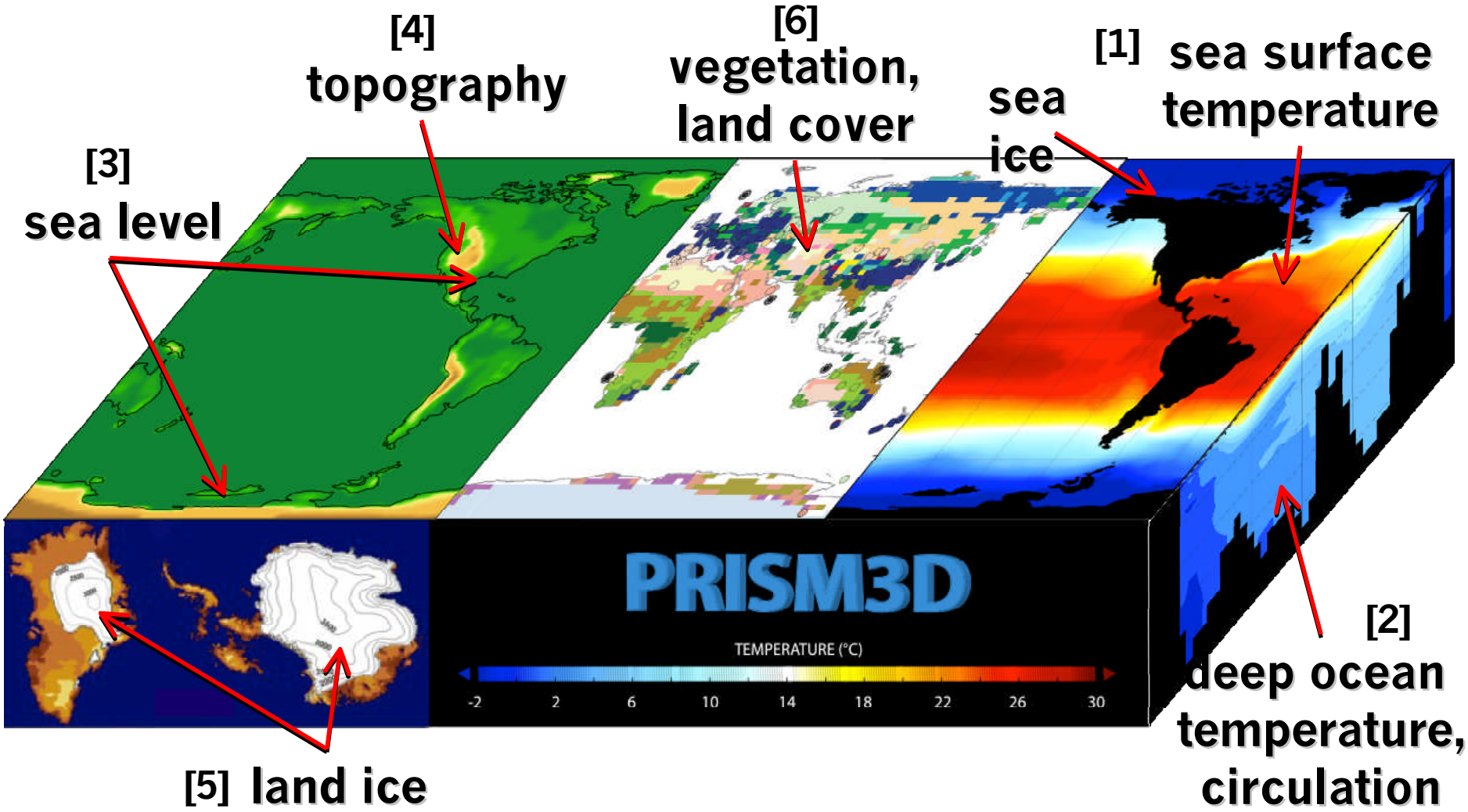
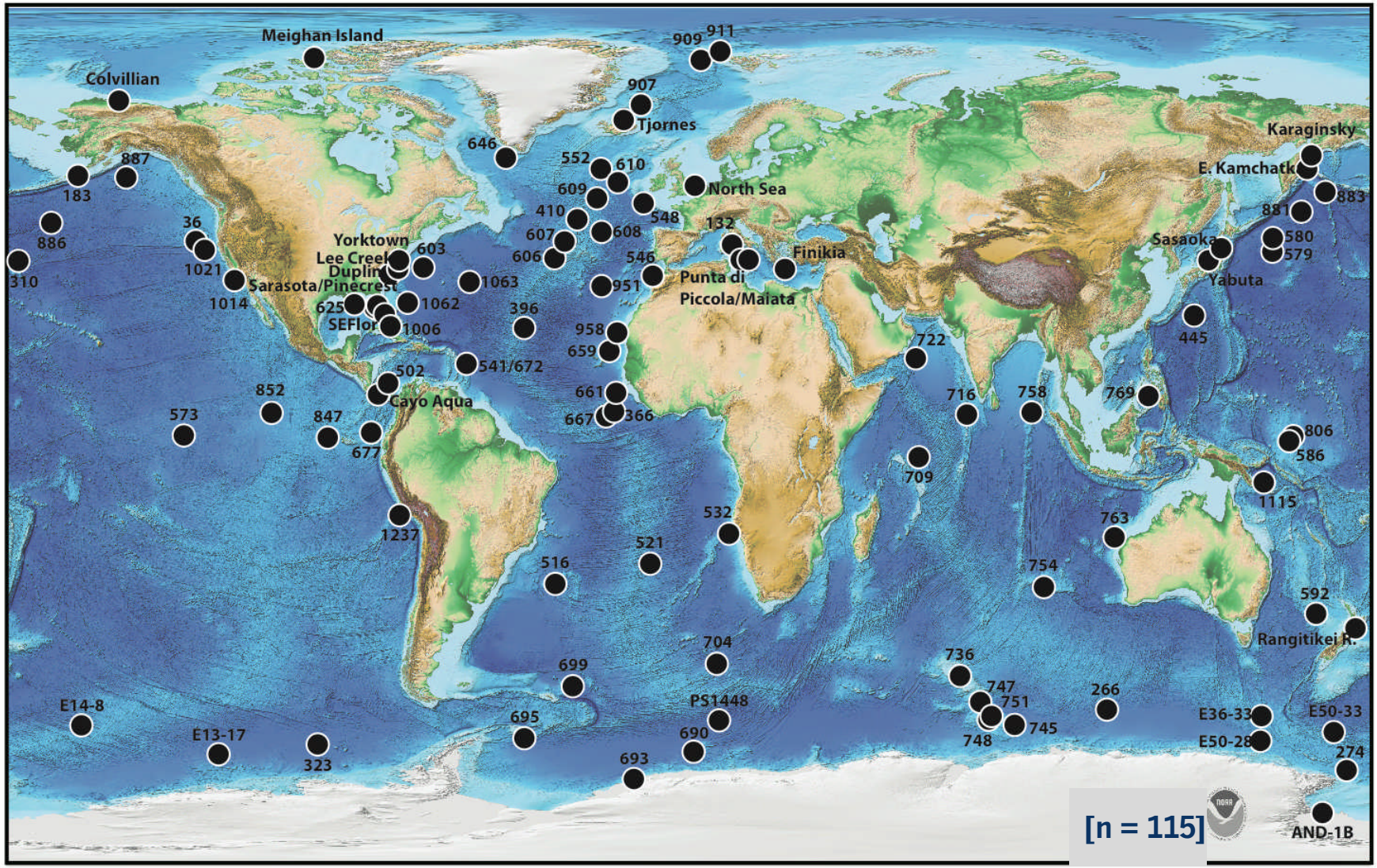
PRISM3D Global Datasets



PRISM is based on analysis of deep sea cores and outcrops of well dated Pliocene age material



Surface Ocean Temperature Reconstruction:

