



Palaeoenvironment in the Eastern Alps during the Last Glacial Cycle



Markus Fiebig¹ & Martina Pacher²

¹Institut für Angewandte Geologie, Universität für Bodenkultur Wien, Peter Jordan Straße 70, A-1190 Wien, markus.fiebig@boku.ac.at

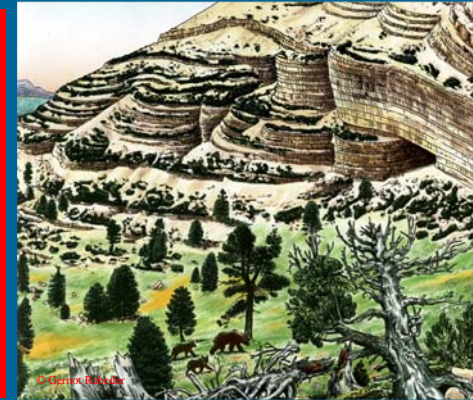
²Institut für Paläontologie, Universität Wien, Althanstraße 14, 1090 Wien



Entrance of Conturines cave (2800 m asl.)

Problem: In several high Alpine caves (left foto to the entrance of the Conturines cave) the fossil record display cave bears during parts of the Last Glacial Cycle. This indicates that survivable conditions must have prevailed (eg. vegetation suppling the vegetable diet for the bears; see drawing on the right side).

Assuming a temperature gradient of 0,7° Celsius per 100 m in altitude we calculated on the base of palaeoclimatological information from three well investigated sites at the Alpine foothills the temperatures at the high Alpine cave bear site.

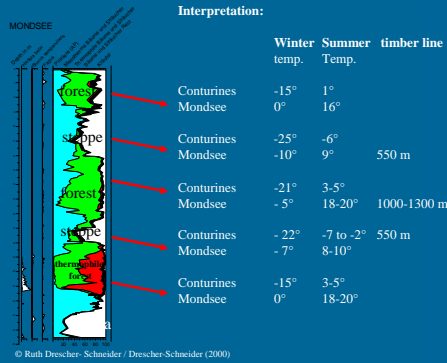


Mondsee (510 m asl.)



lake sediments (550 m asl.)

The site of Mondsee covers the first part of the last glacial cycle.

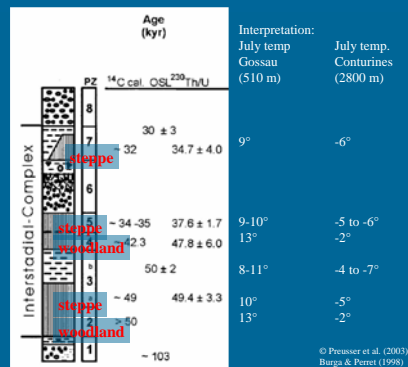


Temperature reconstruction of the first part of the Last Glacial Cycle at Mondsee by Ruth Drescher-Schneider: the winter temperature varied at Mondsee (510 m) between -10 and 0°C and the summer temperature between 8 and 20°C. At Conturines (2800 m) the temperatures must have been about 15 ° colder. Thus the winter temperatures have to be assumed around -15 to -25°C and the summer temperatures around 5 to -7°C during the first part of the Last Glacial Cycle.

Gossau (510 m asl.)



The site of Gossau covers the second part of the last glacial cycle.



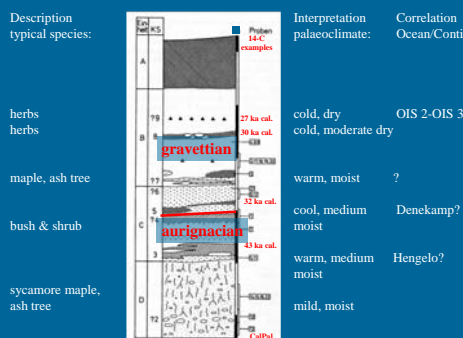
Temperature reconstruction of the second part of the Last Glacial Cycle at Gossau by Monika Jost-Stauffer: the summer temperature varied at Gossau (510 m) between 8 and 13°C. At Conturines (2800 m) the temperatures must have been about 15 ° colder. Thus the summer temperatures at Conturines have to be assumed around - 2 to - 7°C during the second part of the Last Glacial Cycle.

Willendorf (240 m asl.)



The site of Willendorf covers the third part of the last glacial cycle.

| Kulturschicht | Age |
|-------------------------|--------------------|
| 8 | 25.800 – 25.200 |
| MITTLERES GRAVETTIIEN | |
| Bereich Kulturschicht 7 | |
| 7 | 26.500 – 26.100 |
| MITTLERES GRAVETTIIEN | |
| 6 | 26.500 – 26.100 |
| MITTLERES GRAVETTIIEN | |
| Paket C | |
| | 39/38.000 – 28.600 |
| 5 | 30.500 Jahre |
| FRÜHES GRAVETTIIEN | |
| 4 | 32.100 - 31.200 |
| AURIGNACIEN | |



For the third part of the Last Glacial Cycle we have only some paleoclimatic interpretations. An exact temperature reconstruction for the site at Willendorf is not available, but the temperature at a cave 2560 m higher in the Alps should be nearly 18° less. Considering the bush and shrub vegetation with temporarily some sycamore maples and ash tree at Willendorf, trees around the high Alpine Conturines cave seem to be unlikely during this period as well.

Result: We do not find any evidence for moderate climate in high Alpine areas during the Last Glacial Cycle, thus we still need an explanation to understand the appearance of cave bears in the high Alpine region during the Last Glacial Cycle.