Supplement

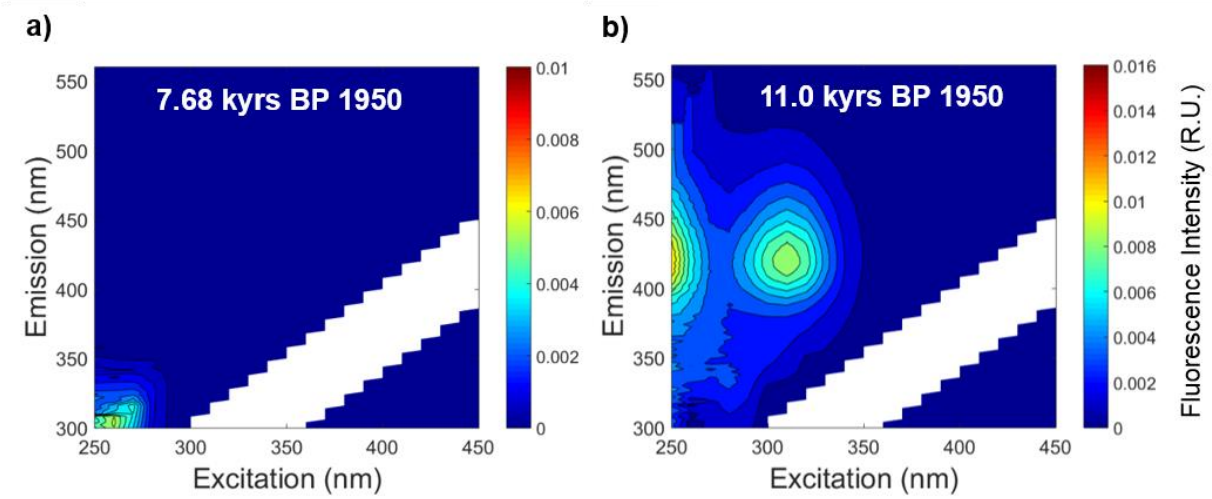

Figure 1: West Antarctic Ice Sheet Divide ice core Excitation Emission Matrices (EEMs) from the Holocene showing examples of a) protein-like organic matter (OM) fluorescence (7.68 kyrs BP; before present 1950), and b) protein- and humic-like OM (11.0 kyrs BP 1950). Fluorescence intensity is reported on the z axis in Raman Units (R.U.).

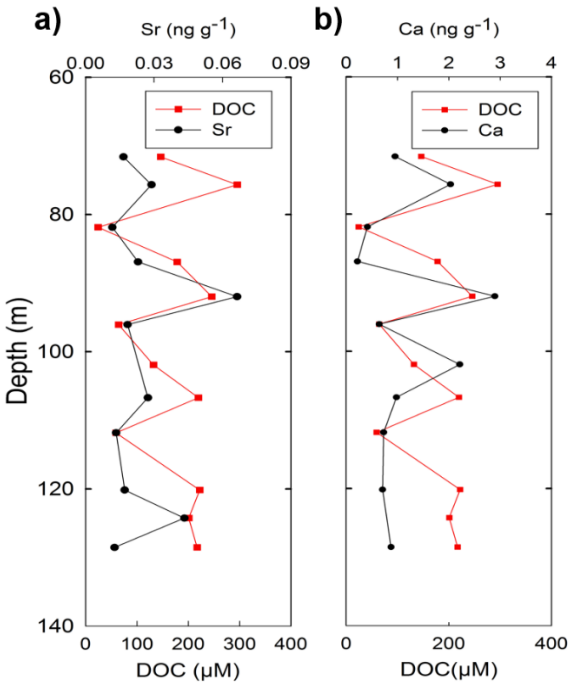

Figure 2: Geochemical concentrations of a) strontium (Sr), and b) non-sea salt calcium (Ca) with dissolved organic carbon (DOC) as a function of shallow ice core depth (m) in the upper West Antarctic Ice Sheet Divide ice core WDC 05Q Stick D.

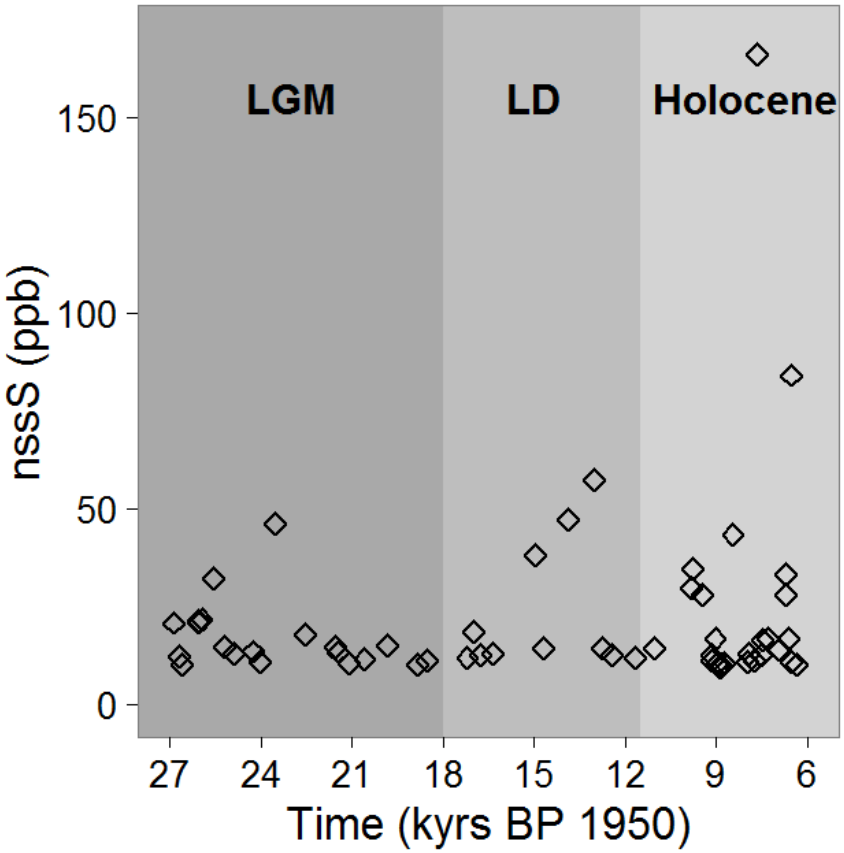

Figure 3: Concentrations of non-sea salt sulfur (nssS; ppb) calculated above the nssS volcanic detection threshold (Sigl et al., 2013) that coincide with a discretely collected EEMs sample for the Last Glacial Maximum (LGM), the last deglaciation (LD), and the Holocene. Note: increases in nssS concentration above the calculated nssS detection threshold are not a metric for volcanic strength.

References

Sigl, M., McConnell, J. R., Layman, L., Maselli, O., McGwire, K., Pasteris, D., Dahl-Jensen, D., Steffensen, J. P., Vinther, B., Edwards, R., Mulvaney, R., and Kipfstuhl, S.: A new bipolar ice core record of volcanism from WAIS Divide and NEEM and implications for climate forcing of the last 2000 years, J Geophys Res-Atmos, 118, 1151-1169, Doi 10.1029/2012jd018603doi, 2013.