Quantitative faunal techniques

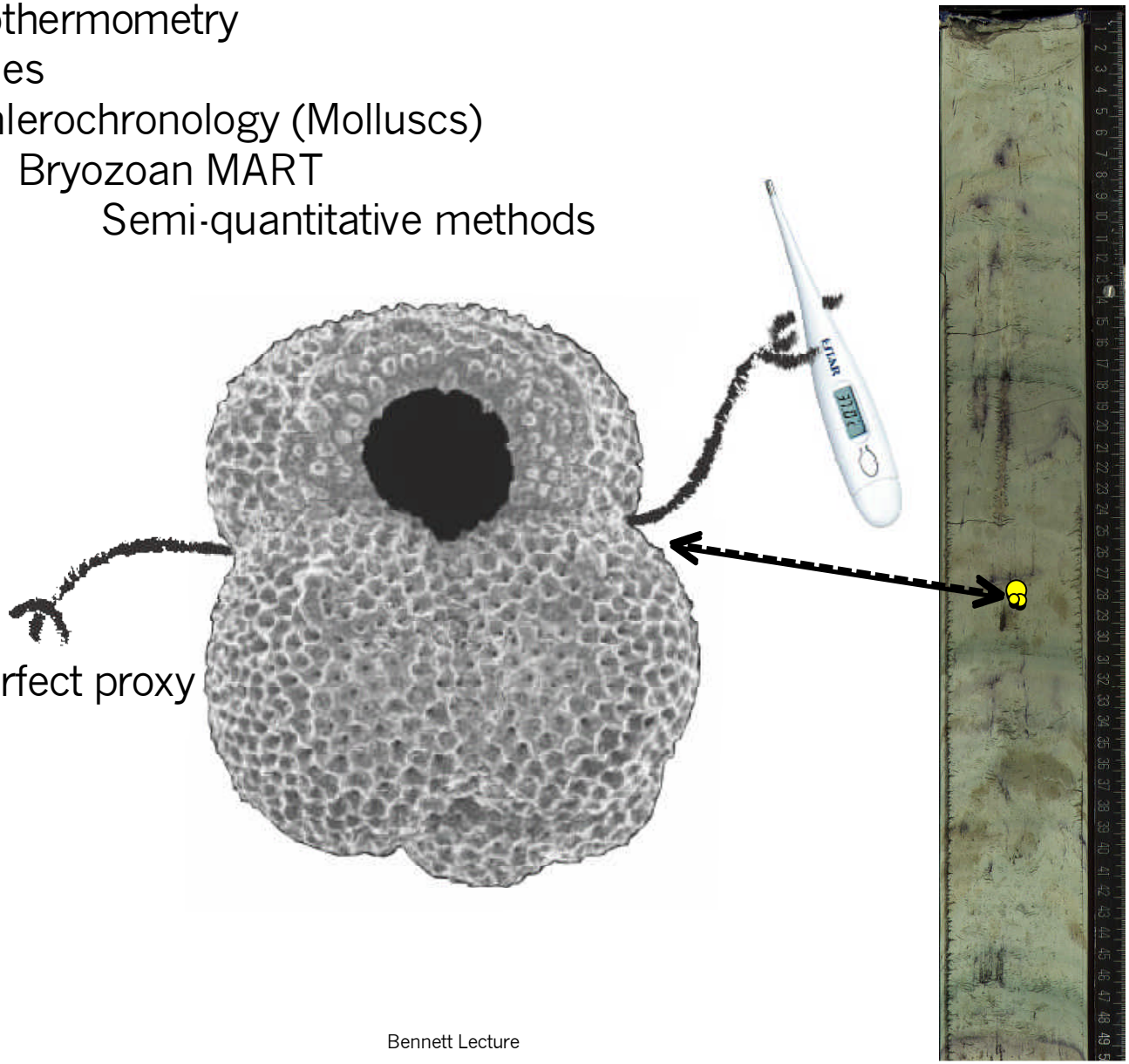
Mg/Ca paleothermometry

Alkenones

Schlerochronology (Molluscs)

