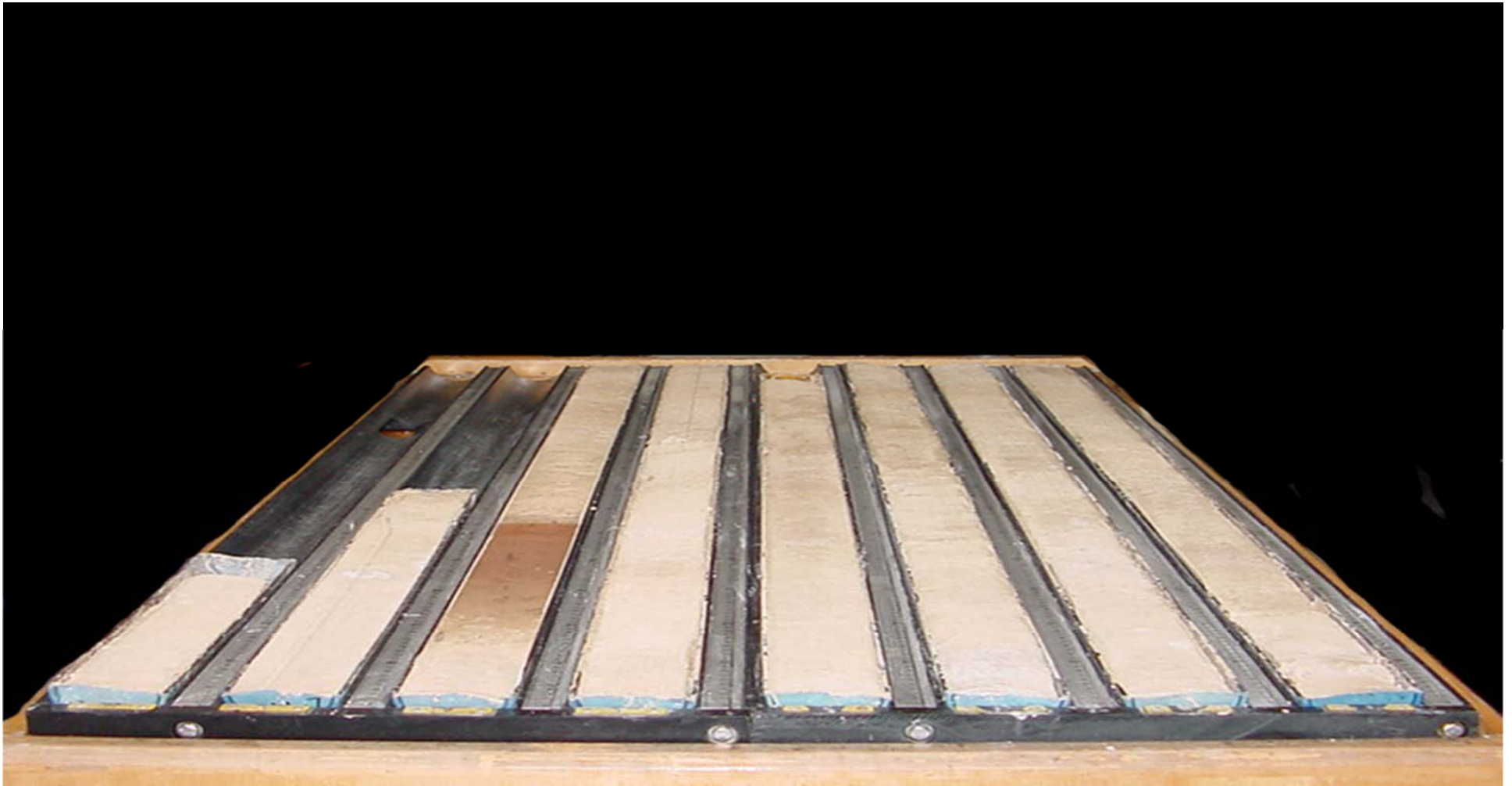
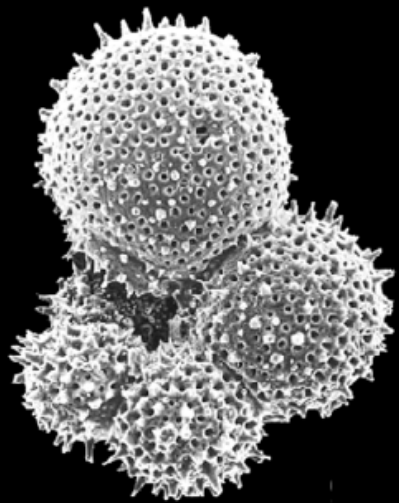


Biotic response of calcareous plankton in the tropics during the Paleocene – Eocene Thermal Maximum

Tracy Aze, Paul N. Pearson, Alexander J. Dickson, Marcus P. S. Badger, Paul R. Bown, Richard D. Pancost, Samantha J. Gibbs, Brian T. Huber, Melanie J. Leng, Angela L. Coe, Anthony S. Cohen, and Gavin Foster.



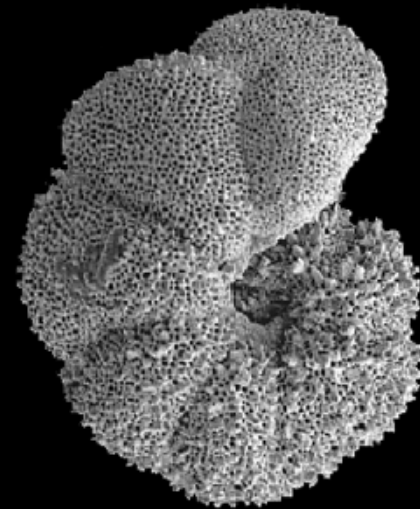
P-E boundary Clay - Evidence of Ocean Acidification
Taken from cruise photos (ODP Leg 208)



