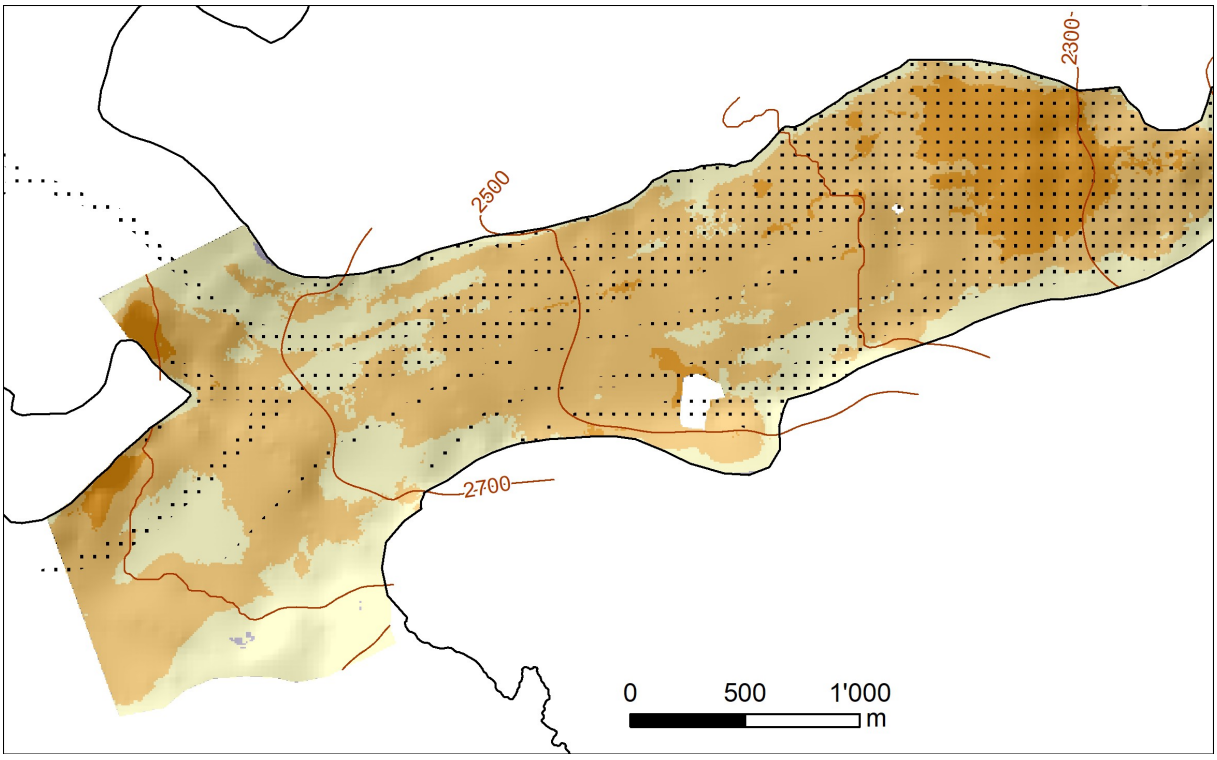
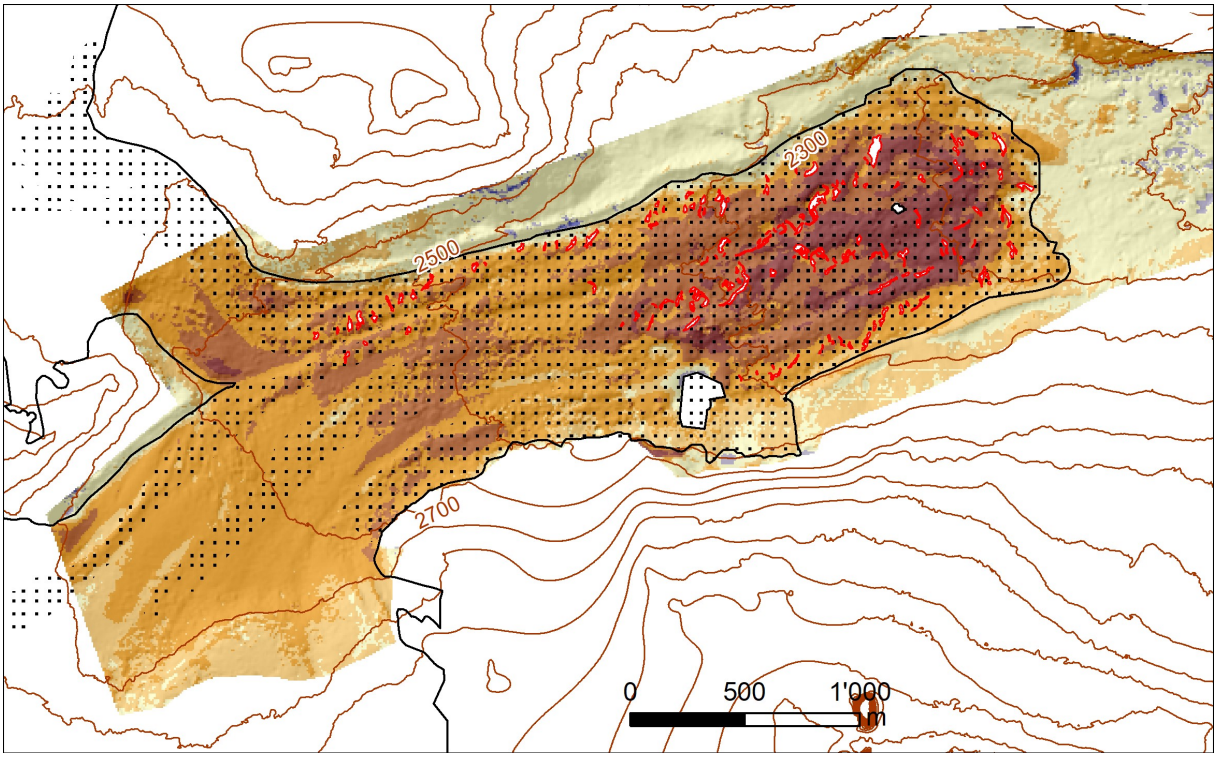
Supplements

