Space Weather Highlights
22 July - 28 July 2024

SWPC PRF 2552
29 July 2024

Solar activity reached moderate and high levels this period with a total of nineteen R1 (Minor) events and three R2 (Moderate) events observed throughout the week. The largest event of the period was an M9.9 flare at 28/0157 UTC from Region 3766 (S07, L=331, class/area=Dac/150 on 28 Jul). Shortly before this flare, the region produced an M7.8 flare at 28/0151 UTC. Associated with these two events were a 250 sfu Tenflare and a 1053 km/s Type II sweep. Region 3762 (S11, L=20, class/area=Fkc/440 on 28 Jul) was the most active region and produced an M7.7/1b flare at 28/1042 UTC, in addition to seven R1 events throughout the week.

Other notable activity included an Earth-directed CME, first visible in C2 imagery at 26/2124 UTC off the SSE, that was associated with a filament eruption late on 26 Jul. Another Earth-directed CME resulted from a long-duration M3.1 flare at 27/0546 UTC from Region 3662. The 27 Jul CME was faster than the 26 Jul CME and are likely to arrive concurrently beginning late on 29 Jul/early on 30 Jul. A full-halo CME associated with the M9.9 flare at 28/0157 UTC, and first visible in LASCO C2 imagery at 28/0224 UTC, is expected to arrive mid-to-late 30 Jul. A final Earth-directed CME followed an episode of dimming in the vicinity of Region 3768 (S16, L=4) at around 28/1400 UTC, and is expected to arrive as a glancing-blow late on 31 Jul/early 01 Aug.

A solar energetic particle event occurred early on 23 Jul as a result of far sided flare activity. The greater than 10 MeV proton flux reached S1 (Minor) storm levels beginning at 23/0300 UTC, reached a peak flux of 24 pfu at 23/1040 UTC, and decreased below S1 levels at 23/2350 UTC. The greater than 100 MeV proton flux reached the 1 pfu event threshold beginning at 23/0205 UTC, reached a peak flux of 1 pfu at 0430 UTC, and decreased below 1 pfu at 23/1510 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels throughout the period.

Geomagnetic field activity was at quiet to unsettled levels on 22-23 Jul, and at quiet levels on 24 Jul, under nominal solar wind conditions. Quiet and unsettled levels were observed on 25 Jul with the onset of CME influences late in the day. Periods of active conditions and G1 (Minor) storming were observed on 26 Jul in response to sustained CME influences and the onset of positive polarity CH HSS influences. Quiet to active levels prevailed on 27 Jul as CME and CH HSS influences diminished. Quiet and unsettled levels were observed on 28 Jul with the return of ambient solar wind conditions.

Space Weather Outlook
29 July - 24 August 2024

Solar activity is expected to reach moderate to high levels, with R1-R2 (Minor-Moderate) events likely to expected, and a slight chance for R3 (Strong) or greater events throughout the period.

No proton events are expected at geosynchronous orbit, barring significant flare activity.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to persist at normal to moderate levels throughout the outlook period.

Geomagnetic field activity is likely to reach G1 (Minor) storm levels on 29 Jul, G3 (Strong) storm levels on 30 Jul, and G2 (Moderate) storm levels on 31 Jul, all in response to the anticipated arrival and passage of multiple CMEs from 26-28 Jul. Quiet and quiet to unsettled geomagnetic field activity is expected to prevail throughout the remainder of the outlook period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
22 July	185	173	1080	C2.2	15	5	0	18	1	0	0	0
23 July	176	167	1175	C1.5	4	1	0	12	1	0	0	0
24 July	175	160	880	C1.3	7	2	0	8	1	1	0	0
25 July	167	171	730	C1.3	9	1	0	11	2	0	0	0
26 July	176	181	1060	C1.5	7	1	0	16	0	0	0	0
27 July	204	178	1320	C1.8	5	5	0	14	5	1	0	0
28 July	214	189	1920	C3.1	5	7	0	22	5	1	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2} -day -sr)		Electron Fluence (electrons/cm^2 -day -sr)
	>1 MeV	>10 MeV	>2MeV
22 July	5.3e+05	2.2e+04	9.6e+05
23 July	5.6e+06	1.4e+06	1.2e+06
24 July	9.0e+06	1.0e+05	1.1e+06
25 July	5.1e+06	2.2e+04	1.1e+06
26 July	1.4e+06	1.6e+04	9.7e+05
27 July	1.0e+06	1.6e+04	3.4e+06
28 July	5.8e+05	1.7e+04	7.4e+06

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
22 July	9	2-2-2-3-3-2-2-2	16	2-2-3-5-4-3-2-1	9	2-1-2-3-3-1-3-2
23 July	8	1-1-1-3-3-2-3-1	2	0-1-0-0-0-0-2-1	5	1-1-1-2-1-1-3-1
24 July	8	2-2-2-2-3-2-2-2	4	1-2-1-1-2-1-1-1	6	2-2-2-2-2-1-1-2
25 July	9	1-1-1-1-3-3-3-3	7	1-2-1-0-1-2-3-3	9	1-2-1-1-2-2-3-3
26 July	23	3-5-4-3-4-4-3-2	38	4-5-4-5-5-6-3-2	23	4-5-4-3-4-4-3-3
27 July	14	2-3-3-3-4-3-2-2	33	1-3-4-6-6-5-2-1	13	2-3-3-3-4-3-1-2
28 July	8	1-1-2-3-2-1-3-2	7	1-2-2-2-3-2-2-1	6	2-1-2-2-2-1-3-2

