Space Weather Highlights
26 July – 01 Aug 1999

Solar activity ranged from low to high levels. The week began with activity at low levels, then increased to moderate levels on 27 July due to an M3/1N at 27/1405UT from Region 8636 (N21, L=332, class/area Fki/610 on 27 July). Moderate activity continued through 28 July with a couple low-level M-class flares from Region 8649 (S15, L=271, class/area Dao/170 on 30 July) including an M1/SF at 28/0201UT with a Type IV radio sweep and a 450 SFU Tenflare. Activity increased to high levels on 29 July by virtue of an impulsive M5/1N flare at 29/1934UT from Region 8651 (N24, L=204, class/area Ekc/870 on 01 August) accompanied by minor discrete radio emission. Activity returned to moderate levels on 30 July with another isolated, low-level M-class flare from Region 8649. Activity decreased to low levels during the last two days of the period with occasional C-class flares from Regions 8645 and 8651.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. No significant changes were observed in the solar wind flow through 29 July. A coronal mass ejection signature was evident on 30 July with a velocity increase from 380 - 680 km/sec, increased densities, and a period of sustained southward IMF Bz with deflections to minus 12 nT (GSM).

No proton events were detected at geo-synchronous orbit during the period.

The greater than 2 MeV electron flux briefly reached high levels on 26 July. Otherwise, fluxes were at normal to moderate levels.

The geomagnetic field was at quiet to unsettled levels through 29 July. A sudden storm commencement occurred at 30/1948UT (89 nT, as measured by the Boulder USGS magnetometer) followed by active to major storm levels with brief severe storm periods at high latitudes. The disturbance declined to unsettled to active levels on 31 July, then ended early on 01 August. The field was at quiet levels for the remainder of the period.

Space Weather Outlook
04 August - 30 August 1999

Solar activity is expected to range from low to moderate levels. Regions 8645 and 8651 are likely to produce additional isolated M-class flares. There will also be a slight chance for a major flare sometime during the period.

There will be a slight chance for a proton event at geo-synchronous altitude.

The greater than 2 MeV electrons flux at geo-synchronous altitude is expected to be at normal to moderate levels during most of the period.

Geomagnetic field activity is expected to be at unsettled to active levels during 05 August due to recent CME activity. Active levels are also possible around 18 August due to coronal hole effects. The geomagnetic field is expected to be at quiet to unsettled levels during the remainder of the period, barring any Earth-directed coronal mass ejections.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	
26 July	172	150	1310	B9.8	4	0	0	4	0	0	0	0
27 July	175	161	1520	B7.0	3	1	0	4	1	0	0	0
28 July	198	218	1540	B7.4	4	2	0	29	2	0	0	0
29 July	202	226	1520	C1.4	7	2	0	25	5	1	0	0
30 July	206	218	1620	C1.7	16	1	0	30	3	0	0	0
31 July	201	220	1720	C1.1	11	0	0	21	1	0	0	0
01 August	216	267	1690	C1.0	9	0	0	22	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2-day-sr) >1MeV	>10MeV	>100MeV	Electron Fluence (electrons/cm^2-day-sr) >.6MeV	>2MeV	>4MeV
26 July	7.1E+4	1.4E+4	3.0E+3		4.0E+7	
27 July	5.4E+4	1.4E+4	2.8E+3		3.9E+7	
28 July	5.4E+4	1.4E+4	2.6E+3		2.3E+7	
29 July	8.2E+4	1.4E+4	2.7E+3		9.8E+5	
30 July	7.7E+5	1.5E+4	3.2E+3		7.5E+5	
31 July	3.0E+5	1.5E+4	3.2E+3		3.1E+5	
01 August	1.6E+5	1.7E+4	3.8E+3		3.4E+6	