Transient excursion taxa

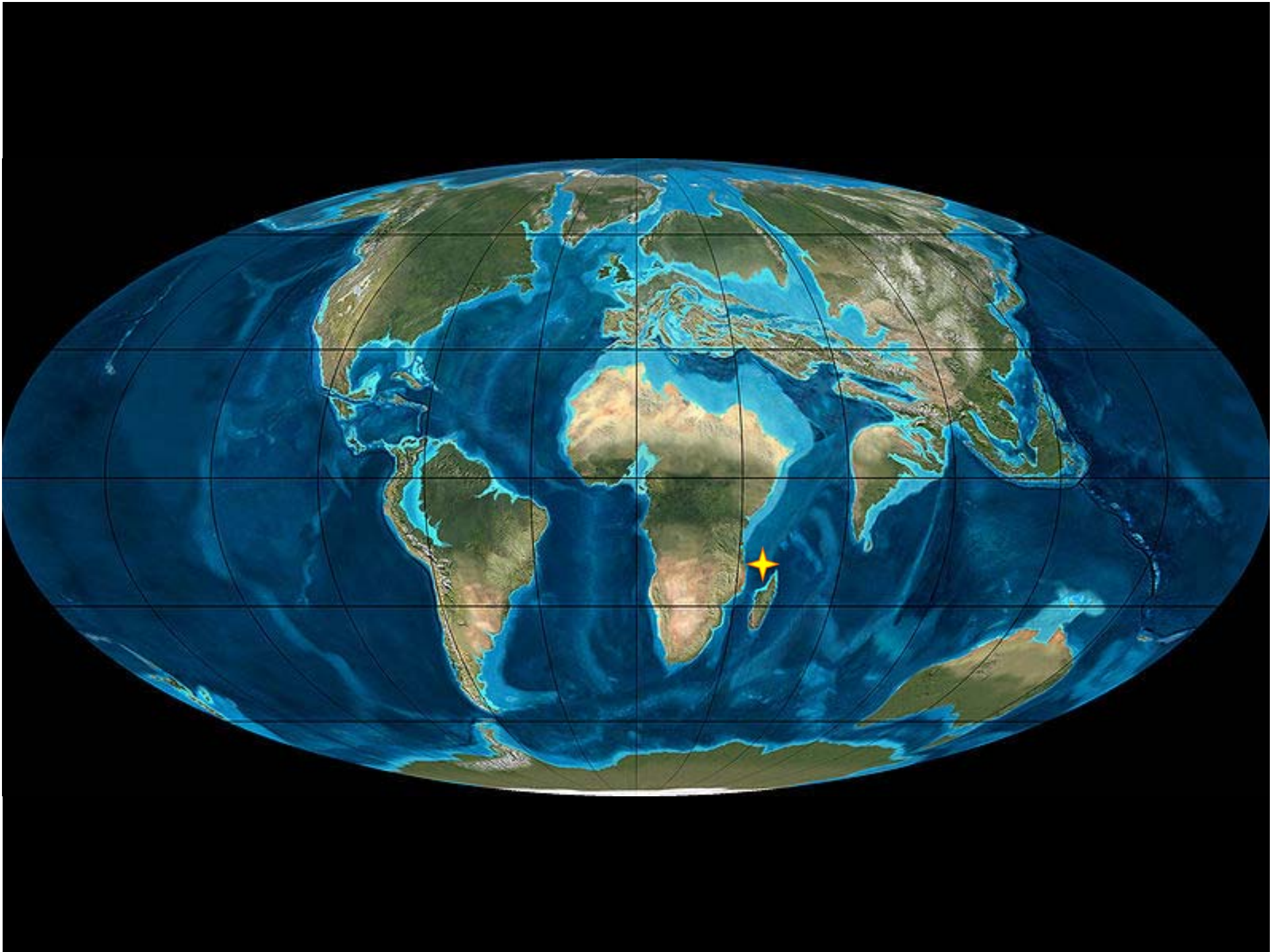


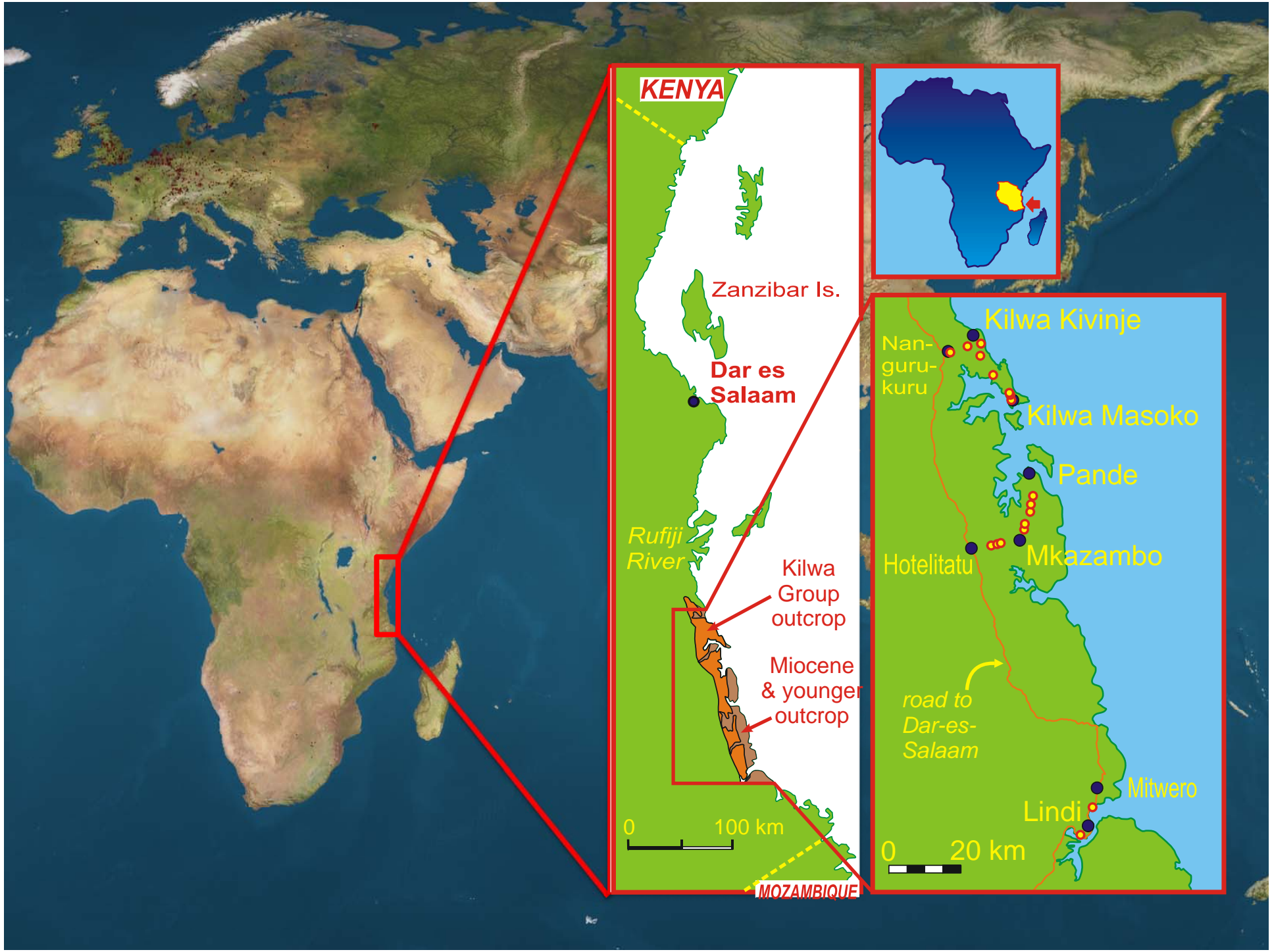
Depth migration



Latitudinal migration

