

## CALCULATING THE LENGTH OF A MARTIAN SOL (DAY)

**Understanding where Mars is in its orbit.** The solar longitude  $L_s$  is the Mars-Sun angle, measured from the Northern Hemisphere spring equinox where  $L_s=0$ .  $L_s=90$  thus corresponds to summer solstice, just as  $L_s=180$  marks the autumn equinox and  $L_s=270$  the winter solstice (all relative to the northern hemisphere). In trying to understand where Mars is in its orbit, it's important to know that while all Martian months involve a change of 30 degrees, there is a large variation in number of days in each of the 12 months there, and also a large variation in angular speed around the sun

While the slightly greater tilt of the Martian axis was not much of a factor around the equinoxes (Month 1, Sol 1; and Month 7, Sol 373), the tilt does make a significant difference at the solstices (Month 3, Sol 193; and Month 10, Sol 515). Note that aphelion (when Mars is furthest from the sun) and perihelion (when Mars is closest to the sun) does not correspond to the start of any Martian month. The next perihelion for Mars will be on October 28, 2016. On the Martian calendar this is Month 9, Sol 485,  $L_s$  250.7. It will then be 1.38 AU from the sun. The last aphelion for Mars was on November 20, 2015 which on the Martian calendar is Month 3, Sol 151,  $L_s$  70.6. It was 1.67 AU from the sun. The next aphelion will be on October 8, 2017.

**TABLE 1:** The following chart can be used to relate Martian  $L_s$  to hours and minutes of daylight at the latitude (4.59 South) of the Mars Science Laboratory rover Curiosity. The dates of solstices, equinoxes, aphelions, perihelions, record high and low temperatures are color highlighted.

TABLE 1 – DATA SUMMARIZING HOW LENGTH OF DAY LIGHT CORRELATED WITH TEMPERATURES AT MSL						
Note: It generally takes 2 or 3 sols to move through each degree of Solar Longitude						
EVENT	LENGTH OF DAY LIGHT	SOLAR LONGITUDE ( $L_s$ )	HIGH AIR TEMP	HIGH GROUND TEMP	LOW AIR TEMP	LOW GROUND TEMP
Start of Autumn	12 hours 1.401703 min.	0	-12 in Year 1; -12 in Year 2	-4 in Year 1; +1 in Year 2	-75 in Year 1; -63 in Year 2	-78 in Year 1; -65 in Year 2
Coldest Air Temperature in Year 2 (-89)	11 hours 45.02733 min.	70	-23 and -28 in Year 1; -29 and -32 in Year 2	-11 and -10 in Year 1; -10 and -16 in Year 2	-89 in Year 2	-89 in Year 2

<b>Second Coldest Ground Temperature in Year 1 (-100)</b>	<b>11 hours 44.30536 min.</b>	<b>77</b>	<b>-23, -25, and -25 in Year 1; -28 and -24 in Year 2</b>	<b>-6 in Year 1 (3 sols); -5 and +1 in Year 2</b>	<b>-86, -86 and -85 in Year 1; -85 and -84 in Year 2</b>	<b>-99, -98 and -100 in Year 1; -94 (2 sols) in Year 2</b>
<b>Second Coldest Ground Temperature in Year 1 (-100)</b>	<b>11 hours 43.9207 min.</b>	<b>83</b>	<b>-23 and -28 in Year 1; -26 and -23 in Year 2</b>	<b>-11 in Year 1 (2 sols); and -13 (2 sols) in Year 2</b>	<b>-87 (3 sols) in Year 1; -85 and -86 in Year 2</b>	<b>-100 and -99 in Year 1; -89 in Year 2</b>
<b>Coldest Air Temperature in Year 1 (-88)</b>	<b>11 hours 43.8786 min.</b>	<b>84</b>	<b>-22 and -23 in Year 1; -29, -27 and -29 in Year 2</b>	<b>-12 and -10 in Year 1; -14, -12 and -13 in Year 2</b>	<b>-88 and -87 in Year 1; -84 and -85 in Year 2</b>	<b>-99 and -97 in Year 1; -88 (2 sols) Year 2</b>
<b>Coldest Ground Temperature in Year 1 (-101)</b>	<b>11 hours 43.8429 min.</b>	<b>85</b>	<b>-30, and -29 in Year 1; -22 and -23 in Year 2</b>	<b>-7 and -6 in Year 1; -12 and -13 in Year 2</b>	<b>-87 and -86 in Year 1; -87 (2 sols) in Year 2</b>	<b>-98 and -101 in Year 1; -87 in Year 2</b>
<b>Start of Winter/ Shortest Day</b>	<b>11 hours 43.76165 min.</b>	<b>90</b>			<b>-86 in Year 2; -90 in Year 2</b>	<b>-84 in Year 1; -87 in Year 2</b>
<b>Coldest Ground Temperature in Year 2 (-100)</b>	<b>11 hours 44.22578</b>	<b>102</b>	<b>-84</b>	<b>-87</b>	<b>-87</b>	<b>-100 in Year 2</b>
<b>Warmest Ground in Year 2 (+19)</b>	<b>11 hours 59.71926 min</b>	<b>174</b>	<b>+4 in Year 1; -12 in Year 2</b>	<b>+13 in Year 1; +19 in Year 2</b>	<b>-86 in Year 1; -76 in Year 2</b>	<b>-86 in Year 1; -87 in Year 2</b>
<b>Sol Closest to equal day and night hours (around sol 176)</b>	<b>12 hours 0.27924 min.</b>	<b>176</b>	<b>-9 and 0 in Year 1; +6 and +5 in Year 2</b>	<b>+6 and +4 in Year 1; +6 and +11 in Year 2</b>	<b>-75 in Year 1, -76 in Year 2</b>	<b>-84 in Year 1; -74 in Year 2</b>
<b>Start of Spring</b>	<b>12 hours 1.401703 min</b>	<b>180</b>	<b>-9 changed to +5 in Year 1; +2 in Year 2</b>	<b>+10 in Year 1; +14 in Year 2</b>	<b>-72 in Year 1; -73 in Year 2</b>	<b>-77 in Year1; -73 in Year 2</b>
<b>Warmest Air Temperature in Year 1</b>	<b>12 hours 7.526816 min.</b>	<b>202</b>	<b>-1 in Year 1, +11 in Year 2</b>	<b>+15 in Year 1, +14 in Year 2</b>	<b>-74 in Year 1; -70 in Year 2</b>	<b>-81 in Year 1; -73 in Year 2</b>
<b>Start Summer (longest day)</b>	<b>12 hours 19.33862 min.</b>	<b>270</b>	<b>-3 in Year 1; -4 in Year 2</b>	<b>+5 in Year 1; +4 in Year 2</b>	<b>-68 in Year 1; -71 in Year 2</b>	<b>-72 in Year 1; -73 in Year 2</b>

Warmest Air Temperature in Year 1	12 hours 18.15718 min.	289	+4 in Year 1; +1 in Year 2			
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**Table 2 - Selected Temperature (given in Table 1) and calculations for daylight hours for all solar longitudes.**