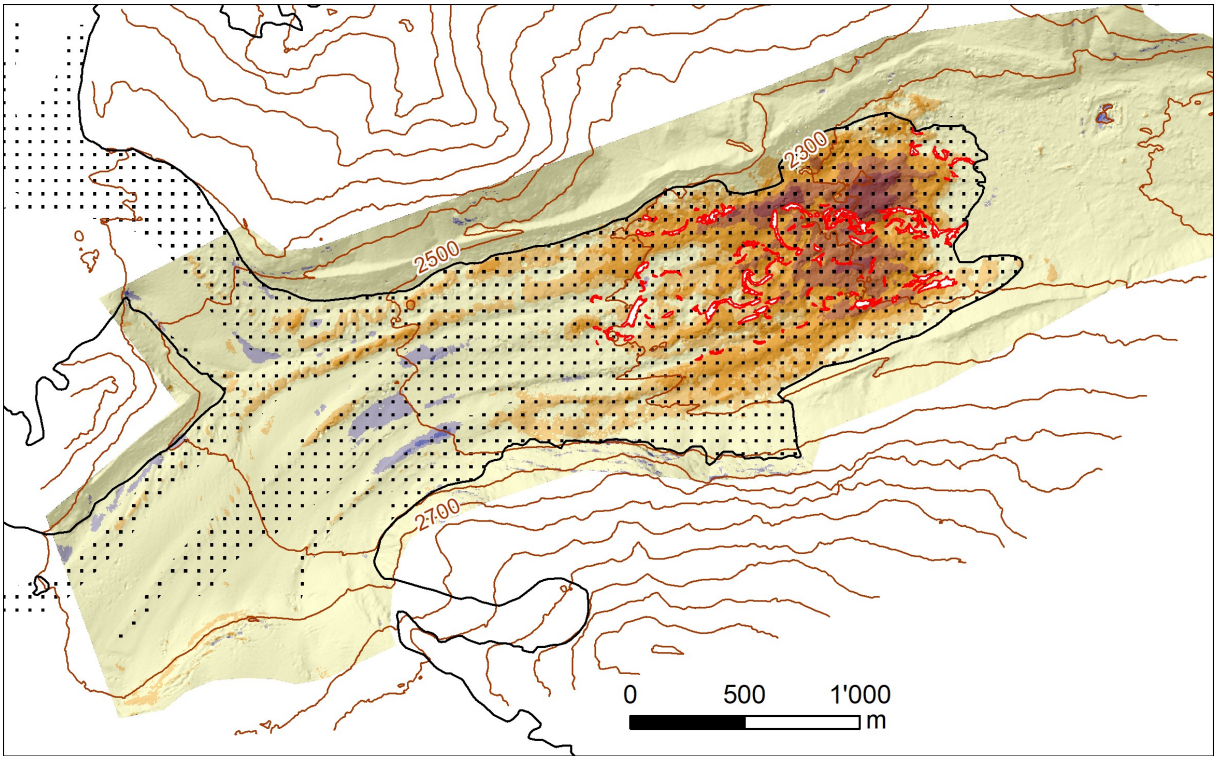
Elevation change for different time periods



