

Table S1: Temperature in the LMS between 1995 and 2012, averaged over seasons and regions. The numbers correspond to the 1-minute mean data.

Season	Region	Mean±stdev in K	Median in K	Number *1000	Season	Region	Mean±stdev in K	Median in K	Number *1000
MAM	North Canada	222.2±4.3	222.8	42	MAM	Greenland	223.3±3.3	223.4	78
JJA		226.1±2.1	225.8	28	JJA		226.9±1.7	226.8	80
SON		221.6±3.0	221.8	44	SON		223.3±2.6	223.7	81
DJF		218.4±4.2	218.2	73	DJF		218.0±3.4	218.1	100
MAM	Scandinavia	221.9±3.8	221.3	28	MAM	North Asia	220.2±4.5	221.1	122
JJA		226.0±2.1	226.1	22	JJA		227.3±1.6	227.6	94
SON		221.3±2.5	221.8	23	SON		219.8±2.7	220.2	103
DJF		216.4±2.6	216.6	20	DJF		214.0±1.9	213.8	82
MAM	North America	222.8±1.9	222.8	145	MAM	North Atlantic	223.3±1.8	223.6	374
JJA		225.2±1.2	225.3	81	JJA		226.4±0.9	226.3	309
SON		223.2±2.1	223.5	107	SON		224.6±1.9	224.4	291
DJF		221.6±1.9	221.3	185	DJF		221.2±1.6	221.2	342
MAM	Europe	219.9±1.9	220.1	283	MAM	Central Asia	219.8±2.5	220.0	199
JJA		224.8±1.6	224.7	209	JJA		226.2±1.3	226.4	81
SON		220.8±2.1	220.4	183	SON		220.6±2.2	220.5	129
DJF		218.1±1.7	217.9	252	DJF		217.9±2.5	217.4	184
MAM	Middle America	-	-	0	MAM	Tropical Atlantic	-	-	0
JJA		-	-	0	JJA		-	-	0
SON		-	-	0	SON		-	-	0
DJF		-	-	0	DJF		-	-	0
MAM	North Africa	-	-	0	MAM	Tropical Asia	-	-	0
JJA		-	-	0	JJA		-	-	0
SON		-	-	0	SON		-	-	0
DJF		-	-	0	DJF		-	-	0
MAM	South America	-	-	0	MAM	South Africa	-	-	0
JJA		-	-	0	JJA		-	-	0
SON		-	-	0	SON		-	-	0
DJF		-	-	0	DJF		-	-	0

Table S2: Temperature in the TPL between 1995 and 2012, averaged over seasons and regions. The numbers correspond to the 1-minute mean data.

Season	Region	Mean±stdev in K	Median in K	Number *1000	Season	Region	Mean±stdev in K	Median in K	Number *1000
MAM	North Canada	214.1±2.0	214.5	3	MAM	Greenland	214.1±2.5	214.4	16
JJA		218.5±1.4	218.2	8	JJA		219.7±1.1	219.6	30
SON		215.9±2.3	216.5	4	SON		216.5±2.7	217	20
DJF		209.8±1.4	210	6	DJF		210.6±2.3	210.6	23
MAM	Scandinavia	213.6±3.9	215.4	2	MAM	North Asia	212.4±3.3	212.6	26
JJA		218.9±1.9	218.8	7	JJA		219.2±1.3	219.1	54
SON		215.5±2.7	215.4	4	SON		213.3±2.3	213.5	34
DJF		209.6±2.0	210.1	3	DJF		208.4±1.8	208.5	17
MAM	North America	215.4±1.7	215.3	64	MAM	North Atlantic	214.3±1.7	214.4	197
JJA		219.3±1.4	219.3	61	JJA		219.2±1.2	219.4	229
SON		217.2±1.9	217.4	53	SON		216.9±1.9	217	453
DJF		214.4±1.6	214.4	54	DJF		212.4±1.4	212.2	136
MAM	Europe	214.2±1.5	214.4	168	MAM	Central Asia	214.4±2.0	214.4	113
JJA		219.4±1.5	219.4	163	JJA		219.4±1.5	219.4	103
SON		215.3±1.9	215.2	148	SON		214.9±2.0	215.3	92
DJF		212.5±1.4	212.4	130	DJF		212.7±2.4	212.6	61
MAM	Middle America	-	-	0	MAM	Tropical Atlantic	-	-	0
JJA		-	-	0	JJA		-	-	0
SON		-	-	0	SON		-	-	0
DJF		-	-	0	DJF		-	-	0
MAM	North Africa	-	-	0	MAM	Tropical Asia	-	-	0
JJA		-	-	0	JJA		-	-	0
SON		-	-	0	SON		-	-	0
DJF		-	-	0	DJF		-	-	0
MAM	South America	-	-	0	MAM	South Africa	-	-	0
JJA		-	-	0	JJA		-	-	0
SON		-	-	0	SON		-	-	0
DJF		-	-	0	DJF		-	-	0