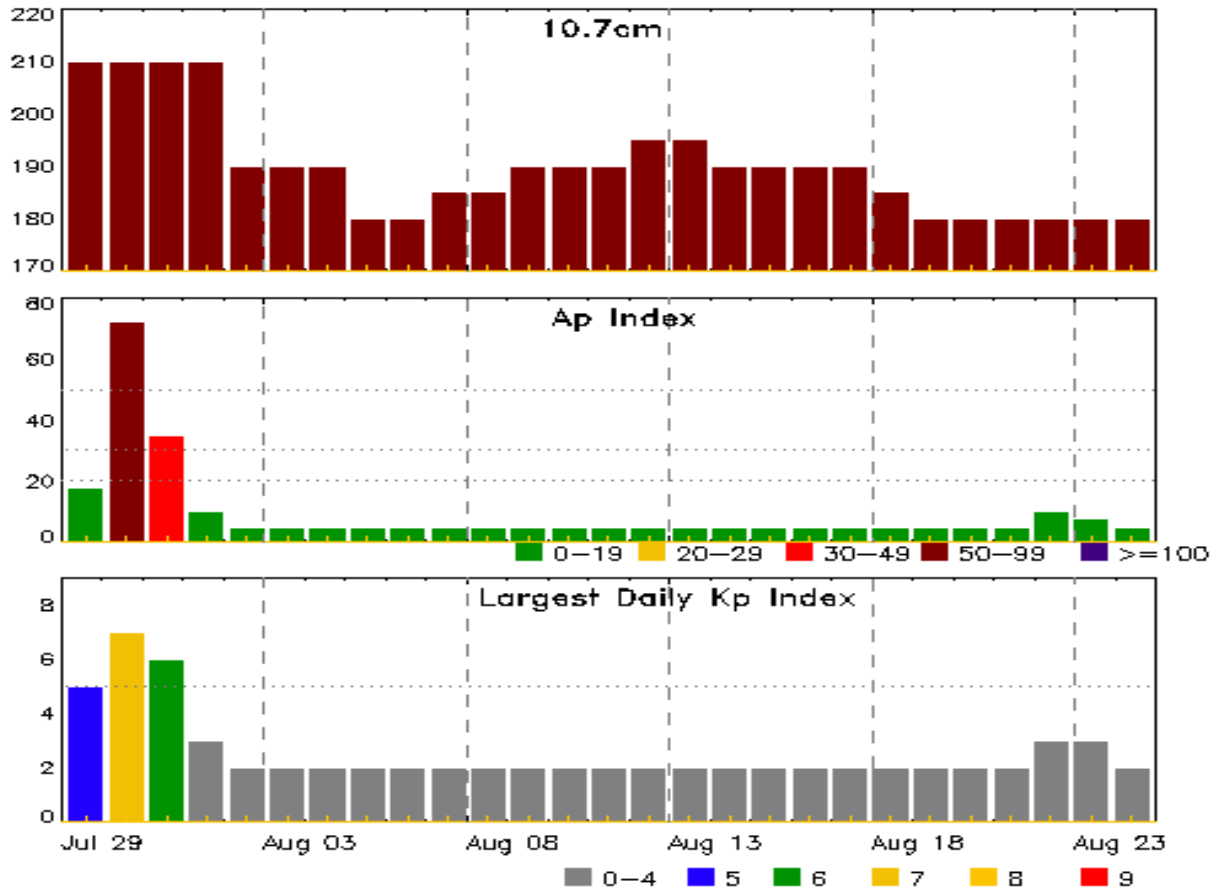
Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
22 Jul 0626	WATCH: Geomagnetic Storm Category G2 predicted	
22 Jul 0944	ALERT: Type II Radio Emission	22/0926
22 Jul 1140	WARNING: Geomagnetic K = 4	22/1139 - 1500
23 Jul 0140	WARNING: Proton 100MeV Integral Flux > 1pfu	23/0140 - 1200
23 Jul 0156	WARNING: Proton 10MeV Integral Flux > 10pfu	23/0155 - 1200
23 Jul 0212	ALERT: Proton Event 100MeV Integral Flux > 1pfu	23/0211
23 Jul 0307	ALERT: Proton Event 10MeV Integral Flux >= 10pfu	23/0306
23 Jul 1024	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	23/0155 - 2359
23 Jul 1024	EXTENDED WARNING: Proton 100MeV Integral Flux > 1pfu	23/0140 - 2359
23 Jul 1433	ALERT: Type II Radio Emission	23/1411
23 Jul 1929	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	23/0155 - 24/2359
23 Jul 1930	EXTENDED WARNING: Proton 100MeV Integral Flux > 1pfu	23/0140 - 24/1200
24 Jul 0203	CANCELLATION: Proton 100MeV Integral Flux > 1pfu	
24 Jul 0757	ALERT: Type II Radio Emission	24/0744
24 Jul 0808	ALERT: Type IV Radio Emission	24/0744
24 Jul 0850	SUMMARY: Proton Event 10MeV Integral Flux >= 10pfu	23/0300 - 2350
24 Jul 0850	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	23/0205 - 1510
24 Jul 1113	CANCELLATION: Proton 10MeV Integral Flux > 10pfu	
24 Jul 1746	ALERT: Type II Radio Emission	24/1726
24 Jul 1819	WATCH: Geomagnetic Storm Category G1 predicted	
24 Jul 1916	ALERT: Type II Radio Emission	24/1816
25 Jul 1249	ALERT: Type II Radio Emission	25/1234
25 Jul 1351	WARNING: Geomagnetic Sudden Impulse expected	25/1348 - 1425
25 Jul 1454	SUMMARY: Geomagnetic Sudden Impulse	25/1422
25 Jul 1629	ALERT: Type II Radio Emission	25/1535