$\lambda_{sun}$ (0 for spring in northern hemisphere), Fall in south (at MSL)	Max air temp	Max ground temp	Min air temp	Min ground temp	Latitude (phi)	$\delta_{degrees} = \arcsin((\sin(25.19) * \sin(\lambda_{sun}))$	$H = \arccos((\sin(-17) - \sin(lw) * \sin(\delta)) / (\cos(lw) * \cos(\delta)))$	Day Length = $2 * 1.027491 * H / 360$	Daylight In Hours David's Calculation (=E value * 24)	Half Sol in Hours	Difference Half day - Daylight (G-F)	Minutes above or below 12 hours for daylight	Hours plus minutes of daylight
This is Ls													
0 (AUTUMN)	-12 in Year 1; -12 in Year 2	-4 in Year 1; +1 in Year 2	-75 in Year 1; -63 in Year 2	-78 in Year 1; -65 in Year 2	-4.59	0	90.17054697	0.51471903	12.35325673	12.329895	0.023362	1.40170306	12 hr 1.401703 m
1					-4.59	0.425603669	90.13638243	0.51452401	12.34857623	12.329895	0.018681	1.12087298	12 hr 1.120873 m
2					-4.59	0.851101167	90.10223209	0.51432907	12.34389767	12.329895	0.014003	0.8401597	12 hr 0.84016 m
3					-4.59	1.276386306	90.06810071	0.514134238	12.33922172	12.329895	0.009327	0.55960221	12 hr 0.559602 m
4					-4.59	1.701352853	90.03399304	0.513939542	12.33454901	12.329895	0.004654	0.27923957	12 hr 0.27924 m
5					-4.59	2.125894518	89.99991384	0.513745008	12.3298802	12.329895	-1.48E-05	-0.00088898	11 hr 59.99911 m
6					-4.59	2.549904928	89.96586793	0.513550664	12.32521595	12.329895	-0.004679	-0.28074393	11 hr 59.71926 m
7					-4.59	2.973277609	89.93186014	0.513356538	12.32055692	12.329895	-0.009338	-0.56028545	11 hr 59.43971 m
8					-4.59	3.395905971	89.89789539	0.513162658	12.31590379	12.329895	-0.013991	-0.83947332	11 hr 59.16053 m
9					-4.59	3.817683284	89.86397861	0.512969051	12.31125723	12.329895	-0.018638	-1.11826682	11 hr 58.88173 m
10					-4.59	4.23850266	89.83011482	0.512775747	12.30661793	12.329895	-0.023277	-1.39662469	11 hr 58.60338 m

11					-4.59	4.658257039		89.79630913		0.512582775	12.3019866	12.329895	-0.027908	-1.67450502	11 hr	58.32549	m
12					-4.59	5.076839171		89.76256672		0.512390164	12.29736393	12.329895	-0.032531	-1.95186522	11 hr	58.04813	m
<b>13 Lowest pressure Year 1 (732 Pa)</b>					-4.59	5.494141598		89.72889286		0.512197944	12.29275065	12.329895	-0.037144	-2.22866191	11 hr	57.77134	m
14					-4.59	5.910056641		89.69529294		0.512006146	12.2881475	12.329895	-0.041748	-2.50485086	11 hr	57.49515	m
15					-4.59	6.324476385		89.66177244		0.511814801	12.28355523	12.329895	-0.04634	-2.78038691	11 hr	57.21961	m
16					-4.59	6.737292666		89.62833699		0.511623942	12.27897461	12.329895	-0.05092	-3.05522391	11 hr	56.94478	m
17					-4.59	7.148397059		89.59499233		0.511433601	12.27440643	12.329895	-0.055489	-3.32931467	11 hr	56.67069	m
18					-4.59	7.557680868		89.56174433		0.511243812	12.2698515	12.329895	-0.060044	-3.60261083	11 hr	56.39739	m
19					-4.59	7.965035114		89.52859902		0.51105461	12.26531063	12.329895	-0.064584	-3.87506286	11 hr	56.12494	m
20					-4.59	8.370350533		89.49556259		0.510866028	12.26078468	12.329895	-0.06911	-4.14661995	11 hr	55.85338	m
21					-4.59	8.773517562		89.46264138		0.510678105	12.25627451	12.329895	-0.07362	-4.41722994	11 hr	55.58277	m
22					-4.59	9.17442634		89.42984189		0.510490876	12.25178102	12.329895	-0.078114	-4.68683933	11 hr	55.31316	m
23					-4.59	9.572966702		89.39717083		0.51030438	12.24730513	12.329895	-0.08259	-4.95539311	11 hr	55.04461	m
24					-4.59	9.969028179		89.36463506		0.510118657	12.24284777	12.329895	-0.087047	-5.22283479	11 hr	54.77717	m
25					-4.59	10.3625		89.33224165		0.509933746	12.23840991	12.329895	-0.091485	-5.48910631	11 hr	54.51089	m
26					-4.59	10.75327109		89.29999786		0.509749689	12.23399255	12.329895	-0.095902	-5.75414796	11 hr	54.24585	m
27					-4.59	11.14123007		89.26791115		0.509566529	12.22959671	12.329895	-0.100298	-6.01789839	11 hr	53.9821	m
28					-4.59	11.52626529		89.2359892		0.50938431	12.22522344	12.329895	-0.104672	-6.2802945	11 hr	53.71971	m
29					-4.59	11.90826481		89.20423991		0.509203076	12.22087382	12.329895	-0.109021	-6.54127143	11 hr	53.45873	m
30					-4.59	12.28711642		89.17267137		0.509022874	12.21654897	12.329895	-0.113346	-6.80076253	11 hr	53.19924	m

31	-4.59	12.66270765	89.14129193	0.508843751	12.21225002	12.329895	-0.117645	-7.05869928	11 hr	52.9413	m
32	-4.59	13.0349258	89.11011015	0.508665757	12.20797816	12.329895	-0.121917	-7.31501128	11 hr	52.68499	m
33	-4.59	13.40365796	89.07913482	0.508488941	12.20373458	12.329895	-0.12616	-7.56962624	11 hr	52.43037	m
34	-4.59	13.76879101	89.04837498	0.508313355	12.19952051	12.329895	-0.130374	-7.82246991	11 hr	52.17753	m
35	-4.59	14.13021166	89.0178399	0.508139052	12.19533724	12.329895	-0.134558	-8.07346609	11 hr	51.92653	m
36	-4.59	14.48780649	88.98753908	0.507966086	12.19118607	12.329895	-0.138709	-8.32253663	11 hr	51.67746	m
37	-4.59	14.84146195	88.95748228	0.507794513	12.18706832	12.329895	-0.142827	-8.56960138	11 hr	51.4304	m
38	-4.59	15.19106443	88.92767948	0.507624391	12.18298538	12.329895	-0.14691	-8.81457822	11 hr	51.18542	m
39	-4.59	15.53650028	88.89814092	0.507455776	12.17893863	12.329895	-0.150956	-9.05738304	11 hr	50.94262	m
40	-4.59	15.87765582	88.86887707	0.50728873	12.17492952	12.329895	-0.154965	-9.29792978	11 hr	50.70207	m
41	-4.59	16.21441747	88.83989864	0.507123313	12.17095951	12.329895	-0.158936	-9.5361304	11 hr	50.46387	m
42	-4.59	16.54667169	88.81121657	0.506959587	12.1670301	12.329895	-0.162865	-9.77189496	11 hr	50.22811	m
43	-4.59	16.87430512	88.78284203	0.506797617	12.16314282	12.329895	-0.166752	-10.0051316	11 hr	49.99487	m
44	-4.59	17.19720459	88.75478643	0.506637468	12.15929924	12.329895	-0.170596	-10.2357466	11 hr	49.76425	m
45	-4.59	17.51525716	88.72706138	0.506479206	12.15550094	12.329895	-0.174394	-10.4636445	11 hr	49.53636	m
46	-4.59	17.82835026	88.69967872	0.506322898	12.15174955	12.329895	-0.178145	-10.688728	11 hr	49.31127	m
47	-4.59	18.13637166	88.67265049	0.506168613	12.14804671	12.329895	-0.181848	-10.9108982	11 hr	49.0891	m
48	-4.59	18.43920959	88.64598892	0.506016421	12.14439411	12.329895	-0.185501	-11.1300544	11 hr	48.86995	m
49	-4.59	18.73675284	88.61970643	0.505866393	12.14079344	12.329895	-0.189102	-11.3460945	11 hr	48.65391	m
50	-4.59	19.02889074	88.59381562	0.505718601	12.13724643	12.329895	-0.192649	-11.5589151	11 hr	48.44108	m

