Stable isotope records for the past 1000 years from 5 ice cores in central Dronning Maud Land (DML)

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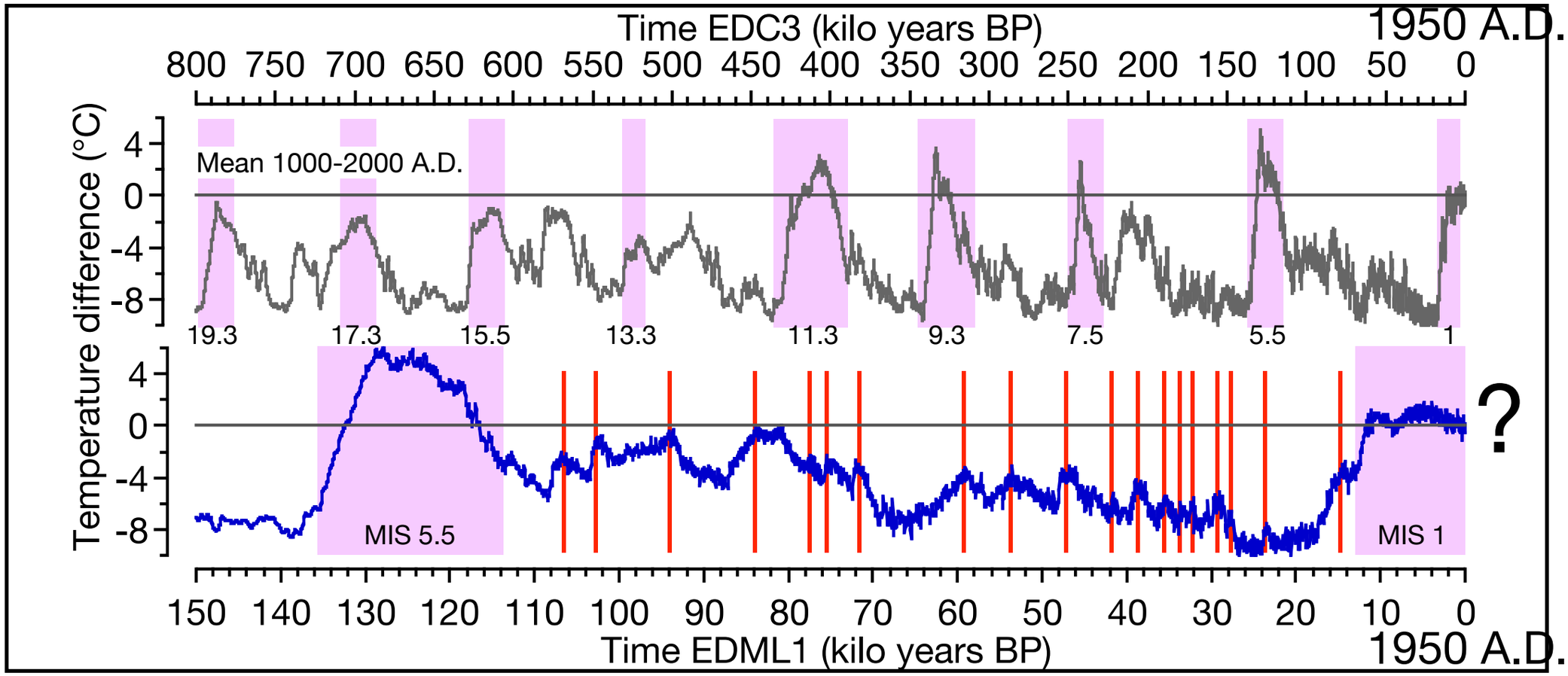
EPICA - European Project for Ice Core drilling in Antarctica



EPICA Dome C (EDC)

EPICA DML (EDML)

Interglacial

AIM corresp. D/O events

EPICA community members, One-to-one coupling of glacial climate variability in Greenland and Antarctica. Nature 444, 195-198 (2006)

Jouzel et al., Orbital and Millennial Antarctic Climate Variability over the Past 100,000 Years. Science 317, 793-796 (2007)

EDML - Kohnen station (2001-2006)

75°S 0°4‘E, 2782 m a.s.l., acc. rate 65 mm w.e./a; -44.6 °C

B32 (1997/98)

75°S 0°0.4‘E, 2782 m asl

B34 (2004/05)

75°S 0°E, 2782 m asl,

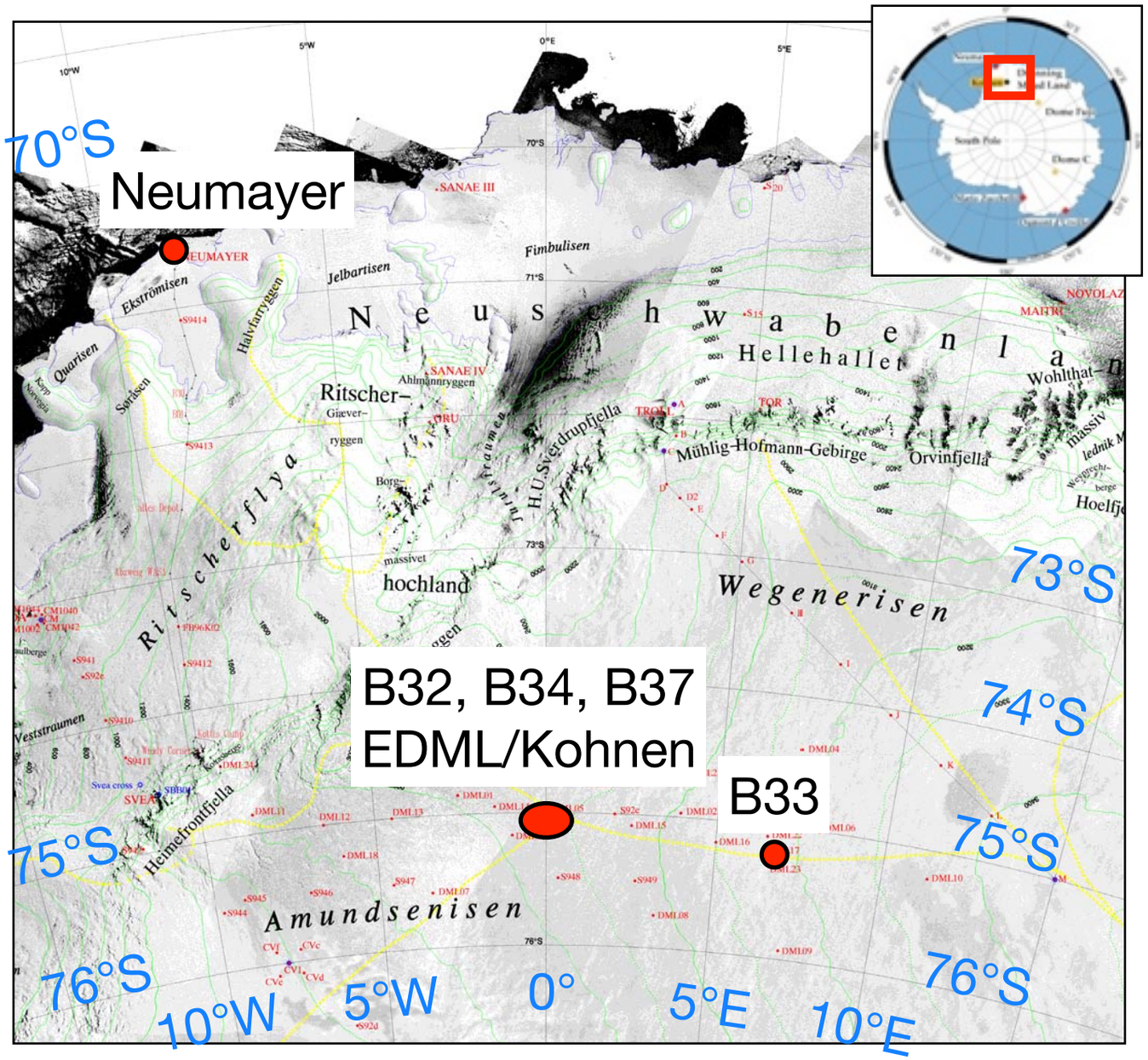
B37 (2005/06)

