Supplementary Information

Supplementary methods

XRF Analysis

Core scanning X-ray fluorescence (XRF) offers a rapid and non-destructive method for semi-quantitatively determining nearly continuous variations in elemental composition of geochemical core samples along their entire length. Archive halves of 2 sections from Core BOFS 32K were analyzed using an Avaatech XRF core scanner at the Godwin Laboratory for Palaeoclimate Research, Department of Earth Sciences, University of Cambridge. Prior to XRF scanning analysis, core sections were brought up to room temperature over 12 hours to avoid compromising the physical composition of the samples. The core surface was carefully scraped clean and covered with a 4 μm thin SPEXCertiPrep Ultralene foil to avoid contamination and minimize desiccation (Richter et al., 2006). Selected elements (Al, Si, K, Ca, Ti, Mn, Fe, Sr, and Ba) were detected at three different voltages using different currents, with a generator setting of 10 kilovolts (kV), 750 μA for Al, Si, K, Ca, Ti, Mn and Fe, 30 kV using a thin palladium filter, 500 μA for Sr, and 50 kV using a copper filter, 1000 μA for Ba. The length and width of the irradiated surface was 2.5 and 12.5 mm, respectively, with a count time of 30 s. Results are presented in log ratios of element intensities, which best reflect changes in chemical composition (Weltje and Tjallingii, 2008).

