Surface ocean warming and hydrographic change in the North Atlantic during the Middle Eocene Climatic Optimum

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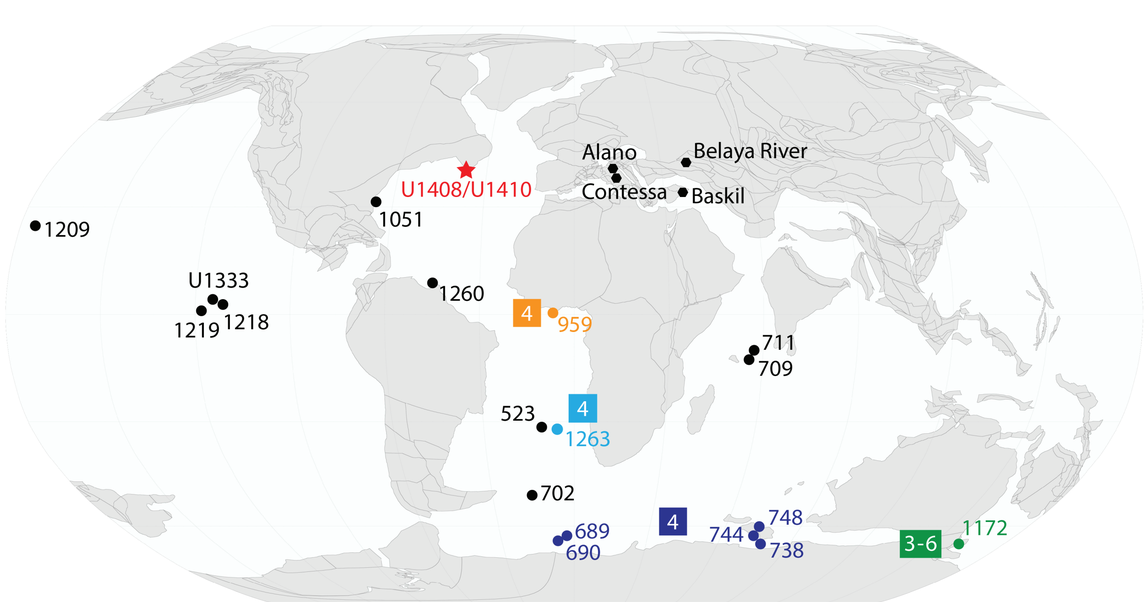
How global was MECO warming?

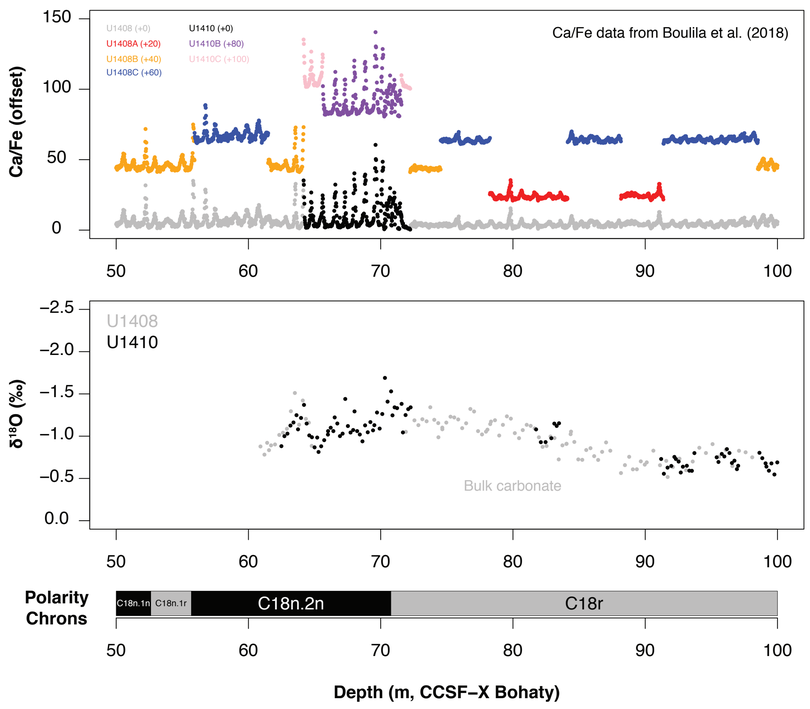
IODP Sites U1408 and U1410 (Newfoundland Drifts):
- highest resolution MECO interval recovered so far
- multiproxy temperature reconstructions possible due to well-preserved foraminifera and abundant organic matter



Overview of sites with existing MECO records, with degree of MECO warming inferred shown in boxes (°C of warming).

