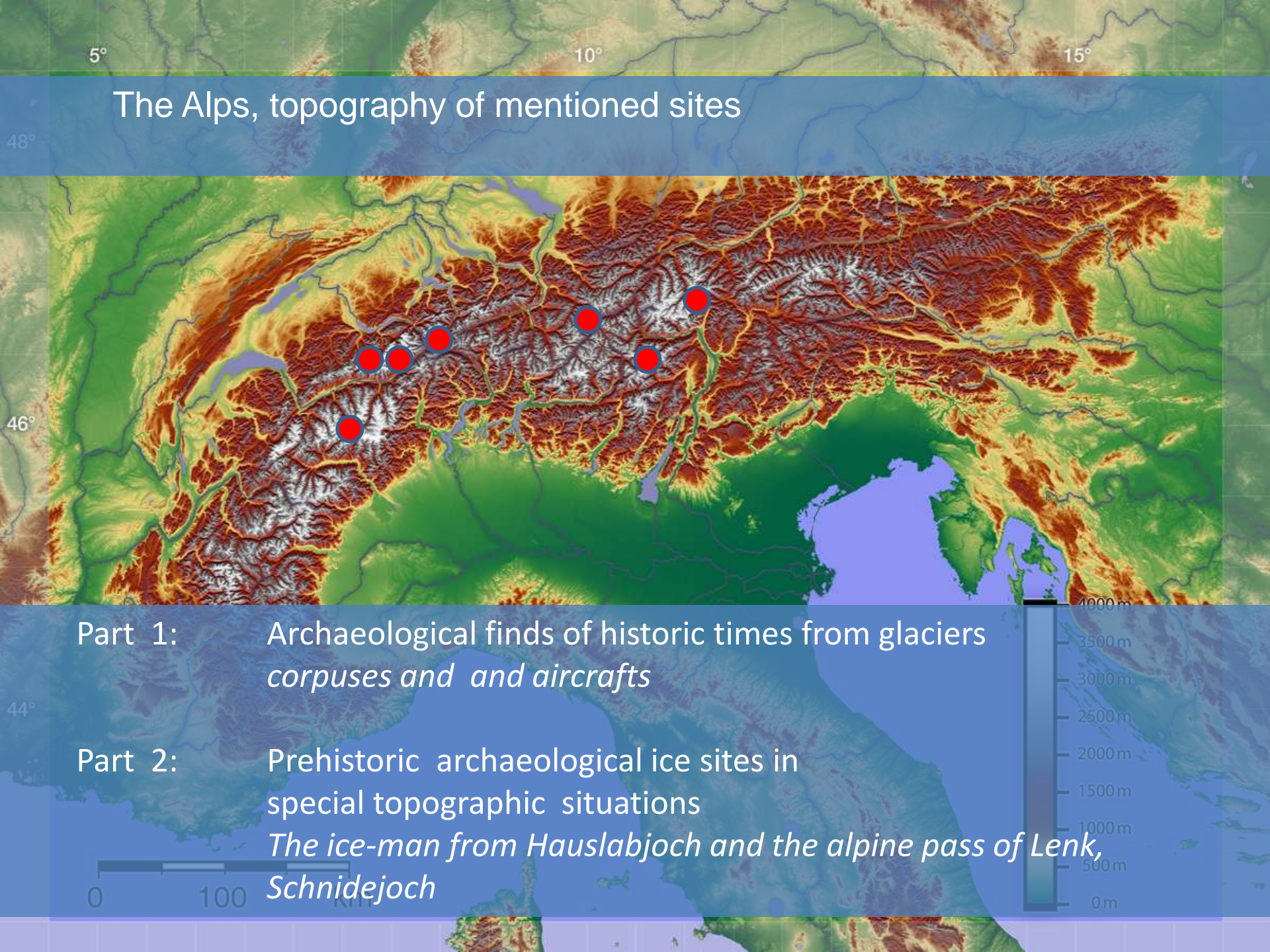
A photograph of a mountain peak with snow patches under a clear blue sky. The mountain is rugged and rocky, with several large, irregular patches of snow and ice clinging to its slopes. The sky is a clear, bright blue. The overall scene is a high-altitude alpine landscape.

Klimapark2469 Conference, Lom, Norway, 25 and 26th May 2009

# The Archaeology of Glaciers and Ice-patches in the Alps. The example of Lenk, Schnidejoch, Switzerland.

Albert Hafner, Archaeological Service of the Canton of Berne, Switzerland



A topographic map of the Alps region, showing elevation contours and geographical features. Seven red dots are placed on the map, indicating specific archaeological sites. The map includes latitude and longitude markings (5°, 10°, 15° longitude; 44°, 46°, 48° latitude) and a scale bar at the bottom left. A vertical elevation scale on the right side ranges from 0m to 4000m in 500m increments.

