Space Weather Highlights **SWO PRF 1407**
12 - 18 August 2002 **20 August 2002**

Solar activity ranged from low to high levels during the period. Activity increased to high levels on 16 August due to a long-duration M5/2n flare from Region 69 (S07, L = 298, class/area Ekc/1960 on 18 August) at 16/1232 UTC. This flare was associated with a 1600 sfu Tenflare, Type II and IV radio sweeps, and a full-halo CME. Region 69 was very large with multiple, persistent delta magnetic configurations. Moderate activity occurred during 13 – 15 and 17 – 18 August due to low-level M-class flares from Region 61 (N08, L = 041, class/area Ekc/360 on 09 August), Region 66 (N14, L = 332, class/area Dai/140 on 14 August), and Region 69.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Recurrent positive-polarity coronal hole effects occurred through 14 August with peak velocities around 550 km/sec. A weak, CME-related shock passed the ACE spacecraft at about 15/1828 UTC. Wind speeds briefly reached 800 km/sec immediately following the passage, then decreased a bit with speeds as high as 670 km/sec through the first half of 16 August. Another CME-related shock passed ACE at approximately 18/1810 UTC associated with a sudden increase in velocities to as high as 600 km/sec. The Bz component of the IMF became more variable following the shock with a range of plus 10 to minus 13 nT (GSM).

A greater than 10 MeV proton event began at geo-synchronous orbit at 14/0900 UTC, reached a peak of 26 pfu at 14/1620 UTC, and ended at 14/1950 UTC. Greater than 10 MeV proton fluxes remained enhanced for the rest of the period.

The greater than 2 MeV electron flux at geo-synchronous orbit was at normal to moderate levels during 12 – 13 August. Fluxes were at normal to high levels for the rest of the period.

Geomagnetic field activity ranged from quiet to active levels during 12 – 13 August with minor storm periods at high latitudes. Activity decreased to mostly quiet to unsettled levels on 14 August. Field activity increased to unsettled to minor storm levels during 15 – 16 August. Activity decreased to mostly quiet to unsettled levels during 17 August. Active to minor storm levels occurred late on 18 August following a sudden impulse at 18/1848 UTC (27 nT, as measured by the Boulder USGS magnetometer).

Space Weather Outlook
21 August - 16 September 2002

Solar activity may reach high levels during 21 – 25 August. Otherwise, low to moderate levels are expected.

There is a chance for a greater than 10 MeV proton event during the period.

The greater than 2 MeV electron flux at geo-synchronous orbit is expected to be at normal to moderate levels during most of the period. However, high flux levels are possible beginning 10 September.

Active geomagnetic field conditions are possible during 21 August and 5 – 12 September. Quiet to unsettled conditions are expected for the rest of the period.

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	4
12 August	184	230	1930	B8.9	5	0	0	4	1	0	0	0
13 August	192	214	2110	B9.3	13	1	0	6	2	0	0	0
14 August	208	254	2620	C1.2	7	2	0	14	2	0	0	0
15 August	210	281	2820	C1.1	11	2	0	12	0	0	0	0
16 August	214	247	2830	C1.6	1	4	0	8	3	1	0	0
17 August	227	270	2730	C1.9	14	2	0	23	1	0	0	0
18 August	241	308	2850	C1.6	12	3	0	20	4	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
12 August	2.0E+5	1.8E+4	3.9E+3		2.5E+7	
13 August	1.2E+5	1.8E+4	3.4E+3		3.3E+7	
14 August	1.9E+7	4.9E+5	3.6E+3		3.9E+7	
15 August	1.5E+7	1.7E+5	3.3E+3		2.0E+8	
16 August	1.1E+6	3.5E+4	3.2E+3		4.6E+7	
17 August	7.7E+6	2.4E+5	3.3E+3		5.3E+7	
18 August	2.7E+7	1.2E+5	3.3E+3		5.3E+7	