Table S3: Temperature in the UT between 1995 and 2012, averaged over seasons and regions. The numbers correspond to the 1-minute mean data.

Season	Region	Mean±stdev in K	Median in K	Number *1000	Season	Region	Mean±stdev in K	Median in K	Number *1000
MAM	North Canada	217.2±3.1	218.5	1	MAM	Greenland	215.5±3.2	216.1	8
JJA		222.5±1.6	221.9	2	JJA		222.1±1.4	221.9	13
SON		219.6±1.7	219.4	1	SON		219.6±3.1	220.1	15
DJF		210.0±3.2	209.5	1	DJF		212.1±1.9	212.3	22
MAM	Scandinavia	216.3±3.5	217	2	MAM	North Asia	214.6±4.1	214.4	11
JJA		223.8±1.6	223.4	7	JJA		222.3±1.7	222.4	32
SON		219.2±2.8	219.5	7	SON		216.6±3.2	216.8	19
DJF		213.5±1.7	213.6	5	DJF		209.4±2.3	209.3	9
MAM	North America	221.4±1.7	221.3	136	MAM	North Atlantic	217.5±1.9	217.5	229
JJA		226.3±1.3	226.5	263	JJA		222.9±1.5	222.9	399
SON		223.6±2.2	224	190	SON		220.9±2.3	220.7	381
DJF		220.3±1.8	220.4	76	DJF		215.6±1.6	215.5	195
MAM	Europe	219.5±1.6	219.7	246	MAM	Central Asia	220.8±2.9	220.7	168
JJA		226.5±1.9	226.7	419	JJA		230.3±3.9	229.8	333
SON		221.6±2.3	221.3	383	SON		222.8±4.1	221.7	224
DJF		217.6±1.3	217.5	217	DJF		218.8±3.3	218.9	68
MAM	Middle America	229.1±4.6	228.5	6	MAM	Tropical Atlantic	226.0±2.3	225.6	109
JJA		228.2±5.1	227.9	3	JJA		227.6±2.4	228.1	86
SON		227.6±5.8	227.8	3	SON		226.0±2.5	226.2	87
DJF		229.7±4.5	229.2	7	DJF		225.5±2.6	225.9	98
MAM	North Africa	227.3±2.6	227.1	170	MAM	Tropical Asia	229.8±3.5	229.7	113
JJA		229.5±2.9	229.6	180	JJA		238.3±3.2	238.1	136
SON		226.9±2.7	226.3	184	SON		230.7±4.8	229.5	132
DJF		225.6±2.2	224.9	161	DJF		227.9±3.5	227.9	106
MAM	South America	230.2±1.7	229.8	39	MAM	South Africa	228.8±3.2	229.1	106
JJA		228.8±2.9	228.7	33	JJA		227.7±3.1	227.6	100
SON		228.8±2.5	229.2	28	SON		228.2±3.3	227.2	100
DJF		229.6±2.0	229.3	40	DJF		227.1±2.8	228.3	99