Bryozoan MART

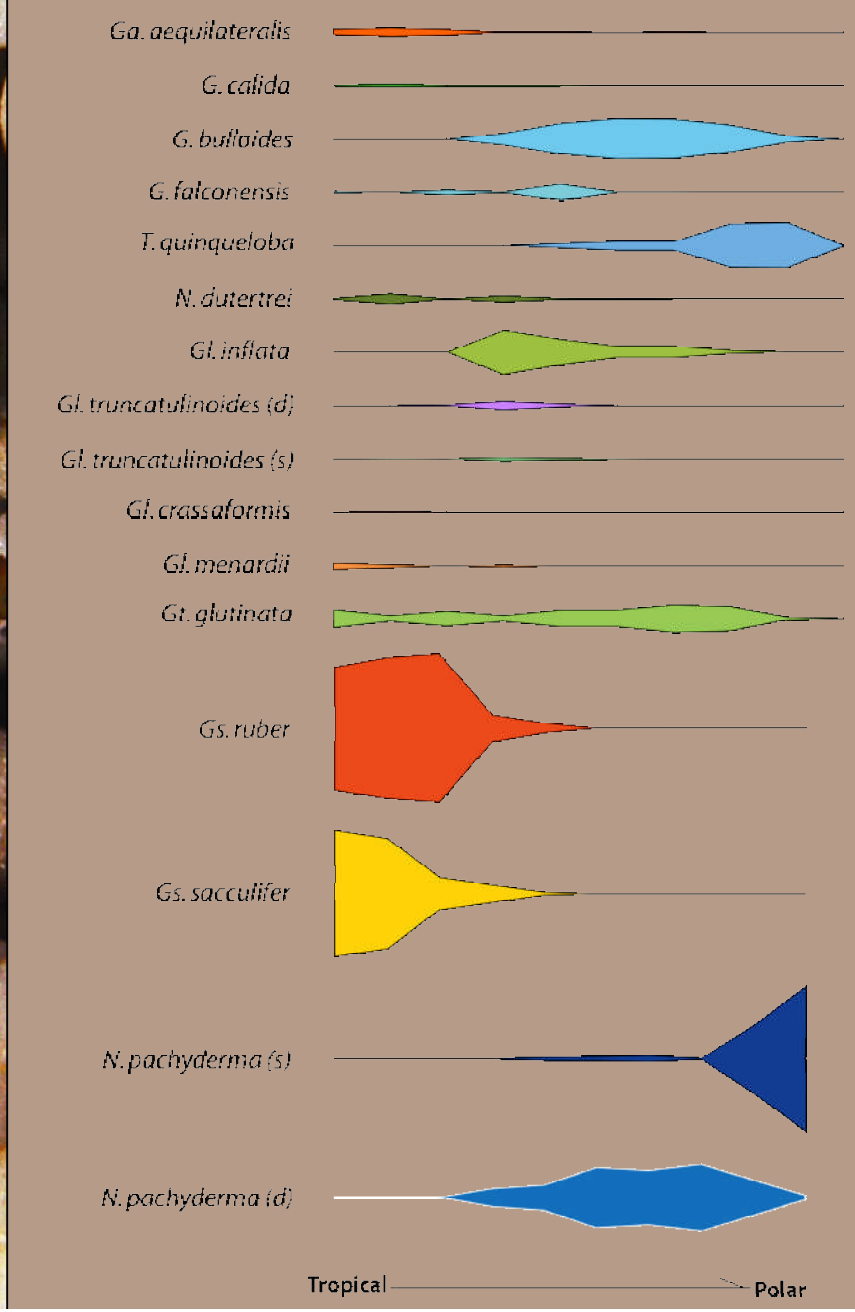
Semi-quantitative methods



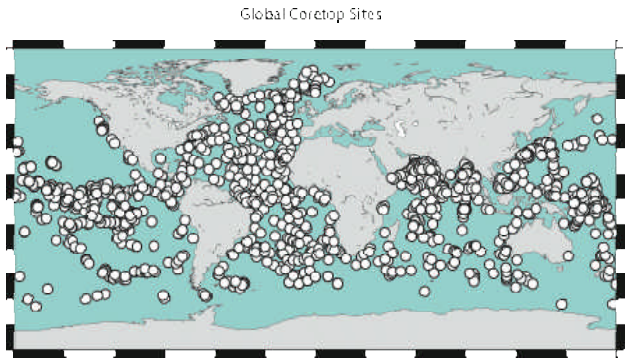
The perfect proxy

Northumbria/GMU

Relative Abundance of North Atlantic Planktonic Foraminifers

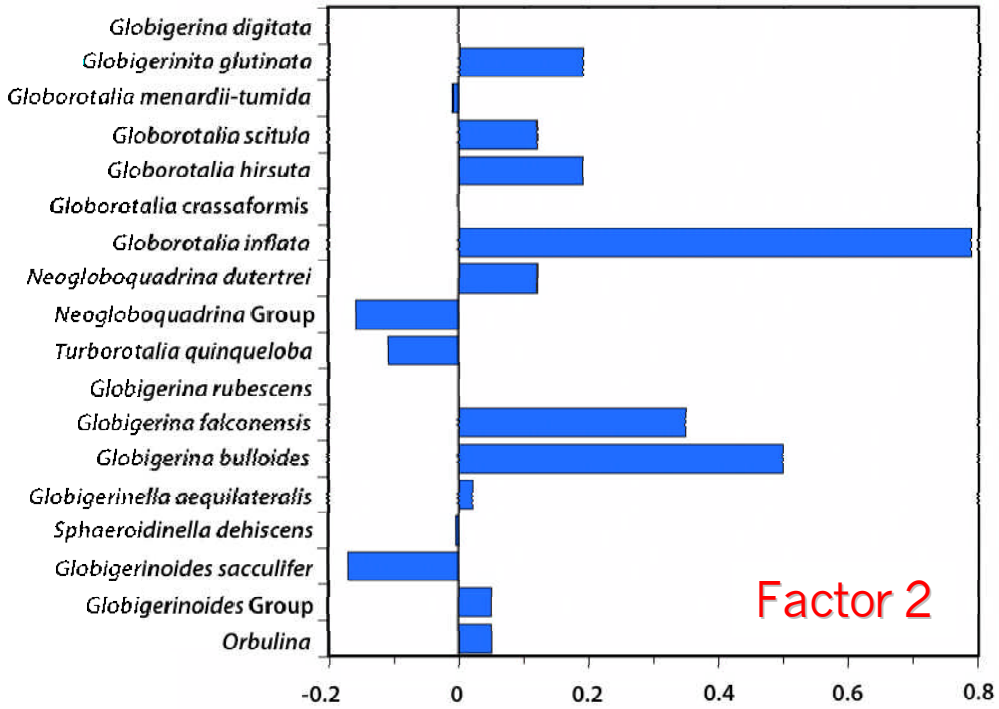


Transfer function example

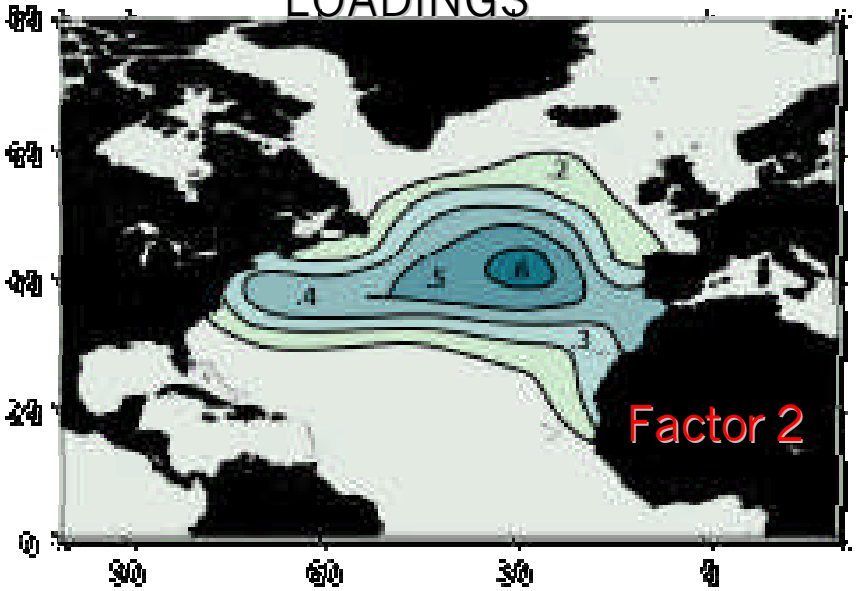


Quantitatively analyze the seafloor distribution of taxa to identify assemblages, which in turn can be related to SST and other environmental variables.

SUBTROPICAL SCORES



SUBTROPICAL LOADINGS

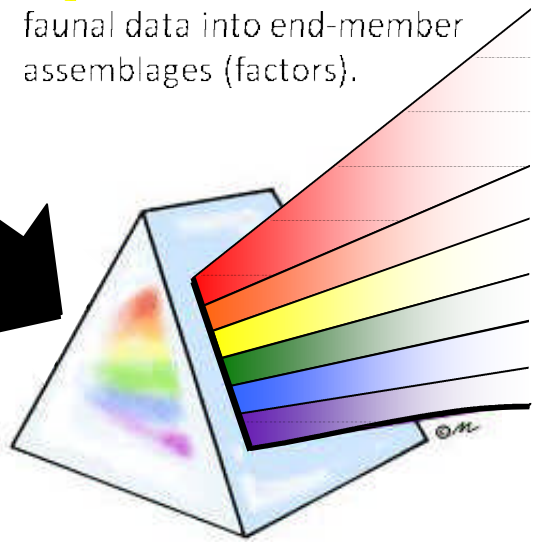


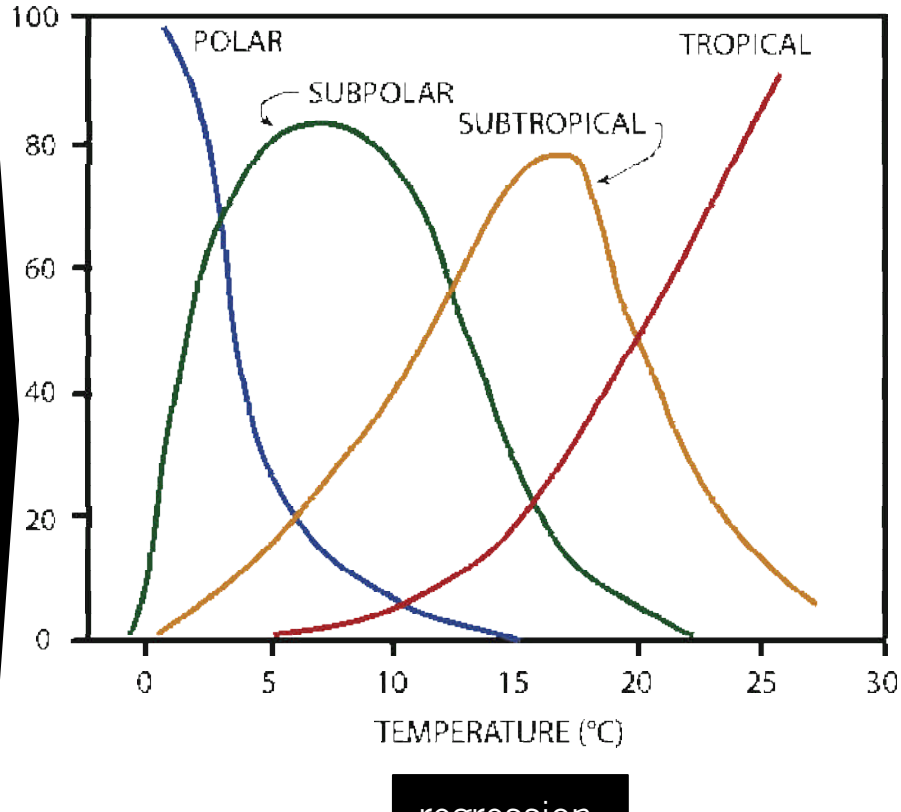
Dowsett, H.J., 1991. The Development of a Long-Range Foraminifer Transfer Function and Application to Late Pleistocene North Atlantic Climatic Extremes. *Paleoceanography*, 6(2): 2

Faunal transfer functions

Downcore faunal data

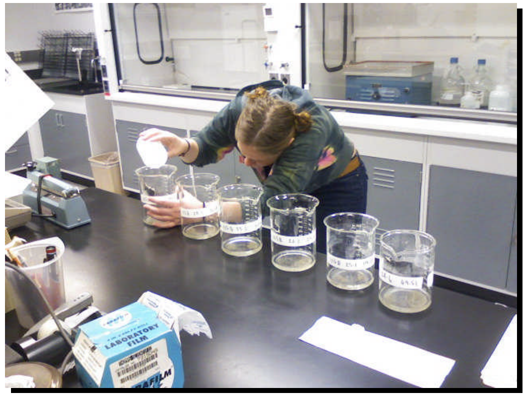
Same Q-mode Factor Analysis used at core top used to transform paleo-faunal data into end-member assemblages (factors).