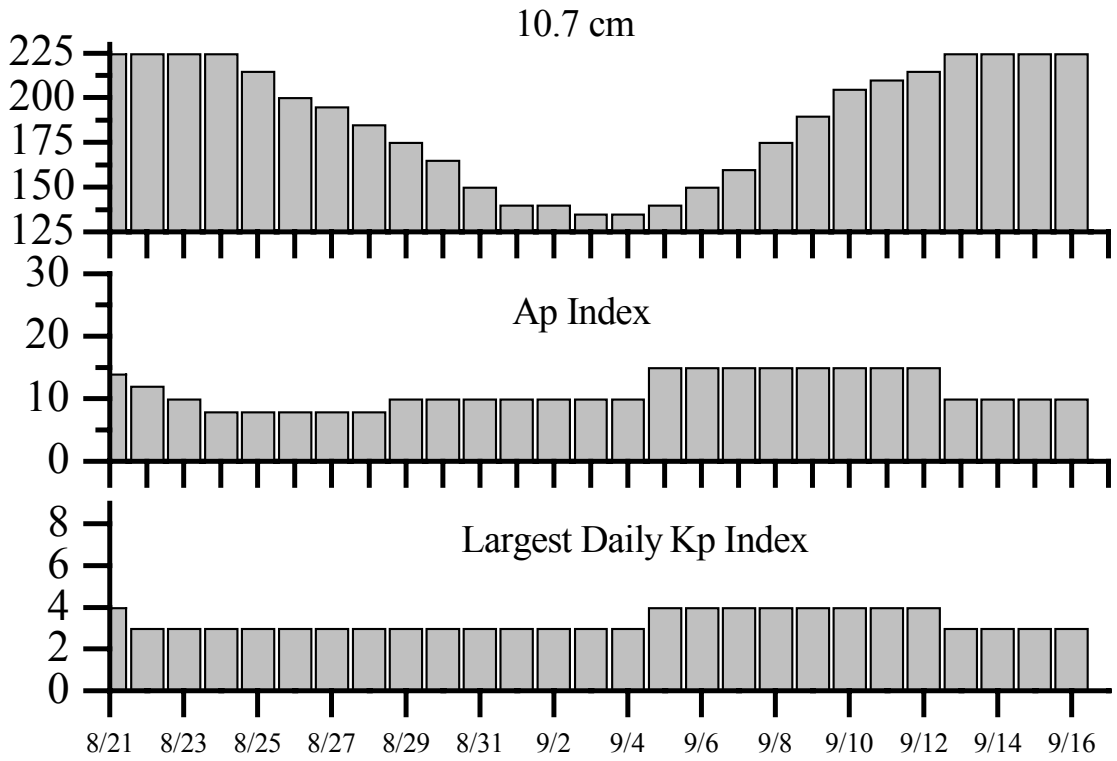
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
12 August	9	2-3-2-2-3-2-2-2	24	3-4-4-5-5-3-2-1	15	3-3-3-4-3-3-3-3
13 August	9	4-3-2-2-1-1-1-2	12	3-3-3-4-2-1-2-1	13	4-4-3-3-3-2-3-2
14 August	10	1-2-3-2-3-2-2-3	26	2-2-3-5-6-4-3-2	15	3-3-3-3-4-3-3-3
15 August	18	2-2-3-4-2-2-5-4	32	4-3-3-6-5-4-4-3	19	3-3-3-4-3-4-5-5
16 August	8	3-2-3-2-2-2-1-1	37	3-4-7-5-5-3-1-1	17	4-3-5-3-3-3-3-2
17 August	8	1-3-3-2-2-1-2-1	19	1-3-6-4-3-2-2-1	13	2-3-4-3-2-2-3-3
18 August	15	3-3-1-1-1-1-4-5	18	4-4-2-2-4-1-4-3	18	4-3-2-3-3-2-4-5

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
12 Aug 1755	EXTENDED WARNING: Geomagnetic K= 4	11/1555 - 13/1500 Aug
14 Aug 0234	ALERT: Type II Radio Emission	14 Aug 0148
14 Aug 0916	ALERT: Proton Event 10MeV Integral Flux > 10pfu	14 Aug 0900
14 Aug 0933	WARNING: Proton 10MeV Integral Flux > 10pfu expected	14 Aug 0935 - 1800
14 Aug 1737	WARNING: Geomagnetic K= 4 expected	14 Aug 1740 - 2359
14 Aug 1755	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	14/0935 - 15/1800 Aug
14 Aug 1851	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	14 Aug 1830
14 Aug 2115	WATCH: Geomagnetic A≥ 20 or greater predicted	16 Aug
14 Aug 2355	EXTENDED WARNING: Geomagnetic K= 4 expected	14/1740 - 15/2359 Aug
15 Aug 0029	3 - 245 MHz Bursts	14 Aug
15 Aug 0030	CONTINUED ALERT: Proton Event 10MeV Integral Flux > 10pfu	14 Aug 0900
15 Aug 0922	ALERT: Geomagnetic K= 4	15 Aug 0919
15 Aug 1006	ALERT: Electron 2MeV Integral Flux > 1000pfu	15 Aug 0950
15 Aug 1535	SUMMARY: Proton Event 10MeV Integral Flux > 10pfu	14 Aug 1620
15 Aug 1909	WARNING: Geomagnetic Sudden Impulse expected	15 Aug 1915 - 2000
15 Aug 2348	EXTENDED WARNING: Geomagnetic K= 4 expected	14 /1740 - 16/1800 Aug
16 Aug 0024	7 - 245 MHz Bursts	15 Aug
16 Aug 0623	ALERT: Type II Radio Emission	16 Aug 0552
16 Aug 0800	WARNING: Geomagnetic K= 5 expected	16 Aug 0800 -1500
16 Aug 0808	ALERT: Geomagnetic K= 5	16 Aug 0808
16 Aug 1229	ALERT: X-Ray Flux exceeded M5	16 Aug 1228
16 Aug 1310	SUMMARY: X-ray Event exceeded M5	16 Aug 1232
16 Aug 1317	ALERT: Type II Radio Emission	16 Aug 1206
16 Aug 1318	ALERT: Type IV Radio Emission	16 Aug 1205
16 Aug 1326	ALERT: Type II Radio Emission	16 Aug 1244
16 Aug 1526	SUMMARY: 10cm Radio Burst	16 Aug 1214
16 Aug 1532	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	16 Aug 1505
16 Aug 2111	WATCH: Geomagnetic A ≥ 20	17 Aug
16 Aug 2113	WATCH: Geomagnetic A ≥ 50 or greater predicted	18 Aug
17 Aug 0057	3 - 245 MHz Bursts	16 Aug
17 Aug 0057	1 - 245 MHz Radio Noise Storm	16 Aug
17 Aug 0736	ALERT: Geomagnetic K= 4 Aug	17 Aug 0735
17 Aug 1428	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	17 Aug 1405
17 Aug 1953	ALERT: Type IV Radio Emission	17 Aug 1639
18 Aug 0041	1 - 245 MHz Burst	17 Aug
18 Aug 0041	1 - 245 MHz Radio Noise Storm	17 Aug
18 Aug 0355	ALERT: Type II Radio Emission	18 Aug 0346
18 Aug 1018	WARNING: Geomagnetic Sudden Impulse expected	18 Aug 1030 - 1130
18 Aug 1326	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	18 Aug 1310
18 Aug 1818	WARNING: Geomagnetic Sudden Impulse expected	18 Aug 1830 - 1915
18 Aug 1855	SUMMARY: Geomagnetic Sudden Impulse	18 Aug 1848
18 Aug 1957	CANCEL WATCH: Geomagnetic A≥ 50	16 Aug 2113
18 Aug 1959	WATCH: Geomagnetic A≥ 30	19 Aug
18 Aug 2035	WARNING: Geomagnetic K= 4 expected	18/2040 -19/1800 Aug
18 Aug 2151	SUMMARY: 10cm Radio Burst	18 Aug 2121
18 Aug 2154	ALERT: Type II Radio Emission	18 Aug 2124
18 Aug 2202	ALERT: Type IV Radio Emission	18 Aug 2137
18 Aug 2206	ALERT: Geomagnetic K=4	18 Aug 2205
18 Aug 2258	ALERT: Geomagnetic K=5	18 Aug 2257
18 Aug 2305	WARNING: Geomagnetic K=5 expected	18 Aug 2305 -1500
18 Aug 2322	CANCEL WARNING: Geomagnetic K=5 expected	18 Aug 2305
18 Aug 2324	WARNING: Geomagnetic K= 5 expected	18/2326 -19/1500 Aug