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
25 Jul 2015	WARNING: Geomagnetic K = 4	25/2015 - 26/0300
26 Jul 0121	ALERT: Geomagnetic K = 4	
26 Jul 0230	EXTENDED WARNING: Geomagnetic K = 4	25/2015 - 26/1200
26 Jul 0402	WARNING: Geomagnetic K = 5	26/0402 - 1200
26 Jul 0409	ALERT: Geomagnetic K = 4	
26 Jul 0544	ALERT: Geomagnetic K = 5	
26 Jul 1434	WARNING: Geomagnetic K = 4	26/1434 - 2100
26 Jul 1455	ALERT: Geomagnetic K = 4	
26 Jul 1559	WARNING: Geomagnetic K = 5	26/1559 - 2100
27 Jul 0500	ALERT: Type II Radio Emission	27/0433
27 Jul 0600	ALERT: Type II Radio Emission	27/0434
27 Jul 0604	SUMMARY: 10cm Radio Burst	27/0537 - 0543
27 Jul 0949	ALERT: Type IV Radio Emission	27/0643
27 Jul 1045	WARNING: Geomagnetic K = 4	27/1045 - 2359
27 Jul 1059	WATCH: Geomagnetic Storm Category G1 predicted	
27 Jul 1105	ALERT: Geomagnetic K = 4	
27 Jul 1532	WATCH: Geomagnetic Storm Category G1 predicted	
27 Jul 1959	WATCH: Geomagnetic Storm Category G2 predicted	
28 Jul 0151	ALERT: X-ray Flux exceeded M5	28/0149
28 Jul 0201	SUMMARY: 10cm Radio Burst	28/0145 - 0151
28 Jul 0202	ALERT: Type II Radio Emission	28/0151
28 Jul 0215	SUMMARY: X-ray Event exceeded M5	28/0153 - 0201
28 Jul 1041	ALERT: X-ray Flux exceeded M5	28/1038
28 Jul 1105	SUMMARY: X-ray Event exceeded M5	28/1027 - 1054
28 Jul 1846	WATCH: Geomagnetic Storm Category G3 predicted	

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
29 Jul	210	18	5	12 Aug	195	5	2
30	210	72	7	13	195	5	2
31	210	35	6	14	190	5	2
01 Aug	210	10	3	15	190	5	2
02	190	5	2	16	190	5	2
03	190	5	2	17	190	5	2
04	190	5	2	18	185	5	2
05	180	5	2	19	180	5	2
06	180	5	2	20	180	5	2
07	185	5	2	21	180	5	2
08	185	5	2	22	180	10	3
09	190	5	2	23	180	8	3
10	190	5	2	24	180	5	2
11	190	5	2				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV
22 Jul	0327	0333	0337	M1.4	0.002	SF	S14E56	3762				
22 Jul	0355	0404	0408	M3.9	0.002	SN	S15E56	3762				
22 Jul	0414	0434	0443	M1.9	0.018	1F	S12E54	3762				
22 Jul	0931	0935	0940	M1.4	0.006						2	
22 Jul	1247	1300	1304	M1.5	0.010			3744	340			
23 Jul	1349	1428	1509	M2.4	0.078	SF	S10E77				2	
24 Jul	0728	0742	0750	M3.6	0.023	2B	S06W81	3751	640		2	2
24 Jul	1707	1721	1727	M2.9	0.016	1F	S07W71	3751	690	110	2	
25 Jul	1527	1537	1543	M1.3	0.007	SF	S09W81	3751			3	
26 Jul	0430	0442	0451	M1.7	0.010	SF	S07W73	3761				
27 Jul	0221	0237	0245	M4.2	0.030	1N	S09E24	3766				
27 Jul	0512	0546	0619	M3.1	0.076	SF	S11W30	3762	700	320	2	
27 Jul	1016	1040	1106	M2.0	0.042	1F	S09E40	3767				
27 Jul	1750	1806	1817	M2.7	0.005	2B	S05E17	3765	170	140		
27 Jul	1824	1839	1851	M3.4	0.041	1B	S09W30	3762				
28 Jul	0139	0151	0153	M7.8	0.037			3766	1e+05	250		
28 Jul	0153	0157	0201	M9.9	0.047			3766				
28 Jul	0337	0348	0403	M1.5	0.022	SF	S10W37	3762				
28 Jul	1027	1042	1054	M7.7	0.072	1B	S11W40	3762				
28 Jul	1243	1250	1255	M2.6	0.014	SF	S09E15	3766				
28 Jul	1808	1826	1840	M1.3	0.018	1F	S13W30	3768	140			
28 Jul	2025	2036	2049	M1.9	0.016	1N	S10W47	3762				

