A multi-proxy reconstruction of Holocene Climate Change from Bleßberg Cave, Germany

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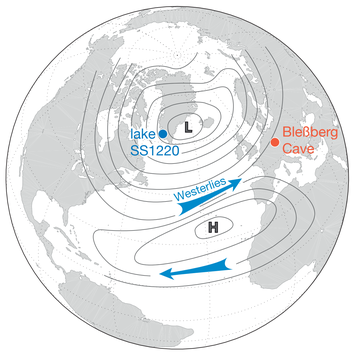
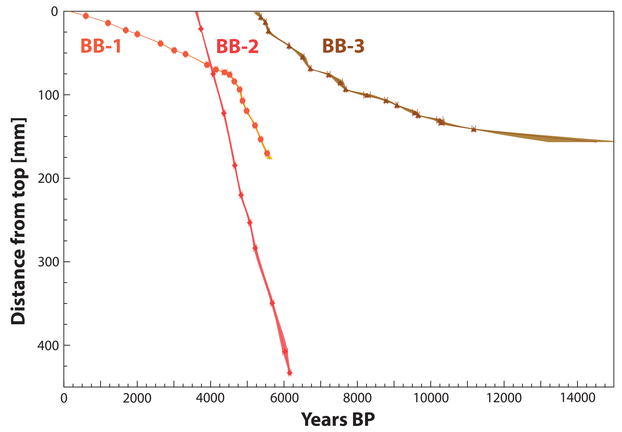


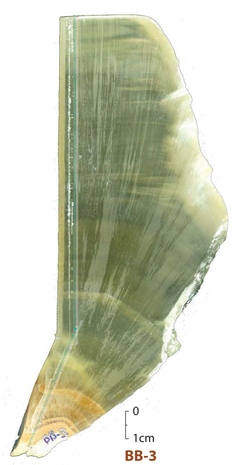
Map of the North Atlantic sector

Bleßberg Cave is located in Thuringia, Germany. Centennial-scale trends in the BB records are similar to lake data from southern Greenland [6].



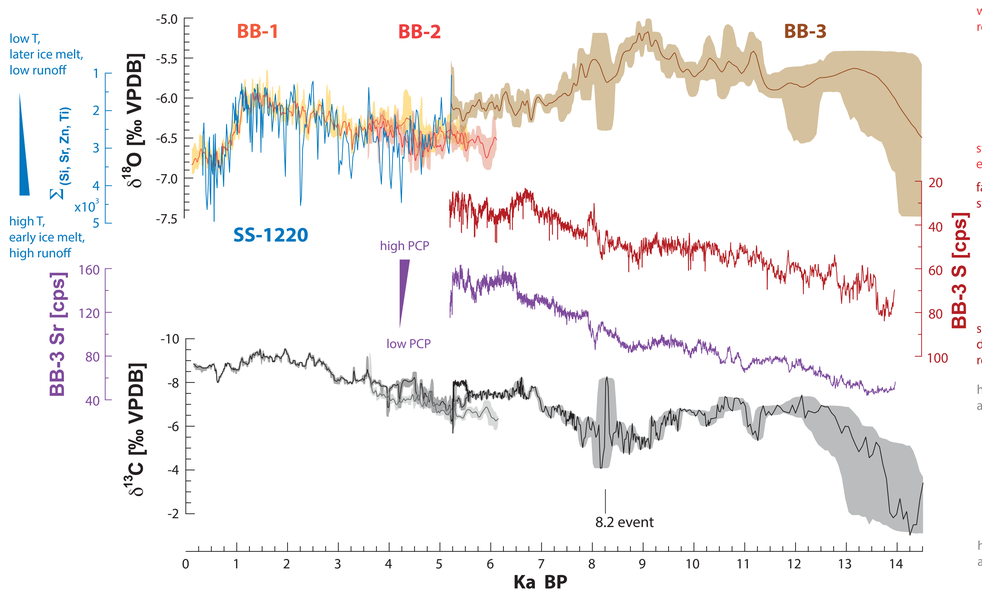
Age-depth models for BB-1, -2, -3

U-Th dates are interpolated with a polynomial function using 1000 MC simulations in COPRA [5]. BB-2 and BB-3 show relativevly uniform growth rates, whereas BB-1 slows drastically after ca. 5 ka BP.



Bleßberg proxies compared

Carbon isotopes, Sr and S inform on effective moisture balance, soil & vegetation dynamics. Questions remain on the interpretation of oxygen isotope variations.



weaker westerlies & reduced Rayleigh?

?

stronger westerlies & enhanced Rayleigh?

fast soil development & strong S retention

slow soil development & reduced S retention

high vegetation activity / density

high vegetation activity / density

1 **Holocene climate** fluctuations were small compared to glacial times, but had significant **impact on past societies** on various timescales [1,2,3]. Few well-dated high-resolution Holocene records are available [4, 5] from **Central Europe**

2 We reconstruct climate variability using 3 stalagmites from **Bleßberg Cave, c. Germany**

T_{cave} = 8.7±0.1°C, RH_{cave} = 99.9±0.2%, CO_{2cave} = 800±25 ppm

45 U/Th dates measured on BB-1, -2, & -3 at the Max Planck Institute for Chemistry, Mainz.

$\delta^{13}C$, $\delta^{18}O$ (Gasbench + Delta Plus XL IRMS), **Sr/Ca** and **S/Ca** (Eagle XXL μXRF) measured at the GFZ Potsdam as environmental proxies for the **period 10-0.4 ka BP**

3 **Lower $\delta^{18}O$** is correlated to **higher runoff** in southern **Greenland** [6] and **Bond events** [7]. $\delta^{18}O$ is likely influenced by **temperature** and **seasonality**.

Decreasing $\delta^{13}C$ and **S/Ca** might indicate increasing **vegetation density** and **soil S-retention**

Higher Sr/Ca suggests increasing **PCP** with **negative summer moisture balance.**

References

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