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
21 Aug	225	14	4	04	135	10	3
22	225	12	3	05	140	15	4
23	225	10	3	06	140	15	4
24	225	8	3	07	150	15	4
25	215	8	3	08	160	15	4
26	200	8	3	09	175	15	4
27	195	8	3	10	190	15	4
28	185	8	3	11	205	15	4
29	175	10	3	12	210	15	4
30	165	10	3	13	215	10	3
31	150	10	3	14	225	10	3
01 Sep	140	10	3	15	225	10	3
02	140	10	3	16	225	10	3
03	135	10	3				

Energetic Events

Date	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
	Begin	Max	½ Max	Class	Integ Flux	Imp/Location Brtns	Lat CMD	Rgn #	245	2695	II	IV
13 Aug	1852	1904	1918	M1.8	.018	1f	S08E55	69				
14 Aug	0147	0212	0246	M2.3	.060	1n	N09W54	61	110	140	3	
14 Aug	1804	1815	1830	M1.4	.015	1f	N10E23	67				
15 Aug	0601	0605	0609	M1.0	.003	Sf	N13E01	66		140		
15 Aug	2323	2333	2336	M1.0	.006	Sf	S13W26	78				
16 Aug	0546	0611	0631	M2.4	.041	Sf	N07W83	61	280	46	3	
16 Aug	1132	1232	1307	M5.2	.160	2n	S14E20	69	4100	1600	3	3
16 Aug	2207	2212	2215	M1.2	.004	69						
16 Aug	2329	2333	2335	M1.7	.003	Sf	S05E06	69				
17 Aug	0058	0108	0114	M1.1	.007	Sf	S19E77	83				
17 Aug	2039	2051	2057	M3.4	.018	Sf	S06W05	69				
18 Aug	0954	1005	1009	M2.3	.013	69	240	61				
18 Aug	1433	1439	1443	M1.9	.007	Sf	S06W15	69				
18 Aug	2112	2125	2137	M2.2	.022	1b	S12W19	69	530	610	1	1

Flare List

Date	Time			X-ray	Optical		Rgn
	Begin	Max	End	Class.	Imp / Brtns	Location Lat CMD	
12 August	0216	0219	0223	C1.4			
	0405	0410	0420	C1.8	1f	S03W64	58
	0443	0443	0447		Sf	S04W65	58
	0630	0637	0640		Sf	S04W65	58
	0803	0804	0808	C2.7	Sf	S06W70	58
	0835	0836	0839		Sf	S04W67	58
	1539	1543	1547	C2.0			
	2213	2217	2224	C1.8			
13 August	0243	0248	0259	C4.6			66
	0447	0450	0516	C3.1	1f	S04W81	58
	0546	0550	0553	C2.3			
	0707	0715	0721	C1.9			
	0708	0709	0712		Sf	S05W84	58
	0746	0747	0750		Sf	N08W46	61
	0756	0757	0805		Sf	S06W85	58
	0818	0827	0835	C1.6			
	0921	0929	0939	C3.3			
	1229	1322	1335	C3.0			
	1406	1417	1425	C3.0			
	1506	1514	1532	C4.8	Sf	N12E41	67
	1855	1902	1932	M1.8	1f	S08E55	69
	2046	2052	2101	C3.1	Sf	N12E39	67
	2120	2147	2205	C2.7			
	2206	2214	2226	C5.0	Sf	N12E38	67
	2250	2255	2259	C2.5			
14 August	0108	0110	0116	C3.4	Sf	N12E36	67
	0147	0201	0343	M2.3	1n	N09W54	61

Flare List - continued.

