

TOTAL SOLAR ECLIPSE OF 2012 NOVEMBER 13

TABLE 8 – MAPPING COORDINATES FOR THE ZONES OF GRAZING ECLIPSE

$\Delta T = 66.8 \text{ s}$									
Longitude	North Graze Zone		Northern	South Graze Zone		Southern	Path Azm °	Elev Fact	Scale Fact km/''
	Latitudes		Limit	Latitudes		Limit			
	Northern Limit	Southern Limit	Universal Time h m s	Northern Limit	Southern Limit	Universal Time h m s			
134°00.0'E	11°39.16'S	11°39.16'S	20:35:39	12°51.57'S	12°54.30'S	20:36:37	109.3	0.93	2.37
135°00.0'E	11°59.17'S	11°59.17'S	20:35:41	13°12.57'S	13°15.27'S	20:36:41	109.4	0.59	2.01
136°00.0'E	12°19.60'S	12°19.60'S	20:35:45	13°34.02'S	13°36.69'S	20:36:47	109.5	0.50	1.94
137°00.0'E	12°40.65'S	12°40.65'S	20:35:52	13°55.98'S	13°58.63'S	20:36:56	110.2	0.58	2.00
138°00.0'E	13°01.58'S	13°01.58'S	20:36:01	14°18.05'S	14°20.72'S	20:37:08	110.6	0.59	2.02
139°00.0'E	13°22.75'S	13°23.30'S	20:36:12	14°40.71'S	14°43.44'S	20:37:21	111.0	0.59	2.01
140°00.0'E	13°44.77'S	13°45.33'S	20:36:26	15°03.79'S	15°06.57'S	20:37:38	111.4	0.59	2.01
141°00.0'E	14°07.17'S	14°07.75'S	20:36:43	15°27.29'S	15°30.13'S	20:37:57	111.8	0.59	2.01
142°00.0'E	14°29.92'S	14°30.59'S	20:37:02	15°51.20'S	15°54.10'S	20:38:19	112.1	0.59	2.01
143°00.0'E	14°53.09'S	14°53.83'S	20:37:24	16°15.54'S	16°18.49'S	20:38:43	112.5	0.59	2.01
144°00.0'E	15°16.67'S	15°17.48'S	20:37:48	16°40.29'S	16°43.29'S	20:39:11	112.9	0.59	2.01
145°00.0'E	15°40.67'S	15°41.53'S	20:38:16	17°05.45'S	17°08.50'S	20:39:41	113.3	0.59	2.01
146°00.0'E	16°05.08'S	16°05.99'S	20:38:46	17°31.02'S	17°34.12'S	20:40:14	113.7	0.59	2.01
147°00.0'E	16°29.90'S	16°30.86'S	20:39:19	17°56.99'S	18°00.15'S	20:40:51	114.1	0.59	2.01
148°00.0'E	16°55.12'S	16°56.12'S	20:39:56	18°23.38'S	18°26.59'S	20:41:30	114.5	0.59	2.01
149°00.0'E	17°20.75'S	17°21.78'S	20:40:35	18°50.16'S	18°53.41'S	20:42:13	114.9	0.59	2.01
150°00.0'E	17°46.78'S	17°47.83'S	20:41:17	19°17.34'S	19°20.63'S	20:42:59	115.2	0.59	2.02
151°00.0'E	18°13.20'S	18°14.27'S	20:42:03	19°44.91'S	19°48.23'S	20:43:48	115.6	0.59	2.01
152°00.0'E	18°40.00'S	18°41.09'S	20:42:52	20°12.85'S	20°16.20'S	20:44:40	116.0	0.59	2.01
153°00.0'E	19°07.17'S	19°08.27'S	20:43:44	20°41.15'S	20°44.53'S	20:45:36	116.3	0.59	2.01
154°00.0'E	19°34.71'S	19°35.82'S	20:44:40	21°09.83'S	21°13.22'S	20:46:35	116.7	0.59	2.01
155°00.0'E	20°02.60'S	20°03.71'S	20:45:39	21°38.83'S	21°42.23'S	20:47:38	117.0	0.59	2.01