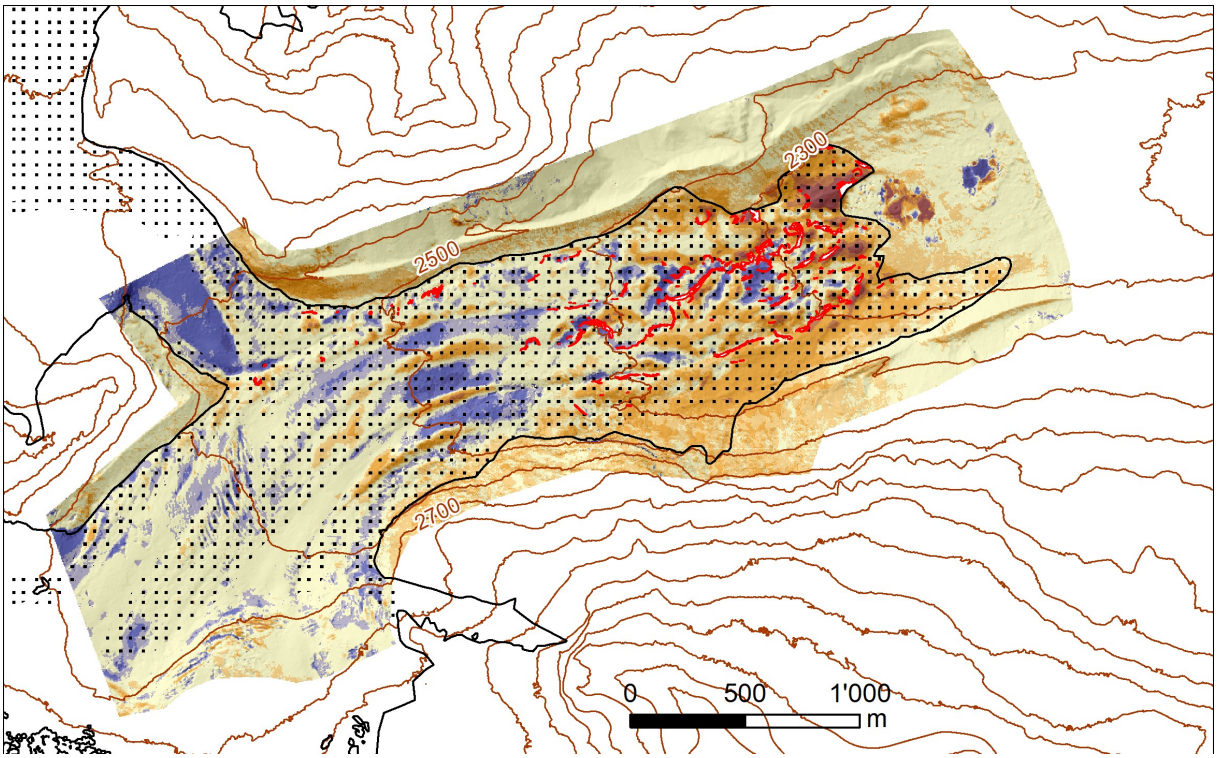
Supplement 1: 1879-1946.