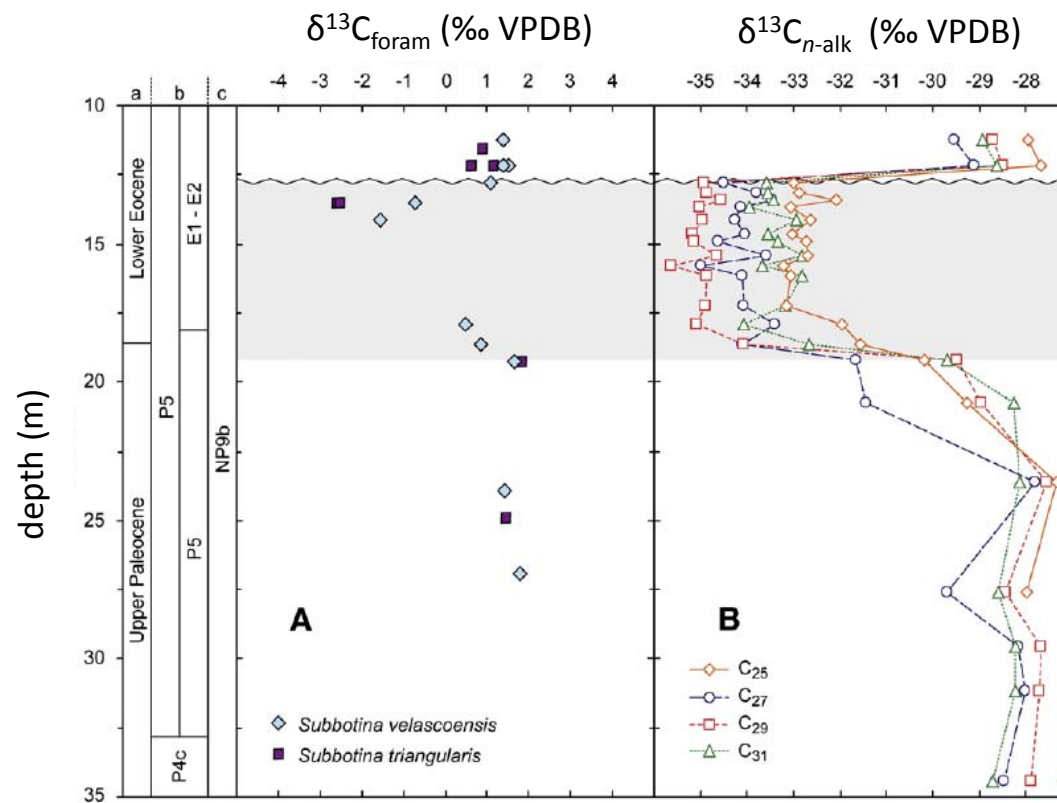
Teratology







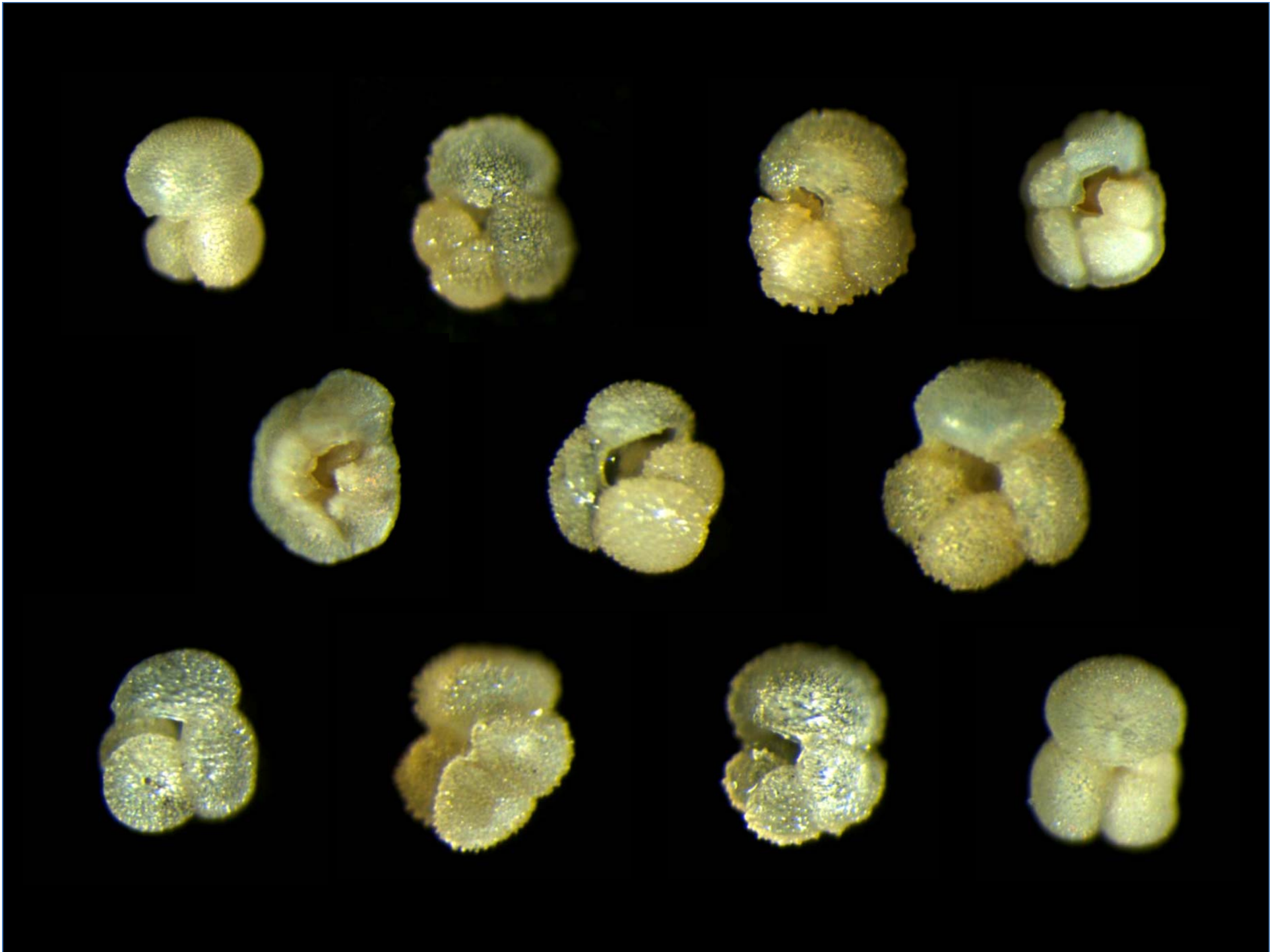
Tanzania Drilling Project Site 14 A

