Space Weather Highlights **SWPC PRF 2498**
10 July - 16 July 2023 **17 July 2023**

Solar activity was at moderate to high levels. Moderate levels were observed on 10, 13-16 Jul. High levels occurred on 11-12 Jul due to an M6.8/Sf at 11/1808 UTC from Region 3368 (S17, L=053, class/area Dao/100 on 11 Jul), an M5.8 at 11/2215 UTC from Region 3372 (N24, L=272, class/area Fko/770 on 14 Jul), and an M6.9/1n at 12/0855 UTC from Region 3372. The majority of the M-class activity was produced by Regions 3372 and 3363 (S21, L=346, class/area Dko/850 on 12 Jul). Region 3372 produced 11 M-class flares and Region 3363 produced 3 M-flares.

Other activity included an M2.3/2n flare at 10/0355 UTC from Region 3366 (S10, L=056, class/area Dso/130 on 10 Jul) with an associated Type II radio sweep and a partial halo CME off the SW limb first observed in SOHO/LASCO C2 imagery at 10/0400 UTC. Another CME was observed at 11/1924 UTC with a southward bias that was associated with a filament eruption centered near S30E07 that began at 11/1830 UTC. WSA/ENLIL modelling of the events showed a potential arrival on 14-15 Jul.

Two more CMEs were modelled with an Earth-directed component. A C8.8 flare at 14/1844 UTC from Region 3370 (S14, L=304, class/area Dao/050 on 11 Jul) with an associated faint, partial halo CME that was first observed in SOHO/LASCO C2 imagery at 14/1903 UTC. Lastly, a CME associated with an M2.9 flare at 15/0741 UTC from Region 3363 that was observed off the SW limb at 15/0737 UTC. Both of the CMEs were modelled with an arrival on 18 Jul, however due to uncertainty in the model run, an arrival as early as 17 Jul was likely.

There was a greater than 10 MeV proton event reaching the S1 (Minor) levels. The event began at 16/0635 UTC, reached a maximum flux of 18 pfu at 16/0735 UTC, and ended at 16/0910 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels. The highest flux value was 933 pfu observed at 10/1810 UTC.

Geomagnetic field activity was at nominal levels with solar wind speed between 300-400 km/s and total field between 4-9 nT through early on 13 Jul. The geomagnetic field was at quiet levels on 10 and 12 Jul and quiet to unsettled levels on 11 Jul. Weak shocks were observed in ACE solar wind data at 13/1109 UTC and 13/1551 UTC. Solar wind speed increased to around 300 km/s to near 350 km/s. Total field increased to a maximum of 14 nT at 13/1621 UTC. The geomagnetic field responded with quiet to unsettled levels on 13 Jul. On 14/1526 UTC, another shock occurred which increased total field to 15 nT and eventually 18 nT. Solar wind speed increased from 388-434 km/s. These were likely arrivals of the CMEs from 10 and 11 Jul. CME activity waned through 15 Jul and background solar wind conditions returned through most of 16 Jul. At 16/1836 UTC, another shock was observed likely associated with the 14 Jul halo CME. Total field increased from 7-14 nT and solar wind speed increased from approximately 350-450 km/s. The Bz component deflected southward initially to -12 nT. The geomagnetic field

responded with quiet to active levels on 14 Jul, quiet to unsettled levels on 15 Jul, and quiet to G1 (Minor) storm conditions on 16 Jul.

Space Weather Outlook
17 July - 12 August 2023

Solar activity is expected to be at low to moderate levels on 17 Jul-12 Aug.

There is a chance for an S1 (Minor) solar radiation storm on 17-19 Jul due to potential significant flare activity from Region 3363 as it transits around the west limb.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 20 Jul-01 Aug due to recurrent CH HSS influence.

Geomagnetic field activity is expected to be at unsettled to active levels on 17-21 Jul with G1 (Minor) storms likely on 17-18 due to persistent CME effects followed by CH HSS activity. Unsettled levels are expected once again on 03-04 Aug due to recurrent CH HSS effects.

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
10 July	191	181	1290	C1.9	12	2	0	40	4	1	0	0
11 July	214	227	1860	C2.6	8	6	0	45	0	0	0	0
12 July	193	219	2140	C2.7	10	4	0	24	4	0	0	0
13 July	203	146	1870	C2.9	13	1	0	13	3	1	0	0
14 July	181	141	1960	C1.3	10	1	0	17	1	0	0	0
15 July	179	96	1690	C1.2	7	3	0	17	1	1	0	0
16 July	184	99	1700	C1.3	15	3	0	15	2	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
10 July	2.5e+05	3.0e+04	4.1e+07
11 July	2.7e+06	2.2e+04	2.0e+07
12 July	1.1e+06	2.1e+04	1.5e+07
13 July	3.2e+05	2.2e+04	8.8e+06
14 July	6.3e+05	2.3e+04	1.8e+06
15 July	2.3e+05	2.8e+04	1.2e+06
16 July	2.0e+06	2.7e+05	1.3e+06