51	-4.59	19.31551336	88.56832925	0.505573118	12.13375483	12.329895	-0.19614	-11.7684112	11 hr	48.23159	m
52	-4.59	19.59651149	88.54326023	0.505430017	12.1303204	12.329895	-0.199575	-11.9744768	11 hr	48.02552	m
53	-4.59	19.87177679	88.5186216	0.505289372	12.12694494	12.329895	-0.20295	-12.1770045	11 hr	47.823	m
54	-4.59	20.14120185	88.49442652	0.50515126	12.12363024	12.329895	-0.206265	-12.3758864	11 hr	47.62411	m
55	-4.59	20.4046803	88.47068824	0.505015755	12.12037812	12.329895	-0.209517	-12.5710133	11 hr	47.42899	m
56	-4.59	20.66210688	88.44742013	0.504882934	12.11719042	12.329895	-0.212705	-12.7622755	11 hr	47.23772	m
57	-4.59	20.91337758	88.42463557	0.504752873	12.11406896	12.329895	-0.215826	-12.949563	11 hr	47.05044	m
58	-4.59	21.15838967	88.40234802	0.50462565	12.1110156	12.329895	-0.218879	-13.132765	11 hr	46.86723	m
59	-4.59	21.3970419	88.38057095	0.50450134	12.10803216	12.329895	-0.221863	-13.311771	11 hr	46.68823	m
60	-4.59	21.62923453	88.35931782	0.504380021	12.10512051	12.329895	-0.224775	-13.4864701	11 hr	46.51353	m
61	-4.59	21.85486944	88.33860208	0.50426177	12.10228248	12.329895	-0.227613	-13.656752	11 hr	46.34325	m
62	-4.59	22.07385031	88.31843711	0.504146663	12.0995199	12.329895	-0.230375	-13.8225067	11 hr	46.17749	m
63	-4.59	22.28608263	88.29883622	0.504034775	12.0968346	12.329895	-0.23306	-13.9836246	11 hr	46.01638	m
64	-4.59	22.4914739	88.27981262	0.503926183	12.09422839	12.329895	-0.235667	-14.1399972	11 hr	45.86	m
65	-4.59	22.6899337	88.26137938	0.503820961	12.09170306	12.329895	-0.238192	-14.2915171	11 hr	45.70848	m
66	-4.59	22.8813738	88.24354941	0.503719182	12.08926038	12.329895	-0.240635	-14.4380781	11 hr	45.56192	m
67	-4.59	23.0657083	88.22633545	0.50362092	12.08690209	12.329895	-0.242993	-14.5795756	11 hr	45.42042	m
68	-4.59	23.24285371	88.20975	0.503526246	12.0846299	12.329895	-0.245265	-14.7159068	11 hr	45.28409	m
69	-4.59	23.4127291	88.19380533	0.503435229	12.0824455	12.329895	-0.24745	-14.8469709	11 hr	45.15303	m

<b>70 COLDEST AIR TEMP YEAR 2</b>	<b>-23 and -28 in Year 1; -</b>	<b>-11 and -10 in Year</b>	<b>-89 Year 2</b>	<b>-89 Year 2</b>	-4.59	23.57525619	88.1785134	0.503347938	12.08035052	12.329895	-0.249544	-14.9726694	<b>11 hr</b>	<b>45.02733</b>	<b>m</b>
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	29 and -32 in Year 2	1; -10 and -16 in Year 2															
71					-4.59	23.73035947	88.16388591	0.503264441	12.07834657	12.329895	-0.251548	-15.0929064	11 hr	44.90709	m		
72					-4.59	23.8779663	88.14993419	0.5031848	12.0764352	12.329895	-0.25346	-15.2075885	11 hr	44.79241	m		
73					-4.59	24.01800702	88.1366692	0.50310908	12.07461792	12.329895	-0.255277	-15.3166257	11 hr	44.68337	m		
74					-4.59	24.15041507	88.12410154	0.50303734	12.07289616	12.329895	-0.256999	-15.419931	11 hr	44.58007	m		
75					-4.59	24.27512709	88.11224135	0.502969639	12.07127133	12.329895	-0.258624	-15.5174209	11 hr	44.48258	m		
76					-4.59	24.39208299	88.10109833	0.502906031	12.06974475	12.329895	-0.26015	-15.6090158	11 hr	44.39098	m		
77 SECOND COLDEST GROUND TEMP YEAR 1 (-100)	-23, -25, and -25 in Year 1; -28 and -24 in Year 2	-6 in Year 1 (3 sols); -5 and +1 in Year 2	-86, -86 and -85 in Year 1; -85 and -84 in Year 2	99, -98 and -100 in Year 1; -94 (2 sols) in Year 2	-4.59	24.50122608	88.09068169	0.50284657	12.06831768	12.329895	-0.261577	-15.6946397	11 hr	44.30536	m		
78					-4.59	24.60250317	88.08100016	0.502791305	12.06699132	12.329895	-0.262904	-15.7742213	11 hr	44.22578	m		
79					-4.59	24.69586459	88.07206189	0.502740283	12.06576679	12.329895	-0.264128	-15.8476932	11 hr	44.15231	m		
80					-4.59	24.78126436	88.06387452	0.502693547	12.06464513	12.329895	-0.26525	-15.9149928	11 hr	44.08501	m		
81					-4.59	24.85866022	88.05644508	0.502651138	12.06362731	12.329895	-0.266268	-15.9760623	11 hr	44.02394	m		
82					-4.59	24.92801369	88.04978001	0.502613092	12.0627142	12.329895	-0.267181	-16.0308487	11 hr	43.96915	m		
83 SECOND COLDEST GROUND TEMP YEAR 1 (-100)	-23 and -28 in Year 1; -26 and -23 in Year 2	-11 in Year 1 (2 sols); and -13 (2 sols)	-87 (3 sols) in Year 1; -85 and -86	-100 and -99 in Year 1; -89	-4.59	24.98929018	88.04388513	0.502579442	12.06190661	12.329895	-0.267988	-16.0793042	11 hr	43.9207	m		

		in Year 2	in Year 2	in Year 2												
84 COLDEST AIR TEMP YEAR 1 (-88)	-22 and -23 in Year 1; -29, -27 and -29 in Year 2	-12 and -10 in Year 1; -14; -12 and -13 in Year 2	-88 and -87 in Year 1; -84 and -85 in Year 2	-99 and -97 in Year 1; -88 (2 sols) in Year 2	-4.59	25.04245901	88.03876561	0.502550218	12.06120524	12.329895	-0.26869	-16.1213862	11 hr	43.87861	m	
85 COLDEST GOUND TEMP YEAR 1 (-101)	-30, and -29 in Year 1; -22 and -23 in Year 2	-30, and -29 in Year 1; -22 and -23 in Year 2	-87 and -86 in Year 1; -87 (2 sols) in Year 2	-98 and -101 in Year 1; -87 in Year 2	-4.59	25.08749348	88.03442597	0.502525447	12.06061072	12.329895	-0.269284	-16.1570578	11 hr	43.84294	m	
86					-4.59	25.12437093	88.03087006	0.502505148	12.06012356	12.329895	-0.269771	-16.1862871	11 hr	43.81371	m	
87					-4.59	25.15307274	88.02810106	0.502489342	12.05974421	12.329895	-0.270151	-16.2090481	11 hr	43.79095	m	
88					-4.59	25.17358442	88.02612142	0.502478042	12.059473	12.329895	-0.270422	-16.2253206	11 hr	43.77468	m	
89					-4.59	25.18589559	88.02493293	0.502471258	12.05931018	12.329895	-0.270585	-16.2350899	11 hr	43.76491	m	
90 (WINTER, SHORTEST DAY)	-27 in Year 1; -27 in Year 2	-16 in Year 1; -12 in Year 2	-86 in Year 1; -90 in Year 2	-84 in Year 1; -87 in Year 2	-4.59	25.19	88.02453664	0.502468995	12.05925589	12.329895	-0.270639	-16.2383473	11 hr	43.76165	m	
91					-4.59	25.18589559	88.02493293	0.502471258	12.05931018	12.329895	-0.270585	-16.2350899	11 hr	43.76491	m	
92					-4.59	25.17358442	88.02612142	0.502478042	12.059473	12.329895	-0.270422	-16.2253206	11 hr	43.77468	m	
93					-4.59	25.15307274	88.02810106	0.502489342	12.05974421	12.329895	-0.270151	-16.2090481	11 hr	43.79095	m	
94					-4.59	25.12437093	88.03087006	0.502505148	12.06012356	12.329895	-0.269771	-16.1862871	11 hr	43.81371	m	
95					-4.59	25.08749348	88.03442597	0.502525447	12.06061072	12.329895	-0.269284	-16.1570578	11 hr	43.84294	m	
96					-4.59	25.04245901	88.03876561	0.502550218	12.06120524	12.329895	-0.26869	-16.1213862	11 hr	43.87861	m	