## The Alps, topography of mentioned sites

Part 1: Archaeological finds of historic times from glaciers  
*corpuses and aircrafts*

Part 2: Prehistoric archaeological ice sites in  
special topographic situations  
*The ice-man from Hauslabjoch and the alpine pass of Lenk,  
Schnidejoch*



# Glaciers corps from the Swiss Alps (Wallis and Graubünden)



Zermatt VS, Theodul pass. Corpus of a mercenary from the 16th century.









Bergün GR, Porchabella glacier and Piz Kesch (in background). Corpus of a woman from the 18th century.













Archaeology of World War I: combat areas in the ice (Adamello region, Tyrol)







Forni glacier, 2004: Austria-Hungarian soldiers are excavated. They died 1918 in the third battle of Monte San Matteo (Photo Maurizio Vicenzi).



## Archaeology of World War II: aircrafts in Austria/Tyrol and Switzerland.



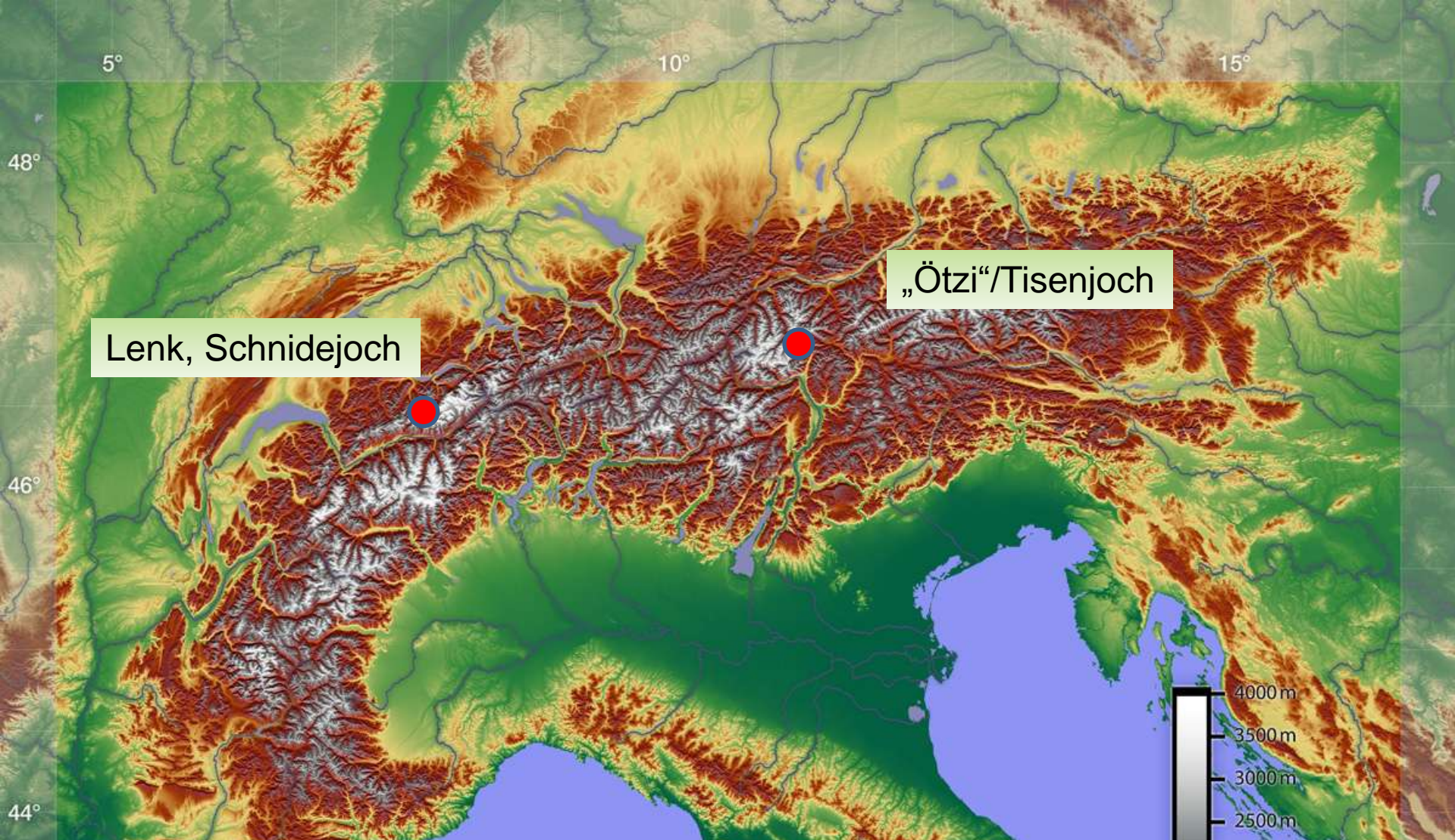
Austria/Tyrol: an German Junkers Ju-52/3 crashed in 1941, emerges since 2001 from the glacier ice.