75°S 0°E, 2782 m asl,

B33 (1997/98)

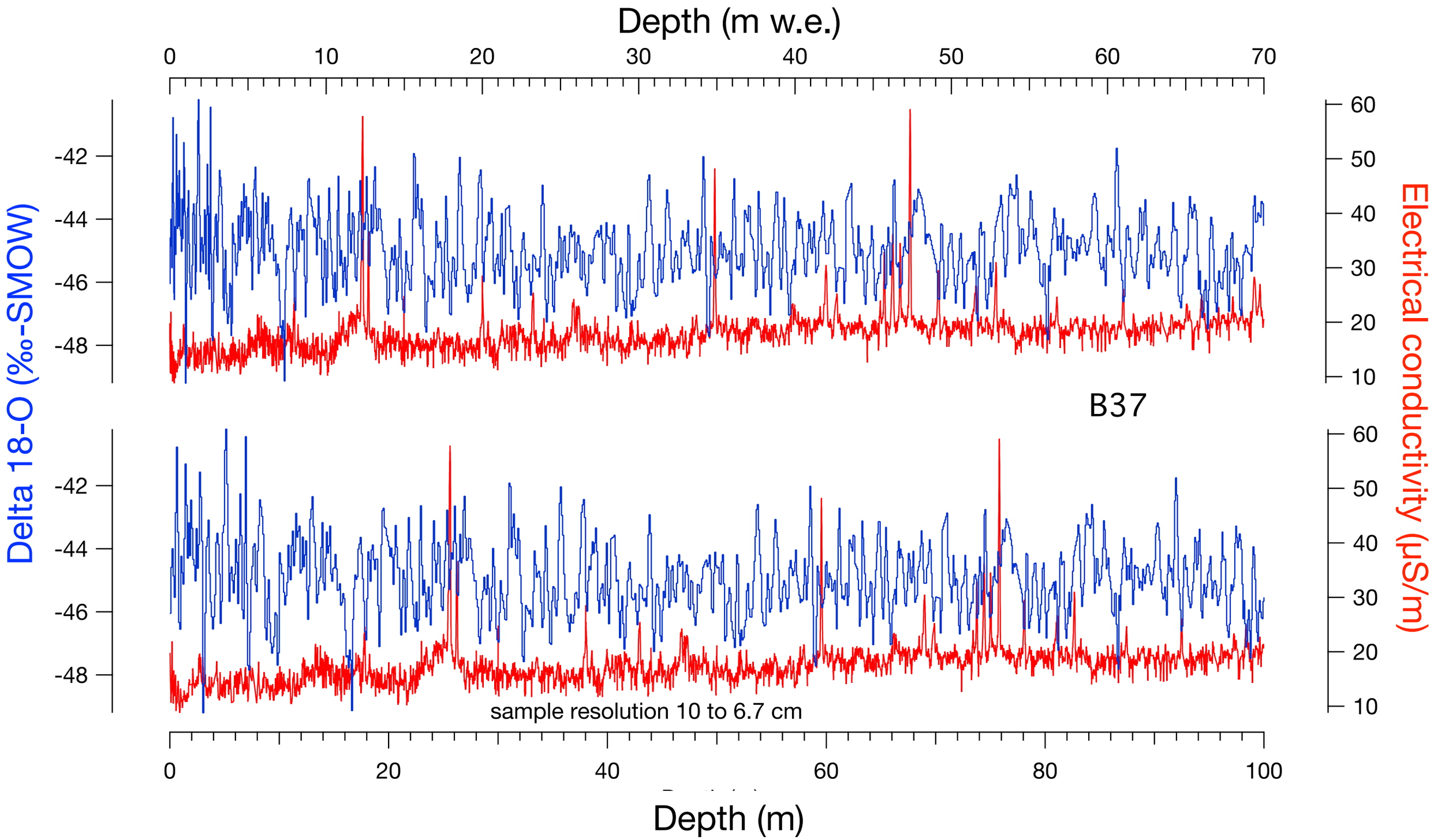
75°10‘S 6°30‘E, 3160 m a.s.l.