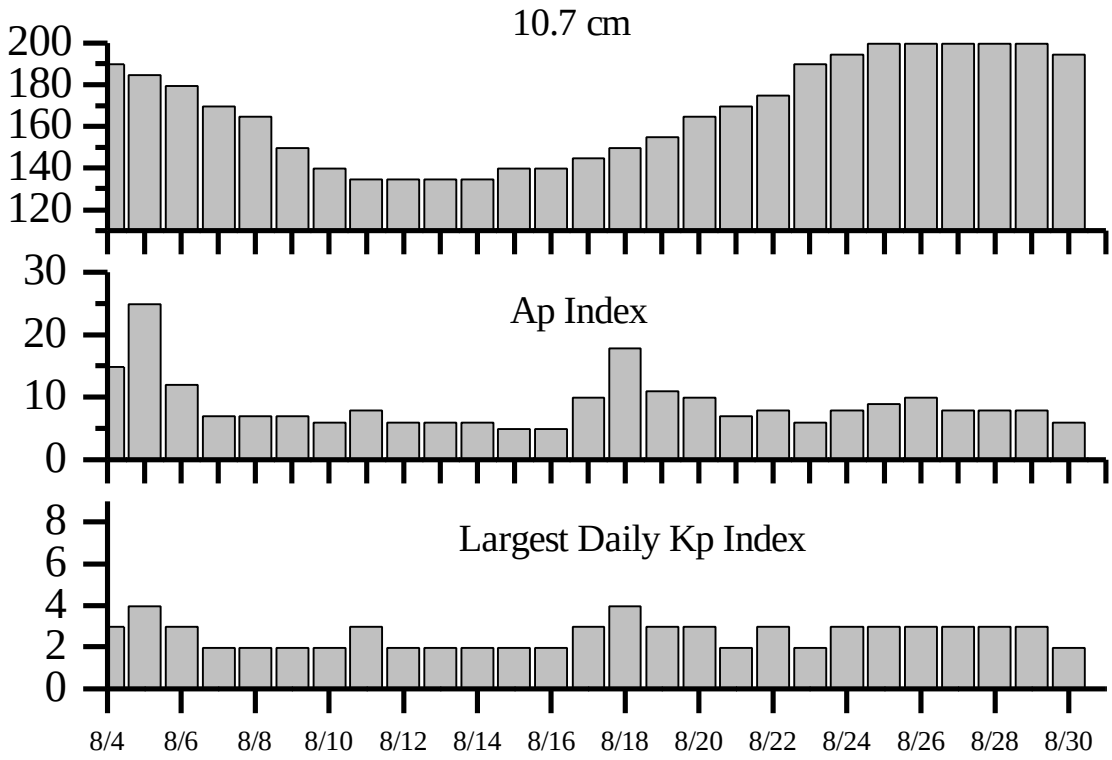
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
26 July	4	1-0-1-2-2-1-1-1	10	2-1-2-3-4-3-1-1	7	3-1-3-2-2-2-2-1
27 July	6	2-2-2-1-2-2-1-1	4	2-1-2-1-1-2-0-0	6	2-2-2-1-2-2-2-1
28 July	7	0-1-1-2-2-2-3-3	17	1-1-1-5-2-5-3-2	9	1-1-2-2-2-3-3-3
29 July	6	2-2-1-1-2-1-2-2	8	3-3-1-3-1-1-0-2	10	3-3-2-2-2-2-2-3
30 July	41	2-2-2-3-4-5-7-6	44	2-3-4-5-6-5-6-5	36	3-2-3-4-5-4-6-6
31 July	21	4-4-3-2-2-2-4-5	21	4-4-4-2-2-4-4-3	21	5-4-4-2-2-2-4-4
01 August	10	5-3-2-1-1-0-0-1	*	4-4-2-0-0-*-0-0	9	4-3-1-1-1-1-1-1

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
26 Jul 1617	>2MeV Electron Event =1000pfu	26 Jul 1600
27 Jul 0009	3 - 245 MHz Bursts	26 Jul
28 Jul 0108	3 - 245 MHz Bursts	27 Jul
28 Jul 0230	10cm Radio Burst 450 sfu	28 Jul 0151
28 Jul 0250	Type IV Radio Emission	28 Jul 0152
28 Jul 1802	K = 4 Observed	28 Jul 15 – 18
28 Jul 1802	K = 4 Warning valid	28 Jul 18 - 24
28 Jul 1912	Type II Radio Emission	28 Jul 1820
29 Jul 1955	X-Ray event M5/1N	29 Jul 1931
29 Jul 0020	1-245 MHz Bursts	28 Jul
30 Jul 1210	K = 4 Observed	30 Jul 09 -12
30 Jul 1329	K = 4 Warning valid	30/1500 to 31/1500 Jul
30 Jul 1523	A = 20 Watch for	30 Jul
30 Jul 1523	K = 5 Observed	30 Jul 12-15
30 Jul 1737	K = 5 Warning valid	30/1800 - 31/1500 Jul
30 Jul 2005	Sudden Impulse 89 nT observed at Boulder	30 Jul 1948
30 Jul 2018	Rapid Alert: K= 6 exceeded	30 Jul 2017
30 Jul 2036	K = 6 Warning valid	30/2100 - 31/1500 Jul
30 Jul 2111	A = 20 Observed	30 Jul 2100
30 Jul 2111	K = 6 Observed	30 Jul 18-21
30 Jul 2346	Rapid Alert: K= 6 exceeded	30 Jul 2320
31 Jul 0052	2 - 245 MHz Bursts	30 Jul
31 Jul 0013	A = 30 Observed	31 Jul 0000
01 Aug 0110	1- 245 MHz Bursts	31 Jul
01 Aug 0044	A = 30 Observed ENDED 31/1800 Jul	31 Jul 0000
01 Aug 0313	K= 4 Observed	01 Aug 00-03
01 Aug 0601	K= 4 Observed	01 Aug 03-06
01 Aug 2200	Type II Radio Emission	01 Aug 2110

Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
04 Aug	190	15	3	18 Aug	150	18	4
05	185	25	4	19	155	11	3
06	180	12	3	20	165	10	3
07	170	7	2	21	170	7	2
08	165	7	2	22	175	8	3
09	150	7	2	23	190	6	2
10	140	6	2	24	195	8	3
11	135	8	3	25	200	9	3
12	135	6	2	26	200	10	3
13	135	6	2	27	200	8	3
14	135	6	2	28	200	8	3
15	140	5	2	29	200	8	3
16	140	5	2	30	195	6	2
17	145	10	3				

Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV
27 Jul	1258	1405	1420	M3.0	.065	1N	N23W50	8636				
28 Jul	0136	0201	0215	M1.1	.015	SF	S15E08	8649	200	450		2
28 Jul	0804	0814	0819	M2.3	.010	1B	S15E03	8649		97		
29 Jul	1622	1656	1717	M1.3	.033	2N	S23E08	8645		21		
29 Jul	1931	1936	1940	M5.1	.017	1N	N25E51	8651		38		
30 Jul	1509	1520	1526	M1.7	.009	1B	S15W28	8649	1200	56		

Flare List

Date	Time			X-ray	Optical		
	Begin	Max	End	Class.	Imp / Brtns	Location Lat CMD	Rgn #
26 July	0639	0644	0652		SF	S24E54	8645
	0841	0847	0854	C2.5			
	1352	1356	1404	C2.6			
	1511	1512	1514		SF	N21W35	8636
	1833	U1839	1844	C1.4	SF	S26E38	8645
	2016	2029	2041	C1.5			8646
	2025	2028	2034		SF	N13W44	8646
27 July	0058	0254	0451	C2.1			
	0738	0747	0750		SF	N13W50	8646
	0854	0857	0915	C2.7	SF	S26E40	8645
	0946	0950	0952	C1.4			
	1309	1323	1442	M3.0	1N	N23W50	8636
	1442	1442	1450		SF	N12W54	8646
	1500	1501	1504		SF	N12W54	8646
28 July	0023	0023	0036		SF	N21W53	8636
	0047	0051	0054		SF	N20W55	8636
	0057	0105	0109		SF	N20W55	8636
	0152	0158	0234	M1.1	SF	S15E08	8649
	0553	0555	0558		SF	S15E06	8649
	0744	0746	0803		SF	S15E04	8649
	0805	0813	0902	M2.3	1B	S15E03	8649
	0853	0855	0901		SF	N22E69	8651
	0903	0904	0911		SF	N24E69	8651
	0927	0936	0950		SF	N24E68	8651
	1002	1005	1012	C1.8			
	1251	1321	1404	C2.0	SF	N20W72	8636
	1322	1323	1334		SF	S25E19	8645
	1425	1431	1444		SF	S15E01	8649
	1457	1515	1525		SF	S22E24	8645
	1547	1555	1619		SF	N23E68	8651
	1742	1743	1800		SF	N22E67	8651
	1745	1746	1749		SF	S22E23	8645

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
28 July	1745	1746	1809		SF	N19W65	8636
	1748	1812	1842		SF	S18E29	8647
	1757	1806	1848	C7.7	1N	S19E22	8645
	1843	1843	1847		SF	S19E29	8647
	1849	1855	1902		SF	N24E65	8651
	1849	1851	1905		SF	S14W03	8649
	1850	1854	1859		SF	S25E24	8645
	1918	1918	1922		SF	S22E23	8645
	1926	1932	2012		SF	S14W04	8649
	1927	1932	1937		SF	N24E65	8651
	1940	1952	1957	C7.9	SF	N23E66	8651
	2034	2035	2046		SF	S14W02	8649
	2210	2210	2216		SF	S23E19	8645
	2317	2318	2325		SF	S14W02	8649
29 July	B1010	U1012	A1029	C2.5	SF	S16W11	8649
	B1059	U1102	A1103		SF	N25E54	8651
	1133	1142	1207	C3.0			
	1213	1214	1222		SF	N20W75	8636
	1238	1252	1335	C4.9	SF	S14W12	8649
	B1306	U1308	1342		SF	S15W12	8649
	1312	U1333	1340		SF	S26E02	8645
	1400	1402	1412	C2.4	SF	S16W12	8649
	1420	1514	1615	C5.6	1N	N23E56	8651
	1445	1447	1459		SF	N23E55	8651
	1512	1514	1522	C6.1	SN	N25E53	8651
	1603	1603	1620		SF	S20E11	8645
	1622	1631	1725	M1.3	2N	S23E08	8645
	1633	1731	2019		1F	N23E52	8651
	1640	1646	1710		SF	S18E11	8647
	1648	1650	1712		SF	N23E54	8651
	1711	1714	1716		SF	S18E11	8647
	1725	1731	1750		SF	N24E52	8651
	1729	1733	1734		SF	S24E09	8645
	1747	1749	1751		SF	S24E10	8645
	1748	1749	1751		SF	S14W15	8649
	1752	1754	1756		SF	S15W12	8649
	1757	1802	1805		SF	S14W15	8649
	1817	1817	1819		SF	S24E09	8645
	1824	1837	1842		SF	S15W14	8649
	1843	1844	1847		SF	S14W16	8649
	1850	1859	1905		SF	S14W16	8649