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn
14 August	0152	0156	0300		Sf	N17E08	0066
	0212	0215	0227		Sf	S17W52	0072
	0349	0352	0356		Sf	N07W55	0061
	0854	0854	0902		Sf	N12E29	0067
	0904	0906	0911	C5.0	Sf	S07E45	0069
	0912	0912	0915		Sf	S06E47	0069
	1004	1011	1015	C4.9			
	1205	1206	1210		Sf	N13E28	0067
	1210	1212	1220	C2.6	Sf	N14E10	0066
	1404	1407	1423	C7.5	Sf	N13E28	0067
	1807	1814	1901	M1.4	1f	N10E23	0067
	1907	1907	1915		Sf	S08E44	0069
	1959	2002	2018		Sf	S05E41	0069
	2136	2136	2145	C4.7	Sf	N13E25	0067
	2221	2222	2226	C1.6	Sf	S07E43	0069
15 August	0012	0017	0023	C2.2			
	0109	0115	0119	C2.7			
	0140	0145	0149	C2.7			
	0236	0251	0255	C4.7			
	0437	0439	0441		Sf	N11W26	0063
	0608	0608	0614	M1.0	Sf	N13E01	0066
	0731	0735	0738	C2.3			
	0752	0753	0808	C2.4	Sf	S06E27	0069
	1136	1136	1146	C4.5	Sf	S14W17	0078
	1324	1333	1411	C3.9	Sf	S04E25	0069
	1438	1442	1453		Sf	S02E25	0069
	1511	1514	1524	C6.9	Sf	S14W21	0078
	1641	1642	1659		Sf	S06E24	0069
	1729	1729	1734	C2.7	Sf	S06E23	0069
	1952	1959	2008	C7.0	Sf	S14W22	0078
	2327	2329	2347	M1.0	Sf	S13W26	0078
	2331	2335	2340		Sf	S04E25	0069
16 August	0013	0027	0106		1f	S07E19	0069
	0055	0055	0101		Sf	S06E04	0068
	0101	0104	0107		Sf	S06E04	0068
	0257	0259	0301		Sf	S14W30	0078
	0603	0611	0637	M2.4	Sf	N07W83	0061
	0618	U0620	0635		1n	S07E16	0069
	0855	0912	0915		Sf	S06E14	0069
	1050	1051	1056		Sf	S07E12	0069
	1111	1213	1409	M5.2	2n	S14E20	0069
	1220	1227	1242		Sf	N15W16	0066

Flare List - continued.

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn
16 August	1513	1551	1626		1f	S07E10	0069
	1804	1815	1820	C5.2			
	2207	2212	2215	M1.2			0069
	2331	2333	2344	M1.7	Sf	S05E06	0069
17 August	0008	0013	0038	C4.1	Sf	S07E05	0069
	0039	0040	0043		Sf	S07E05	0069
	0048	0049	0052		Sf	S05E05	0069
	0105	0105	0109	M1.1	Sf	S19E77	0083
	0247	0248	0253		Sf	S03E06	0069
	0301	0303	0305		Sf	S08E04	0069
	0302	0303	0308		Sf	S05W10	0068
	0504	0505	0509	C3.2	Sf	S06E02	0069
	0606	0627	0639		Sf	N16E59	0081
	0621	0627	0642	C4.3	1n	S03E05	0069
	0622	0622	0632		Sf	N13W27	0066
	B0632	U0632	A0636	C4.6	Sf	S08E05	0069
	0655	0657	0705	C5.0	Sf	S08E02	0069
	0803	0805	0812		Sf	N13W28	0066
	0845	0848	0856	C2.1	Sf	S03W01	0069
	0905	0912	0918	C2.5	Sf	S05E00	0069
	1120	U1124	1133		Sf	S19E20	0079
	1329	1330	1332		Sf	S05W01	0069
	1337	1444	1620	C3.6	Sf	S04W04	0069
	1400	1406	1407		Sf	S04W03	0069
	1415	1415	1421	C4.1	Sf	S04W03	0069
	1439	1442	1455	C4.9	Sf	S02W02	0069
	1545	1547	1559	C4.8	Sf	S05W03	0069
	1639	1643	1648	C3.0			
	1927	1931	1937	C3.4			
	1945	1950	1954	C4.0			
	2047	2049	2108	M3.4	Sf	S06W05	0069
18 August	0007	0008	0012	C3.3	Sf	S11W06	0069
	0037	0037	0042		Sf	S17E61	0083
	0123	0129	0137		Sf	S06W09	0069
	0145	0149	0203	C3.2	Sf	S06W10	0069
	0209	0210	0219		Sf	S17E61	0083
	0245	0314	0321		1f	S03W11	0069
	0328	0336	0342	C8.4	1f	S11W10	0069
	0334	0342	0351		Sf	N13W38	0066
	0438	0445	0453		1f	S19E13	0079
	0551	0559	0622	C4.5	Sf	S19E10	0079
	0553	0554	0605		Sf	N13W40	0066

Flare List - continued.