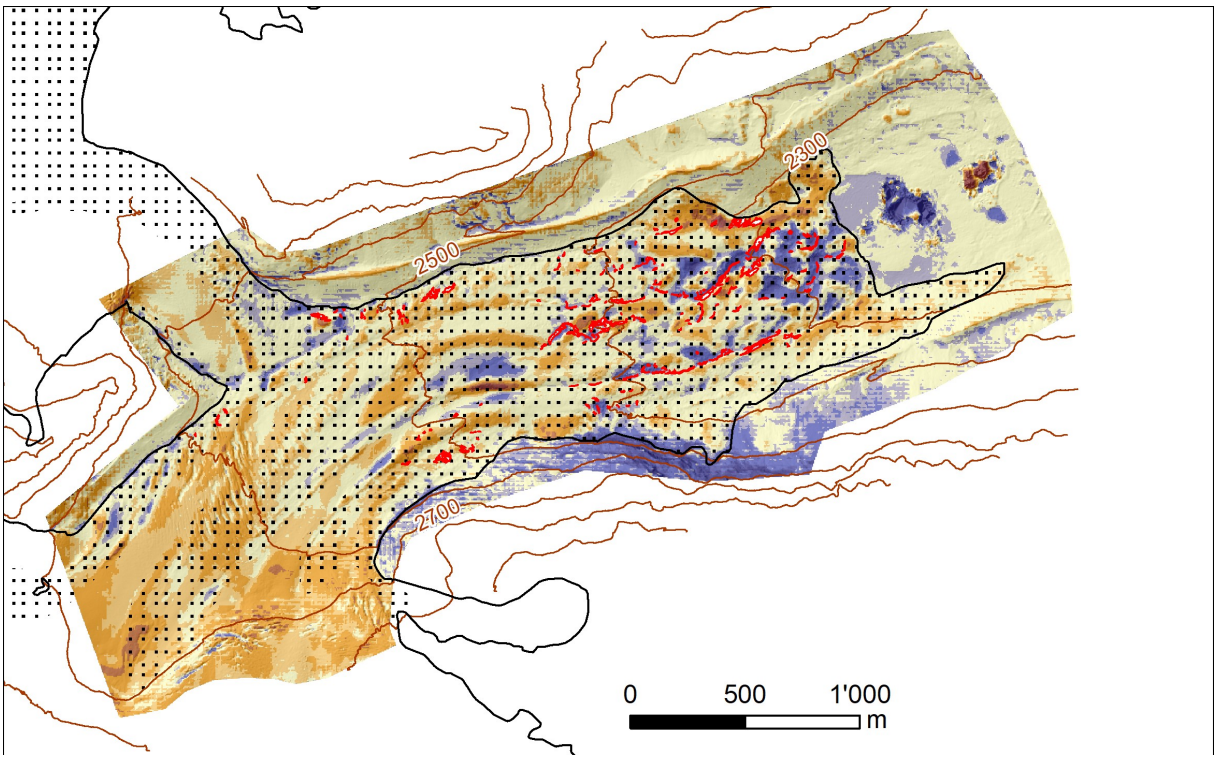
Supplement 2: 1946-1961.



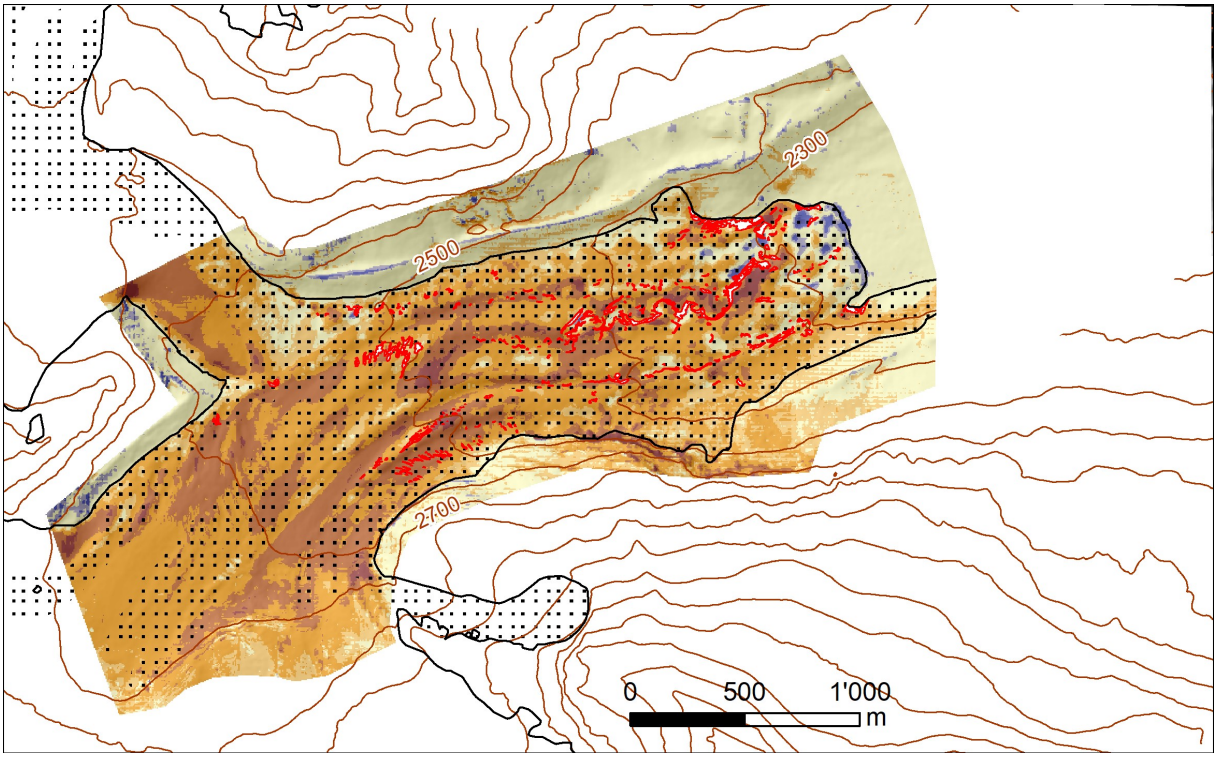
Supplement 3: 1961-1977.



