GSA Data Repository Item 2016299
Hyland, E.G., Sheldon, N.D., and Cotton, J.M., 2016, Constraining the early Eocene climatic optimum: A terrestrial interhemispheric comparison: GSA Bulletin, doi:10.1130/B31493.1.

DATA REPOSITORY

Figure DR1. Paleomagnetic data summary and examples

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Table DR1. Paleomagnetic data

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Data Repository for "Constraining the Early Eocene Climatic Optimum: a terrestrial interhemispheric comparison" by Hyland et al., including Figures DR1-DR2 and Tables DR1-DR4.

Figure DR1. Paleomagnetic data including: A) stereoplot of ChRM directions with Fisher mean values, a95 circles, and modern and Paleogene pole positions; B) example vector endpoint diagrams for demagnetized samples; and C) example thermal decay diagram for demagnetized samples.

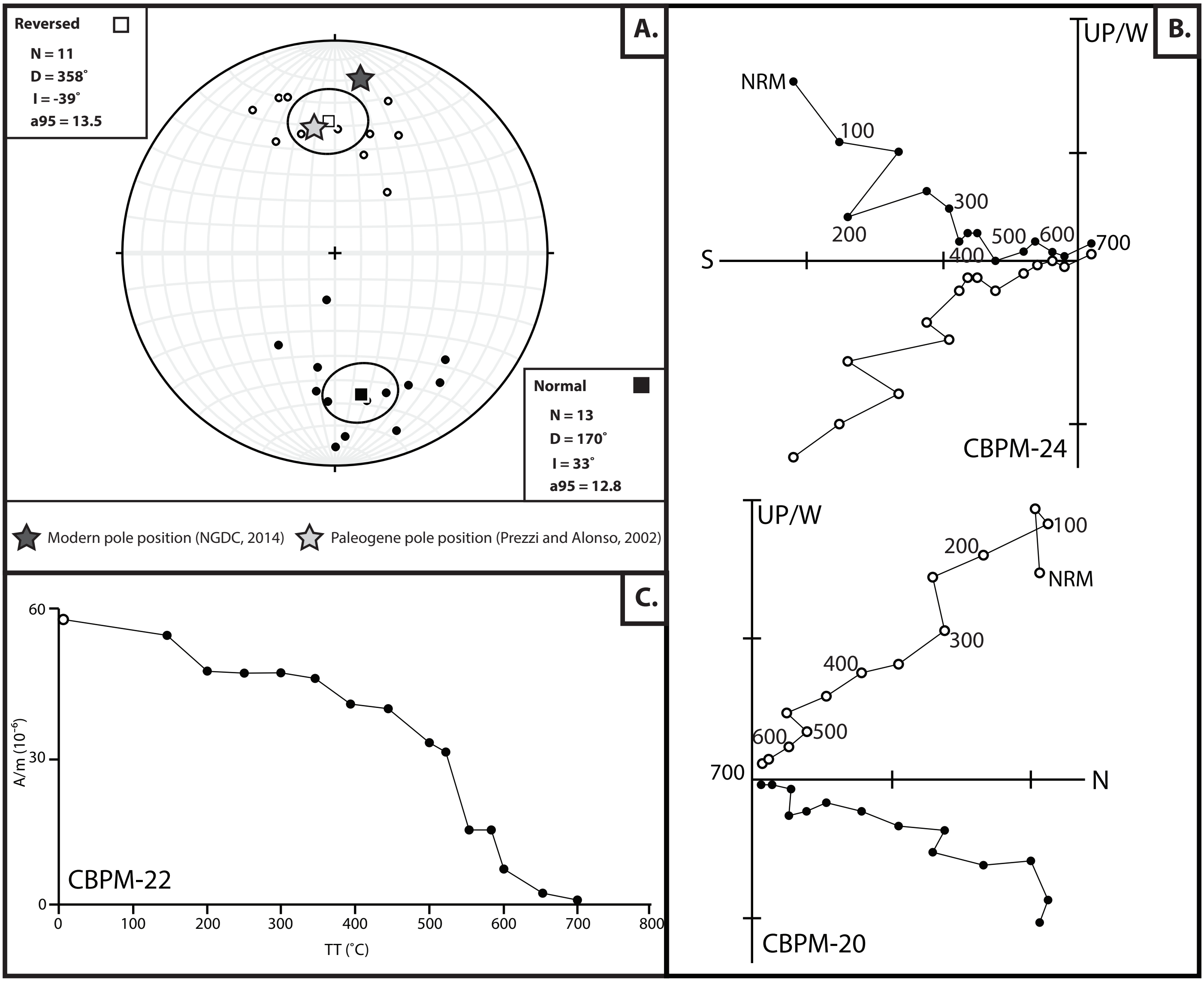

Figure DR2. Stratigraphic column of upper Cerro Bayo section with paleosol details. South American land mammal age (SALMA) for the section is defined by Quattrocchio et al. (1997), Quattrocchio and Volkheimer (2000), Clyde et al. (2014) and Woodburne et al., (2014). Selected paleosols represent type soils for descriptive purposes, and are named for local landmarks. Paleosol classifications are based on the schemes of Mack et al. (1993) and the NRCS (2014).

