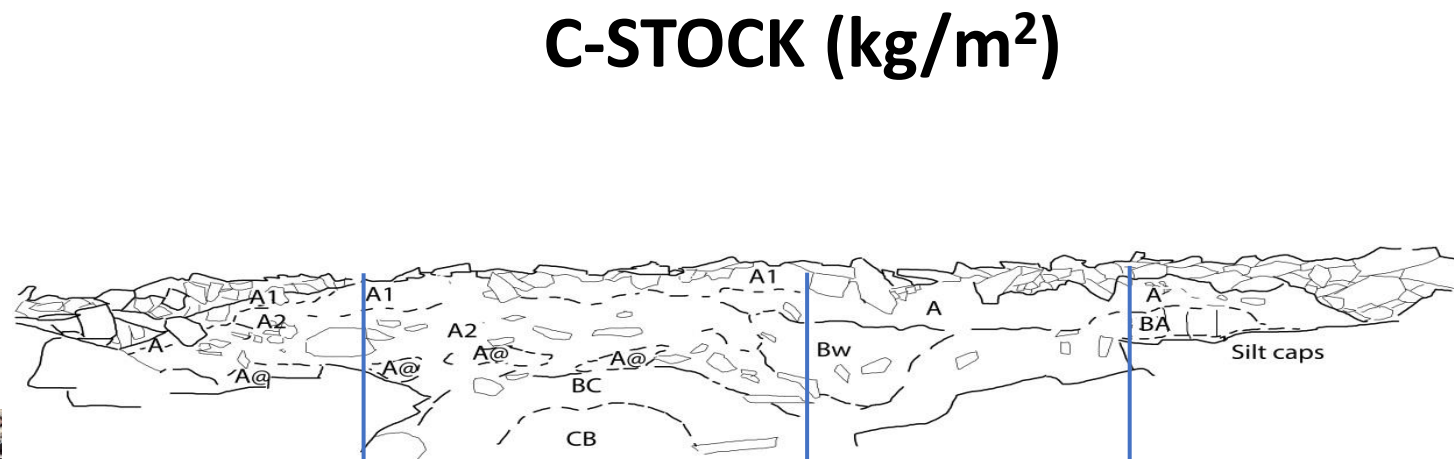
Horizon	Munsell colour, moist	Stone fragments (%)	Clay (%)	Silt (%)	Sand (%)	Structure	pH	TOC (%)	TN (%)
A2	10YR 3/2	30	2.81	14.54	82.65	SB	4.8	1.90	0.10
A1	10YR 3/2	30	2.54	14.95	82.51	SB	4.4	1.08	0.08
BA	10YR 3/3	40	1.59	23.25	75.16	BL	4.8	0.47	0.04
A1+A2	10YR 3/2	40	2.69	15.35	81.96	GR	4.7	1.20	0.10
A	10YR 3/2	80	2.69	14.45	82.86	GR	4.4	1.86	0.15





5.2

2.8



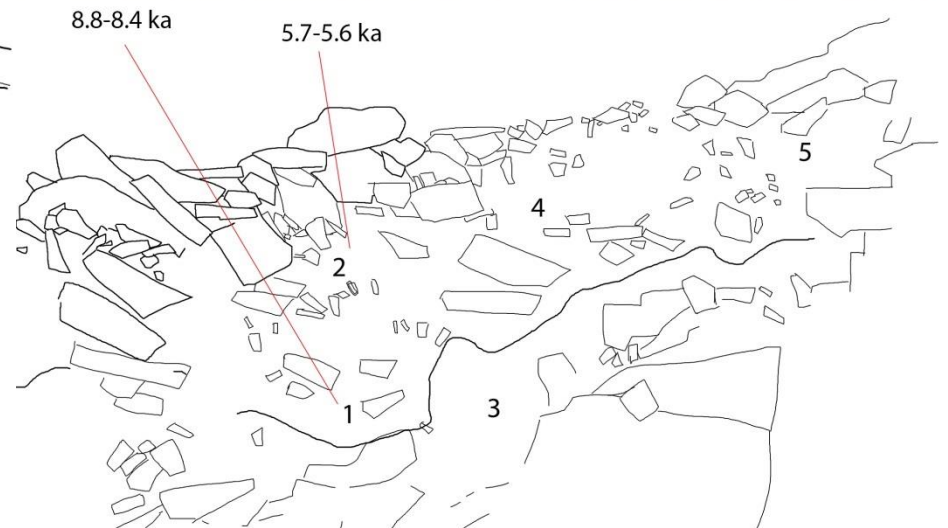
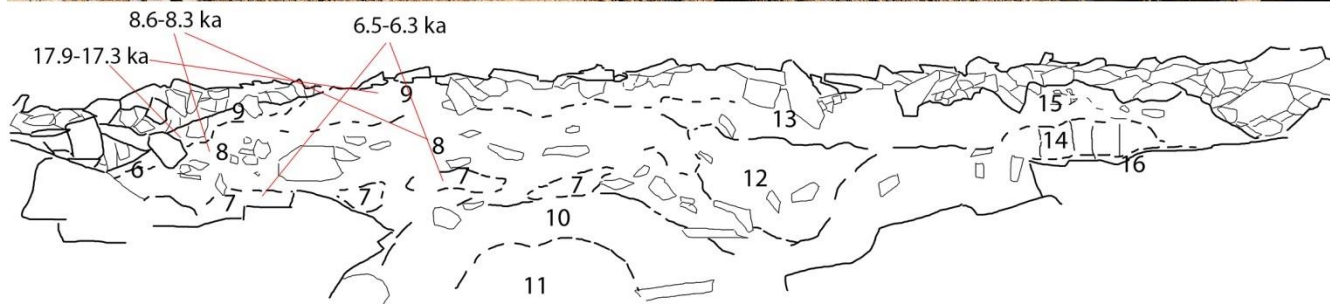
2.9

