



Supplement of

Revisiting the subalpine Mesolithic site Ullafelsen in the Fotsch Valley, Stubai Alps, Austria – new insights into pedogenesis and landscape evolution from leaf-wax-derived *n*-alkanes, black carbon and radiocarbon dating

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Table S1: Re-calibrated radiocarbon results of Schäfer et al. (2011b) for charcoal from the Ullafelsen using IntCal20.

Sample name	Lab Code	¹⁴ C age (yrs BP)	Error (yrs)	Mean age Intcal04 (cal. yrs BP)	±	Mean age Intcal20 (cal. yrs BP)	±	Difference
a	Beta-102085	8660	50	9625	64	9629	68	4
b	Beta-109783	8770	80	9819	158	9814	160	-5
c	KIA21982	9240	40	10404	73	10401	75	-3
d	KIA21983	9295	45	10482	77	10477	80	-5
e	KIA21989	9330	40	10540	63	10535	67	-5
f	Beta-175945	9350	40	10571	60	10564	65	-7
g	KIA21988	9355	40	10578	59	10571	64	-7
h	KIA21984	9380	45	10609	61	10604	68	-5
i	KIA21987	9460	40	10714	103	10717	115	3
k	KIA21986	9505	40	10844	135	10839	139	-5
l	KIA21985	9520	55	10873	136	10867	140	-6
m	Beta-109782	9540	80	10892	146	10888	151	-4
n	KIA21043	9540	40	10902	119	10897	122	-5
o	Beta-175944	9580	40	10929	108	10929	112	0
p	Beta-274943	9500	50	10835	141	10829	145	-6
q	Beta-274944	9400	50	10632	71	10630	81	-2
r	Beta-274945	9530	50	10888	128	10882	132	-6
s	Beta-274946	9400	50	10632	71	10630	81	-2
t	Beta-274947	9530	50	10888	128	10882	132	-6
v	Beta-274949	8650	50	9617	60	9622	64	5
w	Beta-274950	8520	50	9506	27	9507	29	1

Table S2: Overview over all soil samples and geoarchaeological analytical results from the Mesolithic site Ullafelsen as well as from reference sites in the Fotsch Valley.