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
10 July	6	2-1-1-2-2-2-2-1	8	2-2-1-4-2-1-1-1	5	2-2-1-2-1-1-1-1
11 July	8	1-1-3-2-3-2-2-2	12	1-2-4-3-3-3-2-1	8	2-1-3-2-2-2-2-2
12 July	6	2-1-1-2-2-2-2-1	8	3-2-2-2-3-2-1-1	6	2-1-1-2-2-2-2-1
13 July	9	2-1-2-2-2-4-2-2	5	2-1-1-1-1-2-2-2	7	2-1-2-1-2-3-2-2
14 July	17	3-4-3-2-3-3-3-4	32	5-4-4-3-5-4-5-3	20	3-4-3-2-3-4-4-4
15 July	9	2-2-1-3-3-2-3-1	11	2-2-2-5-2-1-1-1	8	3-2-2-3-2-1-2-1
16 July	13	1-1-1-2-3-2-3-5	5	2-0-1-0-1-1-2-3	4	1-1-1-1-1-1-3-5

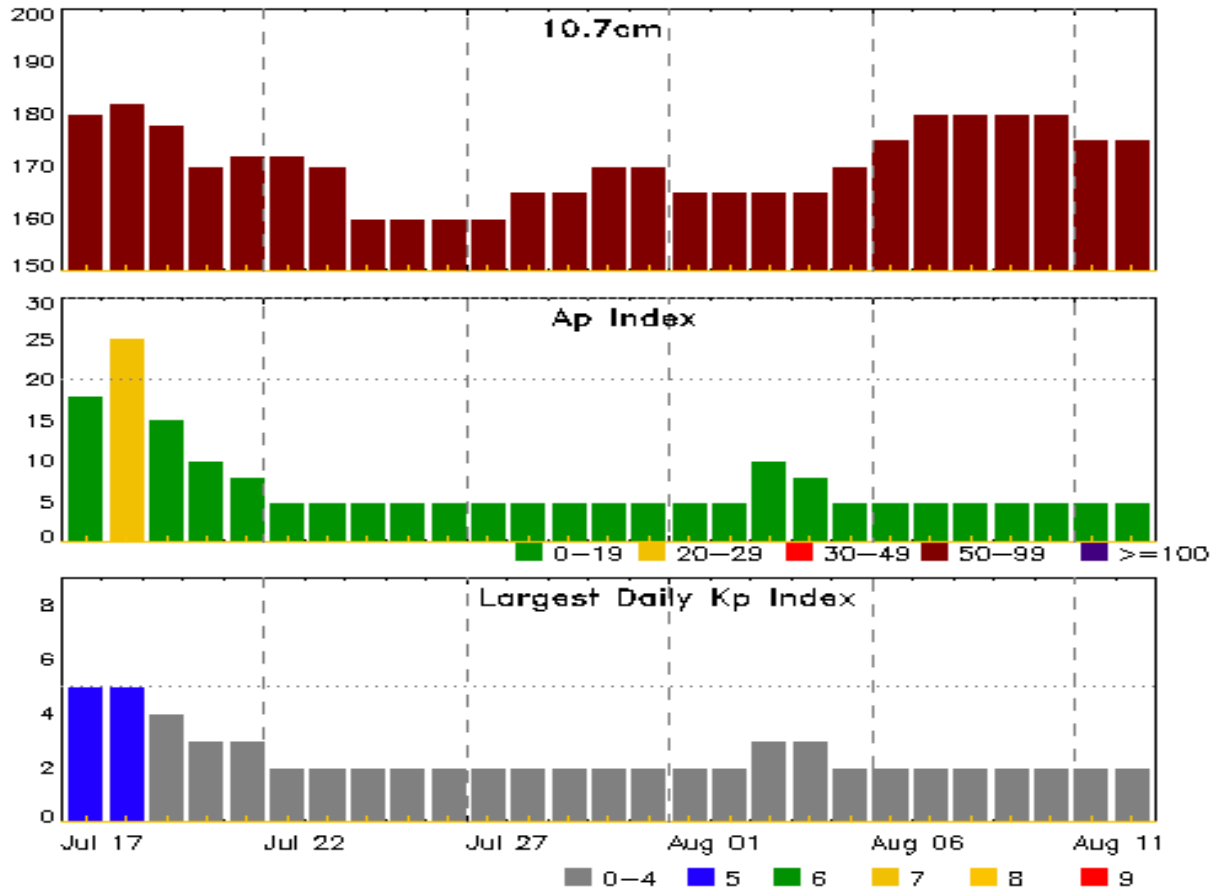
Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
10 Jul 0428	ALERT: Type II Radio Emission	10/0341
10 Jul 1236	ALERT: Type II Radio Emission	10/1146
11 Jul 1806	ALERT: X-ray Flux exceeded M5	11/1804
11 Jul 1824	SUMMARY: X-ray Event exceeded M5	11/1751 - 1816
11 Jul 2022	ALERT: Type II Radio Emission	11/1941
11 Jul 2216	ALERT: X-ray Flux exceeded M5	11/2214
11 Jul 2236	SUMMARY: X-ray Event exceeded M5	11/2204 - 2224
11 Jul 2352	ALERT: Type IV Radio Emission	11/2317
12 Jul 0039	ALERT: Type II Radio Emission	11/2317
12 Jul 0100	CANCELLATION: Type II Radio Emission	
12 Jul 0101	ALERT: Type II Radio Emission	11/2317
12 Jul 0856	ALERT: X-ray Flux exceeded M5	12/0854
12 Jul 0908	SUMMARY: X-ray Event exceeded M5	12/0849 - 0900
12 Jul 2025	WATCH: Geomagnetic Storm Category G1 predicted	
14 Jul 0243	WARNING: Geomagnetic K = 4	14/0242 - 1500
14 Jul 0602	ALERT: Geomagnetic K = 4	14/0559
14 Jul 1551	WARNING: Geomagnetic Sudden Impulse expected	14/1549 - 1654
14 Jul 1552	WARNING: Geomagnetic K = 4	14/1552 - 15/0600
14 Jul 1705	ALERT: Type II Radio Emission	14/1644
14 Jul 1754	ALERT: Geomagnetic K = 4	14/1743
14 Jul 1930	WARNING: Geomagnetic K = 5	14/1930 - 15/0300
15 Jul 0047	ALERT: Type II Radio Emission	15/0025
15 Jul 0256	EXTENDED WARNING: Geomagnetic K = 5	14/1930 - 15/1800
15 Jul 0300	EXTENDED WARNING: Geomagnetic K = 4	14/1552 - 15/2359
15 Jul 0746	SUMMARY: 10cm Radio Burst	15/0729 - 0734
15 Jul 1042	ALERT: Type II Radio Emission	15/1000
15 Jul 1043	ALERT: Type II Radio Emission	15/1018
15 Jul 1658	ALERT: Type II Radio Emission	15/1632