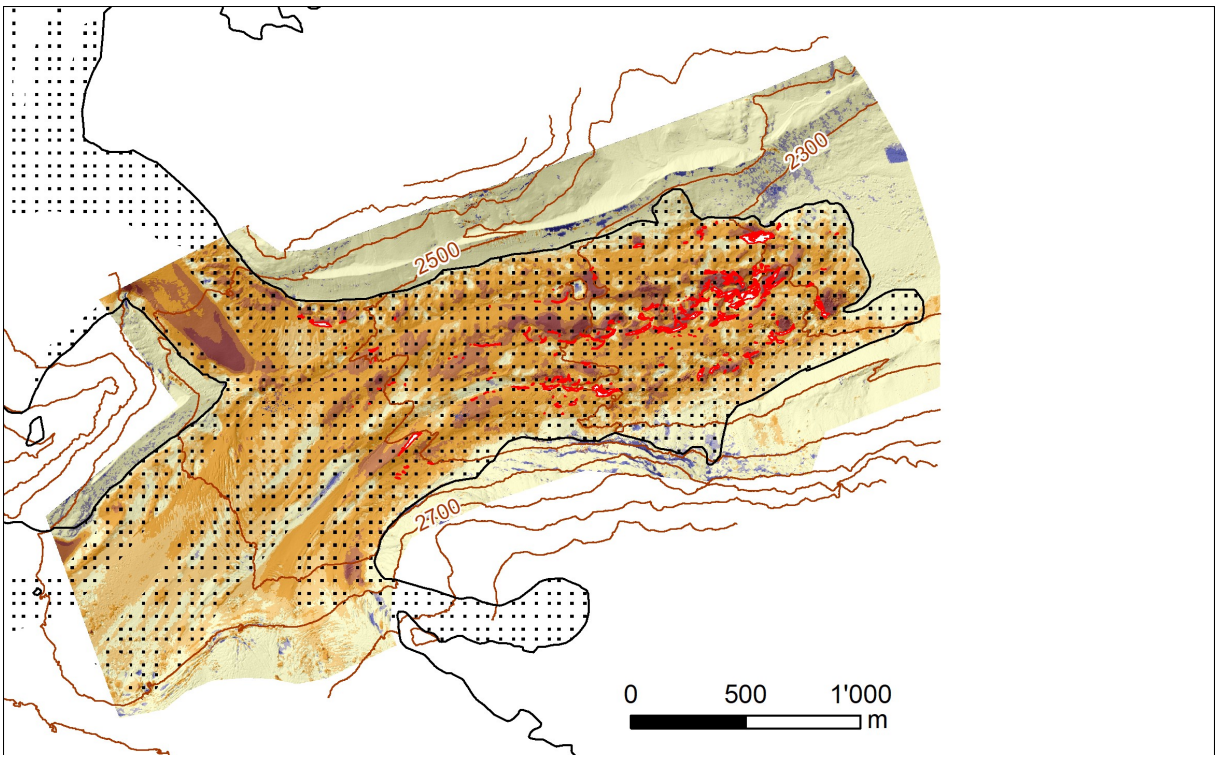
Supplement 4: 1977-1983.