97					-4.59	24.98929018		88.04388513		0.502579442	12.06190661	12.329895	-0.267988	-16.0793042	11 hr	43.9207	m
98					-4.59	24.92801369		88.04978001		0.502613092	12.0627142	12.329895	-0.267181	-16.0308487	11 hr	43.96915	m
99					-4.59	24.85866022		88.05644508		0.502651138	12.06362731	12.329895	-0.266268	-15.9760623	11 hr	44.02394	m
100					-4.59	24.78126436		88.06387452		0.502693547	12.06464513	12.329895	-0.26525	-15.9149928	11 hr	44.08501	m
101					-4.59	24.69586459		88.07206189		0.502740283	12.06576679	12.329895	-0.264128	-15.8476932	11 hr	44.15231	m
<b>102 COLDEST GROUND TEMP YEAR 2</b>	<b>-84</b>	<b>-87</b>	<b>-87</b>	<b>-100 Year 2</b>	-4.59	24.60250317		88.08100016		0.502791305	12.06699132	12.329895	-0.262904	-15.7742213	11 hr	44.22578	m
103					-4.59	24.50122608		88.09068169		0.50284657	12.06831768	12.329895	-0.261577	-15.6946397	11 hr	44.30536	m
104					-4.59	24.39208299		88.10109833		0.502906031	12.06974475	12.329895	-0.26015	-15.6090158	11 hr	44.39098	m
105					-4.59	24.27512709		88.11224135		0.502969639	12.07127133	12.329895	-0.258624	-15.5174209	11 hr	44.48258	m
106					-4.59	24.15041507		88.12410154		0.50303734	12.07289616	12.329895	-0.256999	-15.419931	11 hr	44.58007	m
107					-4.59	24.01800702		88.1366692		0.50310908	12.07461792	12.329895	-0.255277	-15.3166257	11 hr	44.68337	m
108					-4.59	23.8779663		88.14993419		0.5031848	12.0764352	12.329895	-0.25346	-15.2075885	11 hr	44.79241	m
109					-4.59	23.73035947		88.16388591		0.503264441	12.07834657	12.329895	-0.251548	-15.0929064	11 hr	44.90709	m
110					-4.59	23.57525619		88.1785134		0.503347938	12.08035052	12.329895	-0.249544	-14.9726694	11 hr	45.02733	m
111					-4.59	23.4127291		88.19380533		0.503435229	12.0824455	12.329895	-0.24745	-14.8469709	11 hr	45.15303	m
112					-4.59	23.24285371		88.20975		0.503526246	12.0846299	12.329895	-0.245265	-14.7159068	11 hr	45.28409	m
113					-4.59	23.0657083		88.22633545		0.50362092	12.08690209	12.329895	-0.242993	-14.5795756	11 hr	45.42042	m
114					-4.59	22.8813738		88.24354941		0.503719182	12.08926038	12.329895	-0.240635	-14.4380781	11 hr	45.56192	m
115					-4.59	22.6899337		88.26137938		0.503820961	12.09170306	12.329895	-0.238192	-14.2915171	11 hr	45.70848	m
116					-4.59	22.4914739		88.27981262		0.503926183	12.09422839	12.329895	-0.235667	-14.1399972	11 hr	45.86	m

117	-4.59	22.28608263	88.29883622	0.504034775	12.0968346	12.329895	-0.23306	-13.9836246	11 hr	46.01638	m
118	-4.59	22.07385031	88.31843711	0.504146663	12.0995199	12.329895	-0.230375	-13.8225067	11 hr	46.17749	m
119	-4.59	21.85486944	88.33860208	0.50426177	12.10228248	12.329895	-0.227613	-13.656752	11 hr	46.34325	m
120	-4.59	21.62923453	88.35931782	0.504380021	12.10512051	12.329895	-0.224775	-13.4864701	11 hr	46.51353	m
121	-4.59	21.3970419	88.38057095	0.50450134	12.10803216	12.329895	-0.221863	-13.311771	11 hr	46.68823	m
122	-4.59	21.15838967	88.40234802	0.50462565	12.1110156	12.329895	-0.218879	-13.132765	11 hr	46.86723	m
123	-4.59	20.91337758	88.42463557	0.504752873	12.11406896	12.329895	-0.215826	-12.949563	11 hr	47.05044	m
124	-4.59	20.66210688	88.44742013	0.504882934	12.11719042	12.329895	-0.212705	-12.7622755	11 hr	47.23772	m
125	-4.59	20.4046803	88.47068824	0.505015755	12.12037812	12.329895	-0.209517	-12.5710133	11 hr	47.42899	m
126	-4.59	20.14120185	88.49442652	0.50515126	12.12363024	12.329895	-0.206265	-12.3758864	11 hr	47.62411	m
127	-4.59	19.87177679	88.5186216	0.505289372	12.12694494	12.329895	-0.20295	-12.1770045	11 hr	47.823	m
128	-4.59	19.59651149	88.54326023	0.505430017	12.1303204	12.329895	-0.199575	-11.9744768	11 hr	48.02552	m
129	-4.59	19.31551336	88.56832925	0.505573118	12.13375483	12.329895	-0.19614	-11.7684112	11 hr	48.23159	m
130	-4.59	19.02889074	88.59381562	0.505718601	12.13724643	12.329895	-0.192649	-11.5589151	11 hr	48.44108	m
131	-4.59	18.73675284	88.61970643	0.505866393	12.14079344	12.329895	-0.189102	-11.3460945	11 hr	48.65391	m
132	-4.59	18.43920959	88.64598892	0.506016421	12.14439411	12.329895	-0.185501	-11.1300544	11 hr	48.86995	m
133	-4.59	18.13637166	88.67265049	0.506168613	12.14804671	12.329895	-0.181848	-10.9108982	11 hr	49.0891	m
134	-4.59	17.82835026	88.69967872	0.506322898	12.15174955	12.329895	-0.178145	-10.688728	11 hr	49.31127	m
135	-4.59	17.51525716	88.72706138	0.506479206	12.15550094	12.329895	-0.174394	-10.4636445	11 hr	49.53636	m
136	-4.59	17.19720459	88.75478643	0.506637468	12.15929924	12.329895	-0.170596	-10.2357466	11 hr	49.76425	m

137					-4.59	16.87430512	88.78284203	0.506797617	12.16314282	12.329895	-0.166752	-10.0051316	11 hr	49.99487	m
138					-4.59	16.54667169	88.81121657	0.506959587	12.1670301	12.329895	-0.162865	-9.77189496	11 hr	50.22811	m
139					-4.59	16.21441747	88.83989864	0.507123313	12.17095951	12.329895	-0.158936	-9.5361304	11 hr	50.46387	m
140					-4.59	15.87765582	88.86887707	0.50728873	12.17492952	12.329895	-0.154965	-9.29792978	11 hr	50.70207	m
141					-4.59	15.53650028	88.89814092	0.507455776	12.17893863	12.329895	-0.150956	-9.05738304	11 hr	50.94262	m
142					-4.59	15.19106443	88.92767948	0.507624391	12.18298538	12.329895	-0.14691	-8.81457822	11 hr	51.18542	m
143					-4.59	14.84146195	88.95748228	0.507794513	12.18706832	12.329895	-0.142827	-8.56960138	11 hr	51.4304	m
144					-4.59	14.48780649	88.98753908	0.507966086	12.19118607	12.329895	-0.138709	-8.32253663	11 hr	51.67746	m
145					-4.59	14.13021166	89.0178399	0.508139052	12.19533724	12.329895	-0.134558	-8.07346609	11 hr	51.92653	m
146					-4.59	13.76879101	89.04837498	0.508313355	12.19952051	12.329895	-0.130374	-7.82246991	11 hr	52.17753	m
147	Lowest pressure Year 1 (732 Pa)				-4.59	13.40365796	89.07913482	0.508488941	12.20373458	12.329895	-0.12616	-7.56962624	11 hr	52.43037	m
148	Lowest pressure year 2 (732 Pa)				-4.59	13.0349258	89.11011015	0.508665757	12.20797816	12.329895	-0.121917	-7.31501128	11 hr	52.68499	m
149	Lowest pressure year 2 (732 Pa)				-4.59	12.66270765	89.14129193	0.508843751	12.21225002	12.329895	-0.117645	-7.05869928	11 hr	52.9413	m
150					-4.59	12.28711642	89.17267137	0.509022874	12.21654897	12.329895	-0.113346	-6.80076253	11 hr	53.19924	m
151					-4.59	11.90826481	89.20423991	0.509203076	12.22087382	12.329895	-0.109021	-6.54127143	11 hr	53.45873	m
152					-4.59	11.52626529	89.2359892	0.50938431	12.22522344	12.329895	-0.104672	-6.2802945	11 hr	53.71971	m
153					-4.59	11.14123007	89.26791115	0.509566529	12.22959671	12.329895	-0.100298	-6.01789839	11 hr	53.9821	m
154					-4.59	10.75327109	89.29999786	0.509749689	12.23399255	12.329895	-0.095902	-5.75414796	11 hr	54.24585	m
155					-4.59	10.3625	89.33224165	0.509933746	12.23840991	12.329895	-0.091485	-5.48910631	11 hr	54.51089	m
156					-4.59	9.969028179	89.36463506	0.510118657	12.24284777	12.329895	-0.087047	-5.22283479	11 hr	54.77717	m