Soil profile & horizon	Altitude (m a.s.l.)	Coordinates	TC (%)	TOC/N	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	BC (in g C/kg soil)	BC (in g C/kg TOC)	TAC (µg/g soil)	TAC (µg/g TOC)	ACL	OEP	(C31+C33)/(C27+C31+C33)
Ullafelsen	1.1 C4w Ah1		15.1	20.0	-25.1	4.8	9.2	21.6	15.5	102.8	30.4	24.3	0.7
	1.1 C4w Ah2		8.5	24.6	-25.7	8.9	3.1	36.9	28.6	335.8	30.0	8.5	0.6
	1.1 C4w Ah3		4.3	33.8	-25.1	7.5	7.1	165.3	2.6	61.1	30.4	9.2	0.7
	1.1 C4w LL	1869 N 47.14702° E 11.21475°	3.2	25.0	-25.9	7.0	2.8	86.2	2.0	61.6	29.6	7.7	0.6
	1.1 C4w 2Ahb?/Bh?		8.3	28.1	-25.2	6.2	2.2	25.9	0.0	0.0	n.a.	n.a.	n.a.
	1.1 C4w Bs		1.6	24.4	-25.5	4.6	0.8	53.9	0.0	0.0	n.a.	n.a.	n.a.
	1.1 C4w BvCv		0.8	17.9	-25.1	4.1	0.4	43.6	0.1	0.0	n.a.	n.a.	n.a.
	1.1 B5w Ah ¹⁾		18.2	18.0	-24.7	4.2	6.3	34.8	21.6	118.9	29.8	6.7	0.6
	1.1 B5w LL		4.5	37.2	-25.3	8.2	2.5	55.1	10.3	227.2	29.8	4.0	0.6
	1.1 B5w 2Ahb?/Bh?	1869 N 47.14703° E 11.21474°	6.1	28.3	-24.7	6.3	1.9	30.7	0.0	0.0	n.a.	n.a.	n.a.
	1.1 B5w Bs		2.3	27.2	-24.9	5.1	1.0	43.7	0.0	0.0	n.a.	n.a.	n.a.
	1.1 B5w BvCv		0.7	16.2	-25.2	3.7	0.5	75.5	0.1	13.9	n.a.	n.a.	n.a.
	1.1 B5s Ah ¹⁾		10.3	17.9	-25.1	7.8	4.0	38.3	20.9	202.5	30.0	10.3	0.6
	1.1 B5s LL		3.3	22.5	-25.8	7.5	1.3	37.9	4.7	140.4	29.6	9.2	0.6
	1.1 B5s 2Ahb?/Bh?	1869 N 47.14704° E 11.21474°	6.4	26.8	-24.4	6.2	2.4	37.3	0.0	0.0	n.a.	n.a.	n.a.
	1.1 B5s Bs		2.2	24.5	-24.8	5.0	0.2	11.1	0.1	4.9	n.a.	n.a.	n.a.
	1.1 B5s BvCv		0.3	12.4	-25.4	2.7	0.1	24.2	0.0	0.0	n.a.	n.a.	n.a.
	1.1 G5n Ah1		14.2	18.9	-24.6	8.1	2.9	20.3	84.9	599.3	30.6	15.7	0.8
	1.1 G5n Ah2		8.4	26.5	-25.1	8.3	2.5	30.4	54.2	648.2	30.2	8.2	0.7
	1.1 G5n Ah3	1869 N 47.14704° E 11.21482°	25.0	28.4	-25.2	7.5	9.1	36.4	148.1	591.6	29.9	4.8	0.5
	1.1 G5n LL		3.3	25.2	-26.3	7.1	1.2	37.5	6.3	190.9	29.6	6.7	0.6
	1.1 G5n 2Ahb?/Bh?		7.1	26.8	-24.9	5.0	1.6	22.2	2.0	28.6	n.a.	n.a.	n.a.
	1.9 NW Ah1		19.3	16.7	-24.6	6.5	5.9	30.7	82.0	425.7	30.5	7.9	0.7
	1.9 NW Ah2		12.5	18.6	-24.8	9.1	5.0	39.9	26.2	209.6	30.1	6.3	0.7
	1.9 NW Ah3		28.8	27.7	-24.8	8.3	14.7	51.1	100.6	349.4	29.9	4.1	0.6
	1.9 NW LL	1867 N 47.14698° E 11.21492°	2.5	19.5	-25.9	7.0	1.9	75.2	3.2	127.1	30.0	n.a.	0.6
	1.9 NW 2Ahb?/Bh?		4.8	24.9	-25.3	5.8	1.6	32.6	0.6	13.2	n.a.	n.a.	n.a.
	1.9 NW Bv		2.5	27.1	-25.0	5.0	1.0	41.0	0.2	8.6	n.a.	n.a.	n.a.
	1.9 NW BvCv		1.6	26.8	-25.2	4.6	0.1	7.9	0.0	5.0	n.a.	n.a.	n.a.
	1.9 NO Ah ¹⁾		13.6	18.5	-25.1	6.8	3.5	25.7	45.0	331.0	30.7	9.2	0.8
	1.9 NO Ah ²⁾		11.9	21.7	-25.4	9.2	2.5	20.8	34.2	286.4	30.2	7.5	0.7
	1.9 NO LL		4.3	28.3	-25.2	8.2	4.9	113.1	4.0	91.8	30.0	9.5	0.6
	1.9 NO 2Ahb?/Bs?	1867 N 47.14699° E 11.21494°	5.5	23.1	-25.5	6.6	1.6	29.5	0.0	0.0	n.a.	n.a.	n.a.
	1.9 NO Bv		3.6	27.8	-24.8	5.5	0.3	8.8	0.9	24.5	n.a.	n.a.	n.a.
	1.9 NO LL2		1.3	23.6	-26.1	5.8	0.3	21.9	0.3	21.9	n.a.	n.a.	n.a.
	1.9 NO BvCv		2.1	27.1	-25.3	5.1	0.2	11.0	0.3	12.2	n.a.	n.a.	n.a.
	1.9 SW LL	1867 N 47.14698° E 11.21493°	1.3	16.9	-26.3	7.4	0.5	41.2	1.6	126.2	29.8	8.9	0.6