regression coefficients

Paleotemperature estimate

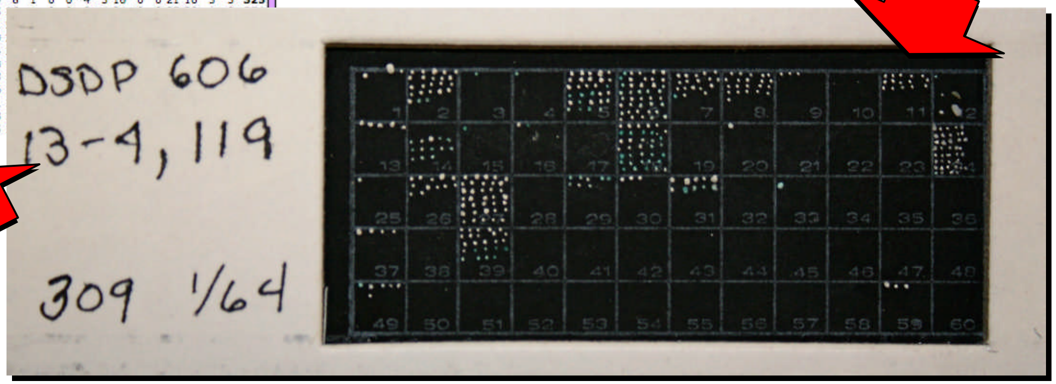


1123C Faunal Data

Counts

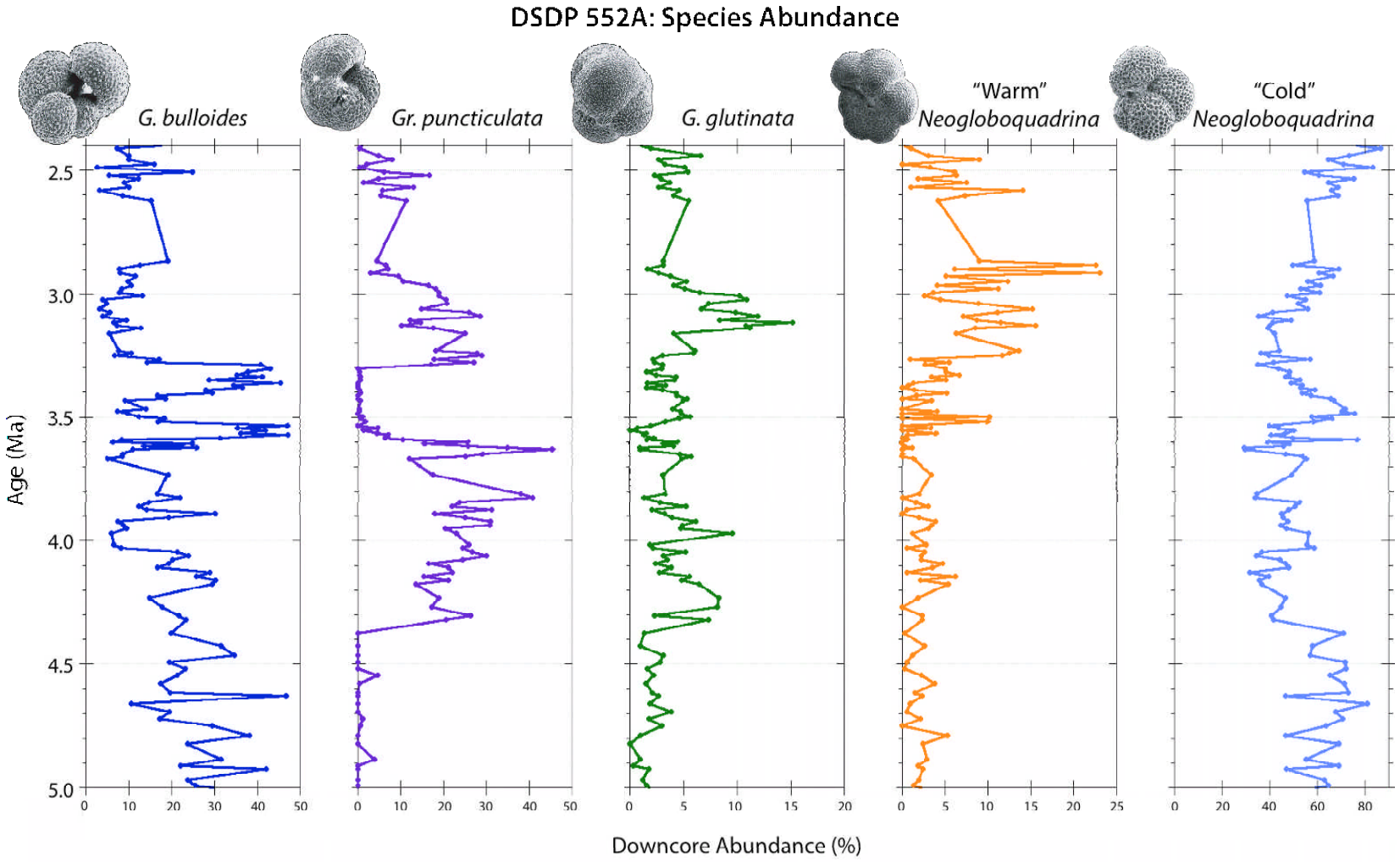
	Hole	Core-Section	Interval (cm)	Depth (mbsf)	Age (Ma)	*Dentoglobigerina altispira*	*Globigerina bulloides*	*Globigerina calida*	*Globigerina decoraperta*	*Globigerina falconensis*	*Globigerina incisa*	*Globigerina praedigitata*	*Globigerina woodi*	*Globigerinella aequilateralis*	*Globigerinella pseudobesa*	*Globigerinita glutinata*	*Globigerinoides obliquus*	*Globigerinoides ruber*	*Globigerinoides sacculifer*	*Globorotalia inflata/puncticulata*
1	1123C	11-4	146-150	100.46	3.01	0	8	1	0	4	1	0	3	0	0	11	1	19	0	130
2	1123C	11-5	96-100	101.46	3.04	0	20	0	0	12	1	0	0	0	0	22	0	1	0	117
3	1123C	11-6	72-76	102.72	3.07	0	27	0	2	13	0	0	7	1	0	27	0	1	0	184
4	1123C	11-7	48-52	103.98	3.10	0	5	0	5	14	0	0	5	0	0	15	0	2	0	204
5	1123C	12-1	24-28	104.24	3.11	0	18	0	5	13	0	0	7	1	0	24	0	9	0	165
6	1123C	12-1	120-124	105.20	3.12	0	6	0	0	3	0	1	1	5	0	6	0	0	0	201
7	1123C	12-3	24-26	107.24	3.17	0	4	0	4	12	0	1	1	1	0	29	0	0	0	149
8	1123C	12-3	120-124	108.20	3.19	0	15	0	2	5	0	0	3	1	0	11	0	0	0	164
9	1123C	12-4	72-76	109.22	3.22	0	7	0	3	8	0	0	4	2	1	12	0	3	0	210
10	1123C	12-5	24-28	110.24	3.24	0	23	0	4	15	0	0	2	2	0	14	0	2	0	233
11	1123C	12-5	120-124	111.20	3.26	0	5	0	3	15	0	0	9	2	0	16	1	0	2	206
12	1123C	12-6	96-100	112.46	3.29	0	11	0	1	13	0	1	7	1	0	26	1	1	0	181
13	1123C	12-7	48-52	113.48	3.31	0	11	0	0	10	0	0	1	0	1	13	0	1	0	258
14	1123C	13-1	90-94	114.40	3.34	1	9	0	12	17	0	1	20	0	0	32	0	6	2	155