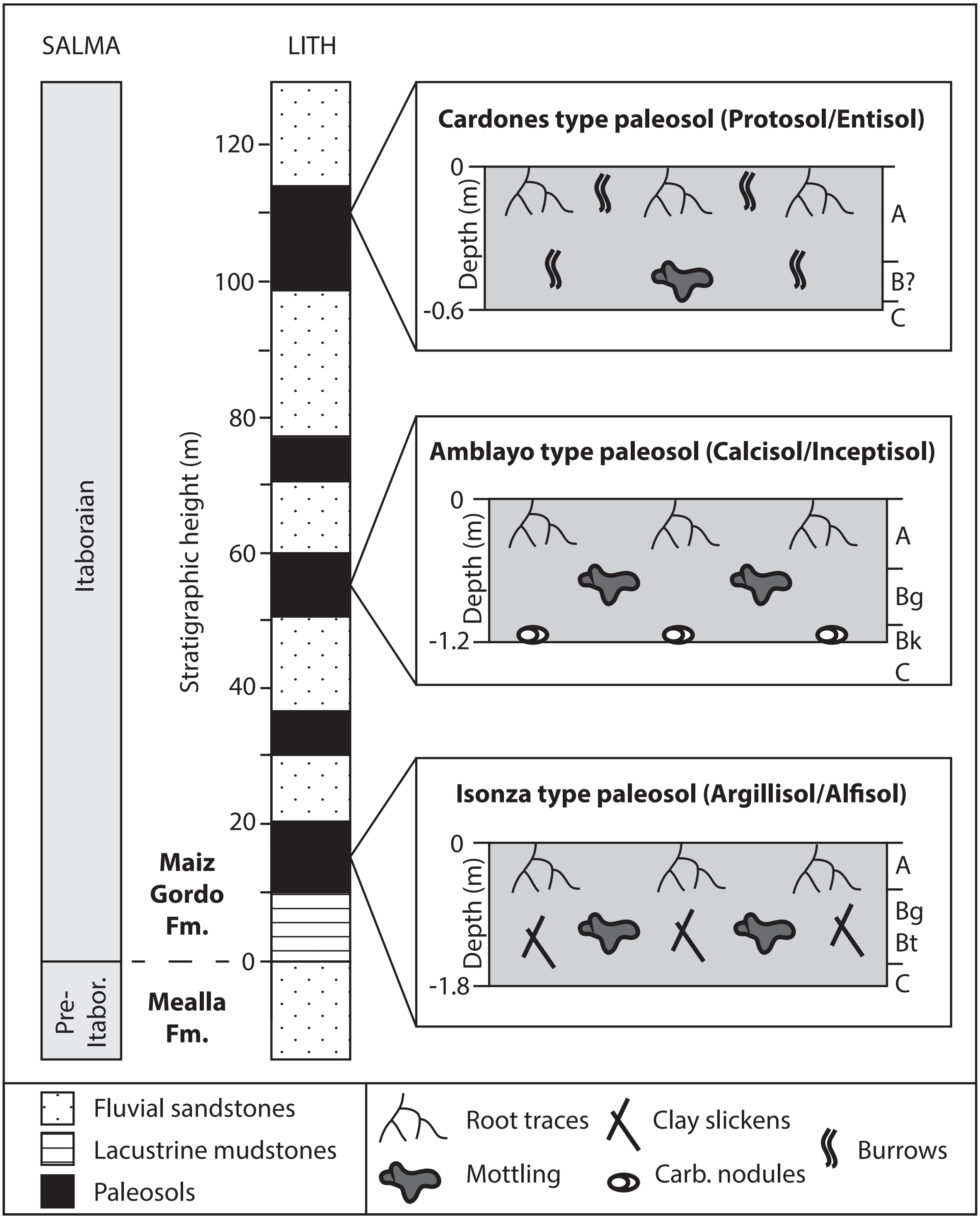

Table DR1. Paleomagnetic data

Sample name	Height (m)[a]	D (°)[b]	I (°)[b]	MAD (°)	VGP (°lat)
CBPM-1	0.0	299	-5	28.3*	27.2
CBPM-2	0.2	183	31	8.9	-81.3
CBPM-3	0.5	141	23	5.8	-51.0
CBPM-4	10.5	134	29	8.7	-46.0
CBPM-5	10.6	160	31	14.7	-69.6
CBPM-6	10.7	168	30	11.8	-75.7
CBPM-7	20.5	189	45	2.3	-81.7
CBPM-8	20.6	191	72	7.8	-57.0
CBPM-9	20.7	340	-23	13.3	67.0
CBPM-10	26.0	330	-23	3.4	58.8
CBPM-11	26.1	343	-24	11.4	69.7
CBPM-12	26.2	019	-25	10.8	68.5
CBPM-13	31.0	180	10	4.5	-70.0
CBPM-14	47.0	188	35	14.3	-80.7
CBPM-15	56.0	212	48	8.1	-61.3
CBPM-16	56.5	332	-40	9.2	64.3
CBPM-17	70.0	344	-41	7.8	75.3
CBPM-18	71.0	028	-37	10.1	63.9
CBPM-19	82.0	016	-41	5.7	75.3
CBPM-20	83.0	001	-41	9.5	88.2
CBPM-21	101.0	014	-52	7.2	75.6
CBPM-22	116.0	040	-59	4.0	53.5
CBPM-23	125.5	161	13	10.8	-64.1
CBPM-24	126.0	177	15	8.2	-72.4
CBPM-25	128.0	151	30	9.0	-61.5

[a] Height refers to stratigraphic height from the base of the Maiz Gordo Fm.
[b] D = declination; I = inclination
* Values excluded from magnetostratigraphic analysis due to MAD >15°

Table DR2. Geochemical data

Sample	Height (m)[a]	SiO_2 (wt%)*	Al_2O_3 (wt%)*	CaO (wt%)**	MgO (wt%)**	Na_2O (wt%)**	K_2O (wt%)**	TiO_2 (wt%)**	Ti/Al	CIA-K[b]	SAL[c]	PWI[d]	MAP (mm/yr)[e]	MAT1 (°C)[f]	MAT2 (°C)[g]
CBM-P16-B	-10.0	69.1	14.8	1.89	4.46	3.30	3.19	0.60	0.05	62.5	0.60	66.4	758	6.2	9.9
CBMG-P1-B	12.5	70.7	13.7	3.27	3.61	2.18	4.15	0.56	0.05	59.0	0.59	66.0	706	6.4	9.9
CBMG-P1-A	13.0	74.7	13.7	1.35	0.78	4.11	2.80	0.31	0.03	-----	-----	-----	-----	-----	-----