reference soil profiles	4.4 Ah		21.9	18.4	-24.7	5.7	n.a.	n.a.	105.8	483.2	30.1	4.5	0.7
	4.4 Ae/LL		4.9	17.9	-25.0	8.1	n.a.	n.a.	9.1	185.2	29.3	3.9	0.5
	4.4 2Ahb/Bh	2171 N 47.15060° E 11.20075°	6.0	23.3	-24.9	4.6	n.a.	n.a.	1.4	22.9	29.4	n.a.	0.6
	4.4 Bv		1.9	22.0	-24.9	3.7	n.a.	n.a.	0.3	15.5	29.3	n.a.	0.5
	4.4 BvCv		1.3	25.1	-25.2	3.2	n.a.	n.a.	0.0	0.0	n.a.	n.a.	n.a.
	4.10 Ah	2179 N 47.15033° E 11.20006°	4.9	15.8	-25.1	5.2	n.a.	n.a.	13.1	267.9	30.0	3.5	0.6
	4.10 Ah		6.7	14.3	-24.5	5.9	n.a.	n.a.	22.0	327.8	29.7	6.4	0.6
	4.11 Ah		11.9	15.2	-23.2	1.8	n.a.	n.a.	55.6	466.9	30.5	9.9	0.8
	4.11 Ae		3.0	12.2	-23.2	6.7	n.a.	n.a.	9.1	304.8	29.9	4.8	0.6
	4.11 Bh	2548 N 47.14373° E 11.17502°	12.9	18.6	-23.8	5.4	n.a.	n.a.	6.7	51.4	29.7	2.6	0.6
	4.11 Bs		4.8	18.2	-22.0	5.3	n.a.	n.a.	0.4	9.2	30.2	n.a.	0.7
	4.11 BvCv		2.1	14.7	-23.2	4.5	n.a.	n.a.	0.3	14.5	30.1	n.a.	0.7
	4.12 Ah		6.6	13.7	-24.3	4.6	n.a.	n.a.	15.7	238.3	30.1	10.3	0.7
	4.12 2Ahb		18.3	17.3	-24.6	5.1	n.a.	n.a.	94.4	437.0	30.0	7.2	0.6
	4.12 2Bh	2455 N 47.14584° E 11.18304°	22.7	19.4	-22.6	6.0	n.a.	n.a.	114.2	624.3	29.4	6.2	0.6
	4.12 3Ahb		6.9	19.4	-23.0	7.9	n.a.	n.a.	119.6	527.1	29.8	7.1	0.7
	4.12 Ae/LL		21.6	14.8	-22.6	3.6	n.a.	n.a.	36.0	521.6	29.3	3.6	0.6
	4.12 Bhs		7.9	16.0	-21.6	7.7	n.a.	n.a.	4.6	58.4	29.5	3.9	0.7
	5.1 Ah1		6.9	13.1	-25.8	4.2	n.a.	n.a.	21.0	305.0	30.3	5.6	0.7
	5.1 Ah2		10.5	13.0	-24.8	6.2	n.a.	n.a.	64.8	635.2	30.3	4.4	0.6
	5.1 Bv(s)		1.5	16.6	-26.1	6.1	n.a.	n.a.	5.9	227.5	30.0	4.4	0.6
	5.1 2Ahb/Bh	2198 N 47.14730° E 11.20136°	15.3	23.5	-24.6	8.1	n.a.	n.a.	72.3	472.4	30.3	6.6	0.7
	5.1 LL		2.6	17.8	-25.1	6.9	n.a.	n.a.	1.2	77.4	29.2	3.4	0.5
	5.1 BvCv		2.9	19.9	-25.2	4.9	n.a.	n.a.	0.4	13.7	29.5	n.a.	0.5
	5.1 BvCv (ht)		8.9	23.5	-25.3	3.8	n.a.	n.a.	1.2	13.1	29.4	n.a.	0.5
	5.5 Ah		16.0	17.1	-23.7	3.9	n.a.	n.a.	59.7	372.9	30.2	10.5	0.7
	5.5 BvCv		3.7	14.1	-23.7	6.1	n.a.	n.a.	10.4	280.7	30.1	5.5	0.6
	5.5 2Ahb		12.5	14.0	-23.4	6.8	n.a.	n.a.	14.9	118.5	30.1	7.2	0.7
	5.5 LL/Ae	2186 N 47.15025° E 11.19981°	3.5	16.9	-24.8	7.1	n.a.	n.a.	3.9	111.9	29.8	8.9	0.6
	5.5 3Ahb		4.9	18.5	-25.1	6.4	n.a.	n.a.	1.3	27.2	29.7	n.a.	0.6
	5.5 3Bhs		2.9	19.5	-24.0	5.7	n.a.	n.a.	0.4	14.6	29.3	n.a.	0.5
	5.5 3BvCv		1.3	14.6	-24.7	5.2	n.a.	n.a.	0.4	27.8	29.6	4.3	0.5
	5.6 Ah		29.4	13.1	-25.4	5.1	n.a.	n.a.	92.9	316.1	30.3	7.2	0.7
	5.6 Ae/LL		2.7	11.3	-24.8	9.7	n.a.	n.a.	5.2	191.6	29.6	3.0	0.6
	5.6 2Ahb/Bv1	2186 N 47.14583° E 11.20402°	10.0	14.4	-23.8	8.9	n.a.	n.a.	6.6	65.6	29.2	3.5	0.6
	5.6 Bv/Bv2		2.5	16.7	-24.5	7.4	n.a.	n.a.	0.0	0.0	n.a.	n.a.	n.a.
	5.8 LL		1.5	17.8	-25.6	7.4	n.a.	n.a.	0.0	0.0	n.a.	n.a.	n.a.
	5.8 2Ahb1	2198 N 47.14734° E 11.20133°	5.9	14.7	-26.7	8.6	n.a.	n.a.	4.8	80.6	30.1	9.1	0.7
	5.8 2Ahb2		4.3	17.7	-27.8	8.5	n.a.	n.a.	2.1	48.0	29.9	2.4	0.6
	5.10s 2Ahb	2301 N 47.15053° E 11.19273°	0.3	6.1	-24.1	3.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