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
22 Jul	0013	0014	0016		SF	S06W25	3751
22 Jul	0115	0121	0125	C6.6			3762
22 Jul	0159	0206	0214	C8.3			3744
22 Jul	0243	0252	0301	C5.0			3762
22 Jul	0327	0333	0337	M1.4	SF	S14E56	3762
22 Jul	0355	0404	0408	M3.9	SN	S15E56	3762
22 Jul	0414	0434	0443	M1.9	1F	S12E54	3762
22 Jul	0515	0518	0522	C5.3			3762
22 Jul	0648	0656	0704	C6.2			3751

Flare List

Date	Time Begin	Time Max	Time End	X-ray Class	Optical Imp/ Brtns	Optical Location Lat CMD	Optical Rgn #
22 Jul	0652	0716	0731		SF	S13E55	3762
22 Jul	0655	0655	0703		SF	S05W30	3751
22 Jul	0705	0709	0714	C5.7			3751
22 Jul	B0734	U0745	0751		SF	S13E55	3762
22 Jul	0814	0816	0825		SF	S13E45	3762
22 Jul	0902	0911	0916	C4.6	SF	S16W21	3761
22 Jul	0916	0923	0943	C4.9	SF	S13E45	3762
22 Jul	0931	0935	0940	M1.4			
22 Jul	0933	0933	0939		SF	N14W80	3744
22 Jul	0949	0953	1001	C7.8			3744
22 Jul	1212	1224	1234	C5.9	SF	S13E51	3762
22 Jul	1247	1300	1304	M1.5			3744
22 Jul	B1437	U1439	A1445		SF	S12W26	3751
22 Jul	1520	1526	1537	C9.0	SF	S16E50	3762
22 Jul	1543	1547	1552	C7.8			3762
22 Jul	1722	1727	1732	C4.5			3744
22 Jul	B1848	1848	1911	C4.3	SF	S10E44	3762
22 Jul	B1931	1931	1934		SF	S12E36	3762
22 Jul	2001	2001	2004		SF	S09W41	3751
22 Jul	2206	2210	2216	C3.2	SF	S11E38	3762
22 Jul	2315	2315	2317		SF	S09W43	3751
23 Jul	0331	0349	0401	C4.5			3751
23 Jul	B0537	U0640	0902		SF	S09W36	3751
23 Jul	0903	0912	0917	C8.5	1N	S10W34	3761
23 Jul	1320	1321	1329		SF	S10W34	3761
23 Jul	1349	1428	1509	M2.4	SF	S10E77	
23 Jul	1412	1413	1420		SF	S13W50	3751
23 Jul	1437	1455	1529		SF	S09W41	3751
23 Jul	1511	1519	1526		SF	S08W39	3761
23 Jul	1626	1630	1641		SF	S07W40	3761
23 Jul	1645	1648	1656		SF	S09W43	3751
23 Jul	1646	1651	1656		SF	S12E30	3762
23 Jul	2002	2005	2007		SF	S07W45	3751
23 Jul	2015	2015	2017		SF	S03W47	3751
23 Jul	2225	2239	2249	C4.8	SF	S06W60	3751
23 Jul	2324	2334	2343	C5.0			
24 Jul	0728	0742	0750	M3.6	2B	S06W81	3751
24 Jul	B1043	U1043	1117	C2.9	SF	S11E17	3762

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
24 Jul	1149	1202	1217	C2.4			3751
24 Jul	1707	1721	1727	M2.9	1F	S07W71	3751
24 Jul	1733	1735	1752		SF	S06E62	3766
24 Jul	1759	1826	1856	C6.8			3759
24 Jul	1856	1901	1912	C4.9			3762
24 Jul	1859	1901	1902		SF	S08W72	3751
24 Jul	1901	1913	1916		SF	S10E10	3762
24 Jul	1917	1921	1930		SF	S12E11	3762
24 Jul	2039	2039	2042		SF	S06E61	3766
24 Jul	2135	2148	2155	C2.8	SF	S09E11	3762
24 Jul	2322	2329	2332	C2.1			3762
24 Jul	2332	2336	2343	C2.8	SF	S14E18	3762
25 Jul	0024	0041	0056	C8.4	1F	S11E08	3762
25 Jul	0122	0129	0135	C5.1			3762
25 Jul	0154	0203	0213	C9.1	1F	S13E14	3762
25 Jul	0518	0526	0531	C2.1			3766
25 Jul	0613	0614	0615		SF	S12E05	3762
25 Jul	0702	0710	0728		SF	S11W60	3761
25 Jul	1046	1100	1109	C2.6			3764
25 Jul	1048	1051	1055		SF	S13E03	3762
25 Jul	1109	1115	1119	C2.9			3764
25 Jul	1114	1114	1116		SF	S12W61	3761
25 Jul	1208	1210	1212		SF	S13E02	3762
25 Jul	1228	1232	1236	C3.0			3761
25 Jul	1253	1254	1258		SF	S07E51	3765
25 Jul	1328	1332	1336	C2.1	SF	S12W00	3762
25 Jul	1343	1343	1348		SF	N24W63	3752
25 Jul	1527	1537	1543	M1.3	SF	S09W81	3751
25 Jul	1659	1706	1710	C2.1	SF	S07W83	3751
25 Jul	2040	2045	2055		SF	S11W03	3762
26 Jul	0129	0138	0142	C2.7			3761
26 Jul	0142	0151	0157	C7.4			3761
26 Jul	0241	0252	0300	C3.9			3751
26 Jul	0324	0330	0334	C1.8			3762
26 Jul	0356	0402	0407	C2.5			3762
26 Jul	0430	0442	0451	M1.7	SF	S07W73	3761
26 Jul	0602	0603	0612		SF	S12W12	3762
26 Jul	0826	0849	0915	C4.6	SF	S11W11	3762