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
29 July	1918	1919	1925		SF	S14W16	8649
	1925	1934	A1955	M5.1	1N	N25E51	8651
	2020	2109	2210		1F	N24E53	8651
	2251	2324	2328		SF	N24E50	8651
	2333	2346	0028	C5.5	1F	N24E50	8651
30 July	0052	0053	0102		SF	N25E47	8651
	0108	0108	0134	C6.4	SF	N22E52	8651
	0158	0200	0231	C3.9	SF	N23E48	8651
	0259	0306	0310		SF	S26W06	8645
	0518	0526	0531		SF	N23E47	8651
	0553	0555	0617	C3.6	SF	N23E46	8651
	0641	0645	0657		SF	N23E45	8651
	0706	0706	0712		SF	S26W07	8645
	0718	0719	0730	C3.9	SF	N25E46	8651
	0835	0835	0840		SF	N25E45	8651
	0837	0839	0842		SF	S16W23	8649
	0848	0856	0900	C5.4	SN	N25E43	8651
	B1036	U1036	A1050		SF	S27E05	8645
	B1109	1117	1154		SF	S24E01	8645
	1158	1202	1220		SF	S15W25	8649
	1200	1210	1229	C3.0	SF	N23E40	8651
	1219	1221	1223	C3.6	SF	S16W25	8649
	1230	1243	1247		SF	N25E43	8651
	1252	1254	1316	C3.8	1F	N23E41	8651
	1319	1320	1325		SF	N25E43	8651
	1335	1337	1341		SF	N25E42	8651
	1344	1351	1354		SF	N25E43	8651
	1355	1417	1427	C2.8	SF	N25E42	8651
	1455	1456	1508		SF	S23W04	8645
	1516	1520	1614	M1.7	1B	S15W28	8649
	1554	1554	1558		SF	S26E00	8645
	1604	1606	1621	C6.1	1N	N24E38	8651
	1636	1639	1640		SF	N24E40	8651
	1720	1735	1742	C3.5			
	1847	1910	1913	C5.4			
	1914	1917	1920	C5.3			
	2018	2021	2023	C3.7			
30 July	2137	2155	2213	C5.0	SN	N25E38	8651
	2214	2214	2254		SF	N24E38	8651
	2323	2335	2343	C5.1	SF	N25E38	8651
	2345	2348	0006		SF	N26E38	8651
	2345	2350	2355		SF	S22W06	8645

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
31 July	0008	0024	0058	C2.3	SF	N25E34	8651
	0024	0024	0030		SF	S19W11	8645
	0233	0236	0239	C1.4			
	0301	0304	0308	C1.6			
	0323	0323	0332	C2.3	SF	N21E36	8651
	0546	0549	0601		SF	N25E34	8651
	0707	0709	0740		SF	N15E33	8650
	0851	0926	1019		SF	N25E32	8651
	0938	0940	0944	C2.4	SF	S26W21	8645
	0945	0945	0950		SF	S26W21	8645
	1024	1029	1037	C4.6			
	1156	1158	1211		SF	N25E31	8651
	1212	1212	1226		SF	N25E29	8651
	1212	1213	1223		SF	S23W16	8645
	1252	1252	1259		SF	N25E29	8651
	1348	1352	1357		SF	N16E30	8650
	1356	1359	1410	C4.1	SF	N25E29	8651
	1358	1358	1403		SF	S20W17	8645
	1414	1418	1420		SF	S23W15	8645
	1422	1424	1448		SF	N25E28	8651
	1607	1612	1621	C2.4	SF	N25E26	8651
	1612	1612	1617		SF	S22W12	8645
	1752	1754	1814	C3.1	1F	N02E00	8645
	1823	1825	1828	C1.7	SF	N25E24	8651
	1928	U1929	A2020		SF	N25E26	8651
	2353	2359	0004	C4.1			
01 August	0043	0106	0116		SF	S25W18	8645
	0111	0116	0122	C2.5			
	0131	0133	0141		SF	N24E23	8651
	0159	0203	0207	C1.6			
	0321	0329	0339		SF	N23E21	8651
	0643	0646	0652		SF	S21W32	8647
	0644	0646	0655	C9.2	SF	S24W31	8645
	0814	0814	0818		SF	S23W24	8645
	0831	0833	0850		SF	S18W27	8647
	0831	0835	0848		SF	S19W25	8645
	0906	0908	0912	C3.6	SF	S23W23	8645
	0946	0948	0954		SF	S26W34	8645
	1031	1032	1041		SF	S18W32	8647
	1249	1251	1300	C3.3	SF	S23W33	8645
	1532	1539	1551	C4.7	SF	S22W31	8645