156°00.0'E	20°30.84'S	20°31.94'S	20:46:42	22°08.14'S	22°11.56'S	20:48:44	117.4	0.59	2.01
157°00.0'E	20°59.40'S	21°00.49'S	20:47:48	22°37.76'S	22°41.19'S	20:49:53	117.7	0.59	2.01
158°00.0'E	21°28.25'S	21°29.35'S	20:48:58	23°07.67'S	23°11.10'S	20:51:06	118.0	0.59	2.01
159°00.0'E	21°57.38'S	21°58.48'S	20:50:11	23°37.83'S	23°41.27'S	20:52:23	118.3	0.58	2.01
160°00.0'E	22°26.78'S	22°27.89'S	20:51:27	24°08.23'S	24°11.68'S	20:53:43	118.6	0.58	2.01
161°00.0'E	22°56.42'S	22°57.54'S	20:52:48	24°38.85'S	24°42.29'S	20:55:07	118.8	0.58	2.00
162°00.0'E	23°26.28'S	23°27.40'S	20:54:11	25°09.64'S	25°13.08'S	20:56:34	119.1	0.58	2.00
163°00.0'E	23°56.34'S	23°57.46'S	20:55:39	25°40.59'S	25°44.03'S	20:58:04	119.3	0.57	2.00
164°00.0'E	24°26.56'S	24°27.68'S	20:57:10	26°11.65'S	26°15.09'S	20:59:38	119.5	0.57	1.99
165°00.0'E	24°56.91'S	24°58.03'S	20:58:44	26°42.81'S	26°46.24'S	21:01:15	119.7	0.57	1.99
166°00.0'E	25°27.37'S	25°28.48'S	21:00:22	27°14.01'S	27°17.43'S	21:02:56	119.9	0.56	1.99
167°00.0'E	25°57.89'S	25°59.00'S	21:02:03	27°45.22'S	27°48.64'S	21:04:40	120.0	0.56	1.98
168°00.0'E	26°28.45'S	26°29.55'S	21:03:47	28°16.40'S	28°19.82'S	21:06:26	120.1	0.55	1.98
169°00.0'E	26°58.99'S	27°00.09'S	21:05:35	28°47.52'S	28°50.93'S	21:08:16	120.2	0.55	1.98
170°00.0'E	27°29.49'S	27°30.59'S	21:07:26	29°18.56'S	29°21.93'S	21:10:09	120.2	0.54	1.97
171°00.0'E	27°59.92'S	28°01.00'S	21:09:19	29°49.41'S	29°52.78'S	21:12:04	120.2	0.54	1.97
172°00.0'E	28°30.25'S	28°31.27'S	21:11:16	30°20.07'S	30°23.43'S	21:14:02	120.2	0.53	1.96
173°00.0'E	29°00.37'S	29°01.39'S	21:13:15	30°50.50'S	30°53.85'S	21:16:02	120.1	0.53	1.96
174°00.0'E	29°30.28'S	29°31.29'S	21:15:17	31°20.65'S	31°23.98'S	21:18:04	120.0	0.52	1.95
175°00.0'E	29°59.94'S	30°00.95'S	21:17:22	31°50.47'S	31°53.79'S	21:20:09	119.9	0.52	1.95
176°00.0'E	30°29.30'S	30°30.31'S	21:19:28	32°19.94'S	32°23.24'S	21:22:15	119.7	0.51	1.95
177°00.0'E	30°58.31'S	30°59.33'S	21:21:37	32°49.00'S	32°52.28'S	21:24:23	119.5	0.50	1.94
178°00.0'E	31°26.96'S	31°27.98'S	21:23:48	33°17.62'S	33°20.87'S	21:26:33	119.3	0.50	1.94
179°00.0'E	31°55.19'S	31°56.21'S	21:26:00	33°45.77'S	33°48.98'S	21:28:44	119.0	0.49	1.93
180°00.0'E	32°22.97'S	32°24.00'S	21:28:14	34°13.40'S	34°16.57'S	21:30:56	118.7	0.49	1.93

TOTAL SOLAR ECLIPSE OF 2012 NOVEMBER 13

TABLE 8 – MAPPING COORDINATES FOR THE ZONES OF GRAZING ECLIPSE (continued)