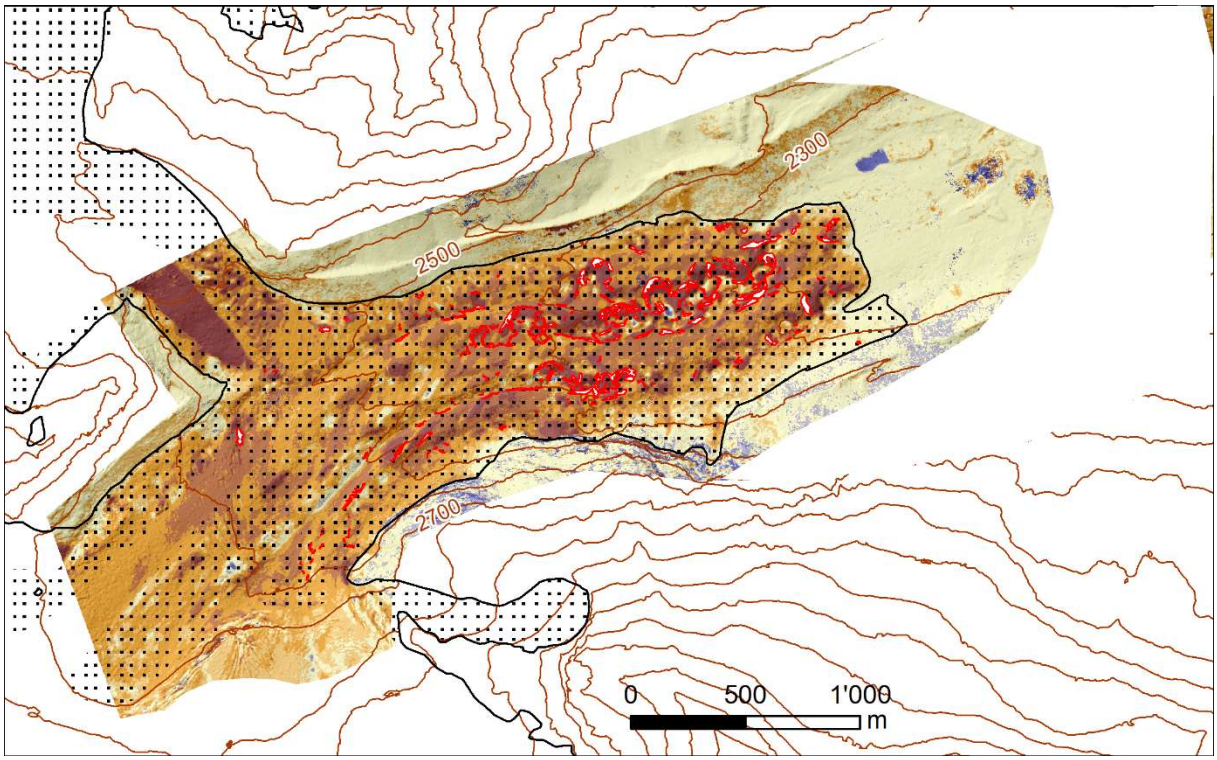
Supplement 5: 1983-1988.



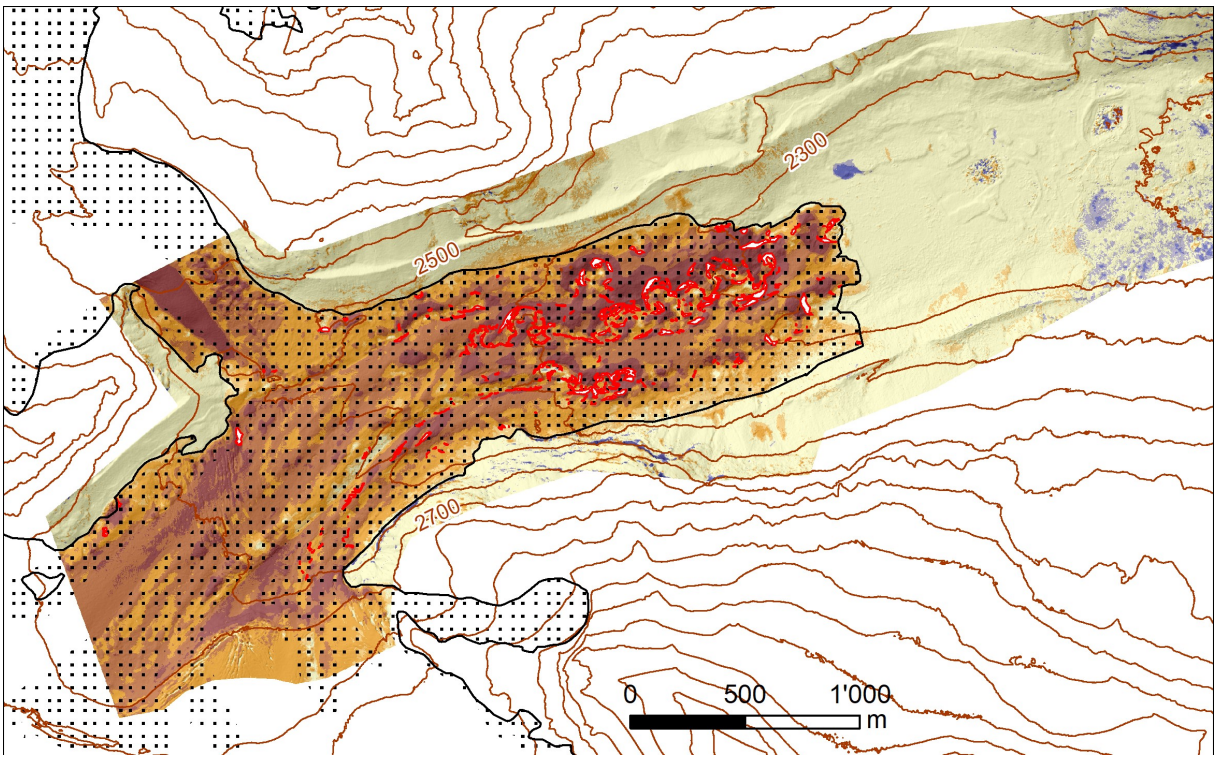
Supplement 6: 1988-1995.