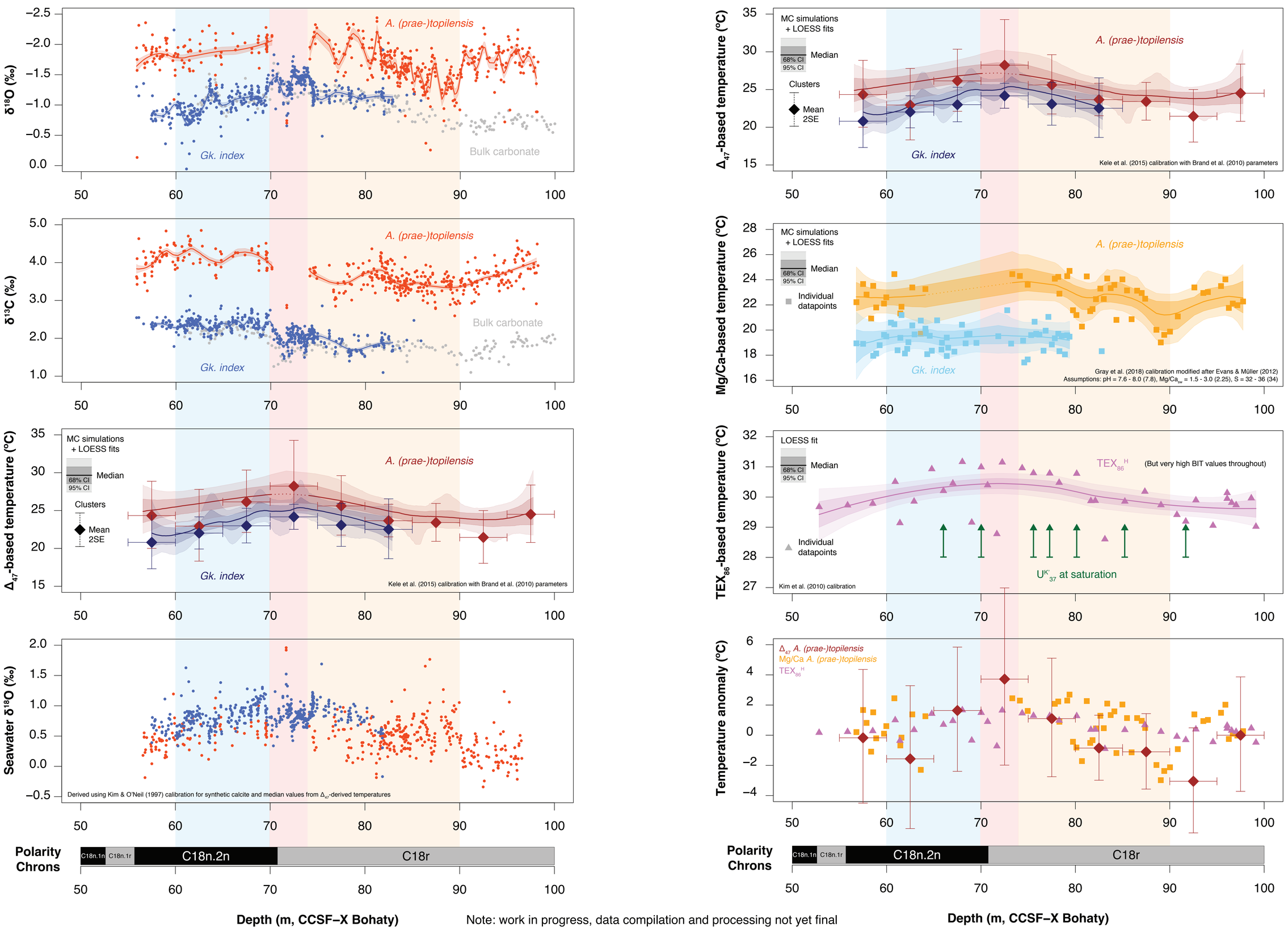
A new U1408/U1410 MECO composite record

- Revised stratigraphic correlations for MECO interval based on XRF data
- MECO peak warmth interval likely missing at U1408 but present at U1410



High-resolution clumped isotope paleothermometry and multiproxy temperature reconstructions

- Surface mixed-layer warming of 4 ˚C during MECO inferred from Δ_{47} measurements on two species of planktonic foraminifera
- Combined foraminiferal Δ_{47} and $\delta^{18}O$ data yield seawater $\delta^{18}O$ increase of ~0.5 ‰, may indicate transient salinization of North Atlantic
- Multiproxy comparison between Δ_{47}, Mg/Ca and TEX_{86} results in roughly similar estimates of warming (2 - 4 ˚C), but absolute values differ greatly and depend on calibration used



Note: work in progress, data compilation and processing not yet final