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
01 August	B1604	U1604	1611		SF	S24W30	8645
	1612	1617	1625	C5.7			
	1710	1717	1728		SF	N24E14	8651
	1741	1743	1758		SF	S19W31	8645
	1806	1810	1818		SF	S23W32	8645
	1821	1829	1846		SF	N25E13	8651
	2002	2004	2012		SF	S31W21	8645
	2101	2103	2123	C3.5	SF	N27E16	8651
	2137	U2139	A2159		SF	S24W39	8645
	2312	2314	2326	C4.3	SF	S28W27	8645

Region Summary

Date	Location (° Lat ° CMD)	Location Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8636												
17 Jul	N20E73	338	0070	07	CAO	004	B				6				
18 Jul	N20E61	337	0310	11	EAO	009	B	1			9				
19 Jul	N20E51	334	0330	13	EAI	018	BG	1	1		5		1		
20 Jul	N20E36	335	0390	15	EAI	025	BG	4			4				
21 Jul	N21E25	333	0390	18	FSO	035	BG	2			6				
22 Jul	N21E12	333	0550	20	FKI	045	BGD	2			10				
23 Jul	N21E00	332	0600	22	FKC	061	BG	1	1		15		1		
24 Jul	N21W14	333	0570	20	FKC	058	BG	3	1		5				
25 Jul	N21W28	333	0560	18	FKI	052	BG	2			4				
26 Jul	N21W42	334	0520	17	FKC	051	BG				1				
27 Jul	N21W54	333	0610	17	FKI	034	BG		1			1			
28 Jul	N21W68	334	0500	15	EAC	022	B	1			5				
29 Jul	N20W82	335	0360	13	EKI	008	B				1				
30 Jul	N21W90	329	0080	07	CAO	004	B								
								17	4	0	71	1	2	0	0