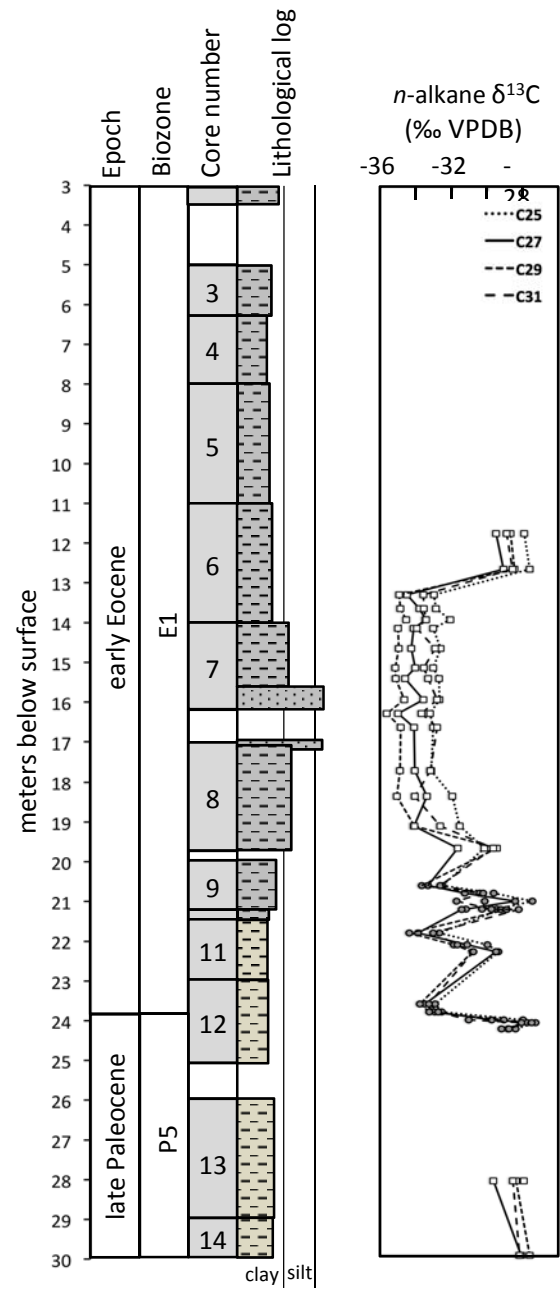


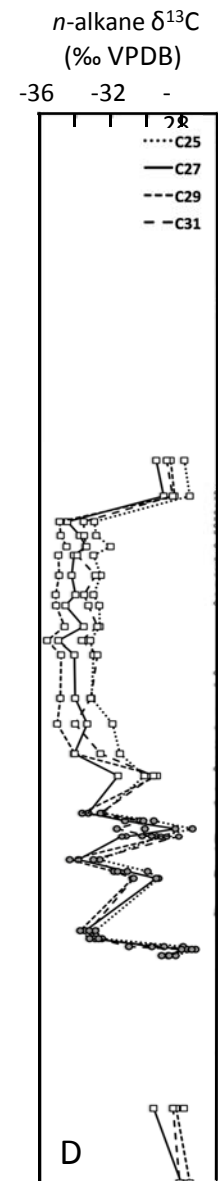
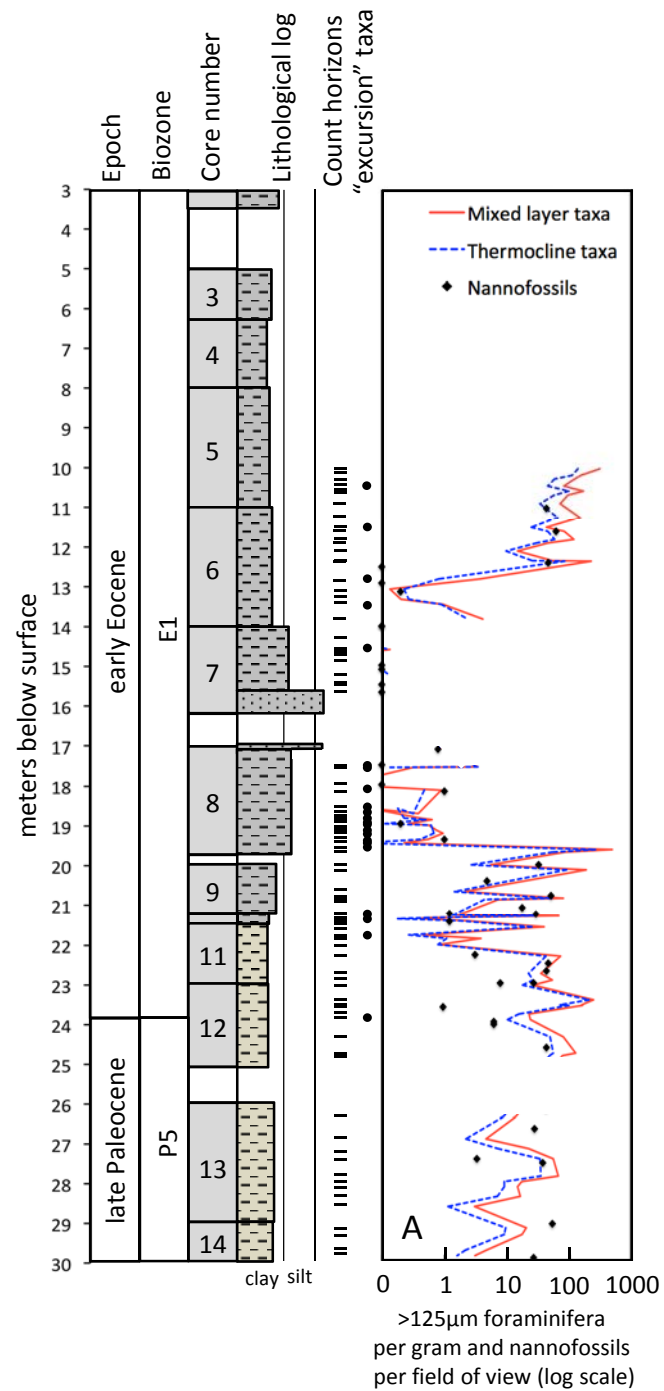
Assemblage data

