Supplementary Data Table DR1. Leaf physiognomic data for each leaf morphotype, including the number of specimens scored to yield the data. Data is grouped according to the fossil macroflora site.

Key: US188 = middle Eocene mudstone site US188, Axel Heiberg Is. (modern location: 79°56.5'N 89°08'W); US111 = late Paleocene Ellesmere island site US111, Fosheim Anticline, Ellesmere Is. (79°43'N 84°45'W); HWC = late Paleocene Hot Weather Ck. site US108, Ellesmere Island (79°56'N 84°29'W); MR = middle Paleocene MacKenzie R. 'bocanne' site US46, Brackett Basin, NWT (64°54'N, 125°24'W); SI = middle Paleocene Seagull Island site US40, Brackett Basin, NWT (64°44'N, 125°07'W). Additional site details can be found in McIver and Basinger (1999) and Sweet et al. (1989).

Notes: Leaf area was calculated using laminal length and width measurements from complete specimens, using the formula area = 2/3 length x width, which applies to non-lobed leaves. Leaf morphotypes that included toothed, non-toothed, or partially toothed specimens were scored 0.5.

TAXON	specimens	no-teeth	min_area (mm^2)	max_area (mm^2)	MLnA
US188_001	78	0	567	6840	7.6
US188_002	18	0	960	7800	7.9
US188_003	38	1	469	5167	7.3
US188_004	21	0	460	7283	7.5
US188_005	4	0	900	5691	7.7
US188_006	2	0	3547	4200	8.3
US188_007	4	0	2772	9000	8.5
US188_008	2	1	65	65	4.2
US188_009	4	0	966	5851	7.8
US188_010	1	0	1653	1653	7.4
US188_011	2	0.5	887	887	6.8
US188_012	1	1	420	420	6.0
US188_013	2	0	7714	13600	9.2
US188_014	1	0	3667	3667	8.2
US188_015	2	1	2336	6933	8.3
Totals	180	30.0%	1826	5270	7.5
US111_001	10	0	1400	4949	7.9
US111_002	37	0	468	6440	7.5
US111_003	4	0	2070	12200	8.5
US111_004	44	0	304	21493	7.8
US111_005	2	1	3827	4320	8.3
US111_006	65	0	243	5413	7.0
US111_007	6	0	360	2533	6.9
US111_008	1	0	11503	11503	9.4
US111_009	1	0	7081	7081	8.9
US111_010	1	0	2531	2531	7.8
US111_011	3	0	224	269	5.5
US111_012	1	0	1100	1100	7.0

US111_013	1	1	3233	3233	8.1
US111_014	1	0.5	2520	2520	7.8
US111_015	1	1	4267	4267	8.4
Totals	178	23.3%	2742	5990	7.8

TAXON	specimens	no-teeth	min_area (mm^2)	max_area (mm^2)	MLnA
HWC_001	61	0.5	293	8750	7.4
HWC_002	1	0	420	420	6.0
HWC_003	10	0	1050	17040	8.3
HWC_004	4	0	767	4200	7.5
HWC_005	5	1	2160	6160	8.2
HWC_006	1	0	1850	1850	7.5
HWC_007	1	0	600	600	6.4
HWC_008	26	0.5	800	25600	8.4
HWC_009	2	0	3547	5460	8.4
HWC_010	2	0	4520	4520	8.4
Totals	113	20.0%	1601	7460	7.7
MR_001	1	0	1992	1992	7.6
MR_002	8	0.5	1036	4319	7.7
MR_003	2	1	481	887	6.5
MR_004	1	0	953	953	6.9
MR_005	9	0	839	3211	7.4
MR_006	18	0.5	420	6395	7.4
MR_007	21	0	936	18300	8.3
MR_008	4	0	327	2100	6.7
MR_009	1	0	1233	1233	7.1
MR_010	1	0	7453	7453	8.9
Totals	66	20.0%	1567	4684	7.4
SI_001	1	0	1173	1173	7.1
SI_002	3	0.5	2433	4267	8.1
SI_003	3	0	1901	8800	8.3
SI_004	89	1	93	2484	6.2
SI_005	12	0	181	2273	6.5
SI_006	45	0	252	22400	7.8
SI_007	15	0.5	85	1440	5.9
SI_008	1	0	1036	1036	6.9
Totals	169	25.0%	895	5484	7.1

Supplementary Data Table DR2. Bioclimatic proflies used for the 25 NLRs from the Axel Heiberg Island middle Eocene macroflora.