	Globorotalia crassaformis	*Globorotalia menardii*	*Globorotalia scitula*	*Globorotalia truncatulinoides*	*Globorotalia tumida*	*Neogloboquadrina "dupac"*	*Neogloboquadrina acostaensis*	*Neogloboquadrina atlantica*	*Neogloboquadrina humerosa*	*Neogloboquadrina pachyderma (d)*	*Neogloboquadrina pachyderma (s)*	*Orbulina universa*	*Turborotalita quinqueloba*	**Total**
1	3	2	1	0	0	0	26	0	0	14	91	6	0	**321**
2	8	0	1	0	0	1	32	0	0	32	66	0	0	**313**
3	4	0	1	1	0	0	21	0	0	16	10	3	3	**321**
4	8	1	0	0	4	3	16	0	0	21	16	3	3	**325**



USGS
science for a changing world

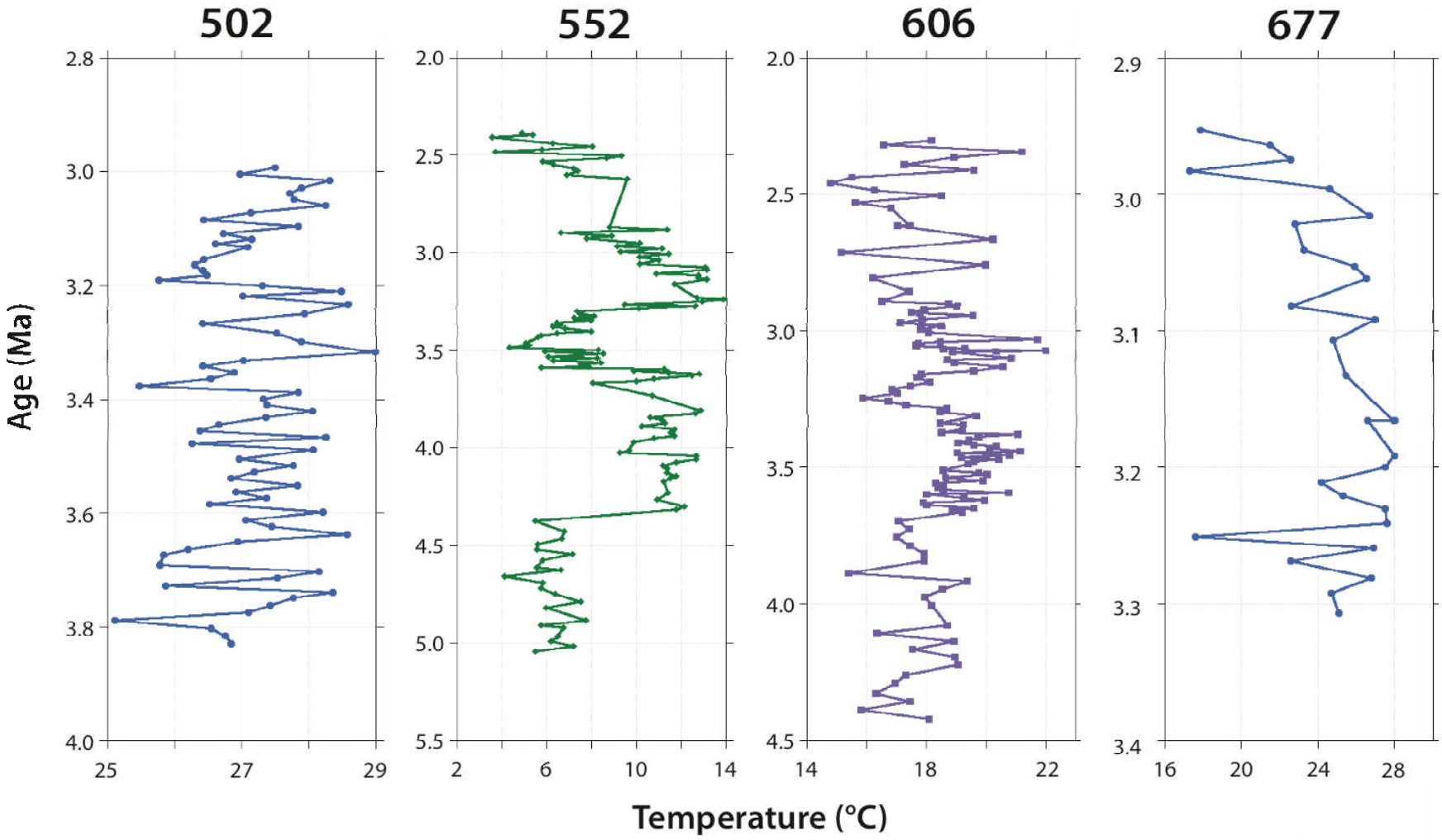
North Atlantic Fauna



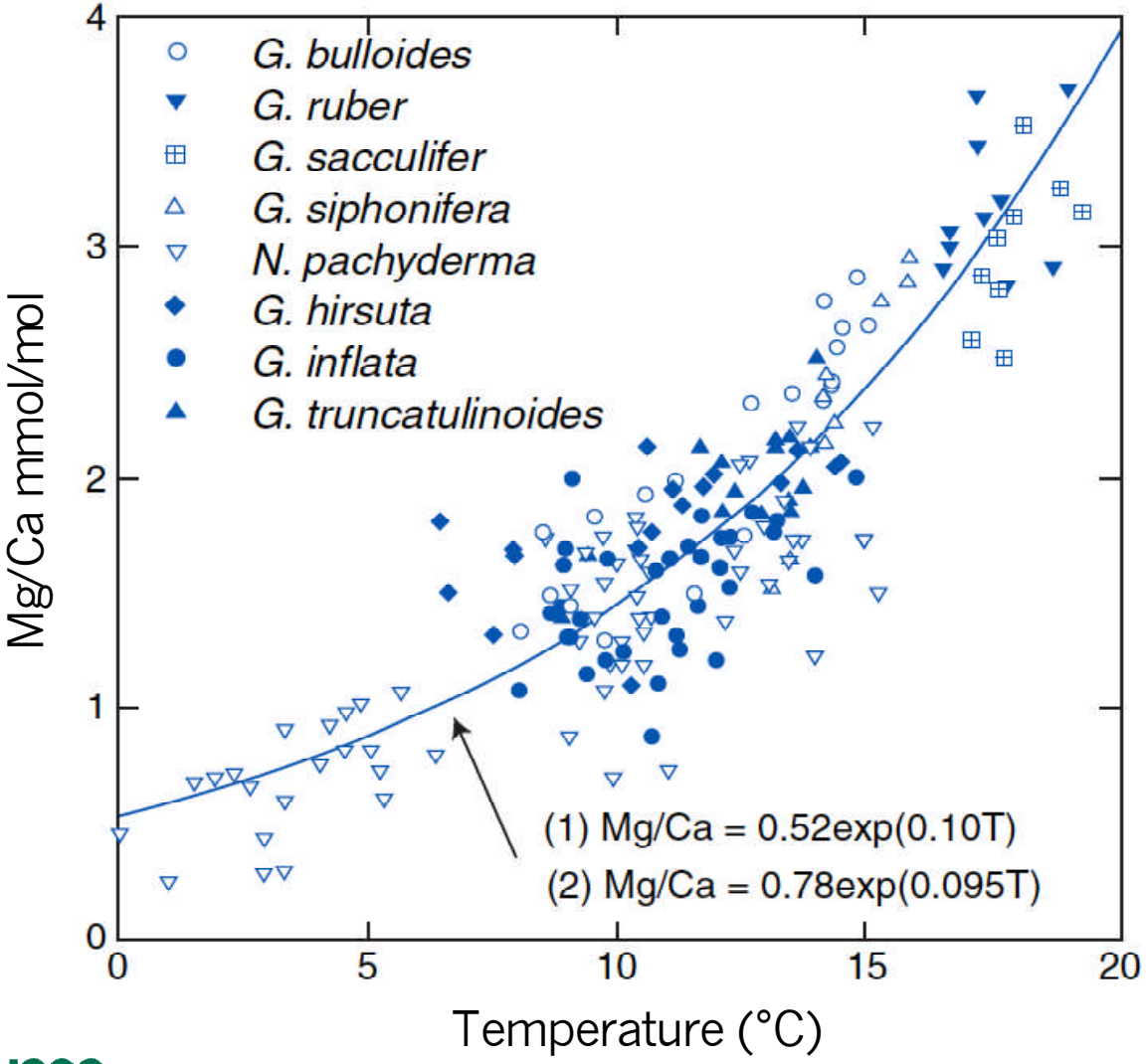
USGS science for a changing world

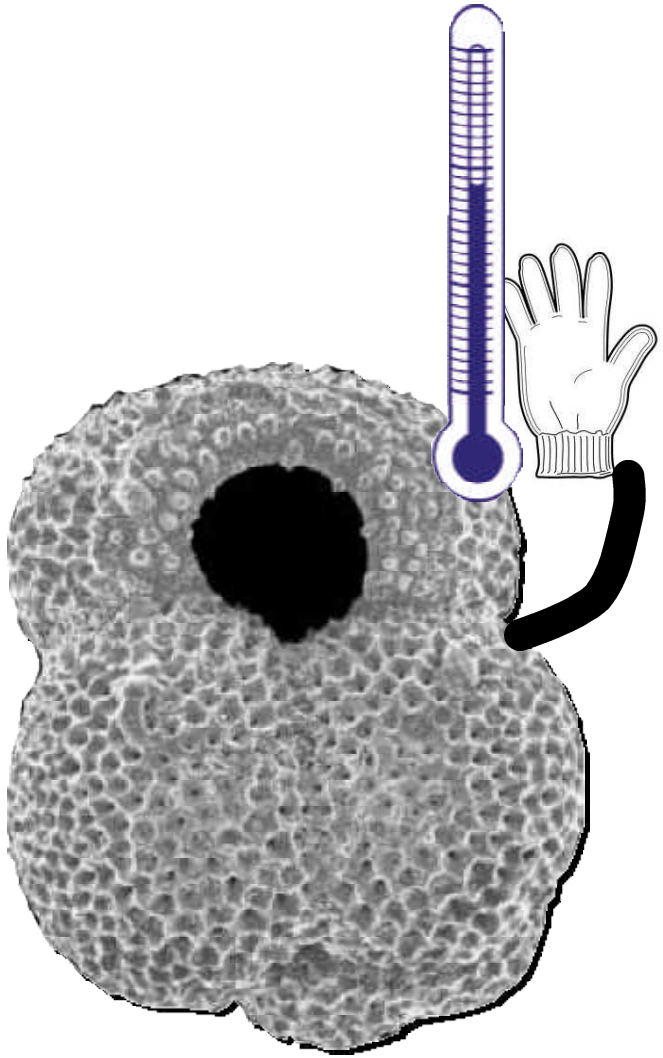
Dowsett, H.J. and Poore, R.Z., 1990. A new planktic foraminifer transfer function for estimating Pliocene-Holocene paleoceanographic conditions in the North Atlantic. *Marine Micropaleontology*, 16(1-2)