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn
18 August	0606	0607	0609		Sf	S07W11	0069
	0730	0731	0813	C8.0	Sf	S07W12	0069
	0910	0924	0936	C3.0	Sf	N16W40	0066
	0954	1005	1009	M2.3			0069
	1205	1209	1213	C4.1			
	1244	1247	1257		Sf	S21E14	0079
	1348	1349	1359	C4.9	Sf	S05W19	0069
	1436	1437	1509	M1.9	Sf	S06W15	0069
	1458	1458	1503		Sf	S08W15	0069
	1645	1650	1701	C6.0	Sf	S20E61	0083
	1943	1947	2002	C4.5	Sf	S20E11	0079
	2008	2008	2010		Sf	S19E08	0079
	2021	2036	2043	C8.7	Sf	S07W20	0069
	2036	2036	2040		Sf	S21E07	0079
	2111	2121	2206	M2.2	1b	S12W19	0069
	2228	2231	2236	C4.3			

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 58														
01 Aug	S05E72	075	0020	02	Axx	001	A								
02 Aug	S07E57	077	0010	01	Hrx	001	A								
03 Aug	S06E43	078	0020	01	Hrx	001	A								
04 Aug	S07E28	079	0030	01	Hsx	001	A								
05 Aug	S06E15	079	0020	01	Hsx	001	A								
06 Aug	S06E03	078	0040	06	Cso	007	B				1				
07 Aug	S06W08	075	0050	08	Dao	008	B								
08 Aug	S06W22	076	0050	07	Dao	008	B								
09 Aug	S07W35	076	0090	08	Dao	015	B								
10 Aug	S06W48	075	0080	09	Dso	008	B								
11 Aug	S05W61	075	0110	09	Dso	010	B	1			1				
12 Aug	S06W75	076	0120	08	Dao	007	B	2			4	1			
13 Aug	S07W89	077	0060	07	Dao	005	B	1			2	1			
								4	0	0	8	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 078

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 59														
02 Aug	N14E67	067	0070	06	Dso	004	B								
03 Aug	N15E54	067	0090	07	Dso	008	B								
04 Aug	N15E41	066	0120	07	Dao	012	B								
05 Aug	N15E28	066	0080	07	Dao	010	B								
06 Aug	N13E14	067	0060	07	Cso	010	B								
07 Aug	N13E00	067	0040	05	Cso	004	B								
08 Aug	N13W15	069	0020	03	Cso	003	B								
09 Aug	N14W26	067	0030	05	Dso	008	B								
10 Aug	N15W39	066	0030	04	Cso	003	B								
11 Aug	N15W52	066													
12 Aug	N15W65	066													
13 Aug	N15W78	066													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		067													
	Region 61														
03 Aug	N08E77	044	0180	02	Hsx	001	A								
04 Aug	N08E65	042	0190	05	Dao	007	B								
05 Aug	N07E53	041	0190	08	Cao	009	B								
06 Aug	N08E41	040	0280	11	Eai	027	B	2			2				
07 Aug	N09E27	040	0310	10	Dai	030	Bd	1			1				
08 Aug	N08E14	040	0340	10	Dki	031	Bd	1			1				
09 Aug	N08E00	041	0360	12	Ekc	051	Bg	1			1				
10 Aug	N08W15	042	0290	11	Ehi	028	Bg								
11 Aug	N07W28	042	0150	10	Cai	019	Bg	1			2				
12 Aug	N08W41	042	0120	05	Cao	012	B								
13 Aug	N09W55	043	0080	05	Cao	006	B				1				
14 Aug	N08W69	044	0110	02	Hsx	002	A		1		1	1			
15 Aug	N06W85	046	0080	02	Hsx	001	A								
16 Aug	N06W98	046	0080	02	Hsx	001	A		1		1				
								6	2	0	10	1	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		041													

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 63												
06 Aug	N15E75	006	0110	12	Eso	003	B	1			1	1			
07 Aug	N17E66	001	0200	11	Eao	004	B	1			1				
08 Aug	N18E51	003	0220	11	Eao	006	B								
09 Aug	N17E38	003	0250	14	Eao	015	B								
10 Aug	N17E26	001	0220	10	Dao	011	B								
11 Aug	N17E13	001	0160	10	Dso	010	B								
12 Aug	N16E00	001	0130	09	Dao	006	B								
13 Aug	N18W14	002	0180	11	Eao	009	B								
14 Aug	N18W26	001	0110	11	Eso	011	B								
15 Aug	N17W39	360	0140	12	Eso	010	B				1				
16 Aug	N17W51	359	0100	08	Dso	006	B								
17 Aug	N18W62	357	0070	02	Hsx	001	A								
18 Aug	N18W75	357	0080	02	Hax	001	A								
								2	0	0	3	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 001

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 64												
07 Aug	S20E13	054	0020	03	Cso	004	B								
08 Aug	S20W02	056	0020	02	Hsx	003	A								
09 Aug	S20W14	055	0020	03	Dro	003	B								
10 Aug	S20W27	055													
11 Aug	S20W40	055													
12 Aug	S20W53	055													
13 Aug	S20W66	055													
14 Aug	S20W79	055													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 056

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 65												
08 Aug	S10E55	359	0000	00	Axx	001	A								
09 Aug	S09E41	000	0010	01	Axx	001	A								
10 Aug	S09E26	001	0010	03	Bxo	002	B								
11 Aug	S09E13	001													
12 Aug	S09E00	001													
13 Aug	S09W13	001													
14 Aug	S07W26	001	0000	01	Axx	001	A								
15 Aug	S07W39	001													
16 Aug	S07W52	001													
17 Aug	S07W65	001													
18 Aug	S07W78	001													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 001