Key: MAP = mean annual precipitation (mm/a); MAT = mean annual temperature (°C); CMMT = coldest month mean temperature (°C). Min = lowest value of occurrence; Max = greatest value of natural occurrence.

Notes: Climate proflies (min and max) for the NLR taxa used were derived from Natural Resources Canada (2003), Thompson et al. (1999) and PALAEOFLORA (Mosbrugger and Utescher, 1997; http://www.geologie.uni-bonn.de/Palaeoflora/Palaeoflora_home.htm). Where there was a difference between these sources, the lowest minimum and the greatest maximum value was used. Estimates were calculated using the method of Greenwood et al. (2005). Fossil taxon list is from McIver and Basinger (1999).

	Fossil taxon	Min MAP	Max MAP	Min MAT	Max MAT	Min CMMT	Max CMMT	NLR used
1	*Metasequoia*	290	2615	12.6	26.6	-1.4	25.4	*Taxodium*
2	*cf. Pseudolarix / Pseudolarix*	979	1531	15.7	21.8	2.2	14.8	*Pseudolarix*
3	*Nyssydium arcticum*	578	2559	7.6	17.0	-5.5	6.2	*Cercidiphyllum japonicum*
4	Betulaceae	90	4685	-13.4	20.9	-34.8	14.1	*Alnus + Betula*
5	*Carya/cf. Carya*	410	1755	7.5	19.4	-16.2	18.2	*Carya*
6	*Osmunda*	206	1864	0.2	23.9	-16.6	19.4	*Osmunda*
7	*cf. Tilia*	415	1560	1.1	19.9	-19.8	11.7	*Tilia*
8	*cf. Rhus*	155	1560	-2.3	24.4	-23.1	16.4	*Rhus*
9	*Betula*	90	4370	-13.4	20.3	-34.8	13.0	*Betula*
10	*cf. Keteleeria*	1096	2100	15.7	22.2	3.8	14.8	*Keteleeria*
11	*Larix altoborealis*	250	2520	-9.7	11.2	-31.0	-1.0	*Larix*
12	*Picea*	185	4370	-12.4	13.2	-34.2	7.6	*Picea*
13	*Pinus*	85	4370	-8.0	30.9	-30.4	26.7	*Pinus*
14	*Tsuga*	395	4370	-6.5	16.3	-17.1	8.1	*Tsuga*
15	*Sequoia*	410	1810	9.4	15.3	4.7	9.6	*Sequoia*
16	*Chamaecyparis*	325	4370	-2.0	20.0	-10.3	12.4	*Chamaecyparis*
17	Myricaceae	930	1630	1.4	20.5	-12.8	13.1	*Myrica*
18	Ericaceae	250	3650	-6.3	24.1	-8.2	16.1	*Arbutus + Rhododendron*
19	unk Taxodiaceae	75	4370	-12.2	26.6	-32.5	26.2	*TCT*
20	*Alnus*	170	4685	-12.2	20.9	-30.9	14.1	*Alnus*
21	*Onoclea*	420	1660	-1.1	14	-14.4	2.2	*O. sensibilis*
22	*Nyssa*	720	2295	4.5	23.0	-10.4	18.9	*Nyssa*
23	*Platanus*	335	1620	5.4	21.8	-10.2	12.4	*P. occidentalis*
24	*Quercus*	85	2555	-1.5	27.2	-22.7	26.2	*Quercus*
25	*cf. Fraxinus*	85	2555	-2.3	24.4	-23.8	18.1	*Fraxinus*