47 mm w.e./a; -46.2°C

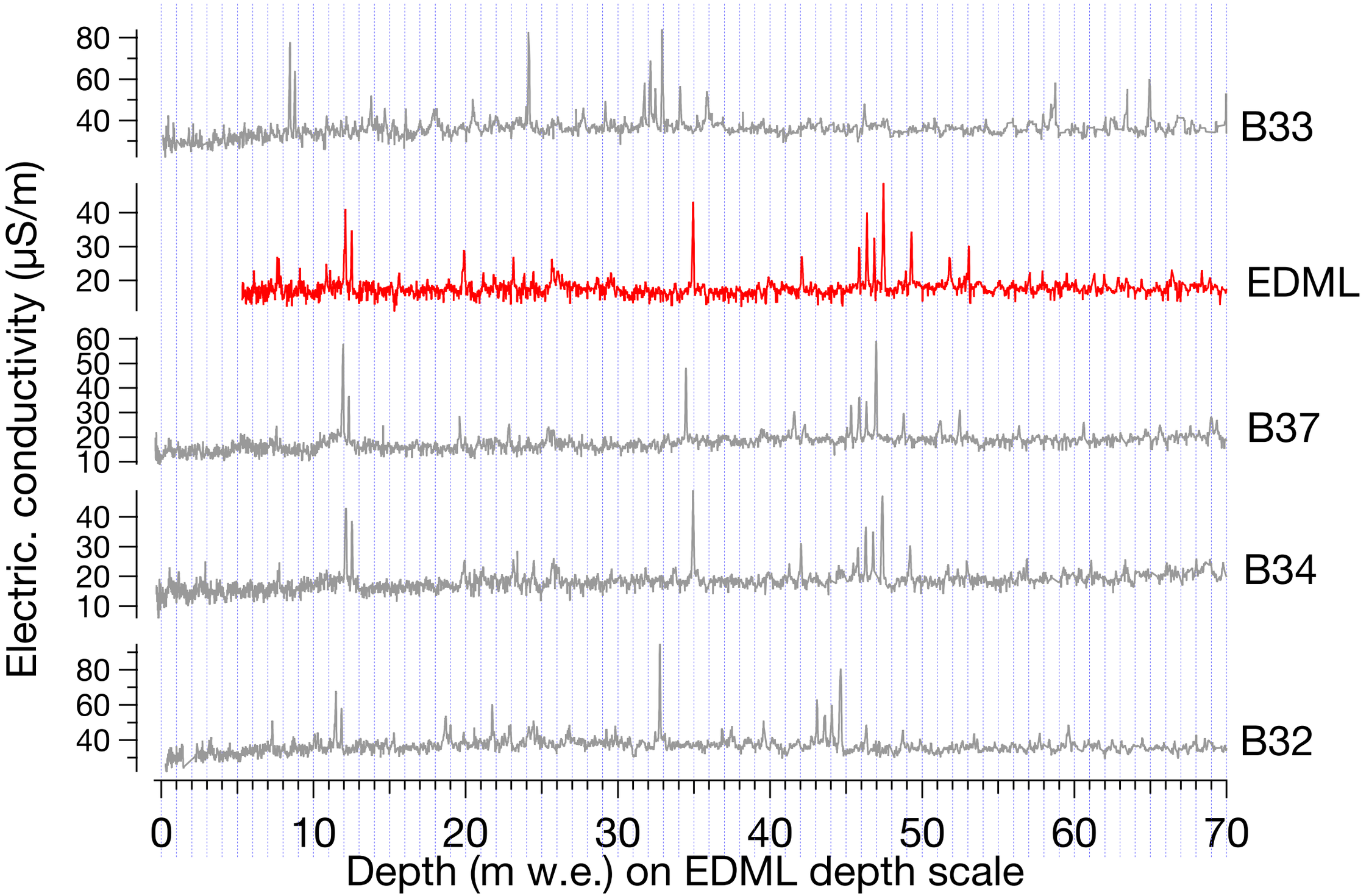


Satellite Image Map Dronning Maud Land 1:2000000, Draft Vers.4.2, BKG, Frankfurt am Main, Nov.1998 (detail)