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
26 Jul	0916	0919	0929	C5.1	SF	S12W73	3761
26 Jul	1048	1054	1110		SF	S02E29	3764
26 Jul	1141	1144	1146		SF	S12W12	3762
26 Jul	1147	1147	1204		SF	S12W12	3762
26 Jul	1211	1230	1329		SF	S08E35	3766
26 Jul	1526	1529	1529		SF	S10E41	3766
26 Jul	1532	1529	1532		SF	S10E39	3766
26 Jul	1547	1600	1602		SF	S09W14	3762
26 Jul	1705	1714	1715		SF	S15W05	3762
26 Jul	1931	1931	1936		SF	S10W23	3762
26 Jul	1958	2002	2005		SF	S15W11	3762
26 Jul	2035	2036	2040		SF	S07E34	3766
26 Jul	2130	2132	2136		SF	S09E47	3767
27 Jul	0036	0047	0102	C4.9			3765
27 Jul	0221	0237	0245	M4.2	1N	S09E24	3766
27 Jul	0507	0631	0711		SF	S06E26	3766
27 Jul	0512	0546	0619	M3.1	SF	S11W30	3762
27 Jul	0626	0627	0655		SF	S10E33	3765
27 Jul	0817	0827	0841	C6.2			
27 Jul	0943	1035	1113		1N	S13W29	3762
27 Jul	0950	0957	1007	C5.3			3762
27 Jul	1016	1040	1106	M2.0	1F	S09E40	3767
27 Jul	1233	1234	1301		SF	S12E29	3765
27 Jul	1307	1318	1324		SF	S12E29	3765
27 Jul	B1343	1345	1357		SF	S10E27	3765
27 Jul	1441	1445	1503		SF	S08E35	3767
27 Jul	1530	1532	1552		SF	S08E34	3767
27 Jul	1603	1605	1610		SF	S11W32	3762
27 Jul	1636	1639	1657		SF	S13W31	3762
27 Jul	1701	1707	1710		SF	S13W31	3762
27 Jul	1720	1728	1735		SF	S11W33	3762
27 Jul	1736	1834	2034		1B	S09W30	3762
27 Jul	1750	1806	1817	M2.7	2B	S05E17	3765
27 Jul	1806	1807	1810		SF	S08E31	3767
27 Jul	1824	1839	1851	M3.4			3762
27 Jul	2011	2012	2018		SF	S08E31	3767
27 Jul	2257	2306	2329	C3.8	1F	S07E30	3767
27 Jul	2329	2336	2344	C3.5			3767

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
28 Jul	0018	0019	0021		SF	S10W37	3762
28 Jul	0139	0151	0153	M7.8			3766
28 Jul	0148	0151	0218		2B	S16E16	3765
28 Jul	0153	0157	0201	M9.9			3766
28 Jul	0315	0316	0323		SF	S08E13	3766
28 Jul	0337	0348	0403	M1.5	SF	S10W37	3762
28 Jul	0525	0545	0557		SF	N07E20	
28 Jul	0605	0610	0616	C4.9	SF	S07E14	3766
28 Jul	0647	0647	0649		SF	S14W36	3762
28 Jul	0746	0747	0750		SF	S08E26	3767
28 Jul	0815	1110	1153		SF	S06E08	3766
28 Jul	0849	0850	0859		SF	S11W40	3762
28 Jul	0911	0911	0913		SF	S12W40	3762
28 Jul	1027	1042	1054	M7.7	1B	S11W40	3762
28 Jul	1058	1106	1138		SF	S08E25	3767
28 Jul	1213	1213	1215		SF	S08E25	3767
28 Jul	1243	1250	1255	M2.6	SF	S09E15	3766
28 Jul	1324	1326	1338		SF	S16W25	3768
28 Jul	B1340	1417	1644		1N	S13W30	3768
28 Jul	1346	1412	1641		1N	S14W25	3768
28 Jul	1554	1600	1609	C8.2	SF	S06E07	3766
28 Jul	1707	1716	1730	C5.7	SF	S08E20	3767
28 Jul	1759	1820	1902	M1.3	1F	S13W30	3768
28 Jul	1853	1900	1901		SF	S05E02	3766
28 Jul	1934	1943	1949		SF	S15W29	3768
28 Jul	1956	1958	2002		SF	S15W29	3768
28 Jul	2025	2036	2049	M1.9	1N	S10W47	3762
28 Jul	2052	2053	2055		SF	S08E19	3767
28 Jul	2134	2138	2143		SF	N10E11	3770
28 Jul	2235	2245	2300	C6.9	SF	S09W44	3762
28 Jul	2344	2353	0000	C4.4	SF	N08E14	3770