3.0

1.50

2.4

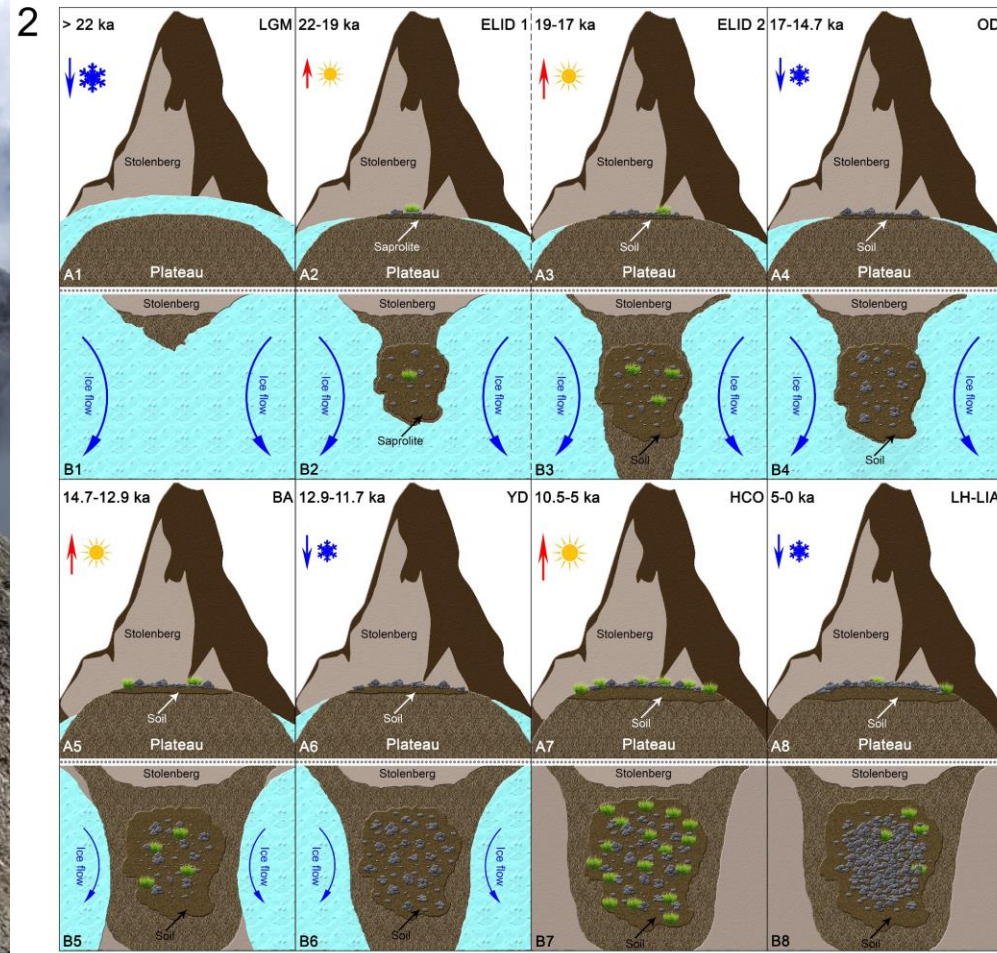
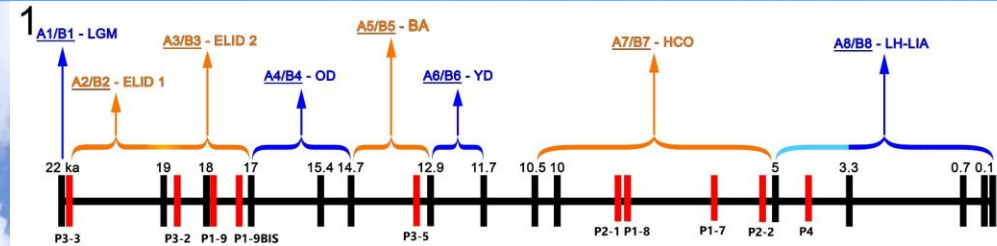
Age