157					-4.59	9.572966702		89.39717083		0.51030438	12.24730513	12.329895	-0.08259	-4.95539311	11 hr	55.04461	m
158					-4.59	9.17442634		89.42984189		0.510490876	12.25178102	12.329895	-0.078114	-4.68683933	11 hr	55.31316	m
159					-4.59	8.773517562		89.46264138		0.510678105	12.25627451	12.329895	-0.07362	-4.41722994	11 hr	55.58277	m
160					-4.59	8.370350533		89.49556259		0.510866028	12.26078468	12.329895	-0.06911	-4.14661995	11 hr	55.85338	m
161					-4.59	7.965035114		89.52859902		0.51105461	12.26531063	12.329895	-0.064584	-3.87506286	11 hr	56.12494	m
162					-4.59	7.557680868		89.56174433		0.511243812	12.2698515	12.329895	-0.060044	-3.60261083	11 hr	56.39739	m
163					-4.59	7.148397059		89.59499233		0.511433601	12.27440643	12.329895	-0.055489	-3.32931467	11 hr	56.67069	m
164					-4.59	6.737292666		89.62833699		0.511623942	12.27897461	12.329895	-0.05092	-3.05522391	11 hr	56.94478	m
165					-4.59	6.324476385		89.66177244		0.511814801	12.28355523	12.329895	-0.04634	-2.78038691	11 hr	57.21961	m
166					-4.59	5.910056641		89.69529294		0.512006146	12.2881475	12.329895	-0.041748	-2.50485086	11 hr	57.49515	m
167					-4.59	5.494141598		89.72889286		0.512197944	12.29275065	12.329895	-0.037144	-2.22866191	11 hr	57.77134	m
168					-4.59	5.076839171		89.76256672		0.512390164	12.29736393	12.329895	-0.032531	-1.95186522	11 hr	58.04813	m
169					-4.59	4.658257039		89.79630913		0.512582775	12.3019866	12.329895	-0.027908	-1.67450502	11 hr	58.32549	m
170					-4.59	4.23850266		89.83011482		0.512775747	12.30661793	12.329895	-0.023277	-1.39662469	11 hr	58.60338	m
171					-4.59	3.817683284		89.86397861		0.512969051	12.31125723	12.329895	-0.018638	-1.11826682	11 hr	58.88173	m
172					-4.59	3.395905971		89.89789539		0.513162658	12.31590379	12.329895	-0.013991	-0.83947332	11 hr	59.16053	m
173					-4.59	2.973277609		89.93186014		0.513356538	12.32055692	12.329895	-0.009338	-0.56028545	11 hr	59.43971	m
<b>174 (WARMEST GROUND TEMP IN YEAR 2)</b>	<b>+4 in Year 1, -12 in Year 2</b>	<b>+13 in Year 1, +19 in Year 2</b>	<b>-75 in Year 1, -76 in Year 2</b>	<b>-86 in Year 1, -87 in Year 2</b>	-4.59	2.549904928		89.96586793		0.513550664	12.32521595	12.329895	-0.004679	-0.28074393	11 hr	<b>59.71926</b>	m
175					-4.59	2.125894518		89.99991384		0.513745008	12.3298802	12.329895	-1.48E-05	-0.00088898	11 hr	59.99911	m

176 (data for 2 sols around Ls 176)	-9 and 0 in Year 1, +6 and +5 in Year 2	+6 and +4 in Year 1, +6 and +11 in Year 2.	-75 in Year 1, -76 in Year 2	-84 in Year 1, -74 in Year 2	-4.59	1.701352853	90.03399304	0.513939542	12.33454901	12.329895	0.004654	0.27923957	12 hr	0.27924	m
177					-4.59	1.276386306	90.06810071	0.514134238	12.33922172	12.329895	0.009327	0.55960221	12 hr	0.559602	m
178					-4.59	0.851101167	90.10223209	0.51432907	12.34389767	12.329895	0.014003	0.8401597	12 hr	0.84016	m
179					-4.59	0.425603669	90.13638243	0.51452401	12.34857623	12.329895	0.018681	1.12087298	12 hr	1.120873	m
180 (SPRING)	-9 changed to +5 in Year 1; +2 in Year 2	+10 in Year 1; +14 in Year 2	-72 in Year 1, -73 in Year 2	-77 in Year 1; -81 in Year 2	-4.59	2.98768E-15	90.17054697	0.51471903	12.35325673	12.329895	0.023362	1.40170306	12 hr	1.401703	m
181					-4.59	-0.425603669	90.20472098	0.514914105	12.35793853	12.329895	0.028044	1.68261099	12 hr	1.682611	m
182					-4.59	-0.851101167	90.23889972	0.515109207	12.36262098	12.329895	0.032726	1.96355777	12 hr	1.963558	m
183					-4.59	-1.276386306	90.27307843	0.515304309	12.36730342	12.329895	0.037408	2.24450426	12 hr	2.244504	m
184					-4.59	-1.701352853	90.30725231	0.515499383	12.3719852	12.329895	0.04209	2.52541109	12 hr	2.525411	m
185					-4.59	-2.125894518	90.34141654	0.515694402	12.37666566	12.329895	0.046771	2.80623864	12 hr	2.806239	m
186					-4.59	-2.549904928	90.37556626	0.515889339	12.38134413	12.329895	0.051449	3.0869469	12 hr	3.086947	m
187					-4.59	-2.973277609	90.40969655	0.516084164	12.38601994	12.329895	0.056125	3.36749541	12 hr	3.367495	m
188					-4.59	-3.395905971	90.44380242	0.51627885	12.3906924	12.329895	0.060797	3.64784323	12 hr	3.647843	m
189					-4.59	-3.817683284	90.47787882	0.516473368	12.39536083	12.329895	0.065466	3.92794877	12 hr	3.927949	m
190					-4.59	-4.23850266	90.51192061	0.516667688	12.40002451	12.329895	0.070129	4.20776983	12 hr	4.20777	m
191					-4.59	-4.658257039	90.54592256	0.516861781	12.40468274	12.329895	0.074788	4.4872634	12 hr	4.487263	m