Region Summary

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3744												
09 Jul	N16E76	150	90	2	Hsx	1	A								
10 Jul	N15E65	148	170	4	Cso	3	B								
11 Jul	N16E51	149	160	10	Dao	6	B								
12 Jul	N16E43	144	180	6	Dso	7	B								
13 Jul	N16E25	147	160	8	Dso	8	B				2				
14 Jul	N15E13	146	150	6	Dso	8	B	1			1	1			
15 Jul	N16W01	148	120	5	Cso	7	B	1			5	1			
16 Jul	N16W16	150	90	3	Cao	5	B	1	2		1	3			
17 Jul	N16W30	151	70	4	Cao	6	B				3				
18 Jul	N16W43	150	40	3	Cai	5	B	1			3				
19 Jul	N16W55	148	20	2	Cro	4	B								
20 Jul	N15W70	151	30	3	Cro	5	B	3	1		5	1			
21 Jul	N15W83	149	80	5	Dai	5	B	5	2		2				
								12	5	0	22	6	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 148

			Region 3745												
10 Jul	S17E58	155	20	5	Cro	2	B								
11 Jul	S17E44	156	20	9	Dro	3	B		1						
12 Jul	S17E31	156	20	9	Bxo	2	B	1			1				
13 Jul	S15E20	153	20	7	Dro	3	B					1	1		
14 Jul	S15E03	156	20	8	Dro	5	B				2				
15 Jul	S18W11	158	20	6	Cso	3	B				1				
16 Jul	S19W23	157	30	5	Dro	7	B								
17 Jul	S20W37	158	60	5	Dao	6	B								
18 Jul	S20W50	157	70	6	Cao	6	B								
19 Jul	S23W61	154	20	5	Cro	6	B								
20 Jul	S23W75	156	20	4	Cro	2	B	1			1				
21 Jul	S23W89	155	30	3	Cro	2	B								
								2	1	0	5	1	1	0	0

Crossed West Limb.
Absolute heliographic longitude: 156

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3747												
11 Jul	S24E44	156	100	4	Hsx	2	A								
12 Jul	S25E32	155	180	3	Hsx	2	A								
13 Jul	S24E18	155	180	4	Cso	2	B		2		1				
14 Jul	S25E04	155	140	4	Hsx	1	A								
15 Jul	S25W07	154	130	2	Hsx	2	A				1				
16 Jul	S26W20	154	120	2	Hsx	2	A								
17 Jul	S25W34	155	100	2	Hax	3	A								
18 Jul	S25W45	152	110	3	Hax	2	A								
19 Jul	S25W59	152	60	1	Hax	2	A								
20 Jul	S25W74	155	50	2	Hax	2	A								
21 Jul	S25W86	152	50	2	Hax	1	A								
								0	2	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 155

			Region 3748												
12 Jul	N15E57	130	30	7	Bxo	4	B								
13 Jul	N15E43	130	10	5	Bxo	4	B								
14 Jul	N14E27	133	10	1	Axx	2	A								
15 Jul	N14E14	133	10	3	Bxo	4	B								
16 Jul	N15E01	133	20	4	Cro	6	B								
17 Jul	N15W13	134	10	1	Axx	2	A								
18 Jul	N16W24	131	10	4	Bxo	3	B								
19 Jul	N15W40	133	10	1	Axx	2	A								
20 Jul	N15W54	135	plage												
21 Jul	N15W68	136	plage												
22 Jul	N15W82	136	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 133

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3749												
13 Jul	S32E66	106	50	4	Cso	2	B								
14 Jul	S32E52	108	50	5	Cso	3	B								
15 Jul	S32E35	112	40	12	Cao	4	B								
16 Jul	S33E29	105	20	1	Hrx	4	A								
17 Jul	S33E17	104	20	3	Hrx	2	A								
18 Jul	S33E04	103	10	1	Axx	1	A								
19 Jul	S33W10	104	plage												
20 Jul	S33W24	105	plage												
21 Jul	S33W38	106	plage												
22 Jul	S33W52	106	plage												
23 Jul	S33W66	107	plage												
24 Jul	S33W80	108	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 103

			Region 3750												
13 Jul	S20E65	108	110	7	Cso	7	B								
14 Jul	S20E52	107	100	8	Cso	6	B								
15 Jul	S20E38	109	90	10	Cao	9	B				1				
16 Jul	S20E27	107	80	8	Dao	6	B	1			1				
17 Jul	S20E13	108	40	9	Cao	7	B								
18 Jul	S19W01	108	20	9	Cro	3	B								
19 Jul	S20W21	111	10	1	Axx	1	A								
20 Jul	S20W35	116	plage												
21 Jul	S20W49	117	plage												
22 Jul	S20W63	117	plage												
23 Jul	S20W77	118	plage												
								1	0	0	2	0	0	0	0