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
15 Jul 1840	CANCELLATION: Geomagnetic K = 4	
15 Jul 1946	WATCH: Geomagnetic Storm Category G1 predicted	
15 Jul 2109	ALERT: Type II Radio Emission	15/1958
15 Jul 2110	ALERT: Type IV Radio Emission	15/2006
16 Jul 0341	WATCH: Geomagnetic Storm Category G1 predicted	
16 Jul 0616	WARNING: Proton 10MeV Integral Flux > 10pfu	16/0615 - 2359
16 Jul 0652	ALERT: Proton Event 10MeV Integral Flux >= 10pfu	16/0635
16 Jul 1407	CANCELLATION: Proton 10MeV Integral Flux > 10pfu	
16 Jul 1411	SUMMARY: Proton Event 10MeV Integral Flux >= 10pfu	16/0635 - 0910
16 Jul 1531	ALERT: Type IV Radio Emission	16/1509
16 Jul 1844	WARNING: Geomagnetic Sudden Impulse expected	16/1900 - 2000
16 Jul 1845	WARNING: Geomagnetic K = 4	16/1900 - 17/0300
16 Jul 1939	SUMMARY: Geomagnetic Sudden Impulse	16/1920
16 Jul 1941	ALERT: Type II Radio Emission	16/1915
16 Jul 2019	ALERT: Type IV Radio Emission	16/1927
16 Jul 2310	ALERT: Geomagnetic K = 4	16/2310
16 Jul 2311	WARNING: Geomagnetic K = 5	16/2310 - 17/0900
16 Jul 2316	EXTENDED WARNING: Geomagnetic K = 4	16/1900 - 17/0900

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
17 Jul	180	18	5	31 Jul	170	5	2
18	182	25	5	01 Aug	165	5	2
19	178	15	4	02	165	5	2
20	170	10	3	03	165	10	3
21	172	8	3	04	165	8	3
22	172	5	2	05	170	5	2
23	170	5	2	06	175	5	2
24	160	5	2	07	180	5	2
25	160	5	2	08	180	5	2
26	160	5	2	09	180	5	2
27	160	5	2	10	180	5	2
28	165	5	2	11	175	5	2
29	165	5	2	12	175	5	2
30	170	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
10 Jul	0329	0355	0412	M2.3	0.040	2N	S13W49	3366	180	23	1	
10 Jul	2206	2218	2229	M1.4	0.013	1N	S12W59	3366	59	120		
11 Jul	1419	1435	1445	M2.0	0.018			3372				
11 Jul	1602	1612	1635	M1.1	0.020			3372				
11 Jul	1751	1808	1816	M6.8	0.052	SF	S19W57	3368				
11 Jul	1920	1929	1939	M1.0	0.011	SF	N24E87	3372				
11 Jul	2204	2215	2224	M5.8	0.032					140		
11 Jul	2334	2337	2345	M1.2	0.007			3368				
12 Jul	0021	0031	0040	M1.4	0.013	SF	N11W24	3367				
12 Jul	0431	0445	0458	M1.3	0.003			3372	100			
12 Jul	0510	0514	0523	M1.3	0.003			3361				
12 Jul	0849	0855	0900	M6.9	0.025	1N	N24E77	3372				
13 Jul	1855	1920	1936	M2.1	0.032	1N	N24E57	3372				
14 Jul	0922	0936	0949	M1.0	0.011	SF	S19W24	3363	210			
15 Jul	0721	0741	0756	M2.9	0.037	2B	S23W37	3363	3600	570		
15 Jul	0943	0953	0957	M1.0	0.004	SF	N11E63	3372	1500			
15 Jul	1005	1010	1014	M2.2	0.005	1N	N23E42	3372	1100		2	
16 Jul	0816	0826	0830	M1.0	0.001			3372	550			
16 Jul	1457	1508	1512	M1.7	0.001	1B	N23E27	3372	6900	170		2
16 Jul	1736	1746	1859	M4.0	0.001	2B	S23W58	3363	38	130		