Sample ID	Cal. Radiocarbon Age (cal. yr BP - 2σ)	Phase
P1-7	6506 - 6306	HCO
P1-8	8561-8300	HCO
P1-9	17866 - 17352	ELID
P2-1	8782 - 8412	HCO
P2-2	5735 - 5589	HCO

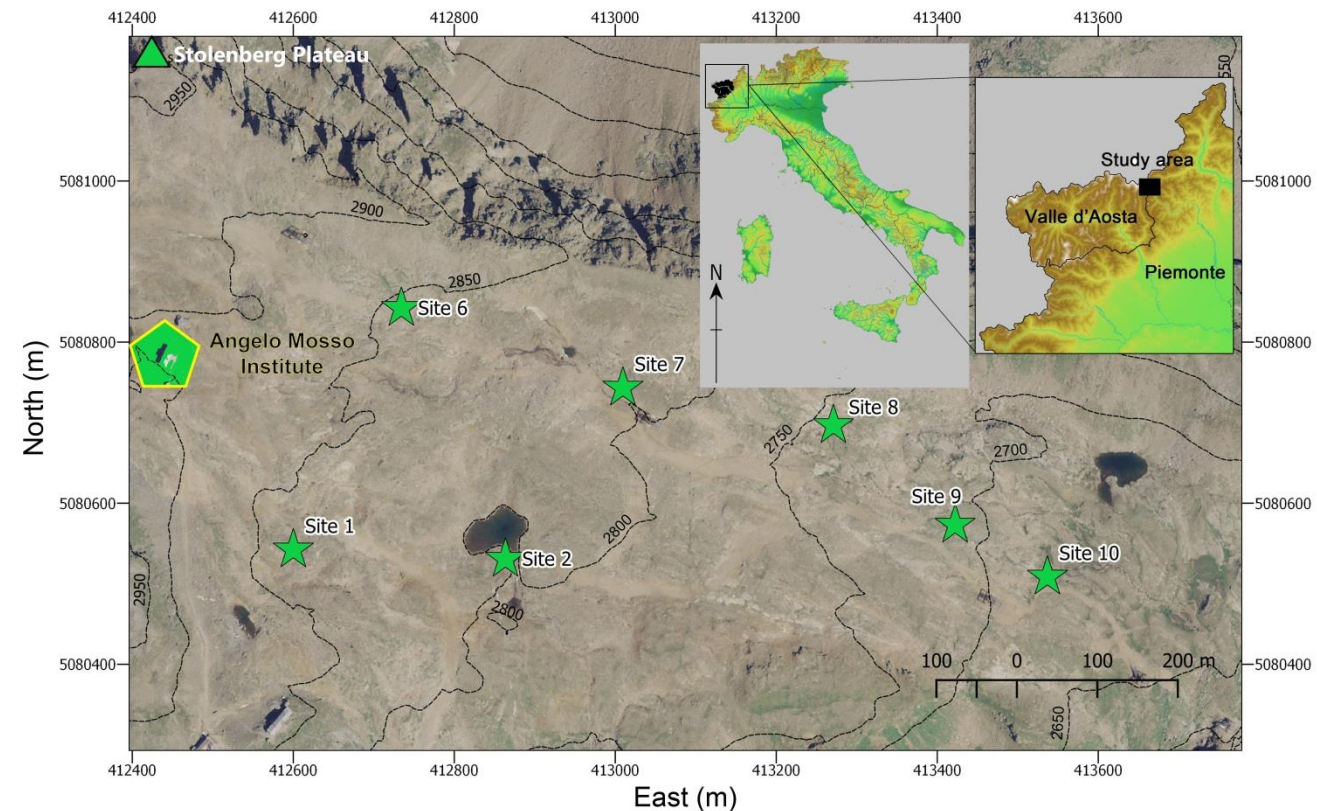
Nunatak Theory

Organic matter origin?



Alpine Tundra: snowbed sites soil $\delta^{13}\text{C}$

- 7 permanent snowbed sites (*Salicetum herbaceae* association)
- Elevation: 2686 – 2850 m a.s.l.
- Climatic, pedoclimatic variables
- Soil C and N forms
- Vegetation and phenology monitoring
- Topsoil $\delta^{13}\text{C}$



Soil $\delta^{13}\text{C}$: snowbed vs blockstream

Site	Elevation (m a.s.l.)	Cover type	$\delta^{13}\text{C}_{(‰)}$
S1	2840	Vegetation	-23.3
S2	2800	Vegetation	-25.1
S6	2854	Vegetation	-23.4
S8	2749	Vegetation	-23.4
P1-7	3030	Blockstream/Blockfield	-24.2
P1-8	3030	Blockstream/Blockfield	-23.9
P1-9	3030	Blockstream/Blockfield	-24.5
P2-1	3030	Blockstream/Blockfield	-24.7
P2-2	3030	Blockstream/Blockfield	-23.9