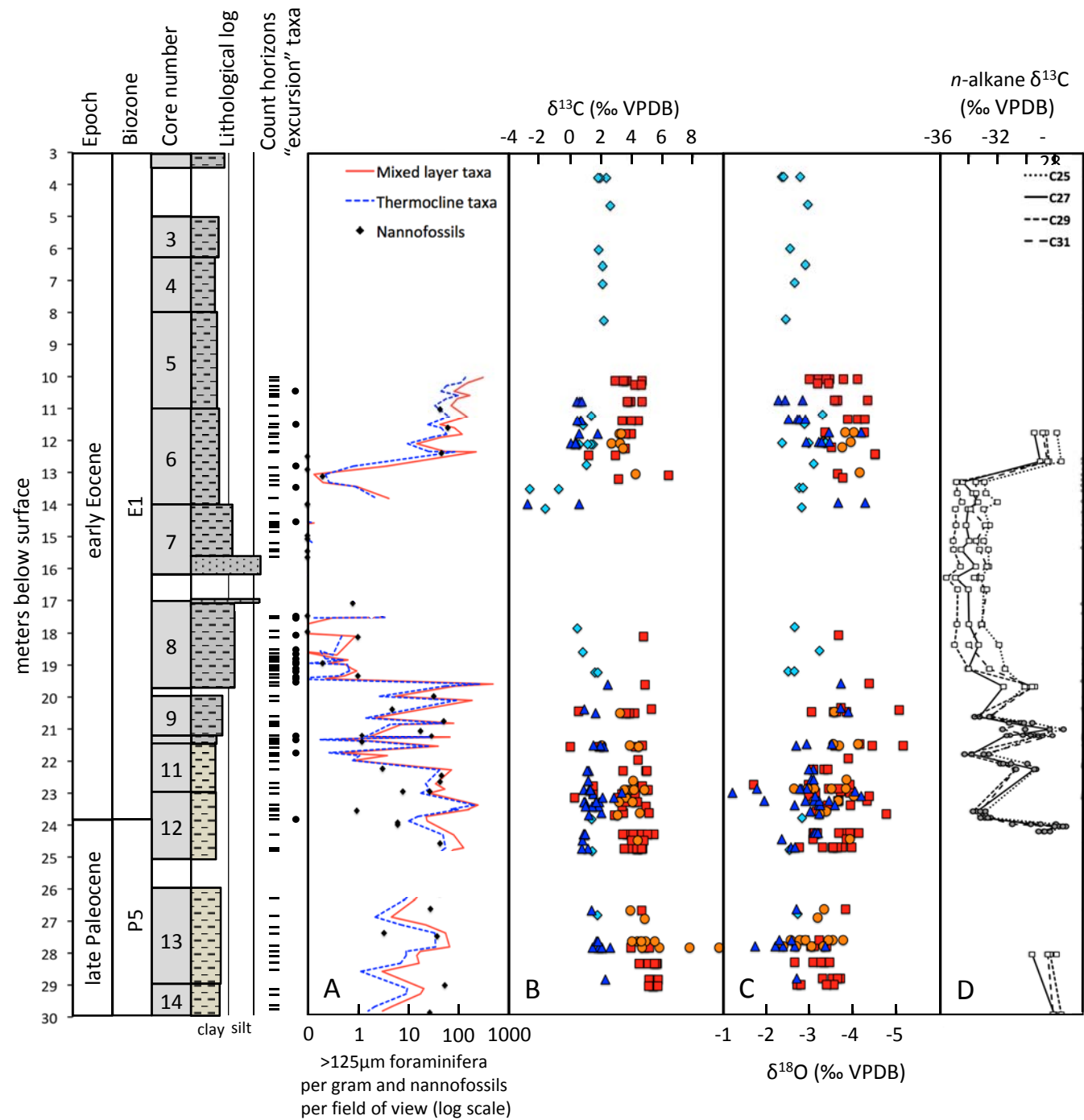
Bulk sediment geochemistry

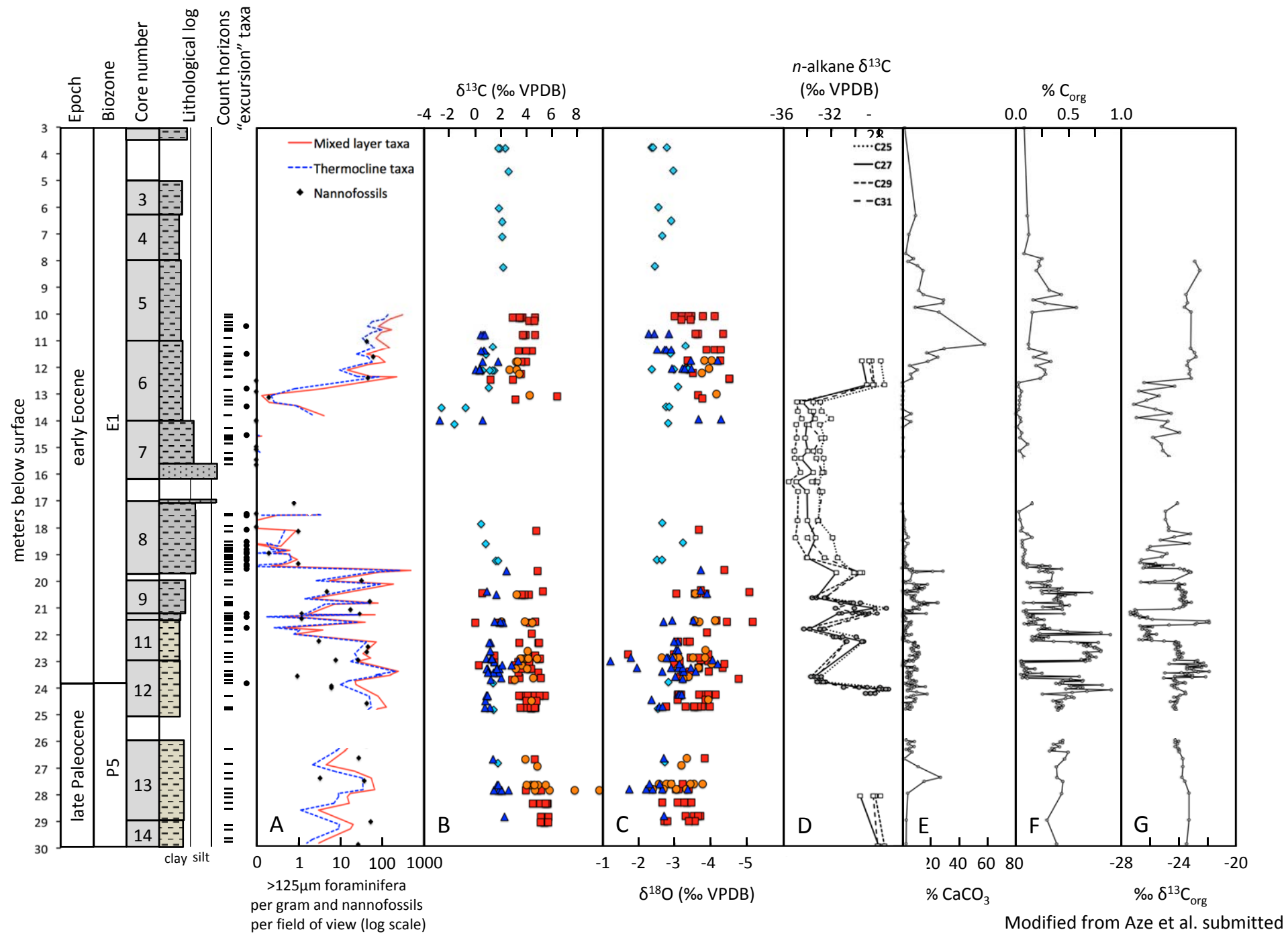
Stable isotope data

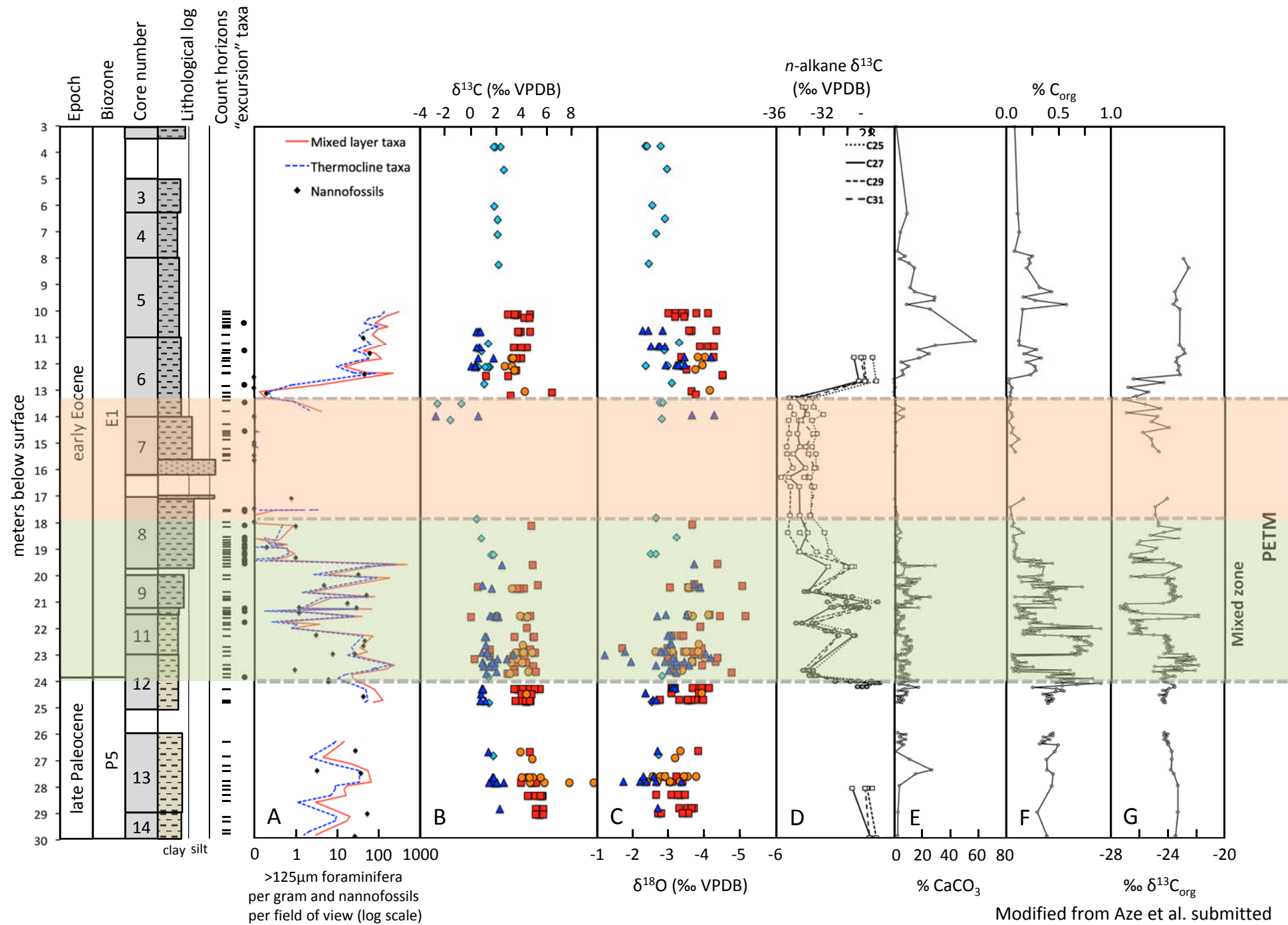