Example for lab measurements: $\delta^{18}O$ and DEP at core B37



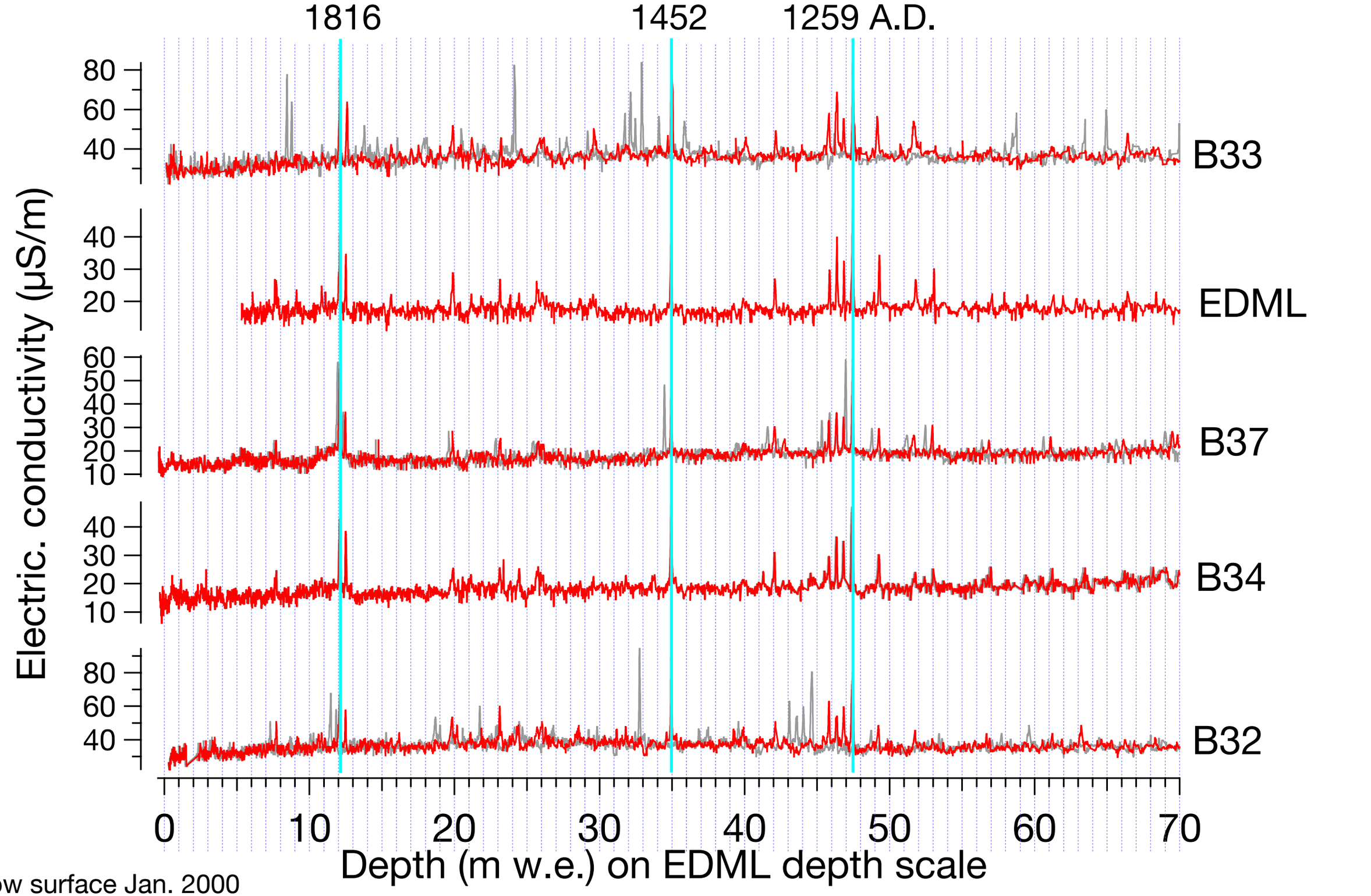
Synchronizing the cores



0: snow surface Jan. 2000

Synchronizing the cores

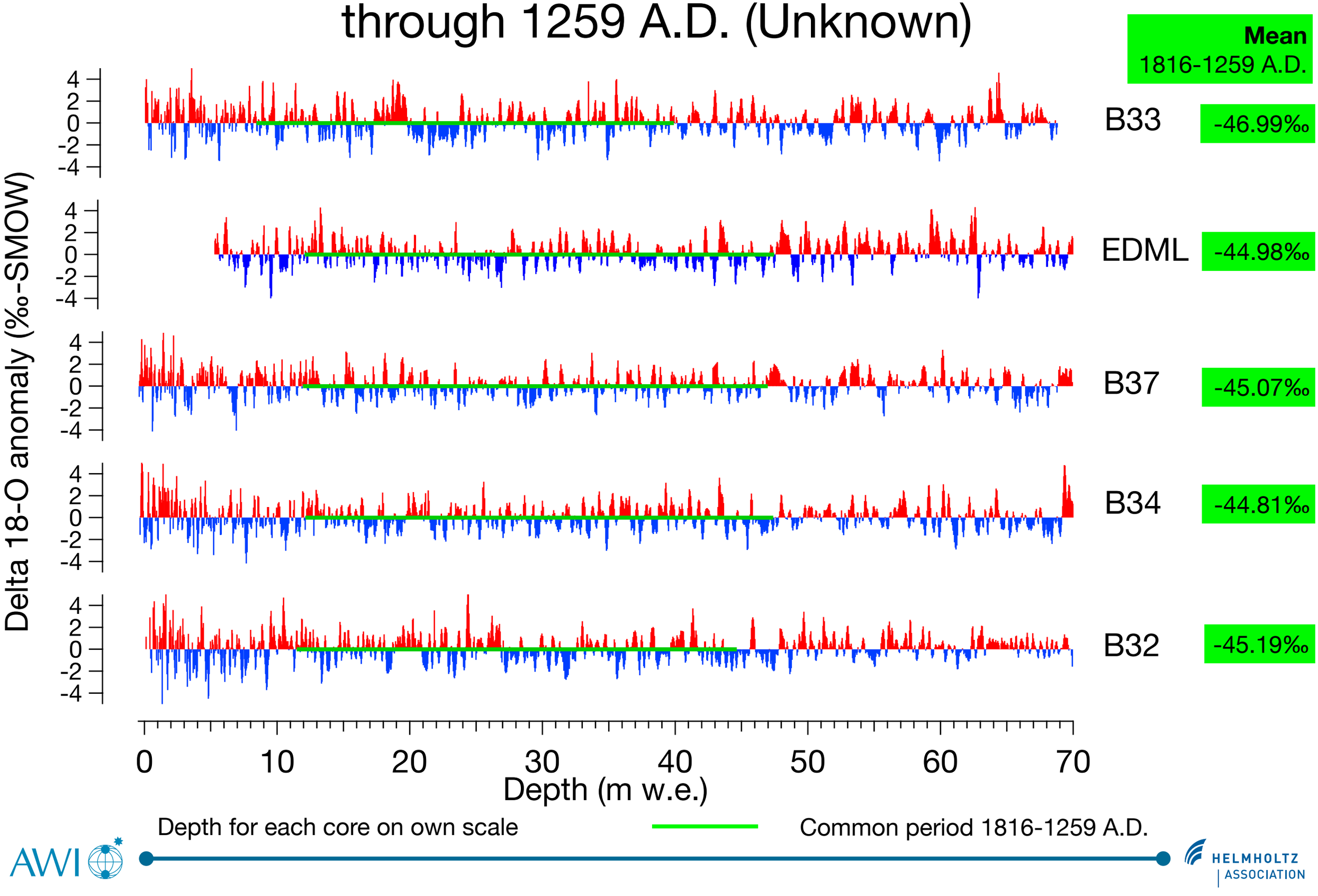
grey: original
red: adjusted to EDML



0: snow surface Jan. 2000

B32, B33: Oerter et al.: Annals Glac. (1999); www.pangaea.de

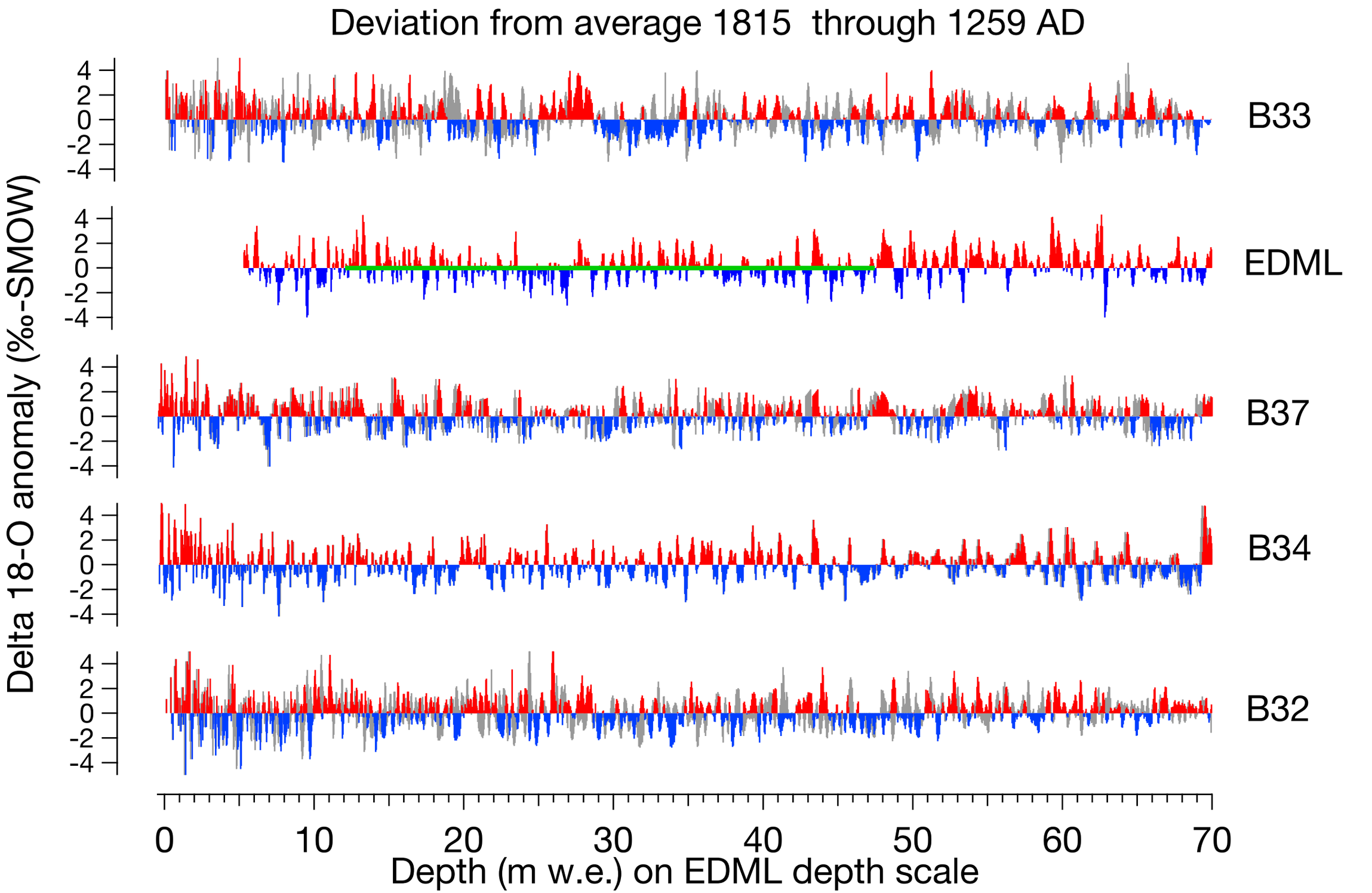
Deviation $\delta^{18}O$ from average 1816 A.D. (Tambora) through 1259 A.D. (Unknown)