Died on Disk.
Absolute heliographic longitude: 108

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3751												
13 Jul	S07E75	98	90	2	Hsx	1	A								
14 Jul	S07E66	95	230	11	Eai	7	B	2			8				
15 Jul	S08E54	93	220	10	Dsi	10	BG	1			1				
16 Jul	S08E41	93	280	11	Ekc	12	BG								
17 Jul	S08E27	94	340	12	Ekc	22	BG	2			4				
18 Jul	S08E14	93	400	11	Ekc	28	BGD	7	2		11	1			
19 Jul	S08E01	92	410	11	Ekc	32	BGD	3	1		7	1	1		
20 Jul	S09W15	96	380	13	Ekc	28	BGD	3	1		5	1			
21 Jul	S08W28	94	380	13	Ekc	28	BGD	7	1		7	1			
22 Jul	S08W42	95	180	11	Eac	21	BGD	2			5				
23 Jul	S08W56	97	150	11	Eso	8	BGD	2			7				
24 Jul	S08W70	98	100	9	Dao	6	BG	1	2		1	1	1		
25 Jul	S08W84	99	50	5	Dao	2	BG	1	1		2				
								31	8	0	58	5	2	0	0

Crossed West Limb.
Absolute heliographic longitude: 92

			Region 3752												
14 Jul	N22E67	93	30	2	Hax	2	A								
15 Jul	N22E53	94	30	2	Hsx	1	A								
16 Jul	N23E40	94	30	1	Hsx	1	A								
17 Jul	N23E26	95	20	1	Hrx	1	A								
18 Jul	N22E14	93	10	1	Hrx	2	A								
19 Jul	N22E01	92	10	1	Hrx	1	A								
20 Jul	N22W13	94	10	1	Axx	1	A								
21 Jul	N22W27	93	plage												
22 Jul	N22W41	95	plage												
23 Jul	N22W55	96	plage												
24 Jul	N22W69	97	plage												
25 Jul	N22W83	98	plage								1				
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 92

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3754												
15 Jul	N23E69	78	30	4	Cro	4	B								
16 Jul	N24E53	81	50	11	Eao	7	B								
17 Jul	N25E39	82	50	7	Cao	4	B								
18 Jul	N25E30	77	40	3	Cao	4	B	2			2				
19 Jul	N24E17	76	10	2	Cro	3	B				1				
20 Jul	N25E04	77	10	3	Bxo	3	B								
21 Jul	N25W10	77	10	2	Axx	1	A								
22 Jul	N25W24	78	plage												
23 Jul	N25W38	79	plage												
24 Jul	N25W52	80	plage												
25 Jul	N25W66	81	plage												
26 Jul	N25W81	82	plage												
								2	0	0	3	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 77

			Region 3755												
16 Jul	N03E61	73	50	4	Dao	4	B								
17 Jul	N03E47	74	100	8	Dao	6	B								
18 Jul	N02E35	72	80	5	Cao	8	B								
19 Jul	N02E19	73	50	5	Cao	8	B								
20 Jul	N02E06	75	30	3	Cro	5	B								
21 Jul	N02W08	75	30	4	Cso	3	B								
22 Jul	N04W22	75	20	4	Cro	4	B								
23 Jul	N04W35	76	15	5	Cro	3	B								
24 Jul	N02W49	77	10	1	Axx	1	A								
25 Jul	N02W63	78	10	1	Axx	1	A								
26 Jul	N02W78	79	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 75

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3756												
16 Jul	S18E68	66	40	2	Hsx	1	A								
17 Jul	S18E54	67	100	5	Hsx	1	A								
18 Jul	S17E40	67	100	3	Hsx	1	A								
19 Jul	S26E25	68	90	1	Cso	2	B				1				
20 Jul	S18E13	68	100	2	Hsx	1	A								
21 Jul	S17W00	67	100	2	Hsx	1	A								
22 Jul	S17W14	67	100	2	Hsx	1	A								
23 Jul	S17W27	68	90	2	Hsx	1	A								
24 Jul	S17W41	69	80	2	Hsx	1	A								
25 Jul	S17W55	70	60	1	Hsx	1	A								
26 Jul	S17W70	71	60	4	Hsx	1	A								
27 Jul	S18W80	68	80	5	Hsx	1	A								
28 Jul	S17W92	67	30	3	Hsx	1	A								
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 67

			Region 3757												
16 Jul	N17E74	60	30	2	Hsx	1	A								
17 Jul	N18E60	61	60	3	Hax	1	A								
18 Jul	N18E47	60	40	2	Hsx	1	A				1				
19 Jul	N17E33	60	20	2	Cso	3	B				1				
20 Jul	N17E22	59	40	5	Cao	5	B				1				
21 Jul	N17E08	58	40	5	Cao	5	B		1		1				
22 Jul	N18W06	59	40	6	Cao	5	B								
23 Jul	N17W19	60	30	4	Hrx	2	A								
24 Jul	N17W32	60	10	1	Hrx	1	A								
25 Jul	N16W46	61	10	1	Hrx	1	A								
26 Jul	N18W61	62	10	1	Axx	1	A								
27 Jul	N18W74	62	10	1	Axx	1	A								
28 Jul	N18W88	63	plage												
								0	1	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 59

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3759												
17 Jul	S05E03	116	0	2	Bxo	3	B								
18 Jul	S06W10	117	110	6	Dao	12	B				1				
19 Jul	S07W23	116	110	6	Dao	12	B				1				
20 Jul	S07W37	118	230	8	Dao	12	B				2				
21 Jul	S06W50	117	200	9	Dao	8	B				1				
22 Jul	S06W64	117	120	11	Eao	8	B								
23 Jul	S04W78	119	110	11	Eao	1	B								
								0	0	0	5	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 116