Crossed West Limb.
Absolute heliographic longitude: 332

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8638												
18 Jul	S10E67	331	0010	01	AXX	002	A								
19 Jul	S10E51	334	0010	02	AXX	002	A								
20 Jul	S13E38	334													
21 Jul	S13E25	334													
22 Jul	S13E12	334													
23 Jul	S13W01	334													
24 Jul	S13W14	334													
25 Jul	S13W27	334													
26 Jul	S13W40	334													
27 Jul	S13W53	334													
28 Jul	S13W66	334													
29 Jul	S13W79	334													
30 Jul	S13W92	334													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		334													
			Region 8640												
20 Jul	N17E76	295	0040	01	HSX	001	A								
21 Jul	N17E63	295	0080	02	HSX	001	A								
22 Jul	N17E49	296	0090	02	HSX	001	A								
23 Jul	N17E37	295	0110	03	HSX	001	A								
24 Jul	N17E24	295	0120	02	HAX	001	A								
25 Jul	N17E10	295	0090	02	HSX	001	A								
26 Jul	N17W03	295	0090	02	HSX	001	A								
27 Jul	N17W16	295	0090	02	HSX	001	A								
28 Jul	N17W28	294	0070	02	HSX	002	A								
29 Jul	N16W42	295	0110	06	CSO	007	B								
30 Jul	N16W55	294	0100	07	CSO	004	B								
31 Jul	N17W69	295	0090	08	CSO	003	B								
01 Aug	N18W82	295	0060	02	HSX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		295													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8642												
21 Jul	S18E65	293	0020	04	BXO	003	B	1			2				
22 Jul	S18E51	294	0040	03	DSO	004	B				2				
23 Jul	S18E38	294	0060	03	CSO	005	B								
24 Jul	S18E25	294	0030	04	BXO	007	B								
25 Jul	S18E11	294	0020	04	BXO	005	B								
26 Jul	S18W02	294													
27 Jul	S18W15	294													
28 Jul	S23W27	293	0010	01	AXX	002	A								
29 Jul	S23W40	293													
30 Jul	S23W53	293													
31 Jul	S23W66	293													
								1	0	0	4	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		294													
			Region 8644												
23 Jul	S24E68	264	0030	02	HAX	001	A		2		1				
24 Jul	S25E54	265	0040	05	CAO	002	B								
25 Jul	S25E42	263	0040	02	HSX	001	A								
26 Jul	S25E28	264	0040	02	HSX	001	A								
27 Jul	S25E16	263	0030	01	HSX	001	A								
28 Jul	S26E02	264	0040	02	HSX	001	A								
29 Jul	S26W08	261	0030	06	CSO	003	B								
30 Jul	S25W23	262	0020	01	CRO	002	B								
31 Jul	S25W36	262	0010	01	AXX	002	A								
01 Aug	S25W49	262													
								0	2	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		264													
			Region 8645												
24 Jul	S26E68	251	0190	09	DKO	005	B	1	2		2	1			
25 Jul	S27E59	246	0320	17	FAO	015	B	1	1		4	1			
26 Jul	S27E46	246	0410	16	FKO	015	B	1			2				
27 Jul	S27E35	244	0530	17	FKO	013	B	1			1				
28 Jul	S26E22	244	0490	18	FKO	024	B	1			6	1			
29 Jul	S24E10	243	0590	19	FKI	034	BG		1		5		1		
30 Jul	S25W03	242	0620	19	FAO	037	BG				7				
31 Jul	S25W16	242	0600	18	FAO	033	BG	2			7	1			
01 Aug	S25W29	242	0540	20	FKI	043	BG	5			14				
								12	4	0	48	4	1	0	0
Still on Disk.															
Absolute heliographic longitude:		242													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8646												
24 Jul	N12W19	338	0020	03	BXO	004	B								
25 Jul	N12W32	337	0020	03	BXO	004	B								
26 Jul	N13W44	336	0000	00	AXX	001	A	1			1				
27 Jul	N13W57	336									3				
28 Jul	N13W70	336													
29 Jul	N13W83	336													
								1	0	0	4	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 338

			Region 8647												
25 Jul	S18E63	242	0110	09	CAO	006	B				2				
26 Jul	S18E51	241	0220	09	DSO	010	B								
27 Jul	S18E37	242	0150	10	DAO	010	B								
28 Jul	S18E24	242	0090	11	EAO	012	B				2				
29 Jul	S18E11	242	0050	11	ESO	017	B				2				
30 Jul	S17W03	242	0040	11	CSO	011	B								
31 Jul	S18W18	244	0040	09	CSO	008	B								
01 Aug	S18W34	247	0040	08	CSO	015	B				3				
								0	0	0	9	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 242

			Region 8648												
25 Jul	N24E84	221	0000	01	AXX	001	A								
26 Jul	N24E67	225	0030	01	HAX	001	A								
27 Jul	N23E55	224	0040	06	DSO	004	B								
28 Jul	N22E42	224	0030	05	BXO	004	B								
29 Jul	N22E29	224	0010	03	CSO	003	B								
30 Jul	N23E16	223	0010	04	BXO	004	B								
31 Jul	N23E04	222	0010	06	BXO	002	B								
01 Aug	N24W12	225	0010	03	BXO	005	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 222

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8649												
27 Jul	S15E09	270	0030	03	DAO	006	B								
28 Jul	S15W05	271	0100	06	DAO	017	B		2		8	1			
29 Jul	S15W16	269	0100	08	DAO	021	B	3			11				
30 Jul	S15W30	269	0170	10	DAO	025	B	1	1		3	1			
31 Jul	S15W44	270	0110	11	CAO	021	B								
01 Aug	S15W54	267	0050	05	CAO	008	B								
								4	3	0	22	2	0	0	0

Still on Disk.
Absolute heliographic longitude: 271

			Region 8650												
27 Jul	N17E75	204	0040	02	HAX	001	A								
28 Jul	N16E64	202	0070	02	HSX	001	A								
29 Jul	N17E50	203	0050	04	CSO	004	B								
30 Jul	N16E36	203	0050	02	HSX	001	A								
31 Jul	N18E23	203	0090	04	DSO	007	B				2				
01 Aug	N18E10	203	0050	07	CSO	012	B								
								0	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 203

			Region 8651												
27 Jul	N24E73	206	0000	00	AXX	001	A								
28 Jul	N24E65	201	0100	09	CAO	007	B	1			8				
29 Jul	N24E49	204	0210	10	DAI	025	B	3	1		6	5			
30 Jul	N24E36	203	0510	10	DAI	026	BG	11			20	2			
31 Jul	N25E23	203	0730	12	EKI	037	B	5			12				
01 Aug	N24E09	204	0870	14	EKC	058	BG	1			5				
								21	1	0	51	7	0	0	0