192					-4.59	-5.076839171	90.57987934	0.517055616	12.40933477	12.329895	0.07944	4.7663857	12 hr	4.766386	m
193					-4.59	-5.494141598	90.61378552	0.517249162	12.41397988	12.329895	0.084085	5.04509203	12 hr	5.045092	m
194					-4.59	-5.910056641	90.64763553	0.517442387	12.41861729	12.329895	0.088722	5.3233367	12 hr	5.323337	m
195					-4.59	-6.324476385	90.6814237	0.51763526	12.42324623	12.329895	0.093351	5.60107301	12 hr	5.601073	m
196					-4.59	-6.737292666	90.7151442	0.517827746	12.4278659	12.329895	0.097971	5.87825312	12 hr	5.878253	m
197					-4.59	-7.148397059	90.74879108	0.518019812	12.43247548	12.329895	0.10258	6.15482801	12 hr	6.154828	m
198					-4.59	-7.557680868	90.78235821	0.518211422	12.43707414	12.329895	0.107179	6.43074738	12 hr	6.430747	m
199					-4.59	-7.965035114	90.81583931	0.518402542	12.44166101	12.329895	0.111766	6.70595964	12 hr	6.70596	m
200					-4.59	-8.370350533	90.84922794	0.518593134	12.44623521	12.329895	0.11634	6.98041177	12 hr	6.980412	m
201					-4.59	-8.773517562	90.88251747	0.51878316	12.45079583	12.329895	0.120901	7.2540493	12 hr	7.254049	m
<b>202 (WARMEST AIR TEMP IN YEAR 1)</b>	<b>-1 in Year 1, +11 in Year 2</b>	<b>+15 in Year 1, +14 in Year 2</b>	<b>-74 in Year 1, -70 in Year 2</b>	<b>-81 in Year 1, -73 in Year 2</b>	-4.59	-9.17442634	90.91570108	0.518972581	12.45534195	12.329895	0.125447	7.52681622	12 hr	<b>7.526816</b>	m
203					-4.59	-9.572966702	90.94877178	0.519161358	12.45987259	12.329895	0.129978	7.79865495	12 hr	7.798655	m
204					-4.59	-9.969028179	90.98172234	0.519349449	12.46438678	12.329895	0.134492	8.06950623	12 hr	8.069506	m
205					-4.59	-10.3625	91.01454537	0.519536812	12.4688835	12.329895	0.138988	8.33930913	12 hr	8.339309	m
206					-4.59	-10.75327109	91.04723322	0.519723404	12.47336169	12.329895	0.143467	8.60800091	12 hr	8.608001	m
207					-4.59	-11.14123007	91.07977805	0.519909179	12.4778203	12.329895	0.147925	8.87551704	12 hr	8.875517	m
208					-4.59	-11.52626529	91.11217177	0.520094092	12.4822582	12.329895	0.152363	9.14179113	12 hr	9.141791	m
209					-4.59	-11.90826481	91.14440608	0.520278094	12.48667426	12.329895	0.156779	9.40675484	12 hr	9.406755	m
210					-4.59	-12.28711642	91.17647243	0.520461138	12.49106731	12.329895	0.161172	9.67033791	12 hr	9.670338	m

211					-4.59	-12.66270765	91.20836202	0.520643173	12.49543615	12.329895	0.165541	9.93246807	12 hr	9.932468	m
212					-4.59	-13.0349258	91.24006582	0.520824147	12.49977953	12.329895	0.169885	10.193071	12 hr	10.19307	m
213					-4.59	-13.40365796	91.27157453	0.521004008	12.50409619	12.329895	0.174201	10.4520704	12 hr	10.45207	m
214					-4.59	-13.76879101	91.30287862	0.5211827	12.50838481	12.329895	0.17849	10.7093877	12 hr	10.70939	m
215					-4.59	-14.13021166	91.33396827	0.521360169	12.51264405	12.329895	0.182749	10.9649424	12 hr	10.96494	m
216					-4.59	-14.48780649	91.36483344	0.521536356	12.51687254	12.329895	0.186978	11.2186518	12 hr	11.21865	m
217					-4.59	-14.84146195	91.3954638	0.521711203	12.52106887	12.329895	0.191174	11.4704312	12 hr	11.47043	m
218					-4.59	-15.19106443	91.42584877	0.521884649	12.52523157	12.329895	0.195337	11.7201935	12 hr	11.72019	m
<b>219 Highest Ground Temp in Year 1</b>	<b>-6 in Year 1; -5 in Year 2</b>	<b>+19 in Year 1, +5 in Year 2</b>	<b>-66 in Year 1, -68 in Year 2</b>	<b>-78 in Year 1, -70 in Year 2</b>	-4.59	-15.53650028	91.45597753	0.522056632	12.52935917	12.329895	0.199464	11.9678497	12 hr	11.96785	m
220					-4.59	-15.87765582	91.48583897	0.52222709	12.53345016	12.329895	0.203555	12.2133086	12 hr	12.21331	m
221					-4.59	-16.21441747	91.51542175	0.522395957	12.53750296	12.329895	0.207608	12.456477	12 hr	12.45648	m
222					-4.59	-16.54667169	91.54471427	0.522563167	12.541516	12.329895	0.211621	12.6972593	12 hr	12.69726	m
223					-4.59	-16.87430512	91.57370467	0.522728652	12.54548765	12.329895	0.215593	12.9355583	12 hr	12.93556	m
224					-4.59	-17.19720459	91.60238085	0.522892344	12.54941625	12.329895	0.219521	13.1712745	12 hr	13.17127	m
225					-4.59	-17.51525716	91.6307305	0.523054172	12.55330012	12.329895	0.223405	13.4043066	12 hr	13.40431	m
226					-4.59	-17.82835026	91.65874105	0.523214064	12.55713753	12.329895	0.227243	13.6345513	12 hr	13.63455	m
227					-4.59	-18.13637166	91.68639972	0.523371947	12.56092674	12.329895	0.231032	13.8619035	12 hr	13.8619	m
228					-4.59	-18.43920959	91.71369352	0.523527748	12.56466596	12.329895	0.234771	14.0862566	12 hr	14.08626	m
229					-4.59	-18.73675284	91.74060925	0.523681391	12.56835338	12.329895	0.238458	14.3075019	12 hr	14.3075	m

230	-4.59	-19.02889074	91.76713353	0.523832799	12.57198717	12.329895	0.242092	14.5255296	12 hr	14.52553	m
231	-4.59	-19.31551336	91.79325281	0.523981895	12.57556548	12.329895	0.24567	14.7402282	12 hr	14.74023	m
232	-4.59	-19.59651149	91.81895336	0.524128601	12.57908643	12.329895	0.249191	14.9514849	12 hr	14.95148	m
233	-4.59	-19.87177679	91.84422133	0.524272838	12.58254811	12.329895	0.252653	15.1591858	12 hr	15.15919	m
234	-4.59	-20.14120185	91.86904273	0.524414525	12.58594861	12.329895	0.256054	15.3632159	12 hr	15.36322	m
235	-4.59	-20.4046803	91.89340345	0.524553583	12.589286	12.329895	0.259391	15.5634593	12 hr	15.56346	m
236	-4.59	-20.66210688	91.91728931	0.524689931	12.59255833	12.329895	0.262663	15.7597993	12 hr	15.7598	m
237	-4.59	-20.91337758	91.94068604	0.524823486	12.59576366	12.329895	0.265869	15.9521188	12 hr	15.95212	m
238	-4.59	-21.15838967	91.96357934	0.524954167	12.59890001	12.329895	0.269005	16.1403001	12 hr	16.1403	m
239	-4.59	-21.3970419	91.98595489	0.525081893	12.60196544	12.329895	0.27207	16.3242254	12 hr	16.32423	m
240	-4.59	-21.62923453	92.00779835	0.525206582	12.60495796	12.329895	0.275063	16.5037771	12 hr	16.50378	m
241	-4.59	-21.85486944	92.02909542	0.525328152	12.60787564	12.329895	0.277981	16.6788375	12 hr	16.67884	m
242	-4.59	-22.07385031	92.04983186	0.525446521	12.6107165	12.329895	0.280821	16.8492895	12 hr	16.84929	m
243	-4.59	-22.28608263	92.06999349	0.525561609	12.61347862	12.329895	0.283584	17.0150167	12 hr	17.01502	m
244	-4.59	-22.4914739	92.08956627	0.525673336	12.61616007	12.329895	0.286265	17.1759035	12 hr	17.1759	m
245	-4.59	-22.6899337	92.10853627	0.525781622	12.61875894	12.329895	0.288864	17.3318356	12 hr	17.33184	m
246	-4.59	-22.8813738	92.12688974	0.525886389	12.62127334	12.329895	0.291378	17.4826998	12 hr	17.4827	m
247	-4.59	-23.0657083	92.14461314	0.525987559	12.62370143	12.329895	0.293806	17.6283848	12 hr	17.62838	m
248	-4.59	-23.24285371	92.16169313	0.526085057	12.62604137	12.329895	0.296146	17.7687812	12 hr	17.76878	m
249	-4.59	-23.4127291	92.17811668	0.526178807	12.62829137	12.329895	0.298396	17.9037815	12 hr	17.90378	m