			Region 3760												
18 Jul	N20W05	112	20	2	Cro	2	B								
19 Jul	N18W17	110	10	1	Axx	1	A								
20 Jul	N20W33	114	10	5	Bxo	3	B								
21 Jul	N20W46	112	10	5	Axx	1	A								
22 Jul	N20W60	114	10	2	Axx	2	A								
23 Jul	N20W74	115	plage												
24 Jul	N20W88	116	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 112

			Region 3761												
19 Jul	S10E13	79	100	4	Dai	3	B								
20 Jul	S10W01	82	200	7	Dai	12	BG				4				
21 Jul	S10W15	81	300	9	Dki	17	BG				2				
22 Jul	S10W29	82	330	9	Dki	16	BG	1			1				
23 Jul	S10W42	83	300	9	Dki	23	BG	1			3	1			
24 Jul	S10W56	84	170	8	Dao	10	BG								
25 Jul	S10W70	85	90	8	Dao	4	BG	1			2				
26 Jul	S09W86	86	100	8	Dao	6	BG	3	1		2				
								6	1	0	14	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 82

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3762												
20 Jul	S14E64	17	50	8	Cao	3	B								
21 Jul	S13E51	15	130	9	Dao	8	B	2			2				
22 Jul	S13E37	16	170	14	Eai	14	BGD	9	3		11	1			
23 Jul	S12E24	17	220	13	Eai	25	BGD				1				
24 Jul	S12E10	18	230	14	Eai	29	BGD	5			5				
25 Jul	S12W04	19	230	16	Fac	35	BGD	4			5	2			
26 Jul	S12W20	20	240	16	Fac	36	BGD	3			8				
27 Jul	S12W30	18	330	18	Fkc	31	BGD	1	2		5	2			
28 Jul	S11W45	20	440	18	Fkc	25	BGD	1	3		6	2			
								25	8	0	43	7	0	0	0

Still on Disk.
Absolute heliographic longitude: 19

			Region 3763												
22 Jul	N03E70	343	80	2	Hsx	1	A								
23 Jul	N03E61	340	110	5	Dso	2	B								
24 Jul	N03E48	340	100	9	Cso	2	B								
25 Jul	N03E34	341	100	8	Cso	2	B								
26 Jul	N03E24	342	120	9	Cso	2	B								
27 Jul	N03E08	340	160	8	Cso	3	B								
28 Jul	N02W06	341	120	9	Cso	2	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 341

			Region 3764												
22 Jul	S03E76	338	30	1	Hsx	1	A								
23 Jul	S04E62	339	30	1	Hax	1	A								
24 Jul	S03E48	340	40	8	Hax	3	A								
25 Jul	S04E37	338	50	7	Cso	4	B	2							
26 Jul	S04E23	339	80	2	Hsx	1	A				1				
27 Jul	S03E08	340	90	3	Hsx	3	A								
28 Jul	S03W06	341	100	3	Cso	2	B								
								2	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 341

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 3765												
23 Jul	S11E74	327	120	2	Hsx	1	A								
24 Jul	S12E59	329	110	2	Hsx	1	A								
25 Jul	S11E45	330	60	2	Hsx	1	A				1				
26 Jul	S12E33	331	120	3	Hsx	1	A								
27 Jul	S12E20	328	180	7	Dso	11	BG	1	1		4		1		
28 Jul	S11E07	328	380	7	Dkc	15	BGD						1		
								1	1	0	5	0	2	0	0

Still on Disk.
Absolute heliographic longitude: 328

			Region 3766												
24 Jul	S08E58	330	30	5	Cro	6	B				2				
25 Jul	S08E51	324	10	5	Bxo	5	B	1							
26 Jul	S07E28	326	60	7	Cso	11	B				4				
27 Jul	S07E19	329	130	8	Dso	11	B		1		1	1			
28 Jul	S07E04	331	150	8	Dac	13	B	2	3		6				
								3	4	0	13	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 331

			Region 3767												
25 Jul	S09E57	318	60	4	Cao	5	B								
26 Jul	S10E47	319	160	9	Dso	9	B				1				
27 Jul	S10E30	318	220	10	Dso	10	B	2	1		4	2			
28 Jul	S11E19	316	200	7	Dsi	10	BGD	1			5				
								3	1	0	10	2	0	0	0

Still on Disk.
Absolute heliographic longitude: 316

			Region 3768												
26 Jul	S16W00	121	10	2	Axx	2	A								
27 Jul	S17W16	4	20	5	Bxo	6	B								
28 Jul	S16W29	4	200	9	Dai	10	B		1		3	3			
								0	1	0	3	3	0	0	0

Still on Disk.
Absolute heliographic longitude: 121

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		Region 3769													
26 Jul	N22E78	283	100	4	Hsx	1	A								
27 Jul	N23E60	285	100	9	Hsx	1	A								
28 Jul	N23E49	286	100	4	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 286

		Region 3770													
28 Jul	N07E08	326	200	8	Dai	10	BG	1			1				
								1	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 326

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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