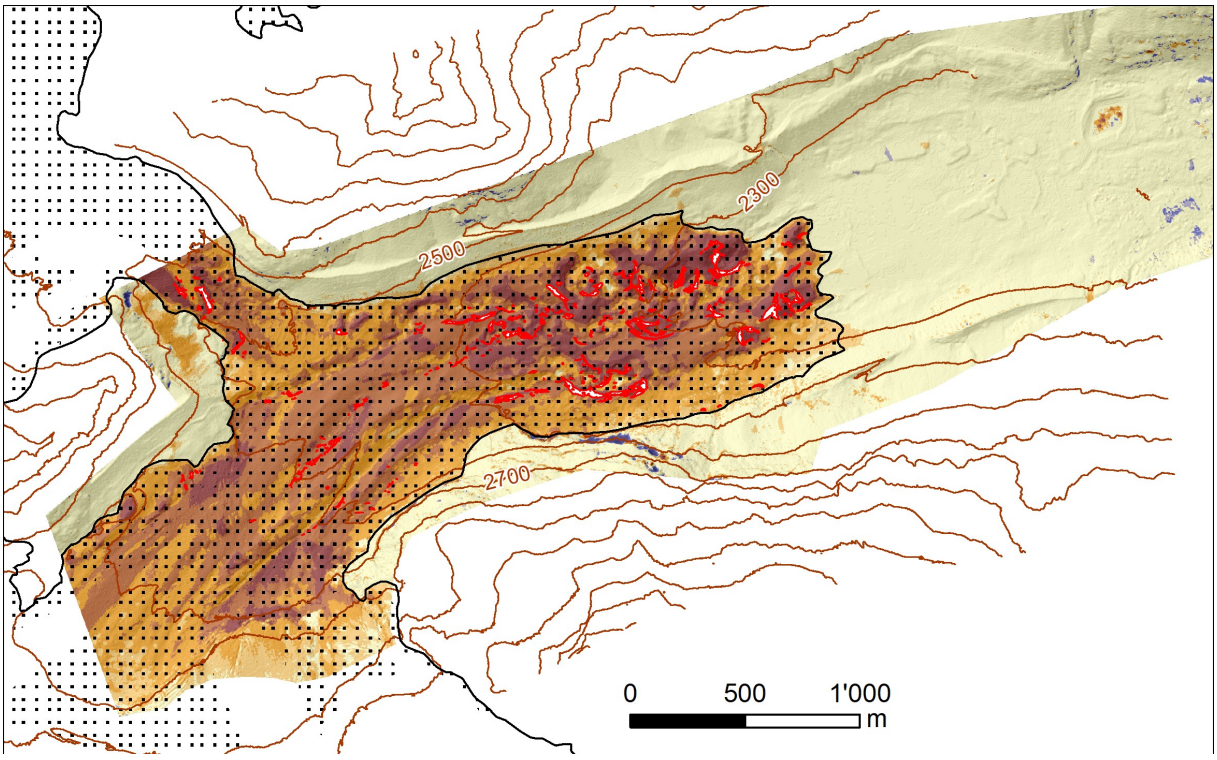
Supplement 7: 1995-2001.



Supplement 8: 2001-2005.



Supplement 9: 2005-2010.



Supplement 10: 2010-2017.

Length change

From	To	dL (m)	dL per year (m)	Cumulative dL (m)
1859	1880	75.2	-3.6 ±0.8	75.2
1880	1946	888.3	-13.5 ±0.2	963.5
1946	1961	245	-16.3 ±0.05	1208.5
1961	1977	347.3	-21.7 ±0.04	1555.8
1977	1983	65	-10.8 ±0.07	1620.8
1983	1988	49.6	-9.9 ±0.08	1670.4
1988	1995	6.8	-1.0 ±0.05	1677.2
1995	2001	20.8	-3.5 ±0.06	1698
2001	2005	75.8	-19.0 ±0.2	1773.8
2005	2010	80	-16 ±0.1	1853.8
2010	2016	53.3	-8.9 ±0.06	1907.1
1859	2016	1907.1	-12.1 ±0.09	
1892	1946	726.8	-13.5 ±0.2	
1946	2010	890.3	-13.9 ±0.01	

Supplement 11: Length change for Zmuttgletscher including annual uncertainties for the respective periods.