Bernese Alps, Switzerland. In december 1946 a US DC3 Dakota aircraft crashes on the Gauli glacier. All passengers and pilots were saved, the machine is still in the ice.



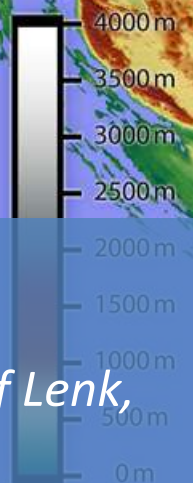


Lenk, Schnidejoch

„Ötzi“/Tisenjoch

Part 2: Prehistoric archaeological ice sites in special topographic situations

*The ice-man from Hauslabjoch and the alpine pass of Lenk, Schnidejoch*





Austrian-Italian border: Tisenjoch, Ötztal Alps. In 1991 was found the mummy of a neolithic man, with full equipment, dated around 3300 BC.













At Lenk, Schnidejoch, Bernese Alps, Switzerland between 2003 and 2008 several hundred objects were found, dating between 4300 BC and 900 AD.





Lake Iffig, 1950 m asl.





Wildhorn cabin SAC, 2350 m asl.







1912

1912

S.A.C.

WILDHORNHUTTE

CAFÉ WILDHORN HORNHUTTE











Wildhorn 3247 m and Schnidejoch 2756 m asl.





Schnidejoch 2756 m asl.





17th september 2004





28th september 2005





Lenk, Schnidejoch, Blick NE, situation end september 2005













GIS reference point at Schnidehorn 2937 m asl.





Helicopter transport for sediment transport.





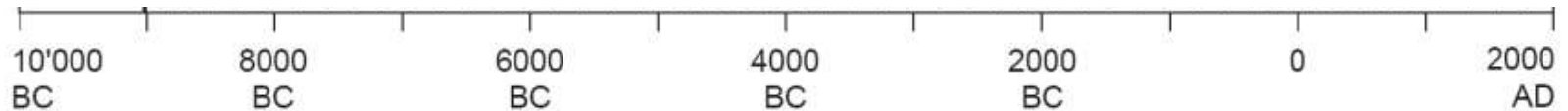
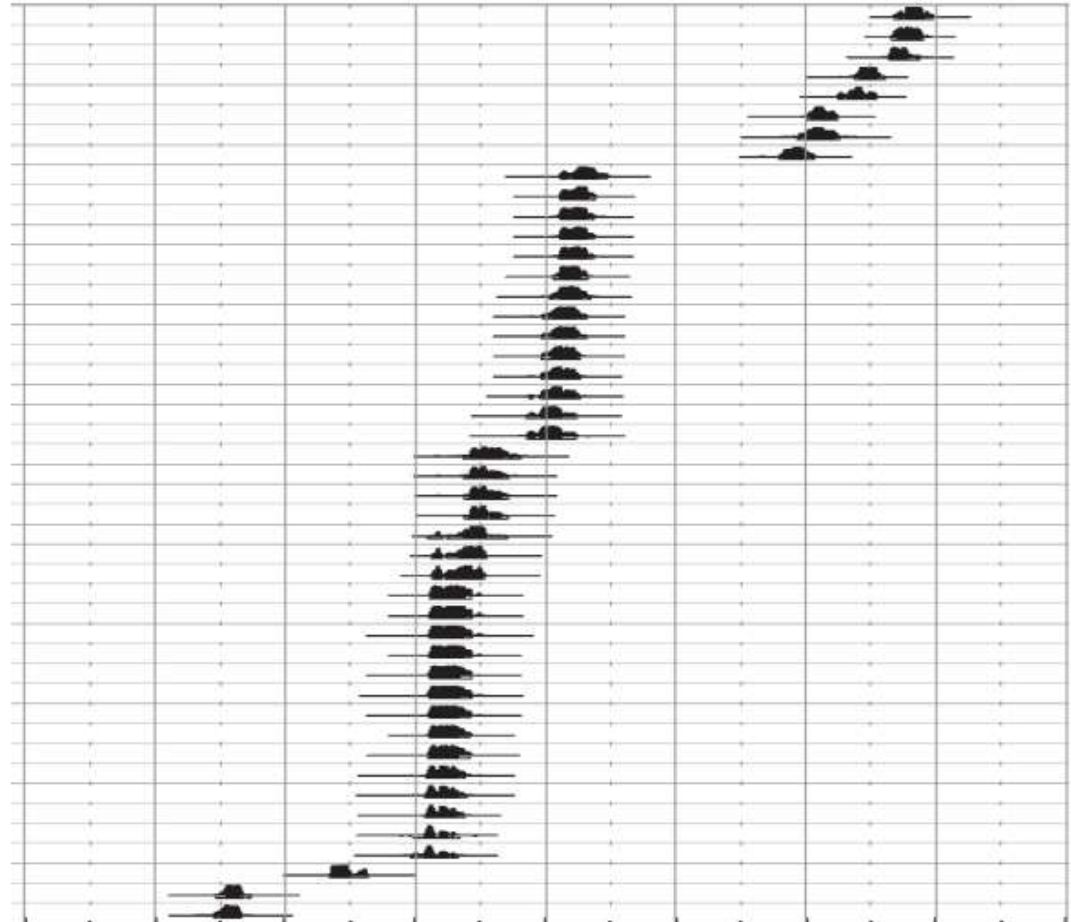
The field team: Albert Hafner, Kathrin Glauser, Urs Messerli