CBMG-P2-B	20.0	71.4	15.0	1.73	2.57	2.03	4.50	0.61	0.05	69.8	0.55	57.1	874	7.2	10.3
CBMG-P2-A	20.5	73.3	14.0	0.97	1.37	1.82	4.09	0.58	0.05	-----	-----	-----	-----	-----	-----
CBMG-P3-C	55.5	69.1	16.5	0.76	1.78	2.65	4.26	0.73	0.06	-----	-----	-----	-----	-----	-----
CBMG-P3-B	55.7	66.1	17.0	0.85	2.98	2.51	4.34	0.75	0.06	75.1	0.52	57.9	969	7.7	10.3
CBMG-P3-A	56.0	67.1	16.8	1.12	1.95	2.29	4.36	0.74	0.06	-----	-----	-----	-----	-----	-----
CBMG-P5-B	58.5	62.5	18.6	1.26	2.38	2.75	4.89	0.93	0.06	73.2	0.53	61.7	934	7.5	10.1
CBMG-P5-A	58.8	61.1	19.0	1.24	2.52	2.60	5.06	0.93	0.06	-----	-----	-----	-----	-----	-----
CBMG-P7-B	72.5	65.6	16.6	1.86	0.98	1.34	4.67	0.72	0.05	74.9	0.44	47.4	966	9.2	10.8
CBMG-P7-A	72.9	65.7	16.3	1.33	2.01	2.31	4.75	0.71	0.06	-----	-----	-----	-----	-----	-----
CBMG-P10-C	98.5	73.7	13.9	0.47	1.39	1.02	4.37	0.56	0.05	-----	-----	-----	-----	-----	-----
CBMG-P10-B	99.0	71.0	15.5	0.58	0.38	0.69	3.61	0.66	0.05	87.6	0.32	29.6	1242	11.3	12.1
CBMG-P10-A	99.5	71.6	14.9	1.14	1.44	0.98	4.44	0.63	0.05	-----	-----	-----	-----	-----	-----
CBMG-P11-C	102.5	76.8	12.5	0.59	1.04	0.78	4.39	0.44	0.04	-----	-----	-----	-----	-----	-----
CBMG-P11-B	103.0	75.9	13.1	0.99	0.18	0.12	3.09	0.41	0.04	86.8	0.27	23.3	1222	12.3	12.8
CBMG-P11-A	103.5	79.1	11.1	1.41	0.88	1.15	3.69	0.33	0.04	-----	-----	-----	-----	-----	-----
CBMG-P12-B	112.0	55.6	23.8	1.69	2.34	0.31	6.47	0.94	0.05	86.9	0.32	56.0	1224	11.5	10.4
CBMG-P12-A	112.4	64.4	18.0	1.48	1.64	0.48	5.08	0.73	0.05	-----	-----	-----	-----	-----	-----