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
10 Jul	B0000	U0000	0005		1F	S12W35	3366
10 Jul	B0000	0012	0023		SF	S24W48	3359
10 Jul	0025	0032	0035	C3.4	SF	S23E31	3363
10 Jul	0035	0043	0051	C4.4	SF	S13W46	3366
10 Jul	0052	0052	0054		SF	N25W23	3361
10 Jul	0102	0106	A0114		SF	S11W34	3366
10 Jul	0106	0107	0108		SF	S13W46	3358
10 Jul	0116	0117	0119		SF	S12W37	3366
10 Jul	0121	0121	0123		SF	S12W37	3366
10 Jul	0149	0158	0202	C9.3			3361
10 Jul	0152	0153	0158		SF	S13W49	3358

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
10 Jul	0156	0159	0210		1N	N24W24	3361
10 Jul	0206	0207	0222		SF	S13W49	3358
10 Jul	0207	0212	0213		SF	S12W37	3366
10 Jul	0329	0355	0412	M2.3	2N	S13W49	3366
10 Jul	0433	0503	0607		1F	S15W51	3358
10 Jul	0438	0506	0557		SF	S21E34	3363
10 Jul	0442	0449	0500		SF	N21W48	3360
10 Jul	0458	0516	0524	C4.0			3368
10 Jul	0500	0528	0601		SF	S13W49	3358
10 Jul	0501	0503	0505		SF	S12W38	3366
10 Jul	0502	0503	0522		SF	S20W37	3368
10 Jul	0504	0506	0512		SF	N21W48	3360
10 Jul	0516	0618	0626		SF	N11W01	3367
10 Jul	0519	0519	0528		SF	S22W55	3359
10 Jul	0524	0531	0542	C4.5	SF	S12W38	3366
10 Jul	0543	0545	0547		SF	S12W38	3366
10 Jul	0611	0619	0634	C4.1	SF	N10W03	3367
10 Jul	0642	0645	0652		SF	S16E71	
10 Jul	0721	0722	0727		SF	S22W55	3359
10 Jul	0745	0745	0802		SF	N23W48	3360
10 Jul	0746	0746	0749		SF	S15E72	3360
10 Jul	0907	0915	0924	C3.1	SF	N09W04	3367
10 Jul	0916	0920	0926		SF	N24W26	3361
10 Jul	0946	0950	0956	C2.9			
10 Jul	1014	1018	1031	C3.0	SF	N09W05	3367
10 Jul	1039	1042	1046		SF	N09W05	3367
10 Jul	1046	1046	1049		SF	N09W05	3367
10 Jul	1117	1122	1127		SF	N09W06	3367
10 Jul	1248	1249	1251		SF	N22W50	3360
10 Jul	1316	1324	1345		SF	N10W08	3367
10 Jul	1448	1455	1503	C2.8			3366
10 Jul	1712	1722	1730	C2.8			
10 Jul	1917	1928	1936	C5.3			3366
10 Jul	1955	1956	1958		SF	S09W56	3358
10 Jul	2033	2033	2038		SF	S24E21	3363
10 Jul	2144	2145	2215		SF	N10W12	3367
10 Jul	2206	2218	2229	M1.4	1N	S12W59	3366
10 Jul	2239	2241	2249		SF	N11W15	3367

Flare List

Date	Time			X-ray	Optical		
	Begin	Max	End	Class	Imp/ Brtns	Location Lat CMD	Rgn #
10 Jul	2315	2315	2319		SF	S24E19	3363
10 Jul	2356	2356	A2359		SF	N24W36	3361
11 Jul	B0000	0024	0037		SF	S20E19	3363
11 Jul	B0000	U0000	0011		SF	N24W36	3361
11 Jul	0024	0024	0025		SF	S13W60	3358
11 Jul	0037	0038	0042		SF	N11W10	3367
11 Jul	0133	0141	0145		SF	N11W10	3367
11 Jul	0145	0149	0155	C3.7			
11 Jul	0210	0214	0218	C8.0			
11 Jul	0252	0254	0255		SF	N11W10	3367
11 Jul	0302	0303	0309		SF	S24W62	3359
11 Jul	0357	0404	0414	C5.6			
11 Jul	0437	0437	0448		SF	S13W60	3358
11 Jul	0445	0505	0552		SF	S20E19	3363
11 Jul	0450	0453	0509		SF	N10W08	3367
11 Jul	0458	0507	0512	C6.7	SF	S12W56	3358
11 Jul	0514	0525	0528		SF	N25W36	3361
11 Jul	0517	0522	0532		SF	S12W56	3358
11 Jul	0523	0524	0528		SF	N25W16	3361
11 Jul	0744	0800	0832		SF	S22E21	3363
11 Jul	0745	0749	0822		SF	S20E19	3363
11 Jul	0847	0849	0857		SF	N10W19	3367
11 Jul	0919	0923	0927	C4.8	SF	N25W38	3361
11 Jul	1032	1036	1108		SF	N10W21	3367
11 Jul	1113	1123	1135	C4.5	SF	S25E11	3363
11 Jul	1133	1138	1139		SF	S13W61	3358
11 Jul	1157	1159	1204		SF	S20W37	3368
11 Jul	1250	1300	1308	C6.5			3358
11 Jul	1258	1300	1308		SF	N26W41	3361
11 Jul	1305	1316	1347		SF	S11W63	3358
11 Jul	1315	1316	1325	C7.6	SF	S13W61	3358
11 Jul	1413	1413	1415		SF	S19W59	3368
11 Jul	1419	1435	1445	M2.0			3372
11 Jul	1422	1426	1500		SF	S18W56	3368
11 Jul	1522	1532	1624		SF	S21E17	3363
11 Jul	1526	1526	1530		SF	S19W57	3368
11 Jul	1539	1606	1617		SF	S19W57	3368
11 Jul	1602	1612	1635	M1.1			3372