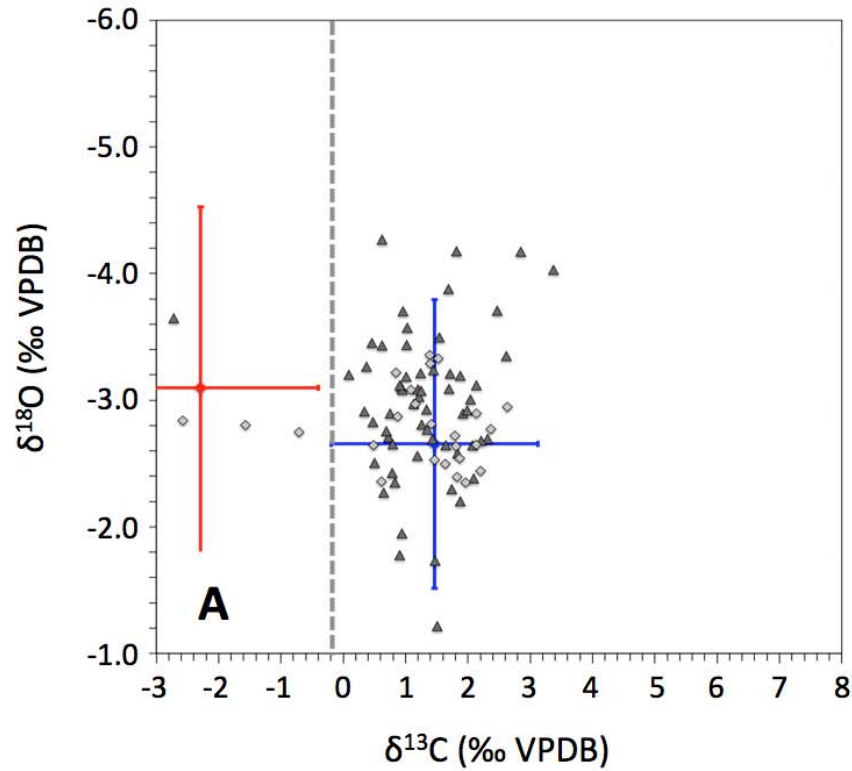




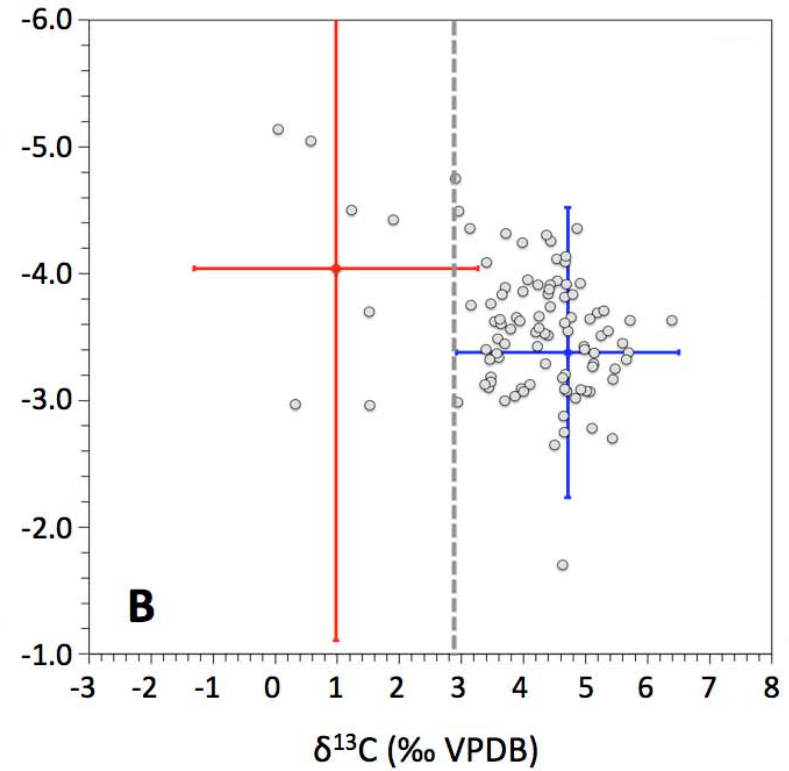


CIE in Tanzania

Thermocline taxa



Mixed layer taxa