			Region 66												
09 Aug	N14E70	331	0010	01	Axx	001	A								
10 Aug	N13E57	330	0080	08	Dso	006	B								
11 Aug	N13E42	332	0050	05	Dro	008	B	1			1				
12 Aug	N15E30	331	0030	10	Dro	012	B								
13 Aug	N14E16	332	0070	09	Dao	019	B	1							
14 Aug	N13E03	332	0140	07	Dai	014	Bg	1			2				
15 Aug	N14W10	331	0130	09	Dao	021	B		1		1				
16 Aug	N14W23	331	0090	09	Dso	017	B		1		1				
17 Aug	N13W36	331	0050	06	Dso	013	B				2				
18 Aug	N14W48	330	0060	07	Dao	011	B	1			3				
								4	2	0	10	0	0	0	0

Still on Disk.
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	M	X	Optical S	1	2	3	4
			Region 67												
10 Aug	N09E71	316	0070	02	Hax	001	A								
11 Aug	N09E58	316	0150	08	Dao	010	B								
12 Aug	N10E44	317	0090	05	Dso	009	B								
13 Aug	N11E33	315	0110	10	Dso	012	B	3			3				
14 Aug	N11E20	315	0210	13	Eao	029	B	2	1		5	1			
15 Aug	N12E07	314	0290	14	Eai	040	B								
16 Aug	N12W06	314	0200	13	Esi	032	B								
17 Aug	N12W20	315	0160	12	Eai	028	B								
18 Aug	N12W34	316	0080	13	Eao	033	B								
								5	1	0	8	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 314

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 68												
10 Aug	S07E71	316	0090	02	Hax	001	A								
11 Aug	S08E60	314	0150	10	Dso	009	B								
12 Aug	S07E47	314	0100	11	Eao	008	B								
13 Aug	S07E34	314	0110	11	Eso	007	B								
14 Aug	S08E21	314	0070	12	Eao	004	B								
15 Aug	S07E07	314	0060	12	Eso	008	B								
16 Aug	S07W06	314	0050	12	Eso	003	B				2				
17 Aug	S08W20	315	0040	12	Eso	006	B				1				
18 Aug	S08W39	321	0020	01	Hsx	001	A								
								0	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 314

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 69												
11 Aug	S08E77	297	0450	13	Eko	005	B	1			1				
12 Aug	S07E65	296	1170	12	Eki	011	Bg								
13 Aug	S07E50	298	1210	11	Ekc	019	Bgd		1			1			
14 Aug	S08E37	298	1520	12	Ekc	025	Bgd	3			5				
15 Aug	S07E24	297	1400	13	Ekc	044	Bgd	3	1		6				
16 Aug	S07E11	297	1750	14	Ekc	037	Bgd		2		3	3	1		
17 Aug	S07W03	298	1950	13	Ekc	058	Bgd	11	1		17	1			
18 Aug	S08W18	300	1960	15	Ekc	074	Bgd	6	3		9	3			
								24	8	0	41	8	1	0	0

Still on Disk.
Absolute heliographic longitude: 298

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 70												
11 Aug	N05W05	019	0010	05	Bxo	005	B								
12 Aug	N08W16	017	0010	02	Axx	002	A								
13 Aug	N08W29	017													
14 Aug	N08W42	017													
15 Aug	N08W55	017													
17 Aug	N08W81	017													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 019

			Region 71												
11 Aug	N11E68	306	0040	02	Hax	002	A								
12 Aug	N11E56	305	0030	02	Hsx	001	A								
13 Aug	N10E42	306	0020	02	Hax	001	A								
14 Aug	N10E29	306													
15 Aug	N10E16	306													
16 Aug	N10E03	306													
17 Aug	N10W10	306													
18 Aug	N10W23	306													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 306

			Region 72												
11 Aug	S18W23	037	0010	02	Bxo	002	B								
12 Aug	S18W35	036	0040	05	Dso	008	B								
13 Aug	S18W48	036	0160	07	Dao	009	B								
14 Aug	S17W60	035	0210	07	Dao	006	B				1				
15 Aug	S18W78	039	0310	10	Dao	005	B								
16 Aug	S18W91	039	0120	06	Dso	002	B								
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 037

			Region 73												
12 Aug	N16W13	014	0010	06	Bxo	006	B								
13 Aug	N16W26	014													
14 Aug	N16W39	014													
15 Aug	N16W52	014													
17 Aug	N16W78	014													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 014

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 74												
12 Aug	N24W01	002	0010	03	Bxo	002	B								
13 Aug	N24W14	002													
14 Aug	N24W27	002													
15 Aug	N24W40	002													
17 Aug	N24W66	002													
18 Aug	N24W79	002													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		002													
			Region 75												
12 Aug	S09E32	329	0010	04	Bxo	005	B								
13 Aug	S10E17	331	0040	05	Dro	005	B								
14 Aug	S12E04	331	0040	04	Dso	006	B								
15 Aug	S11W11	332	0030	04	Cso	005	B								
16 Aug	S11W24	332													
17 Aug	S11W37	332													
18 Aug	S11W50	332													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		331													
			Region 76												
12 Aug	N12E75	286	0060	01	Hsx	001	A								
13 Aug	N12E64	284	0060	01	Hsx	001	A								
14 Aug	N12E51	284	0040	01	Hax	001	A								
15 Aug	N12E38	283	0040	01	Hsx	001	A								
16 Aug	N12E25	283	0020	01	Hsx	001	A								
17 Aug	N12E11	284	0020	01	Hsx	002	A								
18 Aug	N12W02	284	0020	03	Cso	002	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		284													