Glacier and debris-covered area change

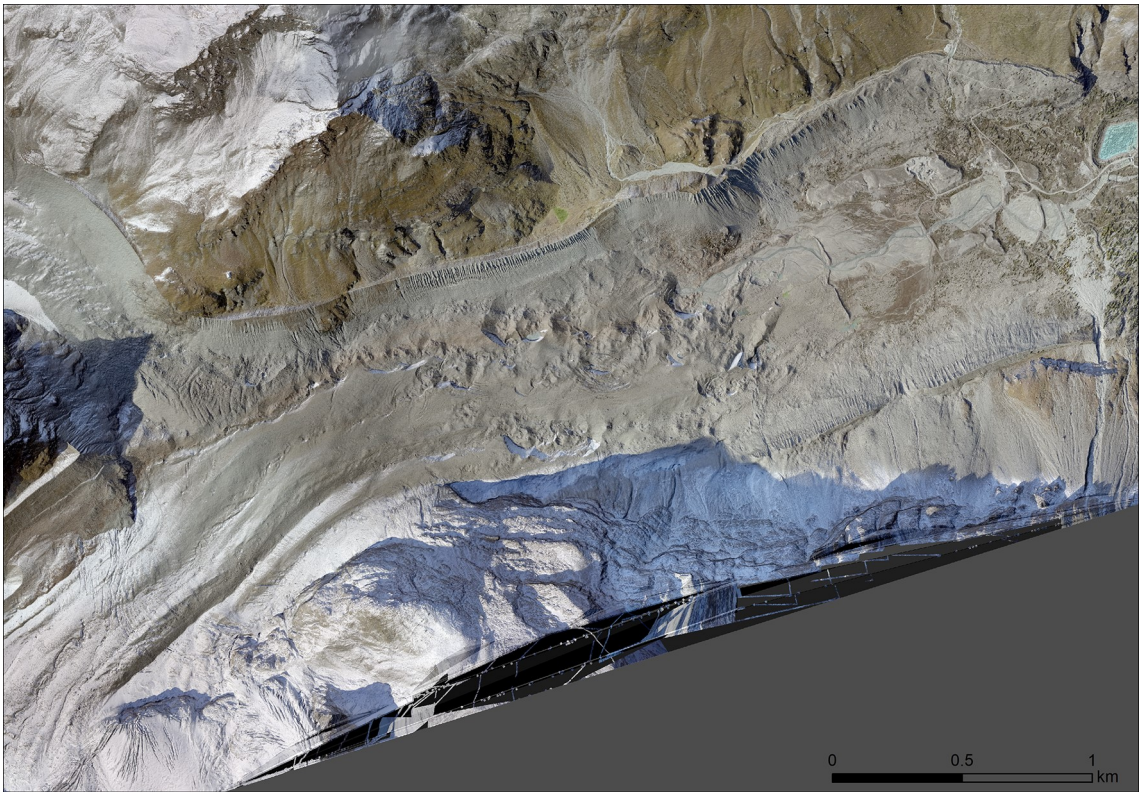
Year	Dc. area (km²)	Total glacier area (km²)	Annual glacier change (km²)	Dc. area share (%)
1859.0	2.75 ±0.2	21.28 ±0.34		12.9
1880.0	2.84 ±0.26	19.22 ±0.40	-0.10	14.8
1946.0	3.91 ±0.01	18.04 ±0.26	-0.02	21.7
1961.0	3.67 ±0.01	17.43 ±0.06	-0.04	21.1
1977.0	3.69 ±0.005	16.96 ±0.14	-0.03	21.8
1983.0	3.74 ±0	16.87 ±0.06	-0.02	22.2
1988.0	3.82 ±0.005	16.77 ±0.16	-0.02	22.8
1995.0	3.98 ±0	16.72 ±0.06	-0.01	23.8
2001.0	4.51 ±0.005	16.66 ±0.06	-0.01	27.1
2005.0	4.79 ±0.005	16.27 ±0.06	-0.10	29.4
2010.0	4.93 ±0.005	16.36 ±0.07	0.02	30.1
2013.0	5.03 ±0.01	15.82 ±0.02	-0.18	31.8
2016.0		15.72 ±0.02	-0.03	

Supplement 12: Area evolution of glacier and supraglacial debris cover.

Aerial photo of 1930

Supplement 13: Aerial image from 1930. Although large parts of the tongue are still snow-covered, the lowest part yields the typical superglacial meltwater channels and ice cliffs.

Orthophoto 2017



Supplement 14: Orthophoto from UAV imagery from September 2017. There was light snowfall some days before the campaign, and the snow is conserved on the north-facing ice cliffs in the lowest part of the glacier tongue.

Moraine from ~2001

Supplement 15: Glacier terminus and forefield in 2016. The terminal moraine from the small advance between 1988 and 1995 is well visible some metres in front of today's terminus, separating vegateted from non-vegetated areas on the right side of the river.