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
11 Jul	1648	1652	1717		SF	S19W57	3368
11 Jul	1701	1704	1727		SF	S11W65	3366
11 Jul	1726	1728	1746		SF	N10W25	3367
11 Jul	1750	1753	1758		SF	S18W58	3368
11 Jul	1751	1808	1816	M6.8			3368
11 Jul	1804	1805	1824		SF	S18W59	3368
11 Jul	1817	1818	1824		SF	N22W46	3361
11 Jul	1902	1903	1919		SF	N24E87	3372
11 Jul	1902	1910	1956		SF	S28E19	3363
11 Jul	1920	1930	2000	M1.0	SF	N24E87	3372
11 Jul	1948	1948	1959		SF	N10W27	3367
11 Jul	2016	2018	2020		SF	N23E81	3372
11 Jul	2027	2027	2044		SF	N10W27	3367
11 Jul	2054	2055	2058		SF	S18W60	3368
11 Jul	2127	2134	2141		SF	S18W60	3368
11 Jul	2204	2215	2224	M5.8			
11 Jul	2258	2303	2311		SF	S14E51	3370
11 Jul	2334	2337	2345	M1.2			3368
12 Jul	0008	0014	0036		SF	S19W61	3368
12 Jul	0018	0022	0039	M1.4	SF	N11W24	3366
12 Jul	0054	0055	0103		SF	S13W75	3358
12 Jul	0158	0200	0204	C8.7	SF	N24E77	3372
12 Jul	0242	0243	0247		SF	N24E77	3372
12 Jul	0329	0331	0335		SF	N11W24	3367
12 Jul	0431	0445	0458	M1.3			3372
12 Jul	0510	0514	0523	M1.3			3361
12 Jul	0530	0530	0600		1F	N25W52	3361
12 Jul	0610	0617	0623	C5.6			3372
12 Jul	0750	0842	0957		1N	N25W54	3361
12 Jul	0823	0832	0838	C4.1			
12 Jul	0849	0855	0900	M6.9	1N	N24E77	3372
12 Jul	0934	0934	0938		SF	S19W72	3359
12 Jul	1010	1011	1015		SF	N23W80	3360
12 Jul	1023	1029	1033	C9.1	SN	N25W52	3361
12 Jul	1040	1043	1102		SF	S19W72	3359
12 Jul	1046	1047	1049		SF	N22W83	3360
12 Jul	1217	1223	1231		SF	N25W57	3361
12 Jul	1357	1359	1405		SF	N26E79	3372

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
12 Jul	1358	1358	1401		SF	S19W69	3359
12 Jul	1402	1404	1412		SF	S25W05	3363
12 Jul	1435	1505	1722	C4.7	1N	N23W58	3361
12 Jul	1510	1514	1518	C4.2			3361
12 Jul	1700	1701	1707		SF	N25E73	3372
12 Jul	1727	1732	1736	C3.6			
12 Jul	1839	1841	1843		SF	N28E79	3372
12 Jul	1934	1938	1944	C4.9			3372
12 Jul	1956	1957	2002		SF	N09W40	3367
12 Jul	2029	2030	2034		SF	N24W58	3361
12 Jul	2128	2128	2130		SF	N25E75	3372
12 Jul	2133	2133	2138		SF	N25E75	3372
12 Jul	2146	2147	2150		SF	N09W40	3367
12 Jul	2223	2230	2235	C3.6			
12 Jul	2236	2245	2327	C5.5	SF	S25W08	3363
12 Jul	2248	2250	2311		SF	N26E74	3372
13 Jul	0032	0042	0046	C7.5			3372
13 Jul	0052	0058	0102	C8.0			3372
13 Jul	0204	0208	0219	C4.8			
13 Jul	0219	0222	0226	C5.5			3372
13 Jul	0243	0248	0252	C5.2	SF	N24E62	3372
13 Jul	0437	0444	0448		SF	N24W64	3361
13 Jul	0505	0511	0528	C7.7	1B	N24E84	3372
13 Jul	0802	0809	0820	C4.8	SF	N24E84	3372
13 Jul	0931	0936	1002		SF	S20W07	3363
13 Jul	0935	0955	1012	C5.1	SF	N25E64	3372
13 Jul	1021	1023	1025		SF	S19W82	3368
13 Jul	1113	1120	1129	C4.7	SF	N25E66	3372
13 Jul	1206	1235	1354	C9.7	1F	N25E66	3372
13 Jul	1425	1426	1436		SF	N26E65	3372
13 Jul	1425	1425	1431		2F	S25W16	3363
13 Jul	1445	1445	1448		SF	N25E64	3372
13 Jul	1648	1652	1656	C4.7			3372
13 Jul	1722	1722	1730		SF	S20W77	3369
13 Jul	1855	1920	1936	M2.1	1N	N24E57	3372
13 Jul	2005	2029	2040		SF	N25E59	3372
13 Jul	2222	2229	2235	C3.6	SF	N09W53	3367
13 Jul	2238	2248	2255	C6.9	SF	N25E58	3372