Still on Disk.
Absolute heliographic longitude: 204

			Region 8652												
28 Jul	N17W37	303	0010	03	BXO	004	B								
29 Jul	N17W50	303													
30 Jul	N17W63	303													
31 Jul	N17W76	303													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 303

Region Summary-continued

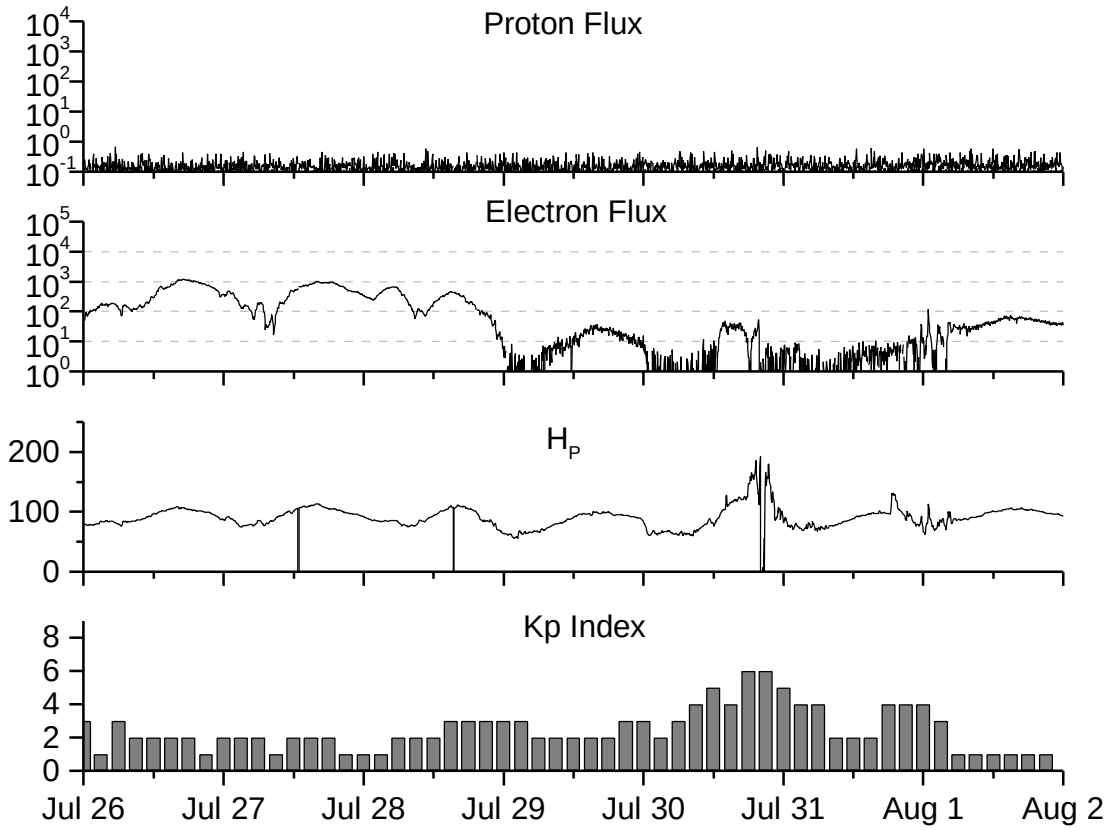
Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8653												
28 Jul	N28W30	296	0030	03	BXO	002	B								
29 Jul	N28W44	297	0010	05	BXO	004	B								
30 Jul	N29W58	297	0020	06	BXO	004	B								
31 Jul	N28W72	298	0020	04	CRO	003	B								
01 Aug	N28W84	297	0020	04	BXO	004	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		296													
			Region 8654												
31 Jul	N19W18	244	0020	04	BXO	004	B								
01 Aug	N19W31	244	0030	07	CSO	006	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		244													
			Region 8655												
01 Aug	N25E38	175	0010	01	HSX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		175													
			Region 8656												
01 Aug	N18E34	179	0010	05	BXO	004	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		179													

Recent Solar Indices (preliminary)
of the observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
					1997				
August	36.7	24.4	0.66	35.9	25.0	79.0	83.4	07	08.3
September	52.8	51.3	0.88	40.5	28.3	96.2	85.7	10	08.4
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	08.6
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
					1998				
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.4	138.4	126.8	13	12.5
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.9	0.69	108.8	77.9	150.1	134.3	08	11.9
					1999				
January	94.3	62.4	0.66	116.5	82.5	142.6	139.0	10	11.8
February	93.4	66.1	0.70			142.0		11	
March	100.5	69.1	0.69			126.3		13	
April	92.9	63.9	0.69			117.3		12	
May	140.5	106.3	0.76			148.6		10	
June	208.3	137.4	0.66			170.0		08	
July	169.2	113.5	0.67			165.6		10	