$\Delta T = 66.8 \text{ s}$									
Longitude	North Graze Zone		Northern	South Graze Zone		Southern	Path Azm °	Elev Fact	Scale Fact km/''
	Latitudes		Limit	Latitudes		Limit			
	Northern Limit	Southern Limit	Universal Time h m s	Northern Limit	Southern Limit	Universal Time h m s			
179°00.0'W	32°50.27'S	32°51.29'S	21:30:29	34°40.50'S	34°43.61'S	21:33:10	118.4	0.48	1.92
178°00.0'W	33°17.05'S	33°18.07'S	21:32:46	35°07.07'S	35°10.07'S	21:35:24	118.0	0.47	1.92
177°00.0'W	33°43.34'S	33°44.26'S	21:35:03	35°32.98'S	35°35.91'S	21:37:39	117.6	0.47	1.91
176°00.0'W	34°09.00'S	34°09.90'S	21:37:22	35°58.27'S	36°01.12'S	21:39:54	117.1	0.46	1.91
175°00.0'W	34°34.07'S	34°34.93'S	21:39:41	36°22.91'S	36°25.66'S	21:42:09	116.7	0.46	1.91
174°00.0'W	34°58.52'S	34°59.33'S	21:42:00	36°46.88'S	36°49.51'S	21:44:25	116.1	0.45	1.90
173°00.0'W	35°22.33'S	35°23.07'S	21:44:20	37°10.14'S	37°12.67'S	21:46:41	115.6	0.45	1.90
172°00.0'W	35°45.47'S	35°46.13'S	21:46:40	37°32.71'S	37°35.10'S	21:48:56	115.0	0.44	1.90
171°00.0'W	36°07.94'S	36°08.51'S	21:49:00	37°54.55'S	37°56.99'S	21:51:12	114.4	0.44	1.89
170°00.0'W	36°29.65'S	36°30.17'S	21:51:20	38°15.67'S	38°18.18'S	21:53:27	113.8	0.43	1.89
169°00.0'W	36°50.61'S	36°51.11'S	21:53:39	38°36.05'S	38°38.62'S	21:55:41	113.2	0.43	1.89
168°00.0'W	37°10.82'S	37°11.32'S	21:55:58	38°55.66'S	38°58.29'S	21:57:55	112.5	0.42	1.88
167°00.0'W	37°30.29'S	37°30.79'S	21:58:17	39°14.56'S	39°17.21'S	22:00:09	111.8	0.42	1.88
166°00.0'W	37°49.00'S	37°49.51'S	22:00:35	39°32.70'S	39°35.35'S	22:02:21	111.1	0.42	1.88
165°00.0'W	38°06.96'S	38°07.48'S	22:02:53	39°50.09'S	39°52.72'S	22:04:33	110.4	0.41	1.88
164°00.0'W	38°24.20'S	38°24.70'S	22:05:09	40°06.73'S	40°09.33'S	22:06:44	109.6	0.41	1.87
163°00.0'W	38°40.70'S	38°41.16'S	22:07:25	40°22.62'S	40°25.16'S	22:08:53	108.9	0.41	1.87
162°00.0'W	38°56.46'S	38°56.86'S	22:09:40	40°37.76'S	40°40.23'S	22:11:02	108.1	0.40	1.87
161°00.0'W	39°11.49'S	39°11.81'S	22:11:54	40°52.16'S	40°54.53'S	22:13:10	107.3	0.40	1.87
160°00.0'W	39°25.75'S	39°26.01'S	22:14:06	41°05.82'S	41°08.07'S	22:15:17	106.5	0.40	1.87
159°00.0'W	39°39.24'S	39°39.47'S	22:16:18	41°18.75'S	41°20.85'S	22:17:22	105.7	0.40	1.87
158°00.0'W	39°51.95'S	39°52.17'S	22:18:28	41°30.94'S	41°33.11'S	22:19:26	104.9	0.40	1.86
157°00.0'W	40°03.87'S	40°04.18'S	22:20:37	41°42.39'S	41°44.72'S	22:21:30	104.1	0.39	1.86