# Lenk, Schnidejoch, Radiocarbon dates C14, 2-sigma range

ETH-29572/UZ-5172.2	1195±50BP
ETH-29572/UZ-5172.1	1230±50BP
ETH-34940/UZ-5607	1305±55BP
ETH-32033/UZ-5334	1585±50BP
ETH-32032/UZ-5333	1650±50BP
ETH-32036/UZ-5337	1895±50BP
ETH-30082/UZ-5186	1910±70BP
ETH-31146/UZ-5257	2055±50BP
ETH-34939/UZ-5605	3400±65BP
ETH-32038/UZ-5339	3435±50BP
ETH-34936/UZ-5602	3450±50BP
ETH-32035/UZ-5336	3450±50BP
ETH-34934/UZ-5600	3455±50BP
ETH-31147/UZ-5258	3480±50BP
ETH-29574/UZ-5174	3490±55BP
ETH-31148/UZ-5259	3525±55BP
ETH-29576/UZ-5176	3530±55BP
ETH-30938/UZ-5248	3540±55BP
ETH-32037/UZ-5338	3550±50BP
ETH-31141/UZ-5252	3565±55BP
ETH-32034/UZ-5335	3595±55BP
ETH-31142/UZ-5253	3600±65BP
ETH-34938/UZ-5604	3945±65BP
ETH-34937/UZ-5603	3965±55BP
ETH-34935/UZ-5601	3965±55BP
ETH-30065/UZ-5227	3970±50BP
ETH-29573/UZ-5173	4020±55BP
ETH-32044/UZ-5345	4050±55BP
ETH-20693/UZ-5180	4075±55BP
ETH-32040/UZ-5341	4135±55BP
ETH-32039/UZ-5340	4135±55BP
ETH-30937/UZ-5247	4145±60BP
ETH-28348/UZ-5061	4145±55BP
ETH-31144/UZ-5255	4155±55BP
ETH-31143/UZ-5254	4160±60BP
ETH-31683/UZ-5332	4160±55BP
ETH-35570/UZ-5635	4165±50BP
ETH-31145/UZ-5256	4170±55BP
ETH-32042/UZ-5343	4195±55BP
ETH-31140/UZ-5251	4215±60BP
ETH-20692/UZ-5179	4215±55BP
ETH-32041/UZ-5342	4250±50BP
ETH-29575/UZ-5175	4265±55BP
ETH-35569/UZ-5606	4765±50BP
ETH-32499/UZ-5344	5560±60BP
ETH-32043/UZ-5344	5600±55BP





Iron Age, Roman Period, Early Middle Ages:

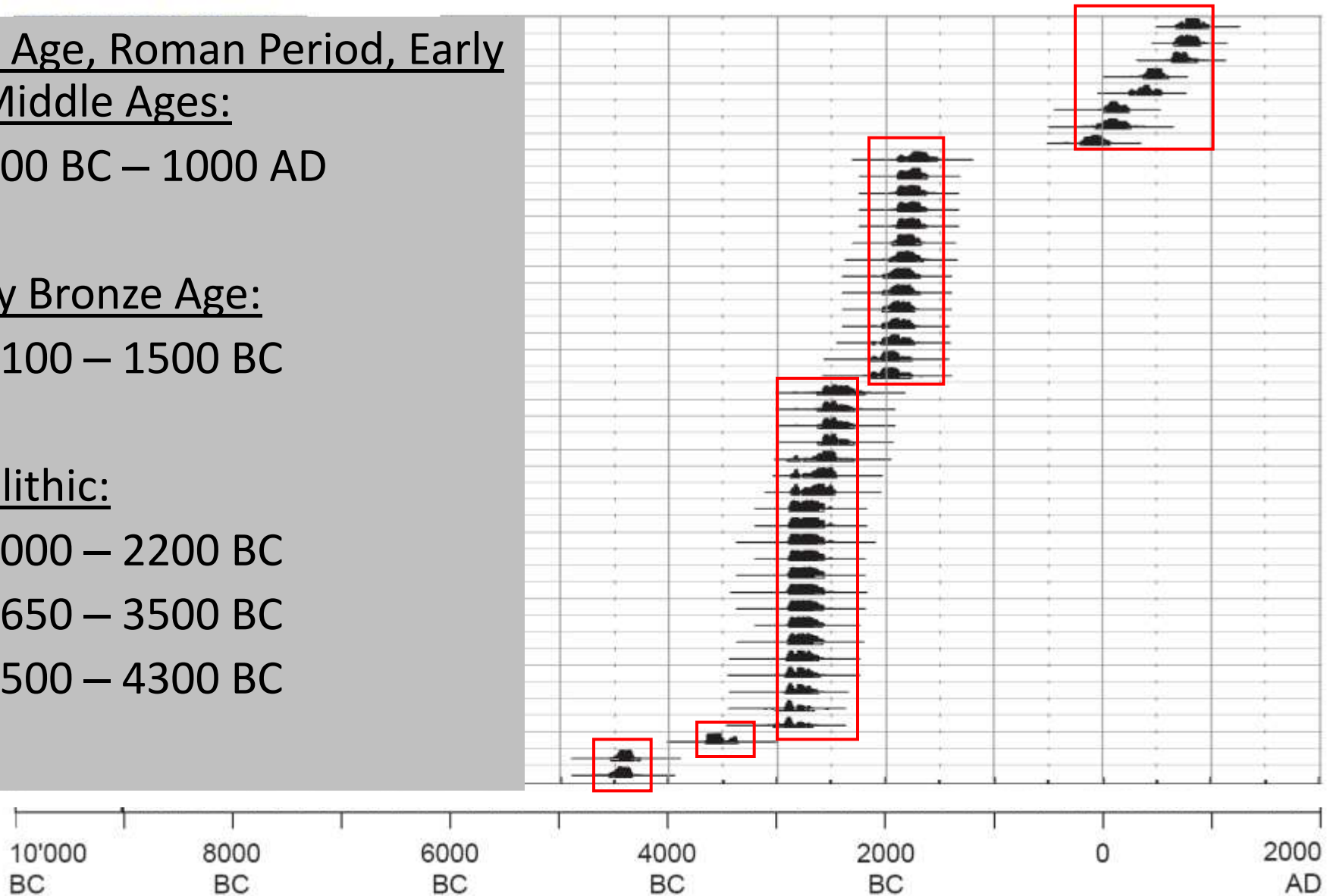
- 200 BC – 1000 AD

Early Bronze Age:

- 2100 – 1500 BC

Neolithic:

- 3000 – 2200 BC
- 3650 – 3500 BC
- 4500 – 4300 BC





Lenk, Schnidejoch, Neolithic finds





ETH-32499/UZ-5344 : 5560±60BP

68.2% probability

4450BC (68.2%) 4350BC

95.4% probability

**4530BC (94.3%) 4320BC**

4290BC ( 1.1%) 4270BC

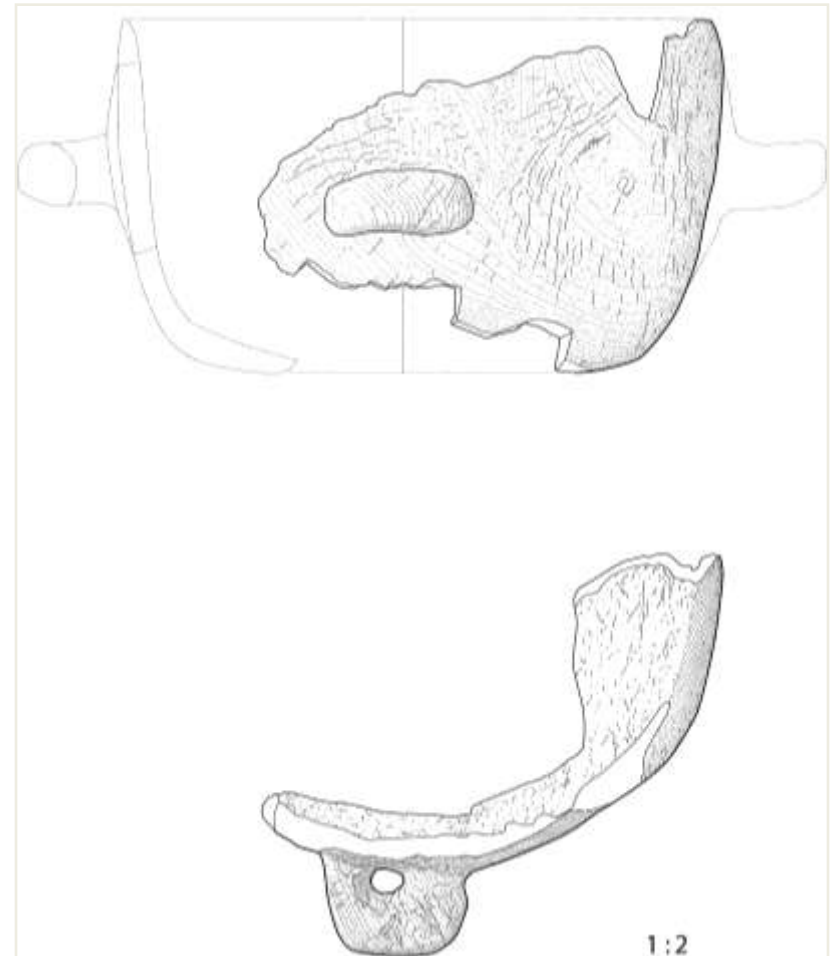
ETH-32043/UZ-5344 : 5600±55BP

68.2% probability

4490BC (68.2%) 4360BC

95.4% probability

**4540BC (95.4%) 4340BC**













Bow sinew.









Reconstruction of the bow quiver.





# Reconstruction of the bow quiver





Lenk, Schnidejoch: arrows









Lenk, Schnidejoch: arrows





Lenk, Schnidejoch: bow (*Taxus baccata*).



160 cm





Lenk, Schnidejoch: arrow heads.



1 cm





Lenk, Schnidejoch: leather leggings.





Lenk, Schnidejoch: leather leggings.





Lenk, Schnidejoch: shoe fragments.



AI 348 007 2004 01 Fr. 90076 ZNF  
Archäologischer Dienst Bern Lr. 4183 SF



# Lenk, Schnidejoch, Early Bronze Age finds



L = 227 mm

















Lenk, Schnidejoch, Roman finds















Iffigsee:

Caracalla, 201–206



Schnidejoch:

Militärmünze, 15 v.Chr.