Downcore SST estimates



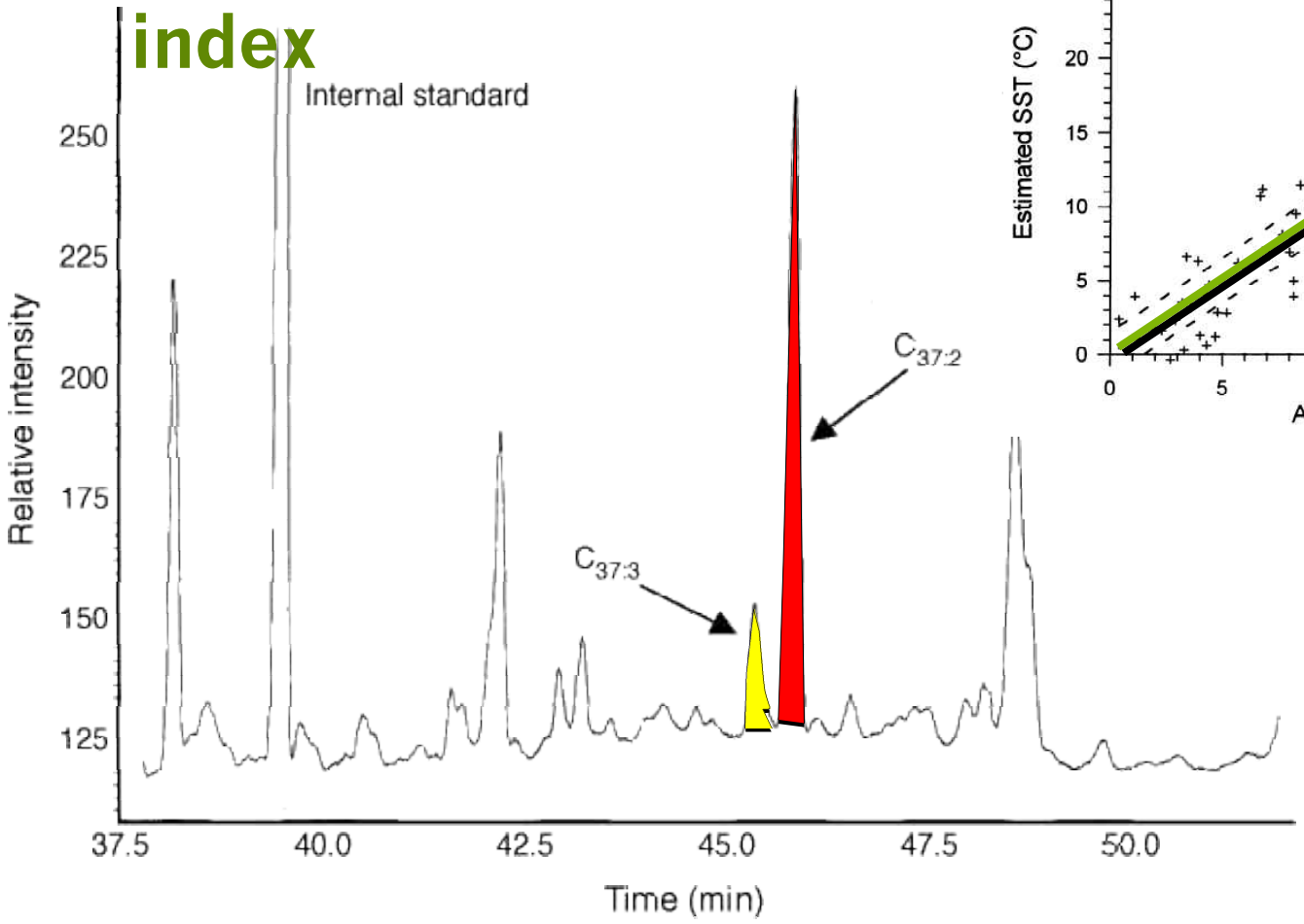
Mg/Ca paleothermometry

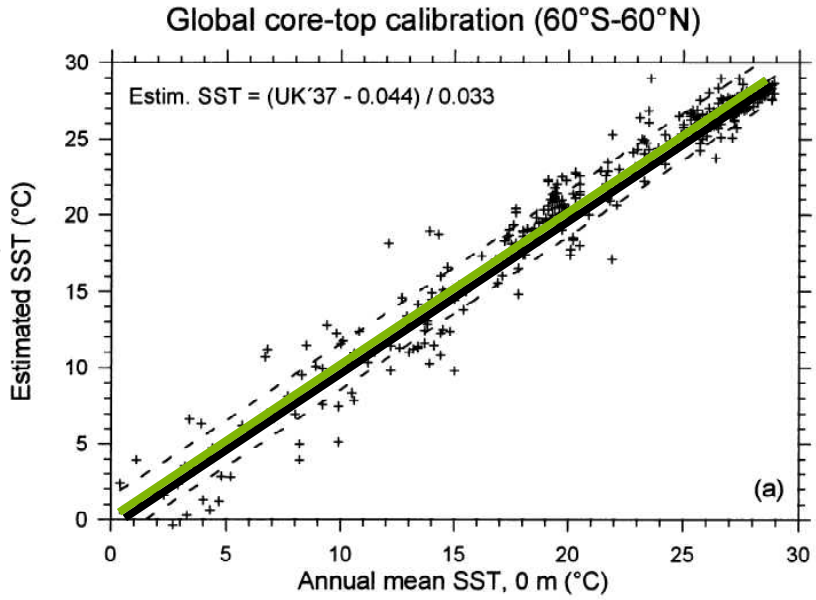




Alkenones

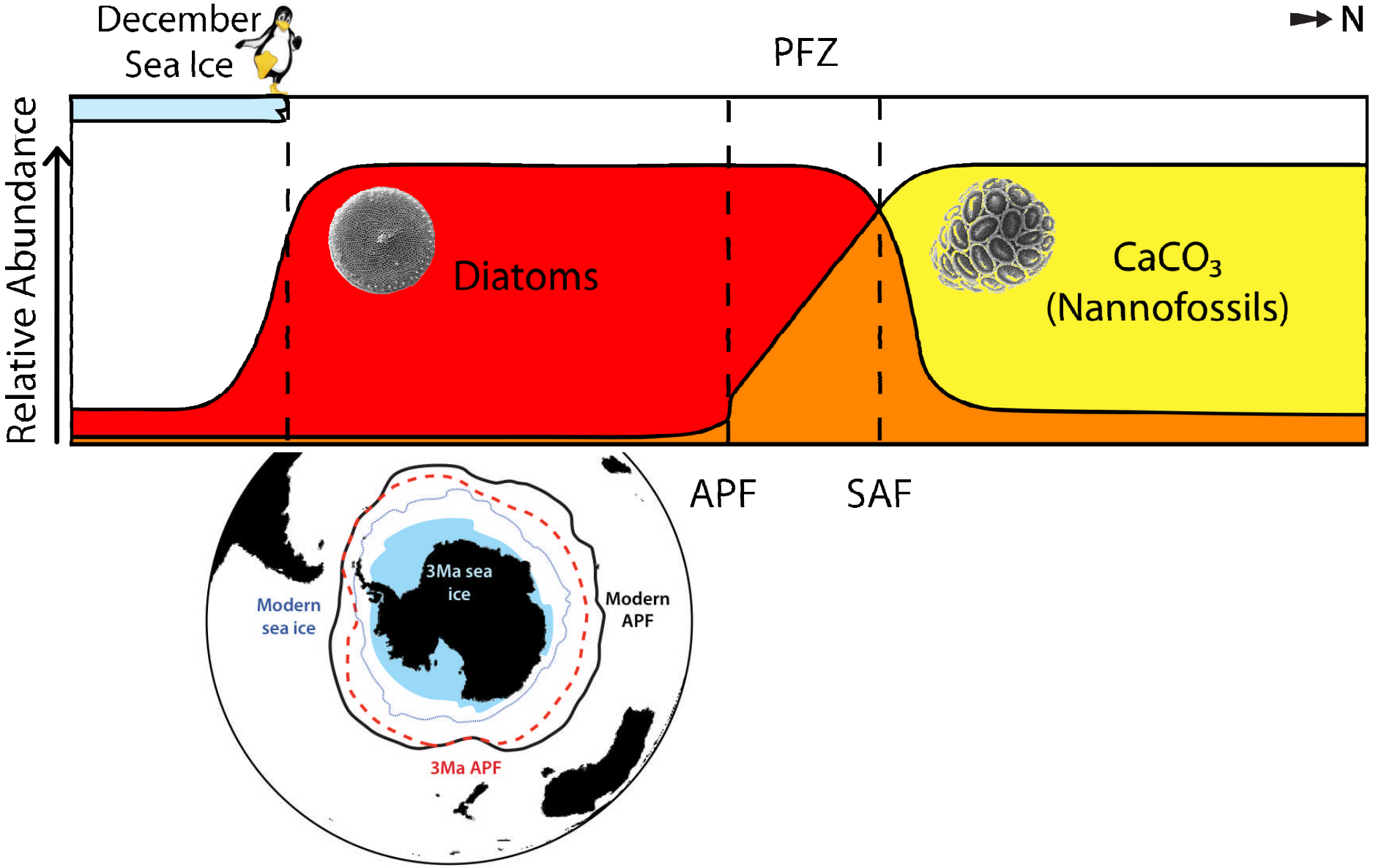
U^{K}_{37} unsaturation index



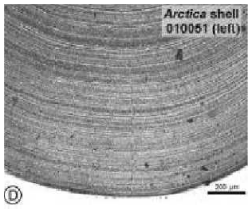


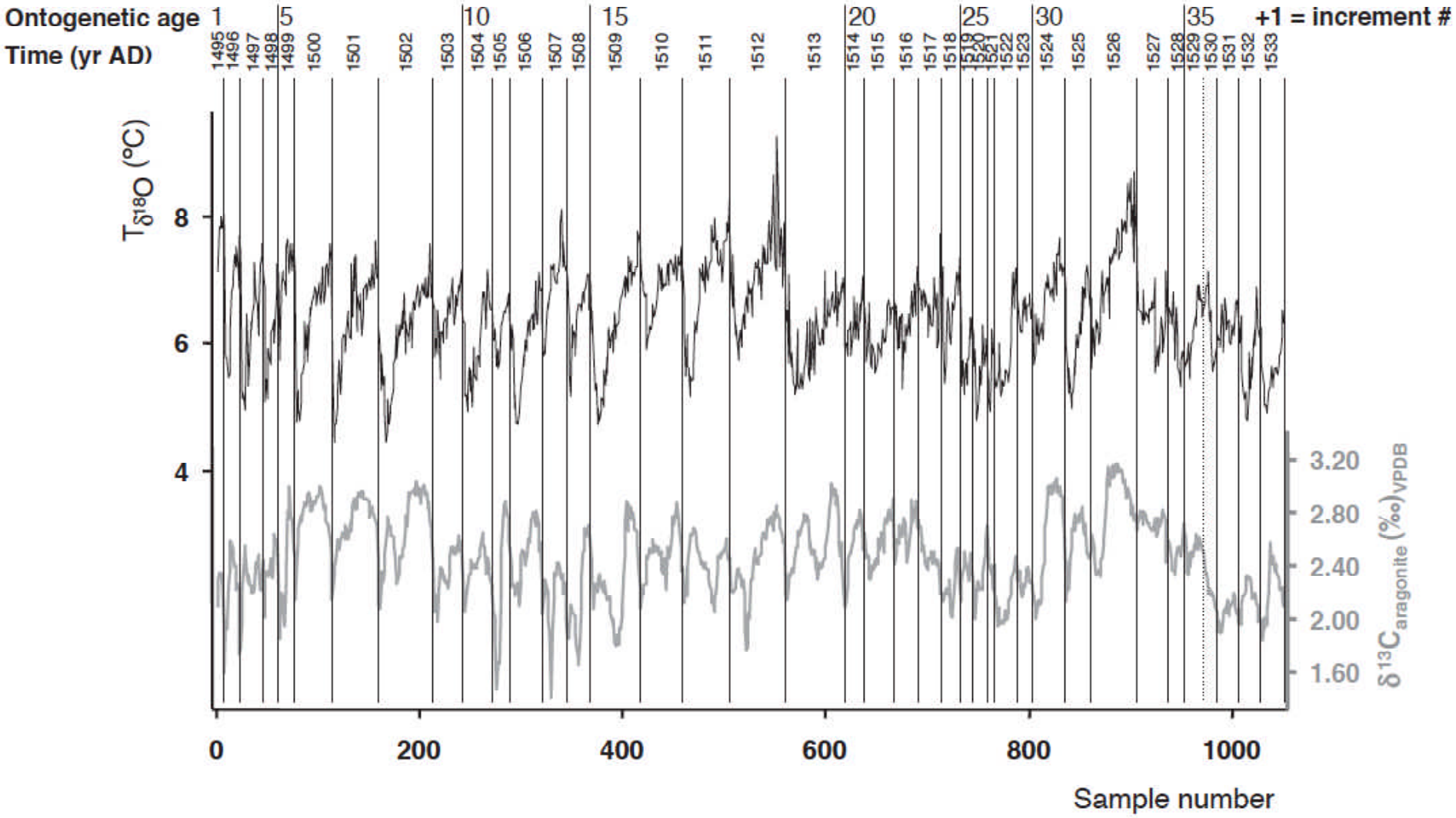
Emiliana huxleyi

Semi quantitative methods



Schlerochronology & Stable Isotopes