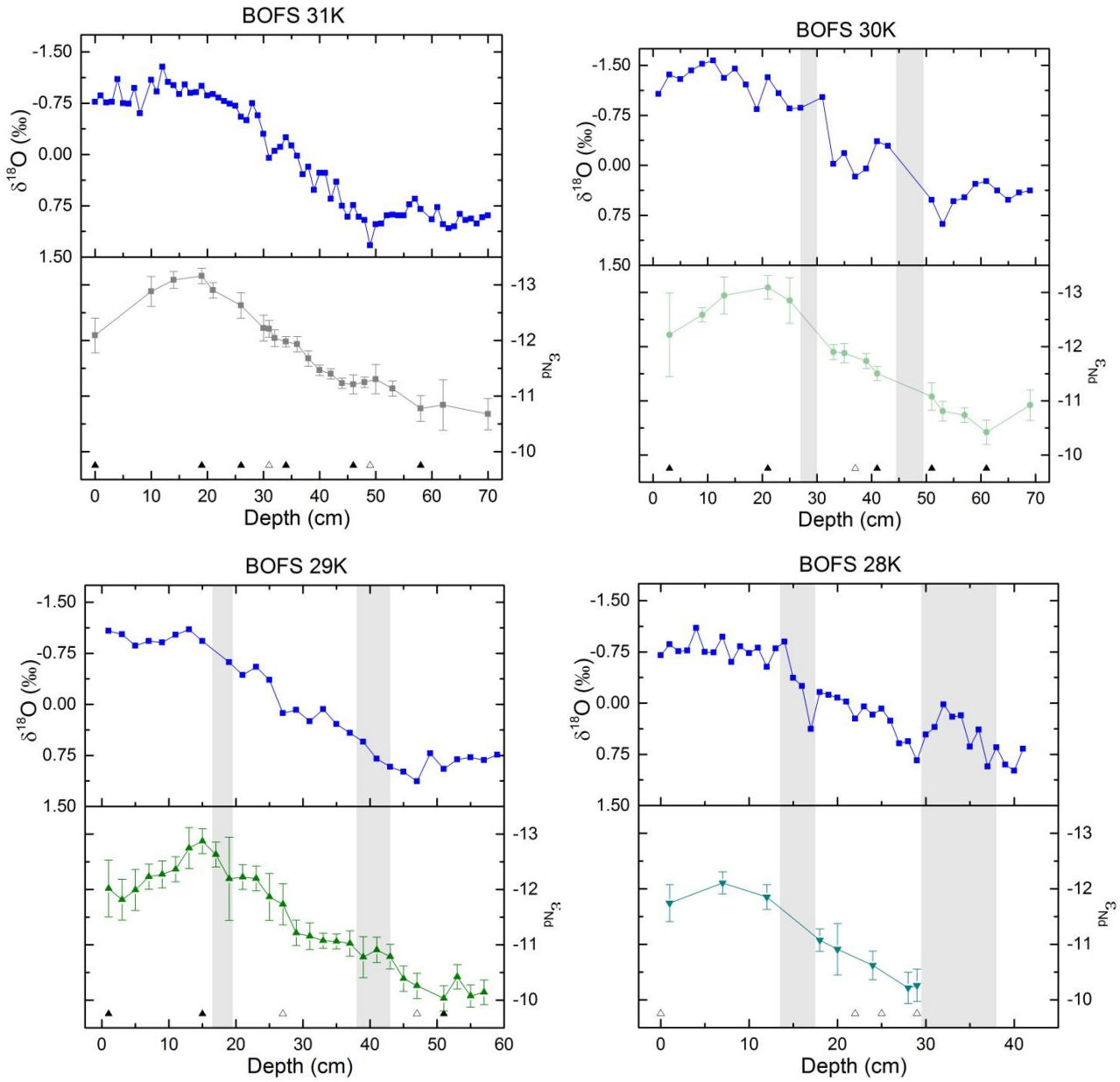

Fig. S1. Plots of planktic foraminiferal $\delta^{18}O$ (Beveridge, 1995) and ε_{Nd} (*this* work) from BOFS 28K-31K. Grey bars indicate regions identified as turbidites by Beveridge (1995). Age control points from planktic radiocarbon dates (filled triangles) and stable isotope tie points (hollow triangles) are indicated at the bottom of each plot and are listed in Table S2.

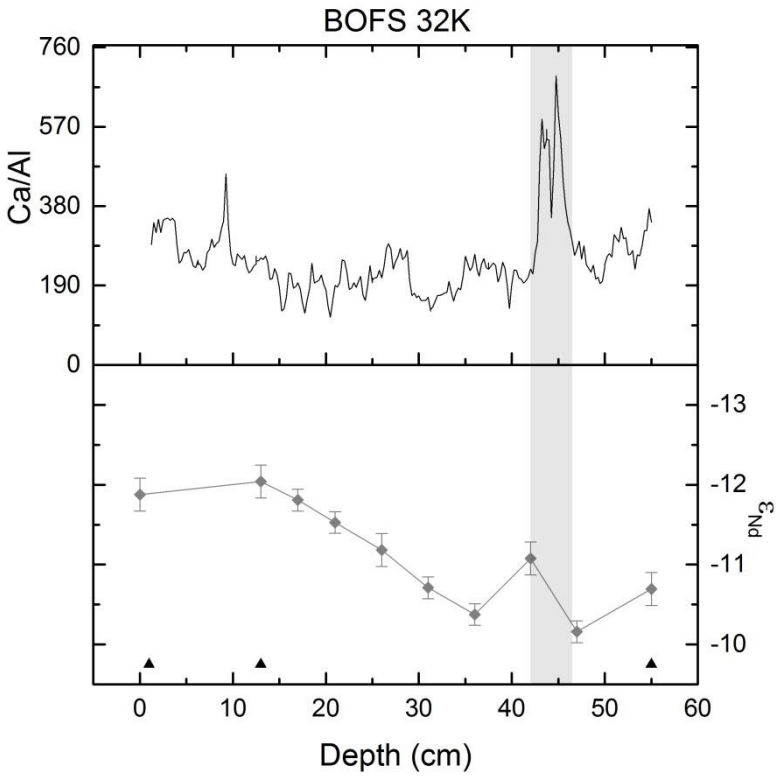

Fig. S2. (Top) Ca/Al results of XRF scanning of BOFS 32K and ε_{Nd} results of measurements made on foraminifera from the same core. Grey shaded bar indicates the region identified as a turbidite in this work based upon the Ca/Al results.

Supplementary References

Beveridge, N.A.S., 1995. Palaeoceanography of the Eastern Atlantic. University of Cambridge.

Richter, T.O., van der Gaast, S., Koster, B., Vaars, A., Gieles, R., de Stigter, H.C., De Haas, H., van Weering, T.C.E., 2006. The Avaatech XRF Core Scanner: technical description and applications to NE Atlantic sediments. Geological Society, London, Special Publications 267, 39-50.

Weltje, G.J., Tjallingii, R., 2008. Calibration of XRF core scanners for quantitative geochemical logging of sediment cores: Theory and application. Earth Planet Sci Lett 274, 423-438.