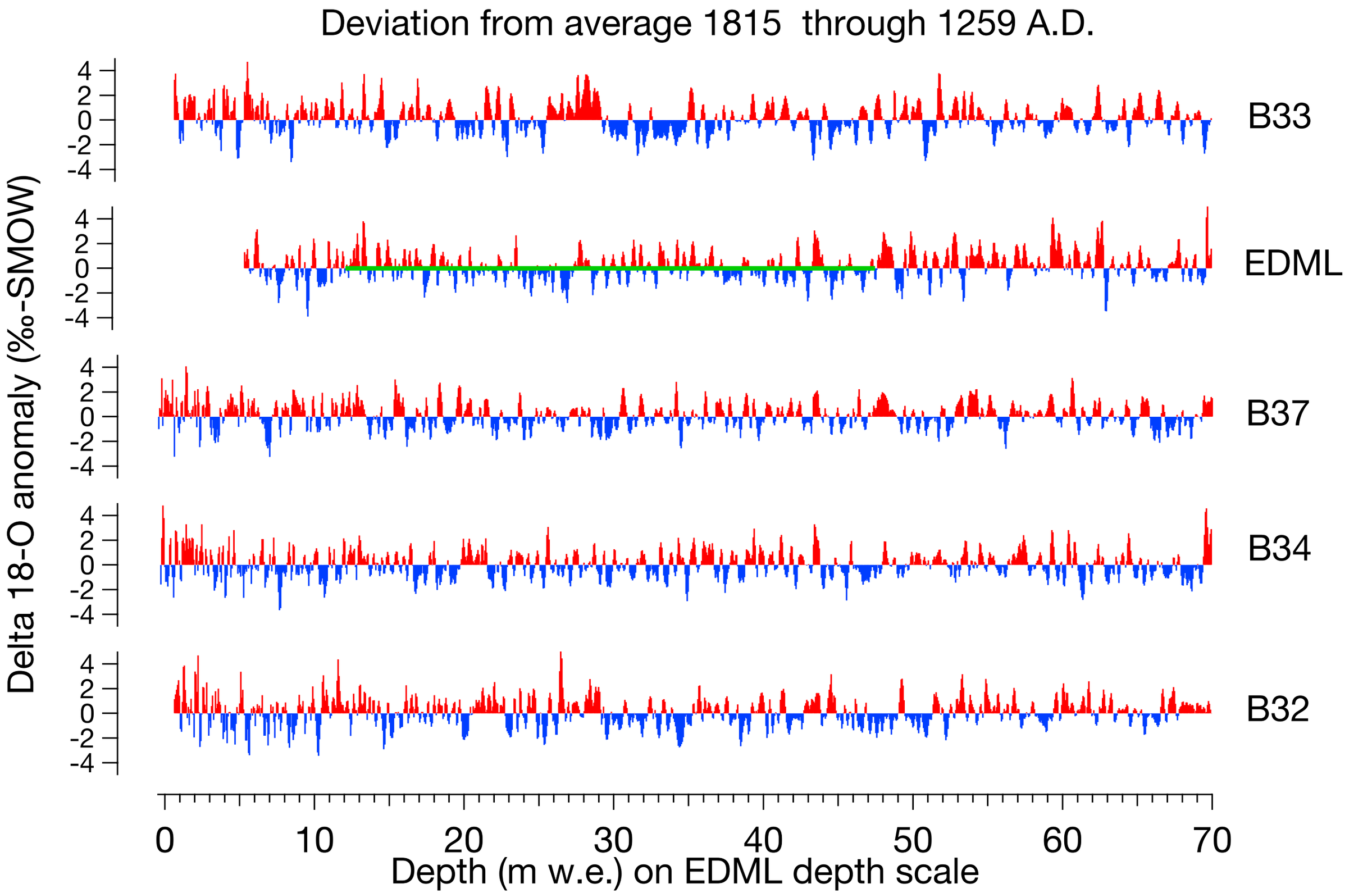
AWI

HELMHOLTZ ASSOCIATION

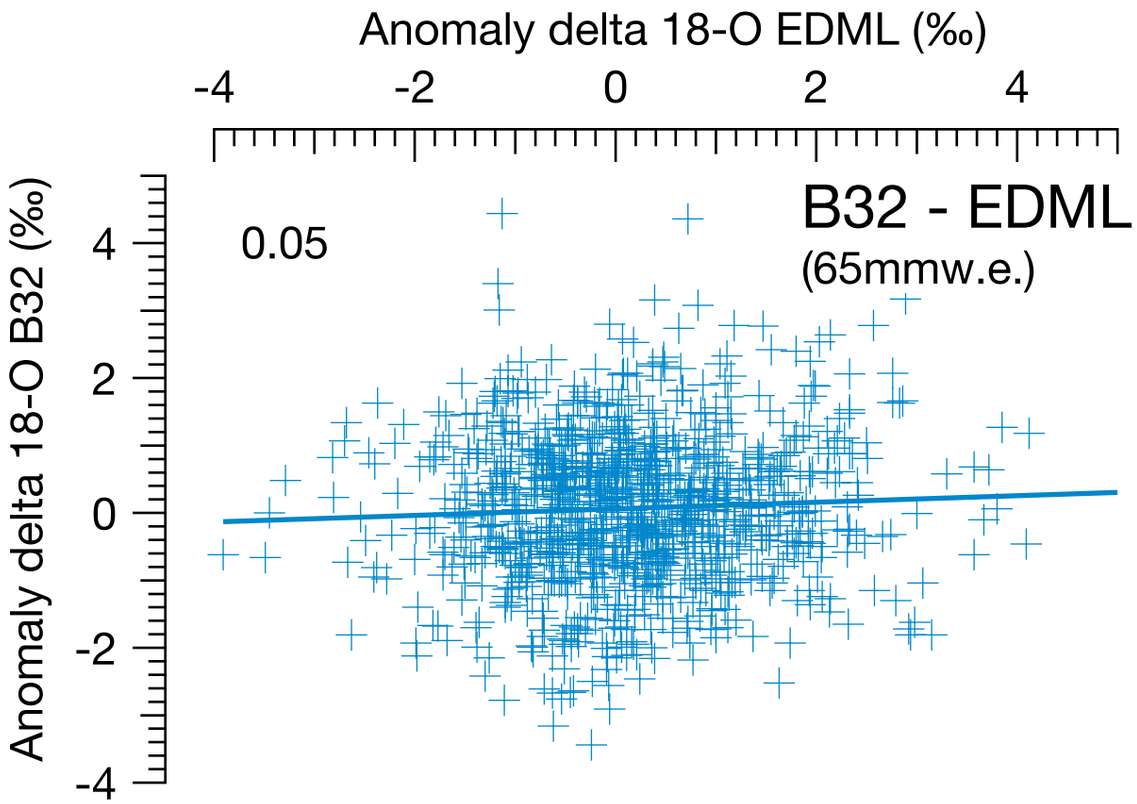
Adjusting the depth of the cores to the EDML depth scale