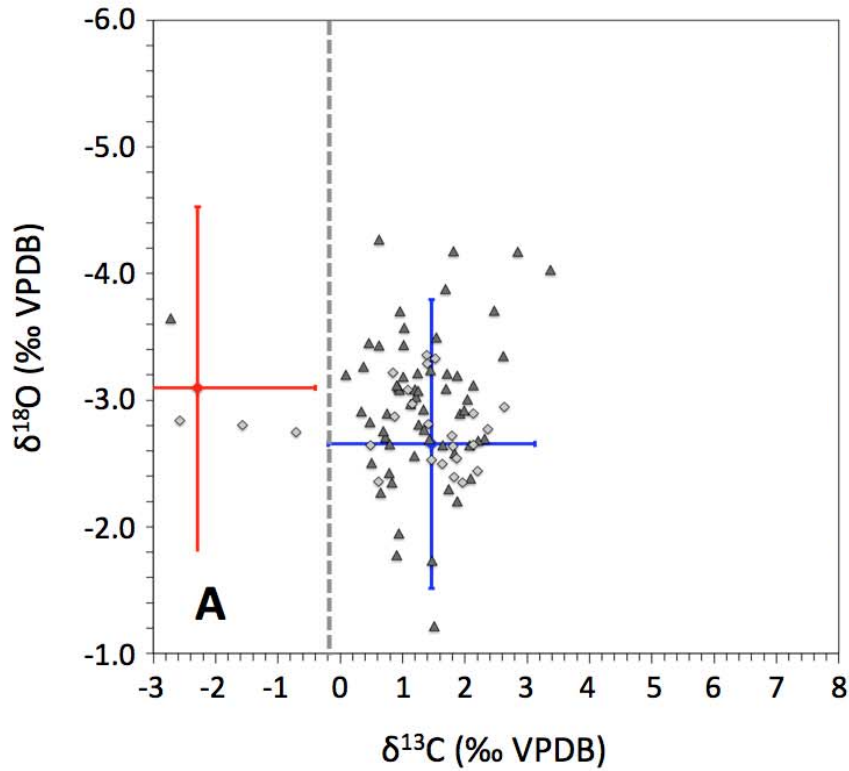


warmer ↑

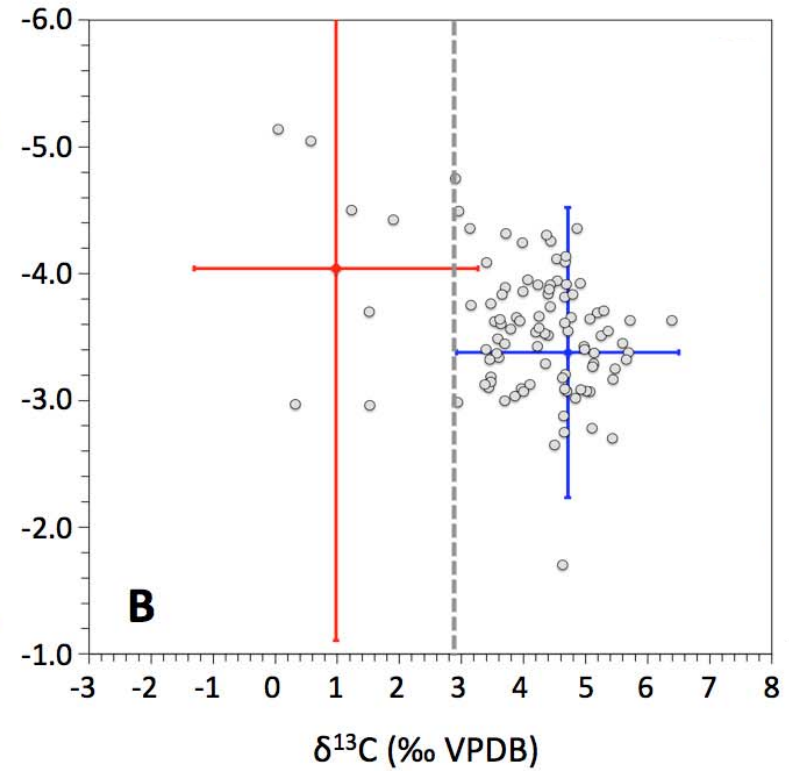
PETM mean values
CIE $\sim -3.7\text{‰}$
Background mean values