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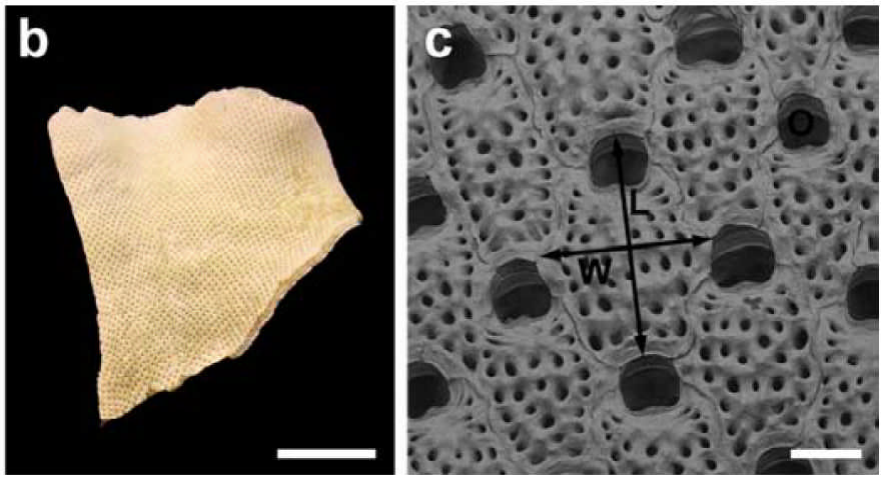
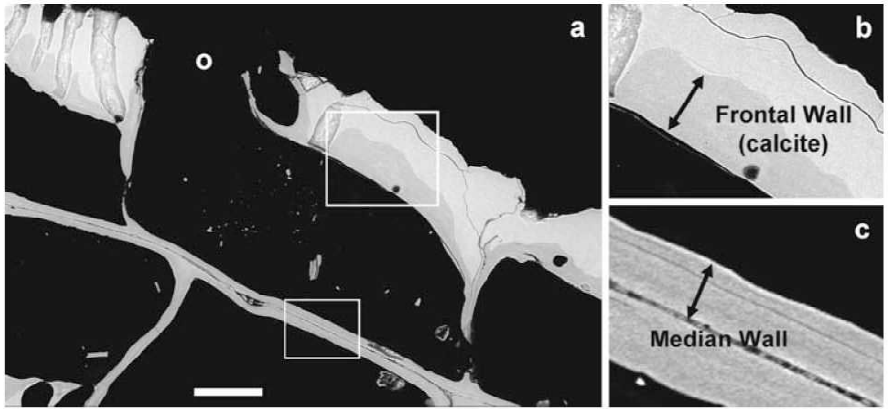
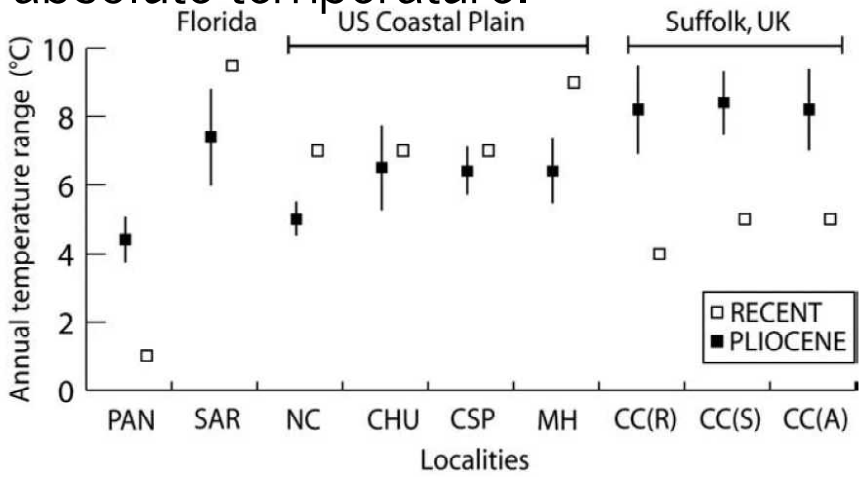
Bryozoan MART Analysis



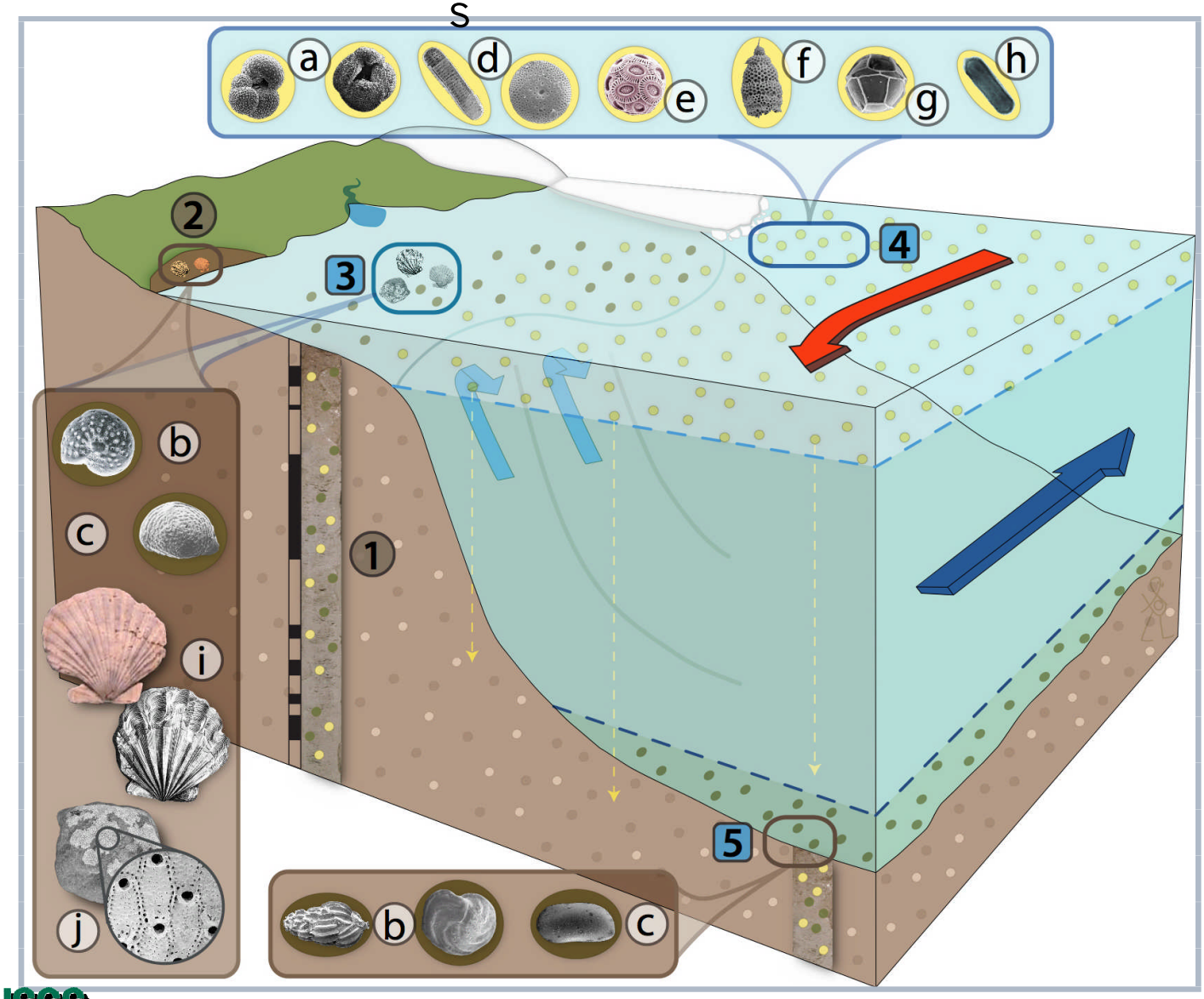


Good relationship between zooid size in cheilostome bryozoa and mean annual range in temperature (MART). This provides a proxy for seasonality, and when coupled with oxygen isotope analyses of frontal walls, absolute temperature.



Deep time marine data fusion

data archives environments proxies/signal carriers



1 deep sea cores
2 outcrops

3 shelf
4 open ocean
5 deep ocean

a planktic forams
b benthic forams
c ostracods
d diatoms
e nannofossils
f radiolaria
g dinoflagellates
h picoplankton
i mollusks
J bryozoa

(*Phil. Trans. Royal Society Dowsett et al., in press*)