250	-4.59	-23.57525619	92.19387101	0.526268737	12.6304497	12.329895	0.300555	18.033281	12 hr	18.03328	m
251	-4.59	-23.73035947	92.20894369	0.526354776	12.63251463	12.329895	0.30262	18.1571773	12 hr	18.15718	m
252	-4.59	-23.8779663	92.22332264	0.526436856	12.63448453	12.329895	0.30459	18.2753712	12 hr	18.27537	m
253	-4.59	-24.01800702	92.23699616	0.526514908	12.63635779	12.329895	0.306463	18.3877667	12 hr	18.38777	m
254	-4.59	-24.15041507	92.24995301	0.526588869	12.63813286	12.329895	0.308238	18.494271	12 hr	18.49427	m
255	-4.59	-24.27512709	92.26218235	0.526658678	12.63980827	12.329895	0.309913	18.5947953	12 hr	18.5948	m
256	-4.59	-24.39208299	92.27367385	0.526724275	12.64138259	12.329895	0.311488	18.6892546	12 hr	18.68925	m
257	-4.59	-24.50122608	92.2844177	0.526785603	12.64285448	12.329895	0.312959	18.7775683	12 hr	18.77757	m
258	-4.59	-24.60250317	92.29440462	0.526842612	12.64422268	12.329895	0.314328	18.85966	12 hr	18.85966	m
259	-4.59	-24.69586459	92.30362588	0.526895249	12.64548598	12.329895	0.315591	18.9354581	12 hr	18.93546	m
260	-4.59	-24.78126436	92.31207337	0.52694347	12.64664328	12.329895	0.316748	19.0048959	12 hr	19.0049	m
261	-4.59	-24.85866022	92.3197396	0.526987231	12.64769354	12.329895	0.317799	19.0679117	12 hr	19.06791	m
262	-4.59	-24.92801369	92.32661769	0.527026493	12.64863583	12.329895	0.318741	19.1244491	12 hr	19.12445	m
263	-4.59	-24.98929018	92.33270145	0.527061221	12.6494693	12.329895	0.319574	19.1744572	12 hr	19.17446	m
264	-4.59	-25.04245901	92.33798536	0.527091383	12.65019319	12.329895	0.320298	19.2178906	12 hr	19.21789	m
265	-4.59	-25.08749348	92.34246461	0.527116952	12.65080684	12.329895	0.320912	19.2547097	12 hr	19.25471	m
266	-4.59	-25.12437093	92.34613509	0.527137904	12.65130969	12.329895	0.321415	19.2848808	12 hr	19.28488	m
267	-4.59	-25.15307274	92.34899343	0.52715422	12.65170128	12.329895	0.321806	19.3083761	12 hr	19.30838	m
268	-4.59	-25.17358442	92.35103699	0.527165885	12.65198125	12.329895	0.322086	19.325174	12 hr	19.32517	m
269	-4.59	-25.18589559	92.35226389	0.527172889	12.65214933	12.329895	0.322254	19.335259	12 hr	19.33526	m

270	-3 in Year 1; -4 in Year 2	+5 in Year 1; +4 in Year 2	-68 in Year 1; -71 in Year 2	-72 in Year 1, -73 in Year 2	-4.59	-25.19	92.35267298	0.527175224	12.65220537	12.329895	0.32231	19.3386217	12 hr	19.33862	m
271					-4.59	-25.18589559	92.35226389	0.527172889	12.65214933	12.329895	0.322254	19.335259	12 hr	19.33526	m
272					-4.59	-25.17358442	92.35103699	0.527165885	12.65198125	12.329895	0.322086	19.325174	12 hr	19.32517	m
273					-4.59	-25.15307274	92.34899343	0.52715422	12.65170128	12.329895	0.321806	19.3083761	12 hr	19.30838	m
274					-4.59	-25.12437093	92.34613509	0.527137904	12.65130969	12.329895	0.321415	19.2848808	12 hr	19.28488	m
275					-4.59	-25.08749348	92.34246461	0.527116952	12.65080684	12.329895	0.320912	19.2547097	12 hr	19.25471	m
276					-4.59	-25.04245901	92.33798536	0.527091383	12.65019319	12.329895	0.320298	19.2178906	12 hr	19.21789	m
277					-4.59	-24.98929018	92.33270145	0.527061221	12.6494693	12.329895	0.319574	19.1744572	12 hr	19.17446	m
278					-4.59	-24.92801369	92.32661769	0.527026493	12.64863583	12.329895	0.318741	19.1244491	12 hr	19.12445	m
279					-4.59	-24.85866022	92.3197396	0.526987231	12.64769354	12.329895	0.317799	19.0679117	12 hr	19.06791	m
280					-4.59	-24.78126436	92.31207337	0.52694347	12.64664328	12.329895	0.316748	19.0048959	12 hr	19.0049	m
281					-4.59	-24.69586459	92.30362588	0.526895249	12.64548598	12.329895	0.315591	18.9354581	12 hr	18.93546	m
282					-4.59	-24.60250317	92.29440462	0.526842612	12.64422268	12.329895	0.314328	18.85966	12 hr	18.85966	m
283					-4.59	-24.50122608	92.2844177	0.526785603	12.64285448	12.329895	0.312959	18.7775683	12 hr	18.77757	m
284					-4.59	-24.39208299	92.27367385	0.526724275	12.64138259	12.329895	0.311488	18.6892546	12 hr	18.68925	m
285					-4.59	-24.27512709	92.26218235	0.526658678	12.63980827	12.329895	0.309913	18.5947953	12 hr	18.5948	m
286					-4.59	-24.15041507	92.24995301	0.526588869	12.63813286	12.329895	0.308238	18.494271	12 hr	18.49427	m
287					-4.59	-24.01800702	92.23699616	0.526514908	12.63635779	12.329895	0.306463	18.3877667	12 hr	18.38777	m
288					-4.59	-23.8779663	92.22332264	0.526436856	12.63448453	12.329895	0.30459	18.2753712	12 hr	18.27537	m

289 (WARMEST AIR TEMP IN YEAR 1)	+4 in Year 1, +1 in Year 2				-4.59	-23.73035947	92.20894369	0.526354776	12.63251463	12.329895	0.30262	18.1571773	12 hr	18.15718	m
290					-4.59	-23.57525619	92.19387101	0.526268737	12.6304497	12.329895	0.300555	18.033281	12 hr	18.03328	m
291					-4.59	-23.4127291	92.17811668	0.526178807	12.62829137	12.329895	0.298396	17.9037815	12 hr	17.90378	m
292					-4.59	-23.24285371	92.16169313	0.526085057	12.62604137	12.329895	0.296146	17.7687812	12 hr	17.76878	m
293					-4.59	-23.0657083	92.14461314	0.525987559	12.62370143	12.329895	0.293806	17.6283848	12 hr	17.62838	m
294					-4.59	-22.8813738	92.12688974	0.525886389	12.62127334	12.329895	0.291378	17.4826998	12 hr	17.4827	m
295					-4.59	-22.6899337	92.10853627	0.525781622	12.61875894	12.329895	0.288864	17.3318356	12 hr	17.33184	m
296					-4.59	-22.4914739	92.08956627	0.525673336	12.61616007	12.329895	0.286265	17.1759035	12 hr	17.1759	m
297					-4.59	-22.28608263	92.06999349	0.525561609	12.61347862	12.329895	0.283584	17.0150167	12 hr	17.01502	m
298					-4.59	-22.07385031	92.04983186	0.525446521	12.6107165	12.329895	0.280821	16.8492895	12 hr	16.84929	m
299					-4.59	-21.85486944	92.02909542	0.525328152	12.60787564	12.329895	0.277981	16.6788375	12 hr	16.67884	m
300					-4.59	-21.62923453	92.00779835	0.525206582	12.60495796	12.329895	0.275063	16.5037771	12 hr	16.50378	m
301					-4.59	-21.3970419	91.98595489	0.525081893	12.60196544	12.329895	0.27207	16.3242254	12 hr	16.32423	m
302					-4.59	-21.15838967	91.96357934	0.524954167	12.59890001	12.329895	0.269005	16.1403001	12 hr	16.1403	m
303					-4.59	-20.91337758	91.94068604	0.524823486	12.59576366	12.329895	0.265869	15.9521188	12 hr	15.95212	m
304					-4.59	-20.66210688	91.91728931	0.524689931	12.59255833	12.329895	0.262663	15.7597993	12 hr	15.7598	m
305					-4.59	-20.4046803	91.89340345	0.524553583	12.589286	12.329895	0.259391	15.5634593	12 hr	15.56346	m
306					-4.59	-20.14120185	91.86904273	0.524414525	12.58594861	12.329895	0.256054	15.3632159	12 hr	15.36322	m
307					-4.59	-19.87177679	91.84422133	0.524272838	12.58254811	12.329895	0.252653	15.1591858	12 hr	15.15919	m