[a] Height refers to stratigraphic height from base of the Maiz Gordo Fm.
[b] Chemical index of alteration (CIA-K) is defined as the molecular ratio: Al/(Al+Ca+Na) × 100
[c] Salinization index (SAL) is defined as the molcular ratio: (K+Na)/Al
[d] Paleosol weathering index (PWI) is defined as the molecular ratio: ((4.20 × Na)+(1.66 × Mg)+(5.54 × K)+(2.05 × Ca)) × 100
[e] Based on CIA-K climofunction of Sheldon et al. (2002)
[f] Based on SAL climofunction of Sheldon et al. (2002)
[g] Based on PWI climofunction of Gallagher and Sheldon (2013)
* Analytical error = ±0.5%
** Analytical error = ±0.1%

Table DR3. Carbon isotope data from organic carbon analyses

Sample name	Height (m)[a]	$\delta^{13}C$ (‰)[b*]	SD (‰)[§]	OC (wt%)
CBMG-P1	13.0	-28.04	0.11	0.02
CBMG-P2	20.5	-24.66	0.17	0.04
CBMG-P3	56.0	-26.39	1.18	0.03
CBMG-P4	57.0	-25.16	0.31	0.01
CBMG-P5	58.8	-26.21	0.20	0.03
CBMG-P6	71.2	-20.69	0.14	0.02
CBMG-P7	72.9	-21.17	0.22	0.03
CBMG-P8	75.0	-21.88	0.17	0.03
CBMG-P9	82.4	-21.61	0.25	0.02
CBMG-P10	99.5	-26.64	0.08	0.02
CBMG-P11	103.5	-27.79	0.18	0.05
CBMG-P12	112.4	-24.35	0.21	0.01

[a] Height refers to stratigraphic height from base of the Maiz Gordo Fm.
[b] Carbon isotope values are the average composition of ≥3 analyses
* Analytical uncertainty is maintained at <0.1‰ for all analyses
§ Standard deviation (S.D.) average = 0.27‰, or 0.18‰ with outlier (CBMG-P3) removed

Table DR4. Data averages from Figure 4 with sources

	Source	n (per bin)	BINS (250 kyr) A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Atm. CO_2	*2, 3*	36 (2.3)	460	440	380	370	260	470	600	420	420	860	1400	1210	800	340	580	390
ΔMAT (ter.)[a]	*1*	52 (3.3)	1.0	1.1	1.1	1.1	1.2	0.8	1.2	1.6	2.2	4.0	4.2	3.1	3.0	2.0	2.0	1.1
ΔMAT (mar.)[b]	*4*	50 (3.1)	0.3	0.3	0.8	0.8	0.6	1.2	0.9	2.0	1.9	2.5	2.9	2.7	2.8	1.8	1.9	1.2
$\Delta^{13}C$ (ter.)[c]	*1*	72 (4.5)	0.5	0.6	0.2	1.8	1.4	1.6	0.9	0.9	2.8	4.0	4.2	2.1	2.0	2.2	1.0	1.0
$\Delta^{13}C$ (plank.)[b]	*5*	94 (5.9)	0.0	-0.15	-0.25	-0.3	-0.55	-0.75	-0.7	-0.65	-0.6	-0.7	-0.55	-0.45	-0.5	-0.2	-0.05	0.0
$\Delta^{13}C$ (benth.)[b]	*6, 7, 8*	88 (5.5)	-0.15	-0.3	-0.6	-0.75	-0.8	-1.0	-1.15	-0.85	-0.65	-0.5	-0.65	-0.65	-0.35	-0.65	-0.2	-0.1

1) This work; 2) Hyland and Sheldon, 2013; 3) Royer et al., 2004; 4) Hollis et al., 2012 (Tex_{86} and Mg/Ca data); 5) Coccioni et al., 2010; 6) Zachos et al., 2008; 7) Dickens and Backman, 2013; 8) Hancock and Dickens, 2005

a) Baseline values recorded as average value for previous 5 Myr of data from Wilf (2000) and Krause et al. (2013).
b) Baseline values recorded as average value for previous 2 Myr of data from same sources.
c) Baseline values recorded as average value for previous 5 Myr of data from Ekart et al. (1999) modified for region (Diefendorf et al., 2010).

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