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 77												
13 Aug	S18E48	300	0010	00	Hsx	001	A								
14 Aug	S17E33	302	0000	00	Axx	001	A								
15 Aug	S17E20	302													
16 Aug	S17E07	302													
17 Aug	S17W06	302													
18 Aug	S17W19	302													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		302													
			Region 78												
14 Aug	S13W12	347	0030	04	Dso	009	B								
15 Aug	S13W26	347	0060	06	Dao	008	B	3	1		4				
16 Aug	S13W39	347	0060	05	Dso	005	B				1				
17 Aug	S14W53	348	0060	04	Cro	002	B								
18 Aug	S14W66	348													
								3	1	0	5	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		347													
			Region 79												
14 Aug	S20E55	280	0020	01	Hax	001	A								
15 Aug	S19E42	279	0120	08	Dso	011	B								
16 Aug	S19E29	279	0140	09	Dso	012	B								
17 Aug	S21E18	277	0150	11	Eao	023	B				1				
18 Aug	S22E04	278	0310	11	Eac	038	B	2			5	1			
								2	0	0	6	1	0	0	0
Still on Disk.															
Absolute heliographic longitude:		278													
			Region 80												
14 Aug	N16E69	266	0120	11	Eao	004	B								
15 Aug	N16E55	266	0160	10	Dso	007	B								
16 Aug	N16E42	266	0170	08	Dso	009	B								
17 Aug	N16E30	265	0140	09	Dao	011	B								
18 Aug	N16E17	265	0110	07	Dao	013	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		265													

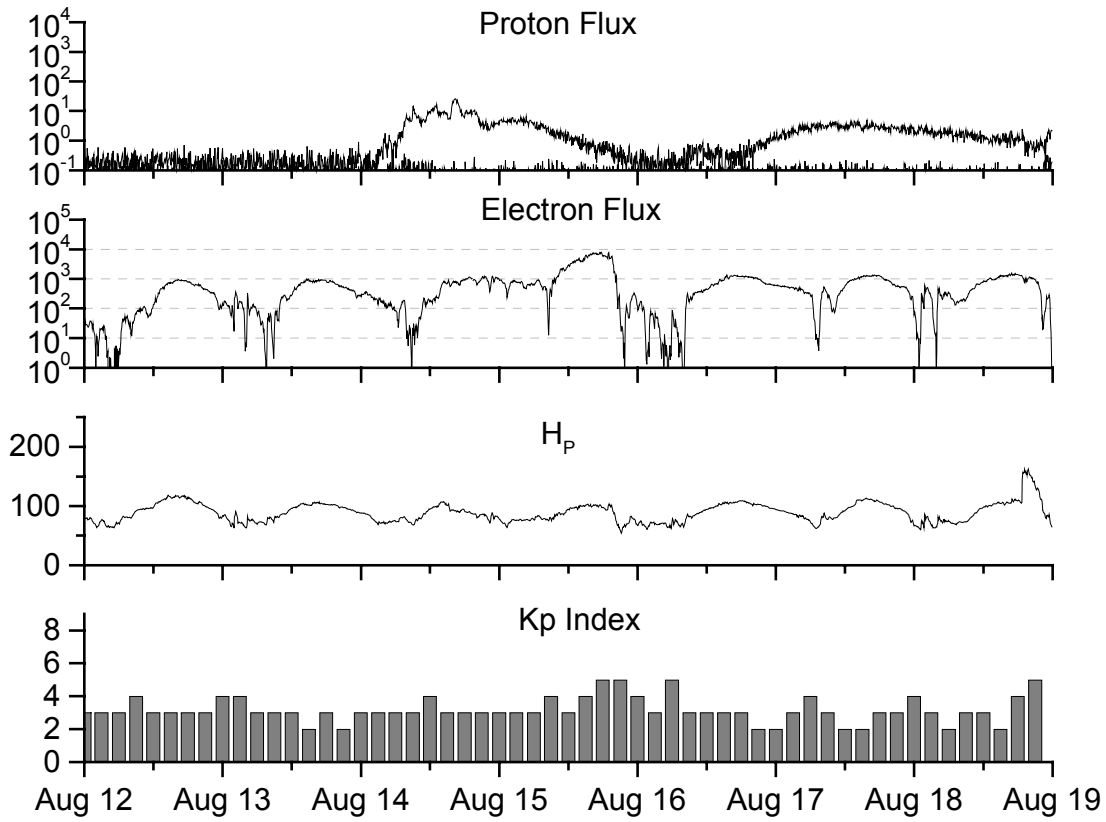
Region Summary - continued.

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 81												
16 Aug	N17E61	247	0050	04	Dro	002	B								
17 Aug	N17E47	248	0020	01	Hrx	002	A				1				
18 Aug	N18E34	248	0010	01	Axx	002	A								
								0	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		248													
			Region 82												
17 Aug	N21E06	289	0020	01	Hrx	002	A								
18 Aug	N20W07	289	0010	03	Bxo	004	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		289													
			Region 83												
17 Aug	S18E67	228	0050	02	Cao	002	B		1		1				
18 Aug	S18E52	230	0080	09	Dso	008	B	1			3				
								1	1	0	4	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		230													
			Region 84												
18 Aug	S16E64	218	0110	01	Hax	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		218													