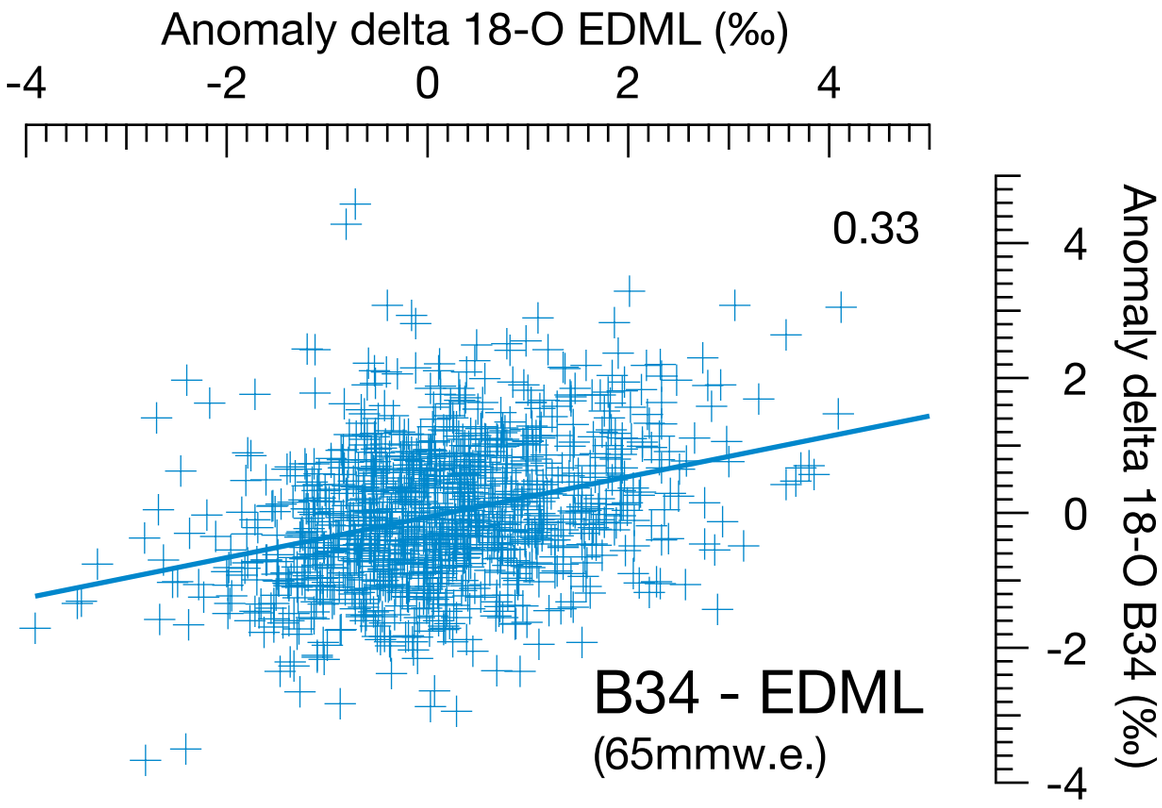


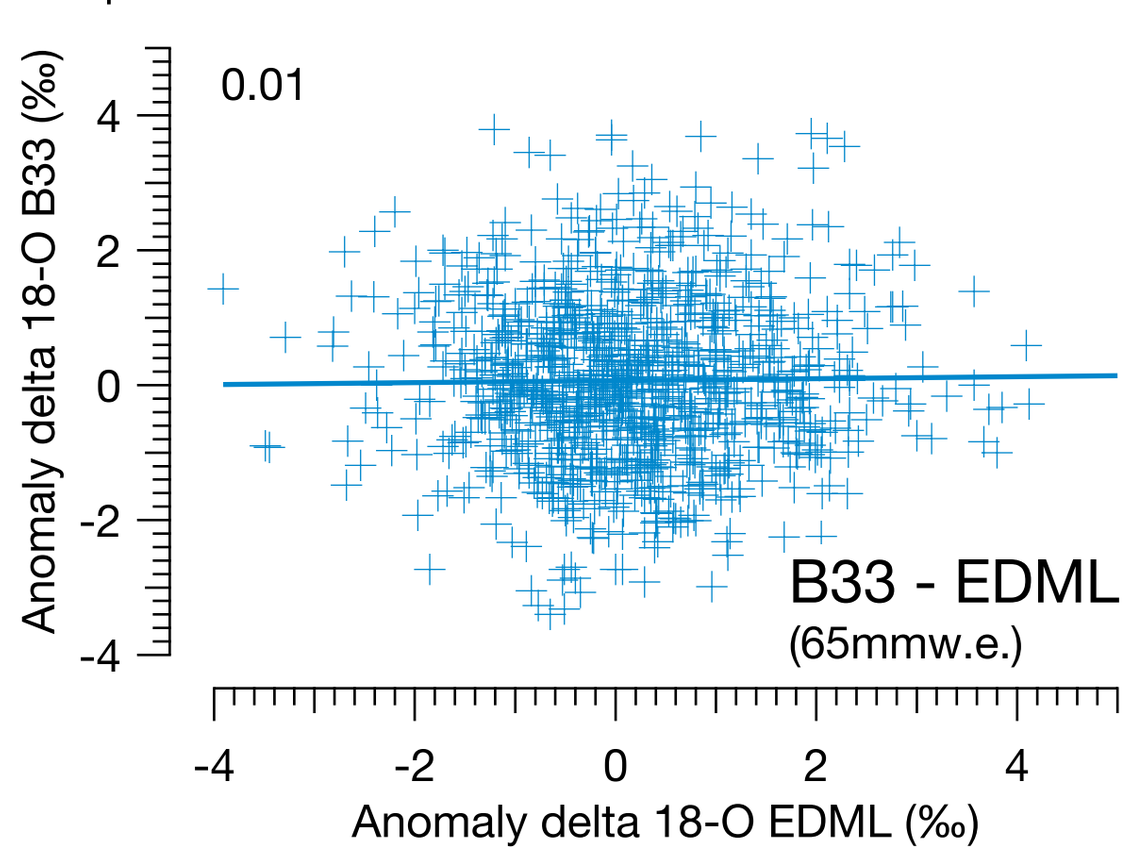
Common depth (m w.e.) & sample interval (65mm w.e.)