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
14 Jul	0007	0009	0014		SF	N11W53	3367
14 Jul	0026	0031	0035	C5.8	SF	N24E49	3372
14 Jul	0031	0032	0033		SF	S20W24	3363
14 Jul	0614	0621	0637		SF	S22W17	3363
14 Jul	0904	0920	0922	C2.6			3361
14 Jul	0913	0913	0918	M1.0	SF	S19W24	3363
14 Jul	1050	1057	1101	C2.0	SF	S23W22	3363
14 Jul	1134	1151	1156	C7.1	1F	N25E51	3372
14 Jul	1156	1202	1211	C7.5			3372
14 Jul	1231	1231	1236		SF	S22W23	3363
14 Jul	1309	1309	1313		SF	S15E34	
14 Jul	1328	1333	1341	C3.5	SF	S24W24	3363
14 Jul	1350	1405	1426	C4.9			
14 Jul	1357	1357	1402		SF	N26E49	3372
14 Jul	1418	1502	1507		SF	S20W22	3363
14 Jul	1426	1438	1443		SF	N23E46	3372
14 Jul	1449	1453	1503		SF	N23E46	3372
14 Jul	1531	1532	1535		SF	S24W26	3363
14 Jul	1723	1724	1727		SN	S22W24	3363
14 Jul	1827	1844	1858	C8.8			3370
14 Jul	1933	1945	2028	C3.6	SF	S15E20	3370
14 Jul	2015	2016	2020		SF	S23W27	3363
14 Jul	2135	2138	2142	C1.7			3363
15 Jul	0005	0016	0023	C6.1			3368
15 Jul	0559	0605	0609	C2.4	SF	S20W35	3363
15 Jul	0721	0741	0756	M2.9	2B	S23W37	3363
15 Jul	0817	0826	0834	C4.6			3368
15 Jul	0921	0933	0941		SF	S22W38	3363
15 Jul	0942	1010	1018		1N	N23E42	3372
15 Jul	0943	0953	0957	M1.0	SF	N11E63	3372
15 Jul	1005	1010	1014	M2.2			3372
15 Jul	1117	1119	1126		SF	N12E62	3373
15 Jul	1201	1201	1204		SF	S24W38	3363
15 Jul	1218	1225	1231		SF	S24W42	3363
15 Jul	1301	1303	1328		SF	S22W43	3363
15 Jul	1303	1318	1359		SF	N08E56	3373
15 Jul	1309	1314	1315		SF	N23E40	3372
15 Jul	1329	1327	1333		SF	N11W73	3367

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
15 Jul	1424	1424	1434		SF	S23W43	3363
15 Jul	1515	1516	1533		SF	N24E33	3372
15 Jul	1559	1602	1606	C3.4	SF	N08E55	3373
15 Jul	1651	1652	1653		SF	S20W46	3363
15 Jul	1849	1850	1855		SF	N07E54	3373
15 Jul	1950	2001	2005	C8.8			3363
15 Jul	2043	2044	2046		SF	N13W79	3367
15 Jul	2050	2100	2104	C2.5			3372
15 Jul	2104	2150	2220	C3.7			3372
15 Jul	2118	2120	2122		SF	N07E53	3373
16 Jul	0040	0045	0049	C2.5			3363
16 Jul	0102	0107	0111	C2.5			3363
16 Jul	0201	0208	0213	C1.7	SF	S20W35	3363
16 Jul	0449	0456	0505	C1.9	SF	S23W49	3363
16 Jul	0548	0548	0551		SF	S23W51	3363
16 Jul	0601	0608	0613	C2.1	SF	N27E28	3372
16 Jul	0647	0654	0705	C2.4			3374
16 Jul	0816	0826	0830	M1.0			3372
16 Jul	0831	0841	0845	C4.7	SF	S20W35	3363
16 Jul	0900	0900	0903		SF	S20W35	3363
16 Jul	1013	1028	1054	C2.9	SF	S24W53	3363
16 Jul	1137	1137	1140		SF	S23W53	3363
16 Jul	1327	1332	1336	C1.7	SF	N23E27	3372
16 Jul	1336	1344	1347	C1.9	SF	S24W57	3363
16 Jul	1347	1403	1409	C3.0	SF	N08E47	3373
16 Jul	1457	1508	1512	M1.7	1B	N23E27	3372
16 Jul	1625	1627	1655		SF	N21E18	3372
16 Jul	1707	1719	1724	C5.7			3363
16 Jul	1712	1713	1721		SF	N25E25	3372
16 Jul	1716	1719	1730		SF	S19W53	3363
16 Jul	1736	1746	1859	M4.0	2B	S23W58	3363
16 Jul	1747	1748	1751		SF	N27E23	3372
16 Jul	1859	1914	1922	C6.2	1F	S21W62	3363
16 Jul	2038	2045	2049	C3.5			3373
16 Jul	2049	2054	2058	C4.2			3372