308	-4.59	-19.59651149	91.81895336	0.524128601	12.57908643	12.329895	0.249191	14.9514849	12 hr	14.95148	m
309	-4.59	-19.31551336	91.79325281	0.523981895	12.57556548	12.329895	0.24567	14.7402282	12 hr	14.74023	m
310	-4.59	-19.02889074	91.76713353	0.523832799	12.57198717	12.329895	0.242092	14.5255296	12 hr	14.52553	m
311	-4.59	-18.73675284	91.74060925	0.523681391	12.56835338	12.329895	0.238458	14.3075019	12 hr	14.3075	m
312	-4.59	-18.43920959	91.71369352	0.523527748	12.56466596	12.329895	0.234771	14.0862566	12 hr	14.08626	m
313	-4.59	-18.13637166	91.68639972	0.523371947	12.56092674	12.329895	0.231032	13.8619035	12 hr	13.8619	m
314	-4.59	-17.82835026	91.65874105	0.523214064	12.55713753	12.329895	0.227243	13.6345513	12 hr	13.63455	m
315	-4.59	-17.51525716	91.6307305	0.523054172	12.55330012	12.329895	0.223405	13.4043066	12 hr	13.40431	m
316	-4.59	-17.19720459	91.60238085	0.522892344	12.54941625	12.329895	0.219521	13.1712745	12 hr	13.17127	m
317	-4.59	-16.87430512	91.57370467	0.522728652	12.54548765	12.329895	0.215593	12.9355583	12 hr	12.93556	m
318	-4.59	-16.54667169	91.54471427	0.522563167	12.541516	12.329895	0.211621	12.6972593	12 hr	12.69726	m
319	-4.59	-16.21441747	91.51542175	0.522395957	12.53750296	12.329895	0.207608	12.456477	12 hr	12.45648	m
320	-4.59	-15.87765582	91.48583897	0.52222709	12.53345016	12.329895	0.203555	12.2133086	12 hr	12.21331	m
321	-4.59	-15.53650028	91.45597753	0.522056632	12.52935917	12.329895	0.199464	11.9678497	12 hr	11.96785	m
322	-4.59	-15.19106443	91.42584877	0.521884649	12.52523157	12.329895	0.195337	11.7201935	12 hr	11.72019	m
323	-4.59	-14.84146195	91.3954638	0.521711203	12.52106887	12.329895	0.191174	11.4704312	12 hr	11.47043	m
324	-4.59	-14.48780649	91.36483344	0.521536356	12.51687254	12.329895	0.186978	11.2186518	12 hr	11.21865	m
325	-4.59	-14.13021166	91.33396827	0.521360169	12.51264405	12.329895	0.182749	10.9649424	12 hr	10.96494	m
326	-4.59	-13.76879101	91.30287862	0.5211827	12.50838481	12.329895	0.17849	10.7093877	12 hr	10.70939	m
327	-4.59	-13.40365796	91.27157453	0.521004008	12.50409619	12.329895	0.174201	10.4520704	12 hr	10.45207	m

328	-4.59	-13.0349258	91.24006582	0.520824147	12.49977953	12.329895	0.169885	10.193071	12 hr	10.19307	m
329	-4.59	-12.66270765	91.20836202	0.520643173	12.49543615	12.329895	0.165541	9.93246807	12 hr	9.932468	m
330	-4.59	-12.28711642	91.17647243	0.520461138	12.49106731	12.329895	0.161172	9.67033791	12 hr	9.670338	m
331	-4.59	-11.90826481	91.14440608	0.520278094	12.48667426	12.329895	0.156779	9.40675484	12 hr	9.406755	m
332	-4.59	-11.52626529	91.11217177	0.520094092	12.4822582	12.329895	0.152363	9.14179113	12 hr	9.141791	m
333	-4.59	-11.14123007	91.07977805	0.519909179	12.4778203	12.329895	0.147925	8.87551704	12 hr	8.875517	m
334	-4.59	-10.75327109	91.04723322	0.519723404	12.47336169	12.329895	0.143467	8.60800091	12 hr	8.608001	m
335	-4.59	-10.3625	91.01454537	0.519536812	12.4688835	12.329895	0.138988	8.33930913	12 hr	8.339309	m
336	-4.59	-9.969028179	90.98172234	0.519349449	12.46438678	12.329895	0.134492	8.06950623	12 hr	8.069506	m
337	-4.59	-9.572966702	90.94877178	0.519161358	12.45987259	12.329895	0.129978	7.79865495	12 hr	7.798655	m
338	-4.59	-9.17442634	90.91570108	0.518972581	12.45534195	12.329895	0.125447	7.52681622	12 hr	7.526816	m
339	-4.59	-8.773517562	90.88251747	0.51878316	12.45079583	12.329895	0.120901	7.2540493	12 hr	7.254049	m
340	-4.59	-8.370350533	90.84922794	0.518593134	12.44623521	12.329895	0.11634	6.98041177	12 hr	6.980412	m
341	-4.59	-7.965035114	90.81583931	0.518402542	12.44166101	12.329895	0.111766	6.70595964	12 hr	6.70596	m
342	-4.59	-7.557680868	90.78235821	0.518211422	12.43707414	12.329895	0.107179	6.43074738	12 hr	6.430747	m
343	-4.59	-7.148397059	90.74879108	0.518019812	12.43247548	12.329895	0.10258	6.15482801	12 hr	6.154828	m
344	-4.59	-6.737292666	90.7151442	0.517827746	12.4278659	12.329895	0.097971	5.87825312	12 hr	5.878253	m
345	-4.59	-6.324476385	90.6814237	0.51763526	12.42324623	12.329895	0.093351	5.60107301	12 hr	5.601073	m
346	-4.59	-5.910056641	90.64763553	0.517442387	12.41861729	12.329895	0.088722	5.3233367	12 hr	5.323337	m
347	-4.59	-5.494141598	90.61378552	0.517249162	12.41397988	12.329895	0.084085	5.04509203	12 hr	5.045092	m

348					-4.59	-5.076839171	90.57987934	0.517055616	12.40933477	12.329895	0.07944	4.7663857	12 hr	4.766386	m
349					-4.59	-4.658257039	90.54592256	0.516861781	12.40468274	12.329895	0.074788	4.4872634	12 hr	4.487263	m
350					-4.59	-4.23850266	90.51192061	0.516667688	12.40002451	12.329895	0.070129	4.20776983	12 hr	4.20777	m
351					-4.59	-3.817683284	90.47787882	0.516473368	12.39536083	12.329895	0.065466	3.92794877	12 hr	3.927949	m
352					-4.59	-3.395905971	90.44380242	0.51627885	12.3906924	12.329895	0.060797	3.64784323	12 hr	3.647843	m
353					-4.59	-2.973277609	90.40969655	0.516084164	12.38601994	12.329895	0.056125	3.36749541	12 hr	3.367495	m
354					-4.59	-2.549904928	90.37556626	0.515889339	12.38134413	12.329895	0.051449	3.0869469	12 hr	3.086947	m
355					-4.59	-2.125894518	90.34141654	0.515694402	12.37666566	12.329895	0.046771	2.80623864	12 hr	2.806239	m
356					-4.59	-1.701352853	90.30725231	0.515499383	12.3719852	12.329895	0.04209	2.52541109	12 hr	2.525411	m
357					-4.59	-1.276386306	90.27307843	0.515304309	12.36730342	12.329895	0.037408	2.24450426	12 hr	2.244504	m
358					-4.59	-0.851101167	90.23889972	0.515109207	12.36262098	12.329895	0.032726	1.96355777	12 hr	1.963558	m
359					-4.59	-0.425603669	90.20472098	0.514914105	12.35793853	12.329895	0.028044	1.68261099	12 hr	1.682611	m

360 (AUTUMN)	-12 in Year 1; -12 in Year 2	-4 in Year 1; +1 in Year 2	-75 in Year 1; -63 in Year 2	-78 in Year 1, -65 in Year 2	-4.59	-5.97537E-15	90.17054697	0.51471903	12.35325673	12.329895	0.023362	1.40170306	12 hr	1.401703	m
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