156°00.0'W	40°15.12'S	40°15.41'S	22:22:45	41°53.15'S	41°55.57'S	22:23:32	103.2	0.39	1.86
155°00.0'W	40°25.59'S	40°25.92'S	22:24:52	42°03.20'S	42°05.68'S	22:25:32	102.4	0.39	1.86
154°00.0'W	40°35.29'S	40°35.71'S	22:26:57	42°12.54'S	42°15.08'S	22:27:32	101.6	0.39	1.86
153°00.0'W	40°44.30'S	40°44.79'S	22:29:01	42°21.19'S	42°23.75'S	22:29:30	100.7	0.39	1.86
152°00.0'W	40°52.61'S	40°53.16'S	22:31:04	42°29.16'S	42°31.72'S	22:31:26	99.9	0.39	1.86
151°00.0'W	41°00.25'S	41°00.83'S	22:33:05	42°36.44'S	42°39.13'S	22:33:22	99.1	0.39	1.86
150°00.0'W	41°07.23'S	41°07.82'S	22:35:05	42°43.06'S	42°45.86'S	22:35:16	98.2	0.39	1.86
149°00.0'W	41°13.52'S	41°14.12'S	22:37:03	42°49.01'S	42°51.91'S	22:37:09	97.4	0.39	1.86
148°00.0'W	41°19.10'S	41°19.75'S	22:39:00	42°54.30'S	42°57.29'S	22:39:01	96.6	0.39	1.86
147°00.0'W	41°24.03'S	41°24.71'S	22:40:56	42°58.95'S	43°01.99'S	22:40:51	95.8	0.39	1.86
146°00.0'W	41°28.32'S	41°29.01'S	22:42:50	43°02.95'S	43°06.04'S	22:42:40	94.9	0.39	1.86
145°00.0'W	41°31.95'S	41°32.69'S	22:44:43	43°06.33'S	43°09.44'S	22:44:27	94.1	0.40	1.86
144°00.0'W	41°34.96'S	41°35.70'S	22:46:34	43°09.07'S	43°12.18'S	22:46:14	93.3	0.40	1.87
143°00.0'W	41°37.35'S	41°38.08'S	22:48:24	43°11.20'S	43°14.29'S	22:47:59	92.5	0.40	1.87
142°00.0'W	41°39.14'S	41°39.85'S	22:50:12	43°12.72'S	43°15.78'S	22:49:42	91.7	0.40	1.87
141°00.0'W	41°40.32'S	41°41.03'S	22:51:59	43°13.64'S	43°16.64'S	22:51:25	90.9	0.40	1.87
140°00.0'W	41°40.89'S	41°41.59'S	22:53:44	43°13.96'S	43°16.88'S	22:53:06	90.2	0.40	1.87
139°00.0'W	41°40.84'S	41°41.56'S	22:55:28	43°13.69'S	43°16.52'S	22:54:45	89.4	0.41	1.87
138°00.0'W	41°40.22'S	41°40.93'S	22:57:10	43°12.83'S	43°15.57'S	22:56:23	88.6	0.41	1.87
137°00.0'W	41°39.02'S	41°39.71'S	22:58:51	43°11.40'S	43°14.02'S	22:58:00	87.9	0.41	1.87
136°00.0'W	41°37.16'S	41°37.91'S	23:00:30	43°09.41'S	43°11.89'S	22:59:36	87.2	0.41	1.88
135°00.0'W	41°34.73'S	41°35.54'S	23:02:08	43°06.85'S	43°09.19'S	23:01:10	86.4	0.42	1.88
134°00.0'W	41°31.75'S	41°32.61'S	23:03:45	43°03.73'S	43°05.91'S	23:02:43	85.7	0.42	1.88
133°00.0'W	41°28.22'S	41°29.12'S	23:05:19	43°00.07'S	43°02.09'S	23:04:15	85.0	0.42	1.88
132°00.0'W	41°24.17'S	41°25.08'S	23:06:53	42°55.86'S	42°57.82'S	23:05:45	84.3	0.43	1.88
131°00.0'W	41°19.57'S	41°20.58'S	23:08:24	42°51.12'S	42°53.01'S	23:07:14	83.7	0.43	1.89
130°00.0'W	41°14.39'S	41°15.46'S	23:09:55	42°45.85'S	42°47.68'S	23:08:41	83.0	0.43	1.89