NOTE: All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI= 158.5, occurred July 1989. * After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 26 July 1999

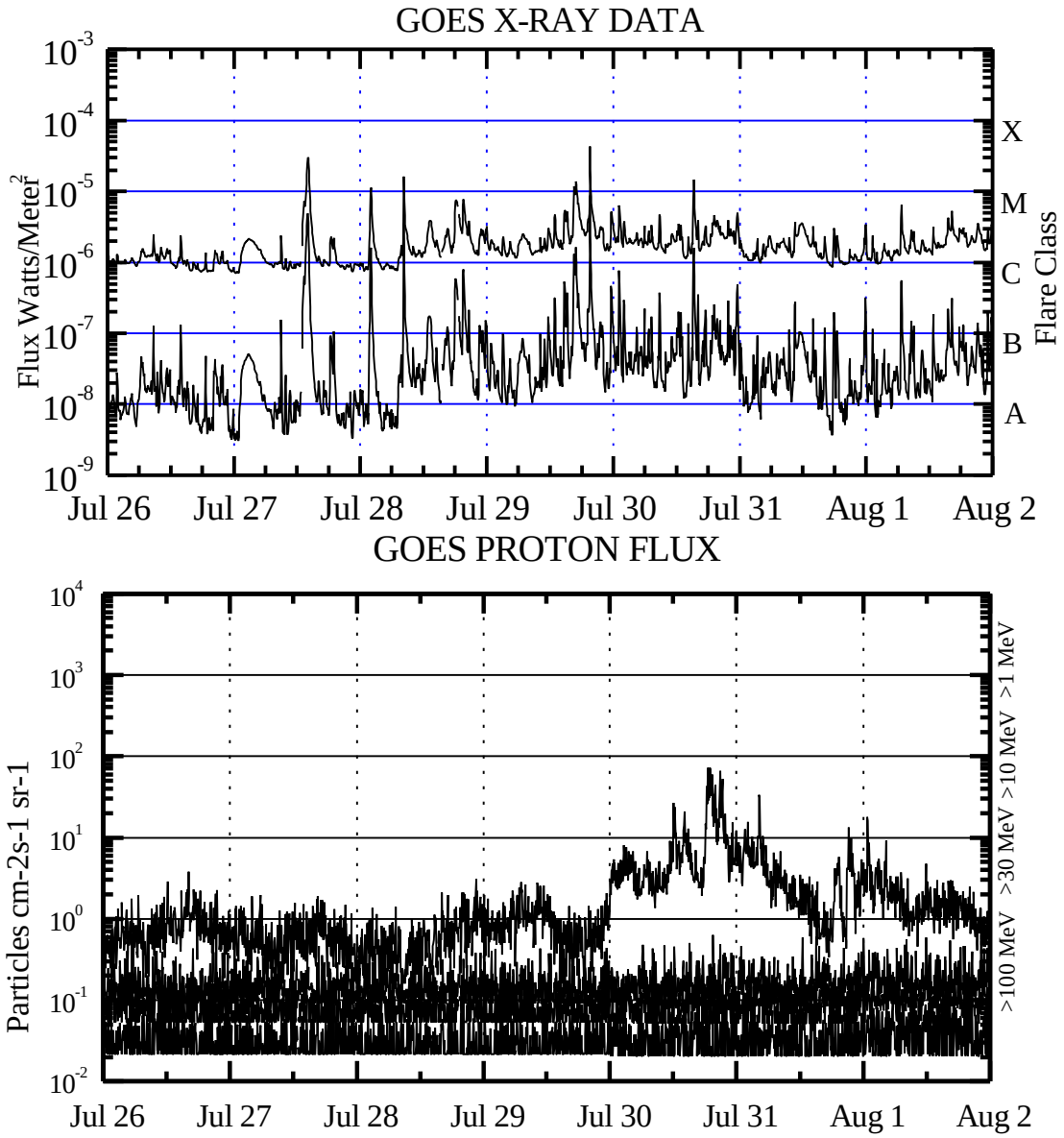
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2–sec –sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-8.

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are " global " parameters that are applicable to a first order approximation over large areas. Hparallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five minute averaged x-ray flux (watts / m^2) as measured by GOES 8 and 10 in two wavelength bands, .05 -.4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five minute averaged integral proton flux (protons/cm2 –sec –sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.