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 3357												
01 Jul	S07E32	91	20	2	Dro	5	B	1			2				
02 Jul	S07E18	92	30	3	Dao	6	B								
03 Jul	S07E05	92	50	6	Dao	6	B								
04 Jul	S07W09	92	40	8	Dao	7	B								
05 Jul	S06W21	91	10	7	Bxo	9	B								
06 Jul	S07W35	92	10	2	Axx	1	A								
07 Jul	S07W48	92	plage												
08 Jul	S07W63	93	plage												
09 Jul	S07W78	95	plage												
								1	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 92

			Region 3358												
01 Jul	S12E57	66	90	3	Dai	3	B	2			1				
02 Jul	S12E43	66	70	6	Dai	15	B				1				
03 Jul	S13E29	68	100	6	Dai	14	B	5	1		8	1			
04 Jul	S14E14	69	40	9	Dsi	13	B	1			3				
05 Jul	S11W02	72	10	7	Bxo	10	B								
06 Jul	S11W15	72	10	11	Bxo	11	B								
07 Jul	S13W23	66	10	5	Bxo	7	B				3				
08 Jul	S13W36	66	10	1	Axx	1	A								
09 Jul	S13W50	67	10	1	Axx	1	A				2				
10 Jul	S13W64	68	plage								5	1			
12 Jul	S13W92	69	plage								1				
								8	1	0	24	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 72

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 3359												
01 Jul	S20E61	61	30	5	Dri	7	B	1	1		1				
02 Jul	S22E41	68	60	7	Dai	7	B	3	1		6				
03 Jul	S22E26	71	80	7	Dso	8	B	1			6				
04 Jul	S21E11	72	60	8	Dso	5	BG	1							
05 Jul	S21W00	70	140	10	Dso	12	BG	2			1	1			
06 Jul	S21W15	72	240	9	Dao	10	B	2			5				
07 Jul	S22W27	71	210	8	Dao	11	B	2	1		2		1		
08 Jul	S22W40	70	30	8	Cro	8	B								
09 Jul	S22W54	71	10	10	Bxo	6	B	2			3				
10 Jul	S21W68	72	10	3	Bxo	3	B	1			3				
11 Jul	S21W82	73	plage								1				
								15	3	0	28	1	1	0	0

Crossed West Limb.
Absolute heliographic longitude: 70

			Region 3360												
02 Jul	N23E44	66	20	2	Hsx	2	A								
03 Jul	N23E30	67	30	2	Hsx	2	A	6			7	1			
04 Jul	N23E15	68	30	5	Cao	8	B	3			1				
05 Jul	N23E07	62	30	4	Cro	6	B	1			1				
06 Jul	N22W06	63	30	4	Cro	7	B	1			2	1			
07 Jul	N23W21	65	20	2	Cro	4	A				1				
08 Jul	N23W35	65	20	2	Hrx	1	A								
09 Jul	N23W46	63	30	4	Dri	6	B								
10 Jul	N23W60	64	30	4	Dro	7	B				5				
11 Jul	N25W72	62	10	5	Bxo	5	B								
12 Jul	N23W89	66	0		Axx	1	A				2				
								13	0	0	20	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 63

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 3361												
04 Jul	N23E45	38	10	7	Bxo	3	B	1			2				
05 Jul	N23E31	39	10	7	Cao	3	BG	1	1		2				
06 Jul	N22E17	40	230	10	Dai	17	B	2			6				
07 Jul	N24E02	42	240	12	Eac	17	BD	2			12				
08 Jul	N24W12	42	260	11	Ekc	21	BD	6			5	1			
09 Jul	N24W26	43	250	11	Ehi	13	BGD	1			4				
10 Jul	N24W38	44	270	11	Ehc	12	BGD	1			3	1			
11 Jul	N25W51	42	250	10	Dhi	20	BG	1			6				
12 Jul	N25W65	42	220	10	Dsi	13	BG	3	1		3	3			
13 Jul	N25W75	39	150	10	Cso	5	B				1				
14 Jul	N24W89	40	40	2	Hsx	1	A	1							
								19	2	0	44	5	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 42

			Region 3362												
05 Jul	S10E60	9	70	2	Hsx	1	A								
06 Jul	S10E47	10	40	2	Hsx	1	A								
07 Jul	S09E33	11	50	2	Hsx	1	A								
08 Jul	S09E19	11	50	2	Hsx	2	A								
09 Jul	S09E06	11	50	2	Hsx	2	A								
10 Jul	S09W06	10	40	2	Hsx	2	A								
11 Jul	S08W20	11	30	1	Hsx	1	A								
12 Jul	S08W34	11	20	1	Hrx	1	A								
13 Jul	S08W45	9	20	1	Hrx	1	A								
14 Jul	S08W59	10	10	1	Axx	1	A								
15 Jul	S08W73	11	plage												
16 Jul	S08W87	12	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 11

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 3363												
06 Jul	S21E68	349	390	5	Hhx	1	A								
07 Jul	S21E56	348	320	5	Hkx	2	A				1				
08 Jul	S21E43	347	320	8	Cko	2	B	1							
09 Jul	S21E30	347	320	6	Hkx	2	A				2				
10 Jul	S21E17	347	500	7	Cko	7	B	1			4				
11 Jul	S21E05	346	780	7	Cko	21	B	1			7				
12 Jul	S21W09	346	850	7	Dko	24	BD	1			2				
13 Jul	S23W20	343	800	8	Dko	20	BD				1		1		
14 Jul	S22W34	345	780	8	Dko	16	BD	3	1		10				
15 Jul	S22W47	346	720	8	Dko	11	BD	2	1		7		1		
16 Jul	S22W59	344	720	10	Dko	9	BD	9	1		9	1	1		
								18	3	0	43	1	3	0	0