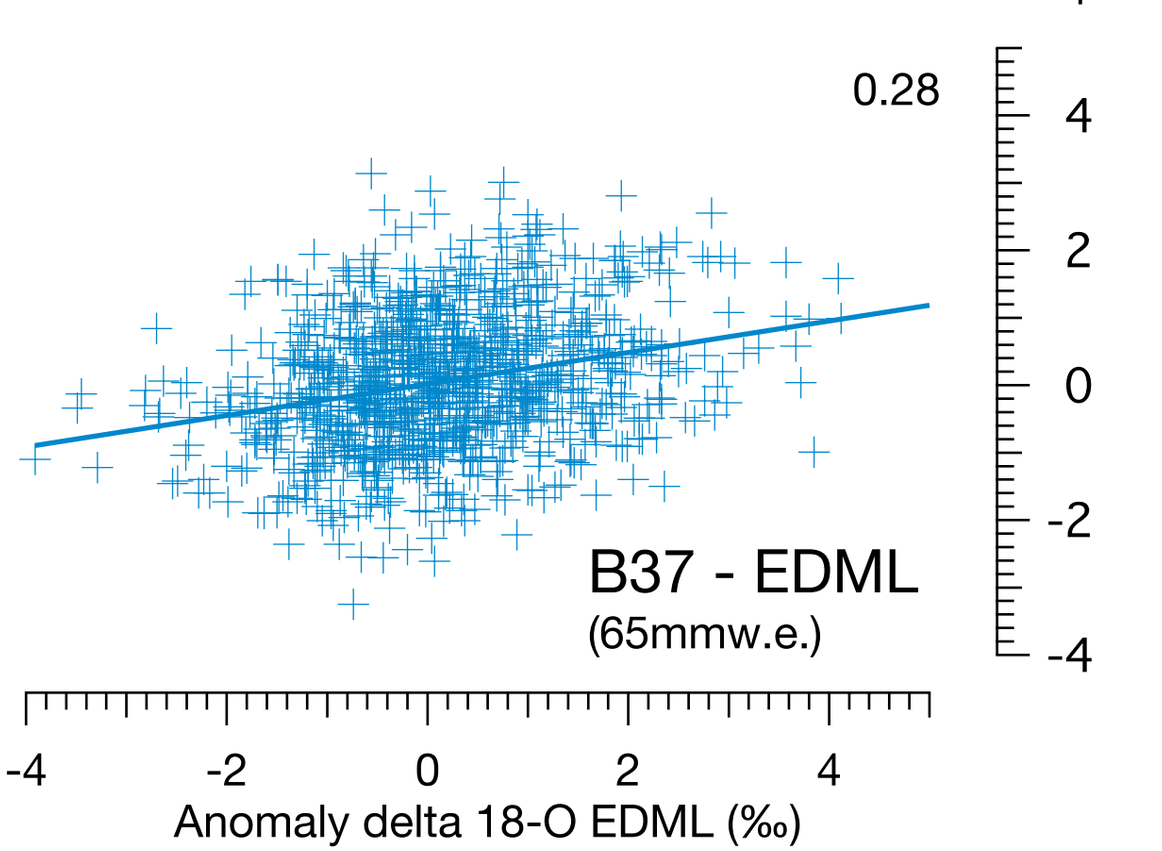


Correlation B32, B33, B34 , B37 with EDML

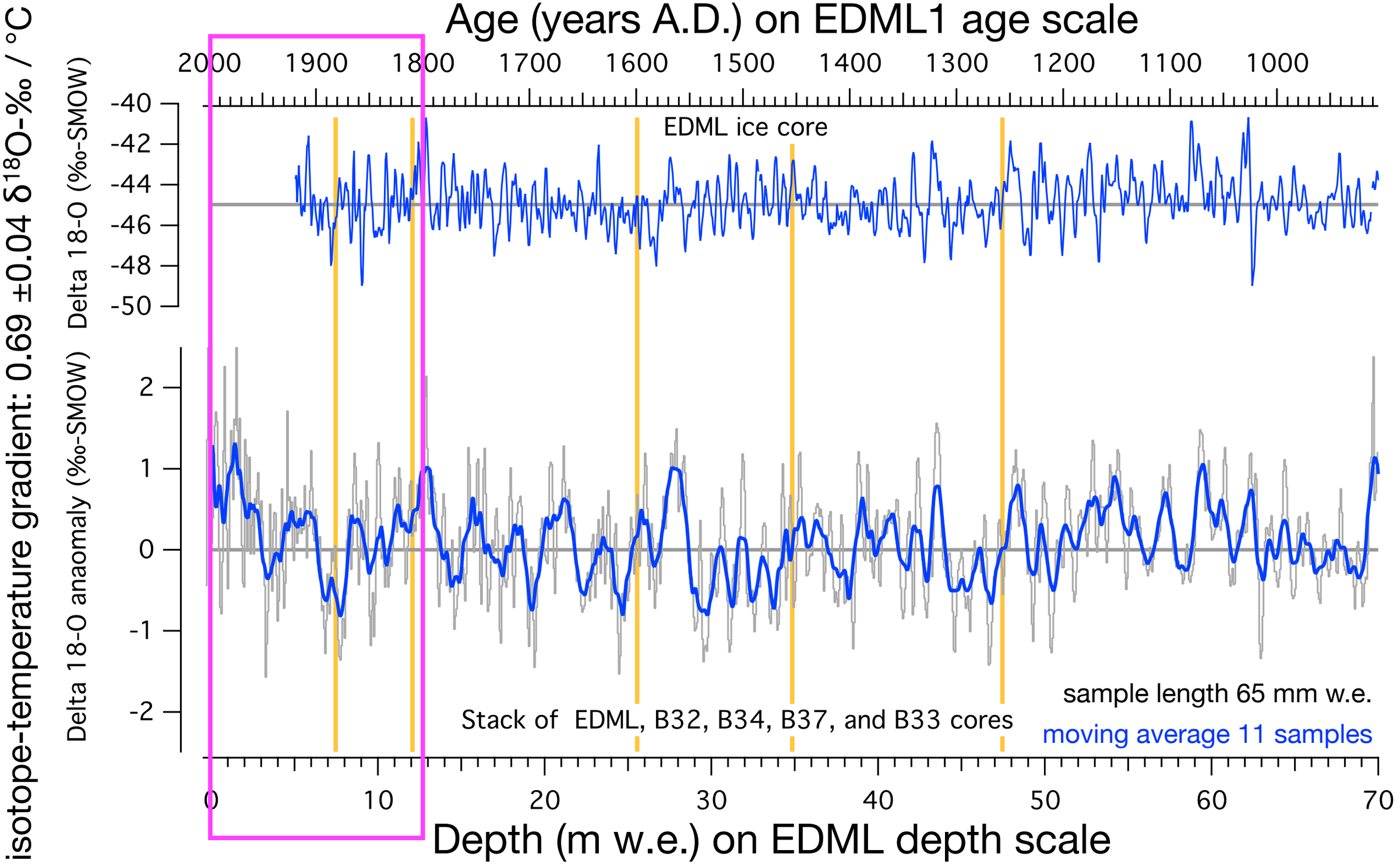




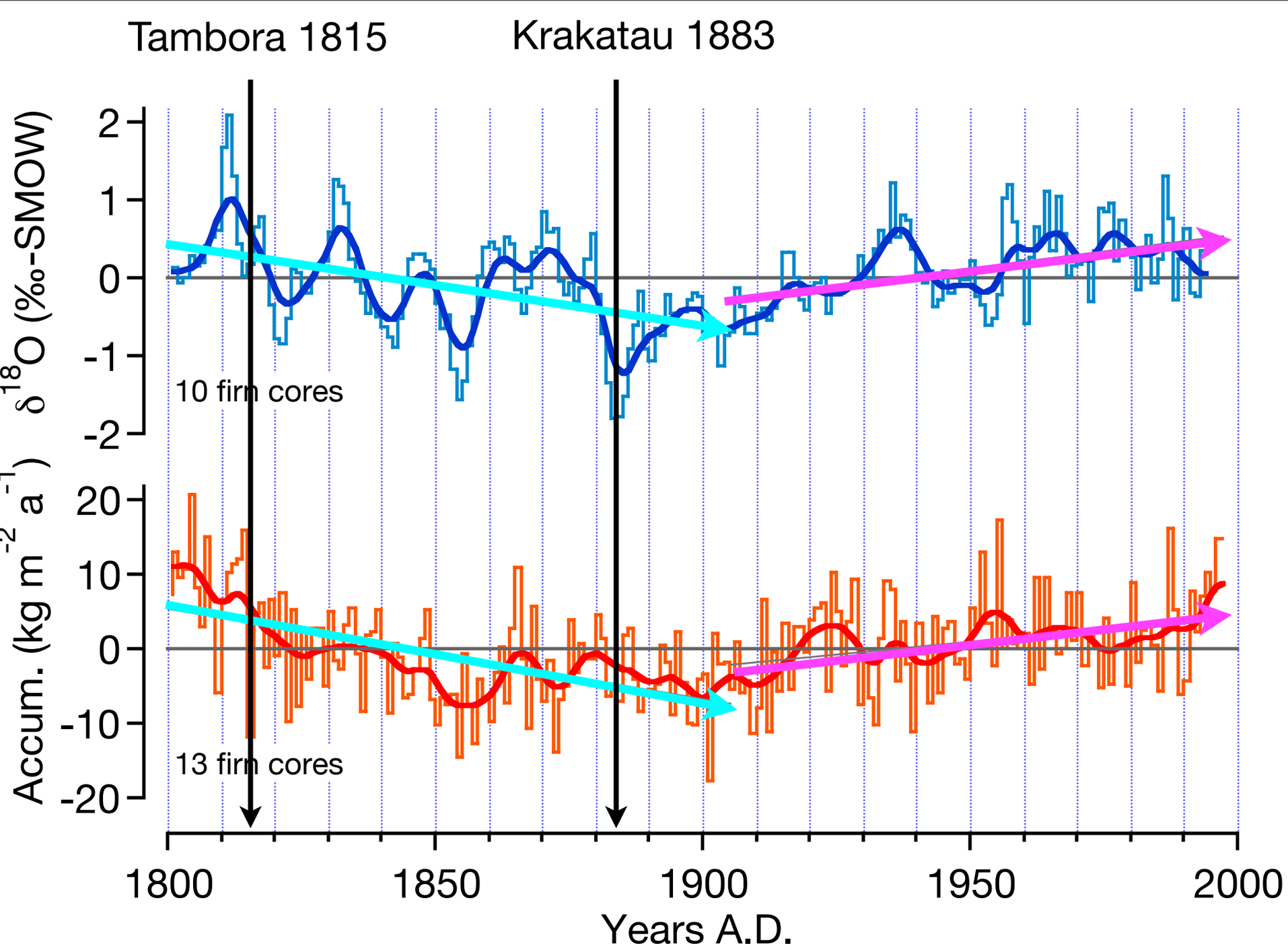




The stacked record of 5 cores



Stack of annual means



Deviation from average 1801-1997

1801-1905:

$\delta^{18}O$: -0.010 ‰/a

Acc.: -0.120 kg $m^{-2}a^{-1}$/a

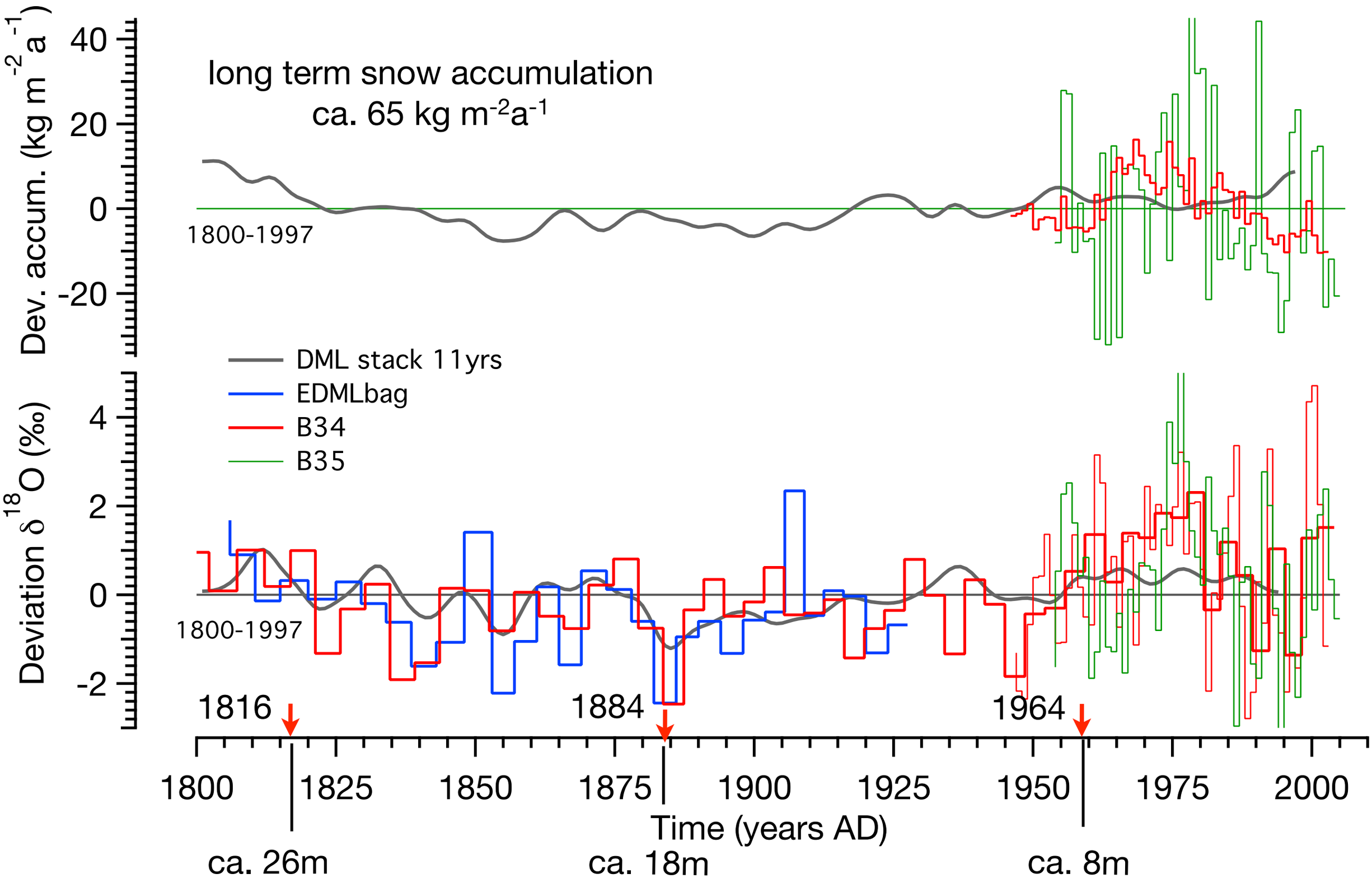
1905-1997:

$\delta^{18}O$: +0.009 ‰/a

Acc.: +0.068 kg $m^{-2}a^{-1}$/a

Oerter et al.: Accumulation rates in Dronning Maud Land, Antarctica, as revealed by dielectric-profiling measurements of shallow firn cores. *Annals of Glaciology* **30**, 27-34 (2000)

DML stack + EDML core + B34 core + B35 core



Thank you for your attention !

Acknowledgement:

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foto: hans oerter, 2006