SSTs in Tanzania

Thermocline taxa



Mixed layer taxa



warmer
↑

Record breaking $\delta^{18}\text{O}$

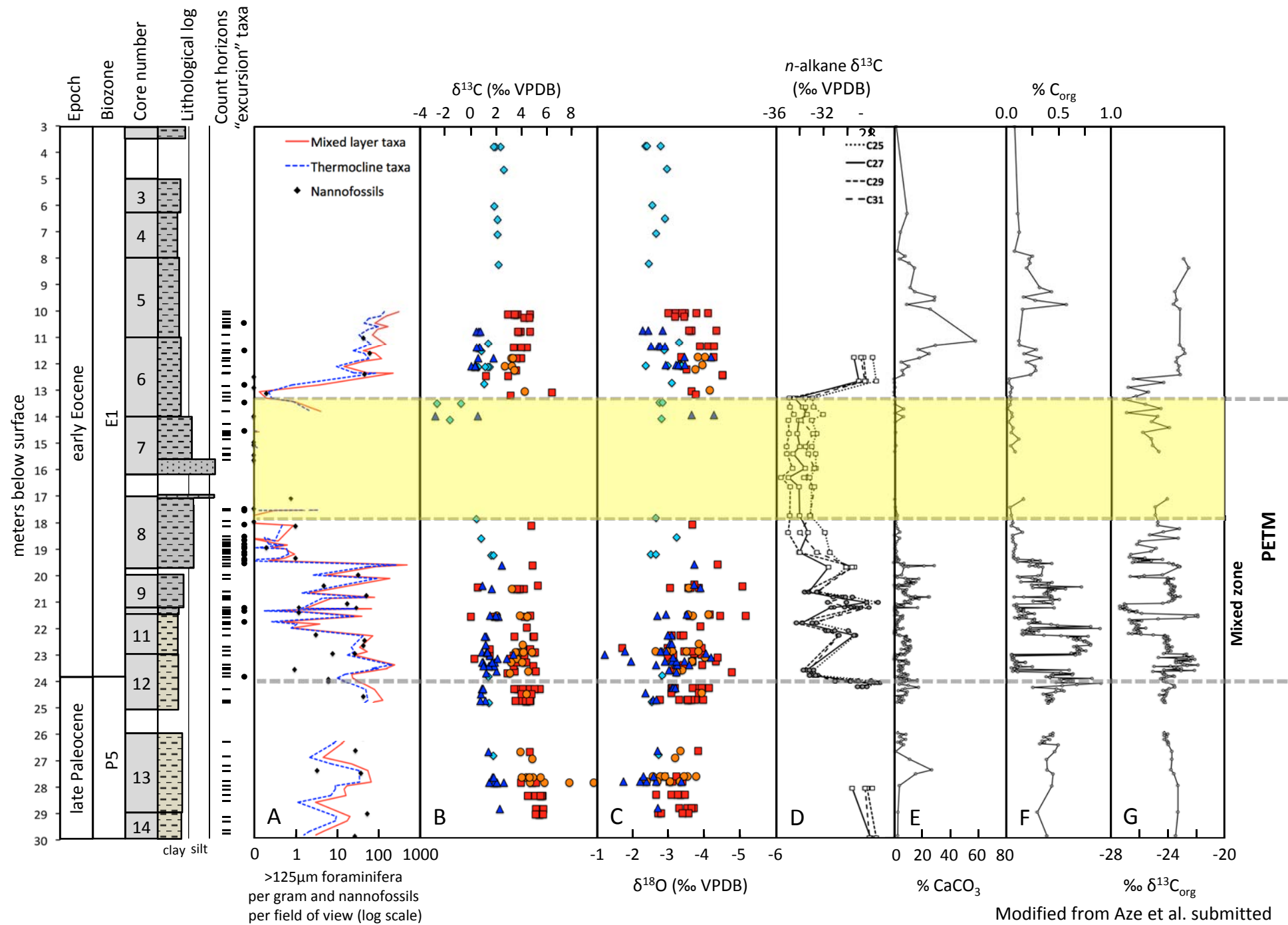
Sea surface temperatures

$\delta^{18}\text{O}$ temperature correction factors	Bemis et al. (1998)			Erez & Luz (1983)			Kim & O'Neil (1997)		
	Pre-PETM	PETM	Lowest $\delta^{18}\text{O}$	Pre-PETM	PETM	Lowest $\delta^{18}\text{O}$	Pre-PETM	PETM	Lowest $\delta^{18}\text{O}$
	$\delta^{18}\text{O}$ -3.38	$\delta^{18}\text{O}$ -4.04	$\delta^{18}\text{O}$ -5.14	$\delta^{18}\text{O}$ -3.38	$\delta^{18}\text{O}$ -4.04	$\delta^{18}\text{O}$ -5.14	$\delta^{18}\text{O}$ -3.38	$\delta^{18}\text{O}$ -4.04	$\delta^{18}\text{O}$ -5.14
No latitude or pH correction	25.0	28.2	33.5	26.9	30.0	35.2	26.3	29.6	35.4
Latitude correction, no pH correction	29.0	32.2	37.5	30.8	33.9	39.1	30.5	34.0	39.9
Latitude correction, pH correction pH -0.25	N/A	33.9	39.2	N/A	35.6	40.9	N/A	35.9	41.9
Latitude correction, pH correction pH -0.45	N/A	35.2	40.5	N/A	36.9	42.2	N/A	37.4	43.4

PETM SSTs up to 43°C

ΔT is $\sim +3^\circ\text{C}$

SST variability associated with the onset of the PETM or seasonality



Summary - PETM in Tanzania

Extreme temperatures and rapid environmental change

Major decline of calcareous plankton in the peak of the event

No teratoids