TOTAL SOLAR ECLIPSE OF 2012 NOVEMBER 13

TABLE 8 – MAPPING COORDINATES FOR THE ZONES OF GRAZING ECLIPSE (continued)

ΔT = 66.8 s

Longitude	North Graze Zone Latitudes		Northern Limit	South Graze Zone Latitudes		Southern Limit	Path Azm °	Elev Fact	Scale Fact km/''
	Northern Limit	Southern Limit	Universal Time h m s	Northern Limit	Southern Limit	Universal Time h m s			
129°00.0'W	41°08.70'S	41°09.82'S	23:11:23	42°40.05'S	42°42.10'S	23:10:07	82.4	0.43	1.89
128°00.0'W	41°02.50'S	41°03.66'S	23:12:50	42°33.74'S	42°36.00'S	23:11:32	81.7	0.44	1.89
127°00.0'W	40°55.81'S	40°56.99'S	23:14:16	42°26.92'S	42°29.37'S	23:12:55	81.1	0.44	1.89
126°00.0'W	40°48.62'S	40°49.82'S	23:15:40	42°19.60'S	42°22.23'S	23:14:17	80.5	0.44	1.90
125°00.0'W	40°40.91'S	40°42.15'S	23:17:02	42°11.78'S	42°14.58'S	23:15:37	79.9	0.45	1.90
124°00.0'W	40°32.72'S	40°34.00'S	23:18:23	42°03.48'S	42°06.42'S	23:16:56	79.3	0.45	1.90
123°00.0'W	40°24.06'S	40°25.36'S	23:19:42	41°54.69'S	41°57.77'S	23:18:13	78.8	0.46	1.90
122°00.0'W	40°14.94'S	40°16.26'S	23:20:59	41°45.42'S	41°48.64'S	23:19:29	78.2	0.46	1.91
121°00.0'W	40°05.36'S	40°06.69'S	23:22:15	41°35.69'S	41°39.03'S	23:20:44	77.7	0.46	1.91
120°00.0'W	39°55.35'S	39°56.67'S	23:23:29	41°25.50'S	41°28.94'S	23:21:57	77.2	0.47	1.91
119°00.0'W	39°44.89'S	39°46.20'S	23:24:42	41°14.86'S	41°18.40'S	23:23:08	76.7	0.47	1.91
118°00.0'W	39°34.01'S	39°35.30'S	23:25:52	41°03.77'S	41°07.40'S	23:24:18	76.2	0.47	1.92
117°00.0'W	39°22.70'S	39°23.96'S	23:27:01	40°52.25'S	40°55.96'S	23:25:26	75.8	0.48	1.92
116°00.0'W	39°10.98'S	39°12.21'S	23:28:09	40°40.30'S	40°44.08'S	23:26:33	75.3	0.48	1.92
115°00.0'W	38°58.86'S	39°00.05'S	23:29:14	40°27.93'S	40°31.77'S	23:27:38	74.9	0.48	1.93
114°00.0'W	38°46.34'S	38°47.49'S	23:30:18	40°15.14'S	40°19.05'S	23:28:41	74.4	0.49	1.93
113°00.0'W	38°33.43'S	38°34.53'S	23:31:20	40°01.96'S	40°05.92'S	23:29:43	74.0	0.49	1.93
112°00.0'W	38°20.14'S	38°21.19'S	23:32:20	39°48.38'S	39°52.39'S	23:30:43	73.7	0.49	1.93
111°00.0'W	38°06.49'S	38°07.49'S	23:33:18	39°34.45'S	39°38.51'S	23:31:42	73.3	0.50	1.94
110°00.0'W	37°52.39'S	37°53.42'S	23:34:15	39°20.11'S	39°24.21'S	23:32:39	72.9	0.50	1.94
109°00.0'W	37°37.95'S	37°39.00'S	23:35:10	39°05.41'S	39°09.55'S	23:33:34	72.6	0.50	1.94
108°00.0'W	37°23.16'S	37°24.24'S	23:36:03	38°50.36'S	38°54.52'S	23:34:27	72.3	0.51	1.94