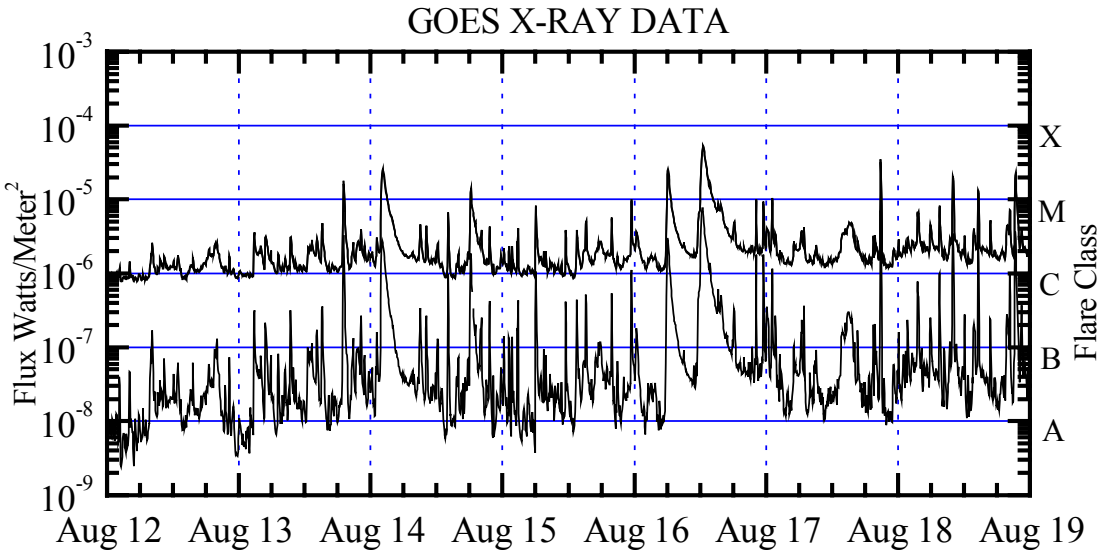
Recent Solar Indices (preliminary)
of the observed monthly mean values

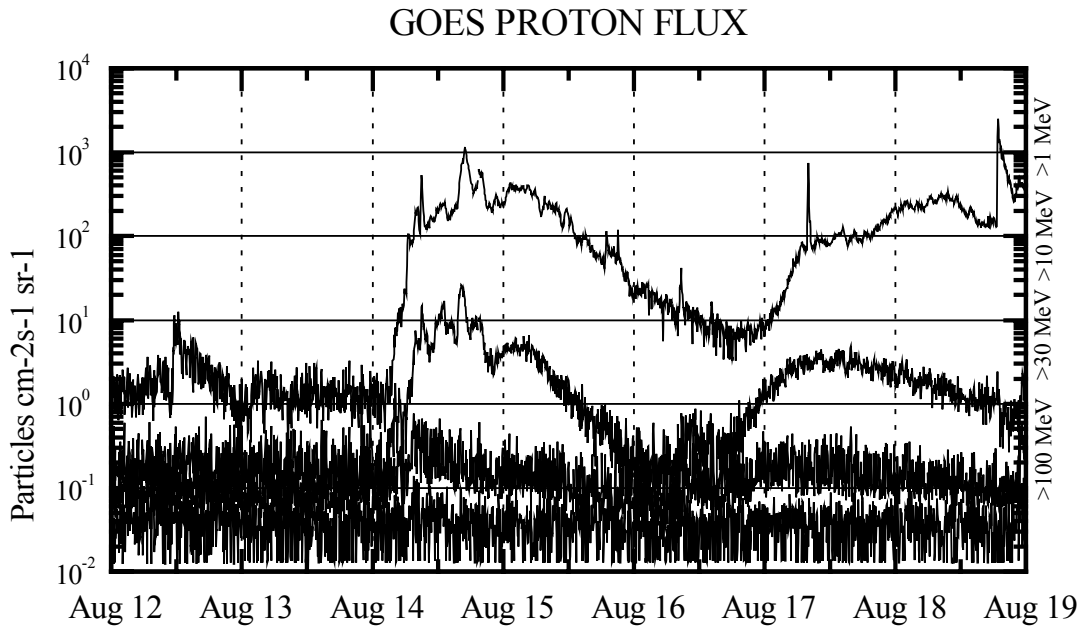
	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
					2000				
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72	166.2	114.4	167.7	175.6	18	14.6
November	149.9	106.5	0.71	162.7	112.7	178.8	173.6	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.0	08	14.4
					2001				
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	174.8	12	12.5
June	196.7	134.0	0.68	167.2	109.9	173.7	178.8	12	12.4
July	124.6	82.2	0.66	172.1	111.8	131.3	183.9	11	12.4
August	159.4	106.8	0.67	176.7	113.8	163.2	188.8	13	12.5
September	229.1	150.7	0.66	178.8	114.3	233.3	191.3	12	12.3
October	197.4	125.6	0.64	179.5	114.1	208.2	191.9	18	11.9
November	178.6	106.5	0.60	183.7	115.6	212.5	193.6	14	11.9
December	217.5	131.8	0.61	184.5	114.7	236.6	193.8	08	12.0
					2002				
January	189.0	113.9	0.60	184.8	113.5	226.4	194.6	07	12.0
February	194.5	108.0	0.56			205.1		09	
March	153.1	98.1	0.64			179.5		10	
April	194.9	120.4	0.62			189.7		15	
May	204.1	120.8	0.59			178.4		15	
June	146.0	88.5	0.61			148.8		11	
July	183.5	99.9	0.54			174.5		13	

NOTE: All smoothed values after June 1999 and monthly values after December 2000 are preliminary estimates. The lowest smoothed sunspot index 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 12 August 2002
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 Air Force Weather Agency) 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.





W*eekly 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/cm^2 –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.