Still on Disk.
Absolute heliographic longitude: 346

			Region 3364												
06 Jul	N23E57	360	20	2	Cro	7	B								
07 Jul	N24E43	1	20	3	Cro	3	B								
08 Jul	N24E29	1	10	1	Axx	1	A	1							
09 Jul	N24E15	2	10	1	Axx	1	A								
10 Jul	N24E01	3	10	1	Axx	1	A								
11 Jul	N25W12	3	10		Axx	1	A								
12 Jul	N25W26	3	10	3	Bxo	5	B								
13 Jul	N25W39	2	0		Axx	1	A								
14 Jul	N25W52	3	plage												
15 Jul	N25W65	4	plage												
16 Jul	N25W79	4	plage												
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 3

			Region 3365												
07 Jul	S36W21	65	20	3	Bxo	2	B								
08 Jul	S36W35	65	10	6	Bxo	2	B								
09 Jul	S36W48	65	10	6	Axx	2	A								
10 Jul	S36W63	67	plage												
11 Jul	S36W77	68	plage												
								0	0	0	0	0	0	0	0

Died on Disk.
Absolute heliographic longitude: 65

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 3366												
07 Jul	S11W09	52	20	3	Dri	10	B				4				
08 Jul	S10W24	54	100	6	Dai	11	B	1							
09 Jul	S10W38	55	120	7	Dsi	10	B	4			4				
10 Jul	S10W52	56	130	10	Dso	6	B	3	2		8	2	1		
11 Jul	S11W67	58	120	10	Cso	7	B				1				
12 Jul	S11W83	60	90	2	Hsx	1	A		1						
13 Jul	S18W91	55	plage												
								8	3	0	17	2	1	0	0

Crossed West Limb.
Absolute heliographic longitude: 52

			Region 3367												
08 Jul	N10E15	14	10	4	Bxo	7	B								
09 Jul	N10E01	16	80	5	Dai	10	B				6				
10 Jul	N10W13	17	120	7	Dsi	13	BG	3			10				
11 Jul	N10W27	18	160	10	Dsi	22	BG				9				
12 Jul	N10W41	18	160	10	Dai	18	B				4				
13 Jul	N10W56	19	200	11	Eai	16	BD	1			1				
14 Jul	N10W69	20	170	10	Dao	9	B				1				
15 Jul	N10W83	21	80	10	Dao	4	B				2				
								4	0	0	33	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 16

			Region 3368												
09 Jul	S19W33	50	30	3	Dri	5	B	1							
10 Jul	S19W47	51	100	8	Dao	9	B	1			1				
11 Jul	S17W64	53	100	7	Dao	14	B		2		10				
12 Jul	S17W78	55	80	8	Dai	11	B				1				
13 Jul	S17W92	56	plage								1				
								2	2	0	13	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 50

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 3369												
09 Jul	S18W23	39	30	3	Dro	5	B								
10 Jul	S18W37	41	50	5	Cso	7	B								
11 Jul	S18W51	42	60	5	Cso	4	B								
12 Jul	S18W65	42	0	1	Axx	2	A								
13 Jul	S18W79	43	plage								1				
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 39

			Region 3370												
10 Jul	S15E61	303	30	7	Dso	4	B								
11 Jul	S14E47	304	50	7	Dao	8	B				1				
12 Jul	S15E33	304	30	8	Dro	8	B								
13 Jul	S15E21	302	20	8	Cro	5	B								
14 Jul	S15E08	303	10	5	Bxo	4	B	2			1				
15 Jul	S15W06	304	plage												
16 Jul	S15W20	305	plage												
								2	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 304

			Region 3371												
11 Jul	S15E59	292	20	1	Hax	1	A								
12 Jul	S15E48	289	30	1	Hax	2	A								
13 Jul	S15E34	290	30	2	Hax	2	A								
14 Jul	S15E20	291	30	2	Hax	2	A								
15 Jul	S15E07	291	20	1	Hax	1	A								
16 Jul	S15W07	292	20	1	Hrx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 291

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 3372												
11 Jul	N22E75	276	270	2	Hkx	3	A		3		3				
12 Jul	N24E65	272	650	14	Eki	13	B	3	2		8	1			
13 Jul	N24E53	271	650	15	Eko	16	B	11	1		8	3			
14 Jul	N24E39	272	770	15	Eko	11	BD	3			4	1			
15 Jul	N24E26	272	660	17	Fko	13	BGD	2	2		3	1			
16 Jul	N23E13	272	700	16	Fko	18	BGD	3	2		5	1			
								22	10	0	31	7	0	0	0

Still on Disk.
Absolute heliographic longitude: 272

			Region 3373												
14 Jul	N08E66	245	120	7	Dao	6	B								
15 Jul	N07E52	246	180	9	Dso	6	B	1			5				
16 Jul	N07E39	246	240	10	Dai	20	B	2			1				
								3	0	0	6	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 246

			Region 3374												
14 Jul	S09E69	242	30	1	Hsx	1	A								
15 Jul	S08E55	243	30	1	Hsx	1	A								
16 Jul	S08E41	244	20	1	Hsx	1	A	1							
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 244

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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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