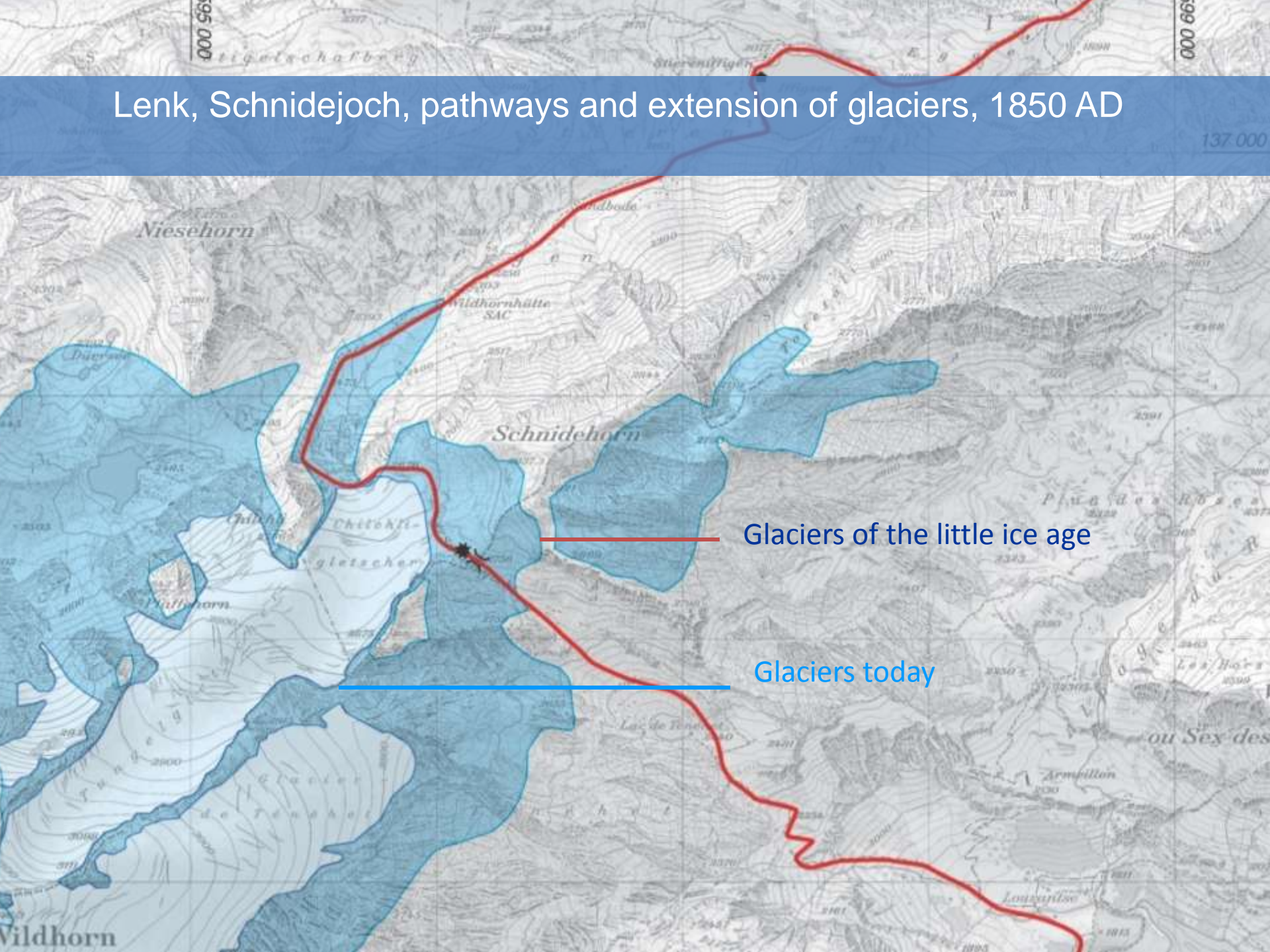
Lenk, Schnidejoch, Early Middle Ages



AI 348 . 007 . 2004 . 01 Fnr. 84675



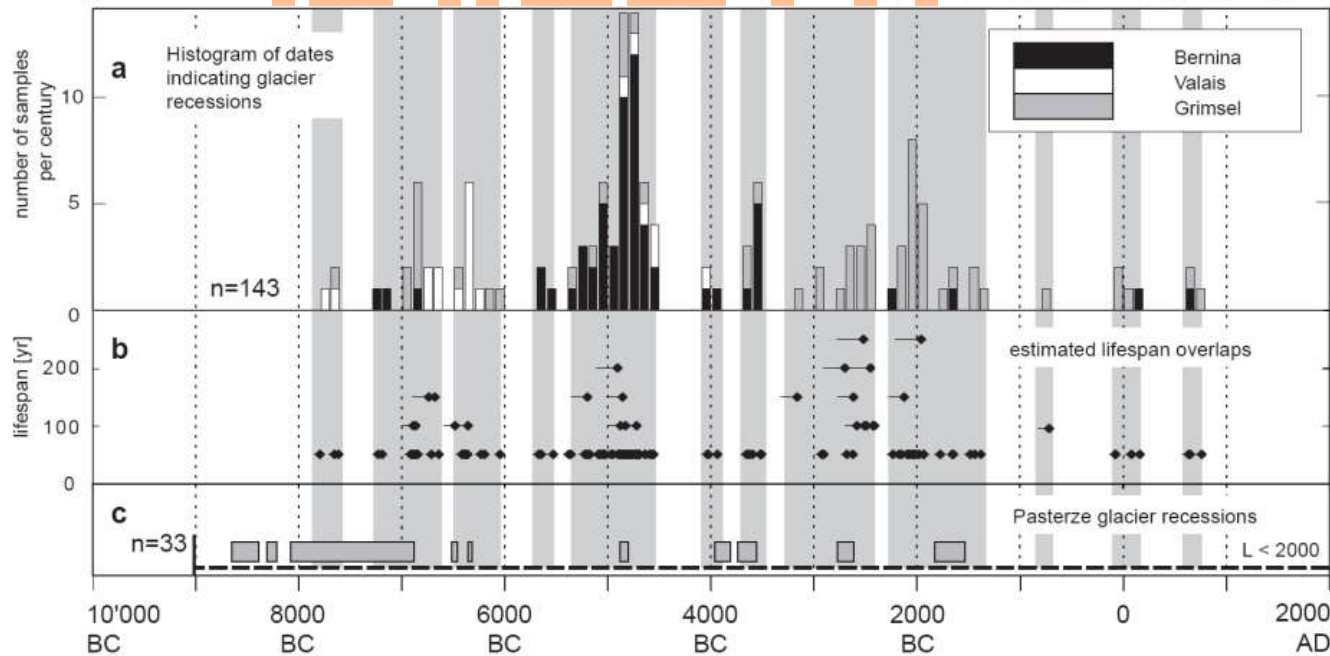
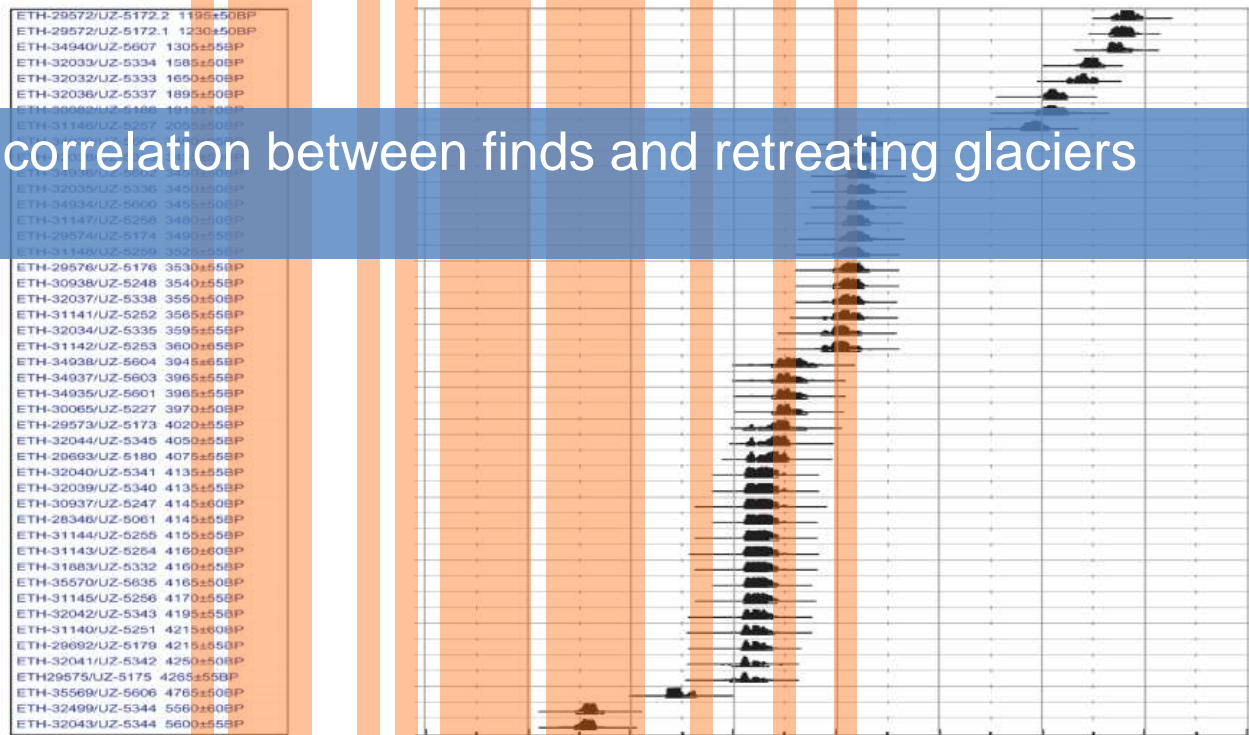
# Lenk, Schnidejoch, pathways and extension of glaciers, 1850 AD



Glaciers of the little ice age

Glaciers today

# Lenk, Schnidejoch, correlation between finds and retreating glaciers





## Main Research team Lenk, Schnidejoch:

Albert Hafner, director, Archäologischer Dienst Kanton Bern ADB  
Kathrin Glauser, alpine technics and security, ADB

Leather: Marquita and Serge Volken, Gentle Craft Lausanne

DAN human: Kurt W. Alt, University of Mainz

Wood: Werner Schoch, WSL Birmensdorf

Textiles: Antoinette Rast

Fat analysis on leather: Jorge Spangenberg, Uni Lausanne

Bow equipment: Jürgen Junkmanns, Uni Köln

C14: ETH Zürich

Pollenanalysis on leather: Lucia Wick, IPNA University of Basel

DNA animal: Angela Schlumbaum, IPNA

Bones: Jörg Schibler, IPNA

Botanical remains: Christoph Brombacher, IPNA

Climate: Proff. Heinz Wanner and Martin Grosjean,  
Geographic Institut University of Bern / Oeschger Center for Climate  
Change Research