1) These horizons could not be assigned unambiguously to either the Ah1, the Ah2 or the Ah3 horizon and were therefore excluded from further data evaluation.

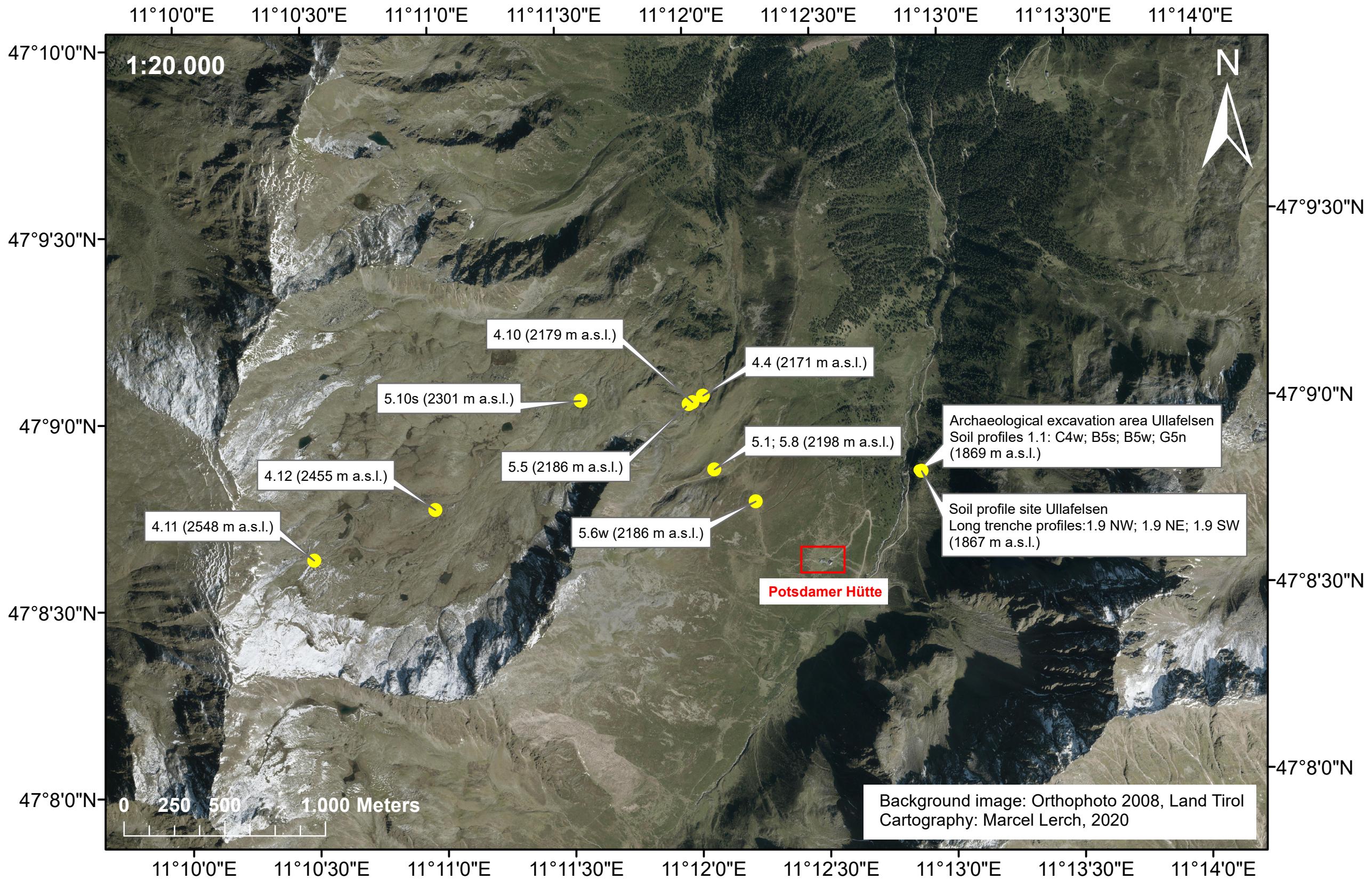


Figure S1: Map of the Fotsch Valley showing the locations of the Ullafelsen and the reference soil profiles.