107°00.0'W	37°08.06'S	37°09.16'S	23:36:54	38°34.96'S	38°39.14'S	23:35:19	72.0	0.51	1.95
106°00.0'W	36°52.63'S	36°53.75'S	23:37:43	38°19.22'S	38°23.43'S	23:36:09	71.7	0.51	1.95
105°00.0'W	36°36.90'S	36°38.03'S	23:38:30	38°03.17'S	38°07.39'S	23:36:57	71.4	0.52	1.95
104°00.0'W	36°20.88'S	36°22.02'S	23:39:16	37°46.79'S	37°51.03'S	23:37:43	71.1	0.52	1.95
103°00.0'W	36°04.58'S	36°05.71'S	23:39:59	37°30.12'S	37°34.36'S	23:38:28	70.9	0.52	1.96
102°00.0'W	35°48.00'S	35°49.14'S	23:40:41	37°13.16'S	37°17.40'S	23:39:10	70.7	0.53	1.96
101°00.0'W	35°31.15'S	35°32.29'S	23:41:21	36°55.91'S	37°00.16'S	23:39:51	70.5	0.53	1.96
100°00.0'W	35°14.06'S	35°15.19'S	23:41:59	36°38.40'S	36°42.64'S	23:40:30	70.3	0.53	1.96
099°00.0'W	34°56.72'S	34°57.85'S	23:42:34	36°20.62'S	36°24.87'S	23:41:07	70.1	0.54	1.97
098°00.0'W	34°39.16'S	34°40.28'S	23:43:08	36°02.60'S	36°06.85'S	23:41:43	69.9	0.54	1.97
097°00.0'W	34°21.33'S	34°22.49'S	23:43:40	35°44.35'S	35°48.59'S	23:42:16	69.7	0.54	1.97
096°00.0'W	34°03.29'S	34°04.49'S	23:44:11	35°25.87'S	35°30.10'S	23:42:47	69.6	0.54	1.97
095°00.0'W	33°45.06'S	33°46.29'S	23:44:39	35°07.18'S	35°11.40'S	23:43:17	69.4	0.55	1.97
094°00.0'W	33°26.64'S	33°27.90'S	23:45:05	34°48.28'S	34°52.50'S	23:43:45	69.3	0.55	1.98
093°00.0'W	33°08.05'S	33°09.33'S	23:45:29	34°29.20'S	34°33.41'S	23:44:11	69.2	0.55	1.98
092°00.0'W	32°49.29'S	32°50.61'S	23:45:52	34°09.94'S	34°14.14'S	23:44:35	69.1	0.55	1.98
091°00.0'W	32°30.38'S	32°31.71'S	23:46:12	33°50.50'S	33°54.70'S	23:44:57	69.0	0.56	1.98
090°00.0'W	32°11.33'S	32°12.69'S	23:46:31	33°30.94'S	33°35.12'S	23:45:17	69.0	0.56	1.98
089°00.0'W	31°52.15'S	31°53.53'S	23:46:47	33°11.18'S	33°15.36'S	23:45:35	68.9	0.56	1.99
088°00.0'W	31°32.85'S	31°34.25'S	23:47:02	32°51.32'S	32°55.49'S	23:45:52	68.9	0.56	1.99
087°00.0'W	31°13.43'S	31°14.85'S	23:47:15	32°31.33'S	32°35.49'S	23:46:07	68.8	0.57	1.99
086°00.0'W	30°54.89'S	30°54.89'S	23:47:26	32°11.23'S	32°15.38'S	23:46:19	68.8	0.57	1.99
085°00.0'W	30°35.04'S	30°35.04'S	23:47:35	31°51.02'S	31°55.17'S	23:46:30	68.8	0.57	2.00
084°00.0'W	30°15.36'S	30°15.36'S	23:47:43	31°30.73'S	31°34.87'S	23:46:39	68.7	0.58	2.00
083°00.0'W	29°55.61'S	29°55.61'S	23:47:48	31°10.35'S	31°14.49'S	23:46:46	68.8	0.59	2.01
082°00.0'W	29°35.80'S	29°35.80'S	23:47:52	30°49.90'S	30°54.04'S	23:46:52	68.8	0.60	2.02
081°00.0'W	29°15.94'S	29°15.94'S	23:47:54	30°29.36'S	30°33.57'S	23:46:54	68.8	0.67	2.08