Space Weather Highlights **SWO PRF 1402**
08 - 14 July 2002 **16 July 2002**

Solar activity was at low to high levels. Activity rose to high levels on 11 July due to an M5/2b flare from Region 30 (N19, L = 013, class/area Fkc/780 on 14 July). Region 30 also produced isolated low-level M-class flares on 08, 11, and 13 July. All of these flares were unremarkable in radio aspects. Region 30 grew steadily in size and magnetic complexity and developed multiple magnetic delta configurations by the close of the period. Forecaster's note: Region 30 produced an X3/3b flare and halo CME on 15 July. Details will be provided in next week's edition.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Solar wind speeds were elevated during 09 – 10 July with peaks to around 530 km/sec, likely due to a negative-polarity coronal hole. Speeds were also elevated during 12 – 13 July with peaks to around 600 km/sec, likely due to a positive-polarity coronal hole.

A greater than 10 MeV proton event ended at geo-synchronous orbit at 08/0620 UTC (the event began at 07/1830 UTC following a long-duration event near the Sun's southwest limb). There were no proton events during the rest of the period.

Greater than 2 MeV electron fluxes at geo-synchronous orbit were at normal to moderate levels through 11 July, then decreased to normal levels for the rest of the period.

Geomagnetic field activity was at quiet to active levels during 09 and 12 July, likely due to coronal hole effects. There were also brief minor storm periods at high latitudes on 12 July. Quiet to unsettled conditions prevailed during the rest of the period.

Space Weather Outlook
17 July - 12 August 2002

Solar activity is expected to range from low to moderate levels during most of the period. Isolated low-level M-class flares are possible throughout the period. Region 30 may produce additional isolated major flare activity before it rotates out of view on 23 July.

There is a chance for a proton-producing flare from Region 30 before it rotates out of view on 23 July.

Greater than 2 MeV electron fluxes at geo-synchronous orbit are expected to be at normal to moderate levels for most of the period.

Geomagnetic field activity is expected to increase to active to minor storm levels during 17 – 18 July in response to the halo CME observed late on 15 July. Active periods are possible during 20 July; and 02, 05, and 08 August due to recurrent coronal hole effects. 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	Optical S	1	2	3	4
08 July	131	125	530	B5.3	2	2	0	0	0	0	0	0
09 July	136	129	780	B6.5	5	1	0	0	0	0	0	0
10 July	129	118	840	B4.4	4	0	0	8	0	0	0	0
11 July	136	99	860	B5.2	9	2	0	6	1	1	0	0
12 July	133	93	750	B6.5	6	1	0	8	0	1	0	0
13 July	135	141	840	C1.3	6	0	0	7	1	0	0	0
14 July	144	152	850	B3.8	6	0	0	5	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
08 July	3.6E+6	5.2E+5	2.8E+3		2.4E+7	
09 July	6.9E+5	1.2E+5	2.4E+3		1.6E+6	
10 July	5.9E+5	1.0E+5	2.3E+3		5.3E+6	
11 July	4.2E+5	4.1E+4	2.3E+3		8.3E+6	
12 July	1.8E+5	1.9E+4	2.3E+3		2.7E+5	
13 July	9.0E+4	1.3E+4	2.5E+3		6.9E+5	
14 July	8.5E+4	1.2E+4	2.6E+3		1.4E+6	

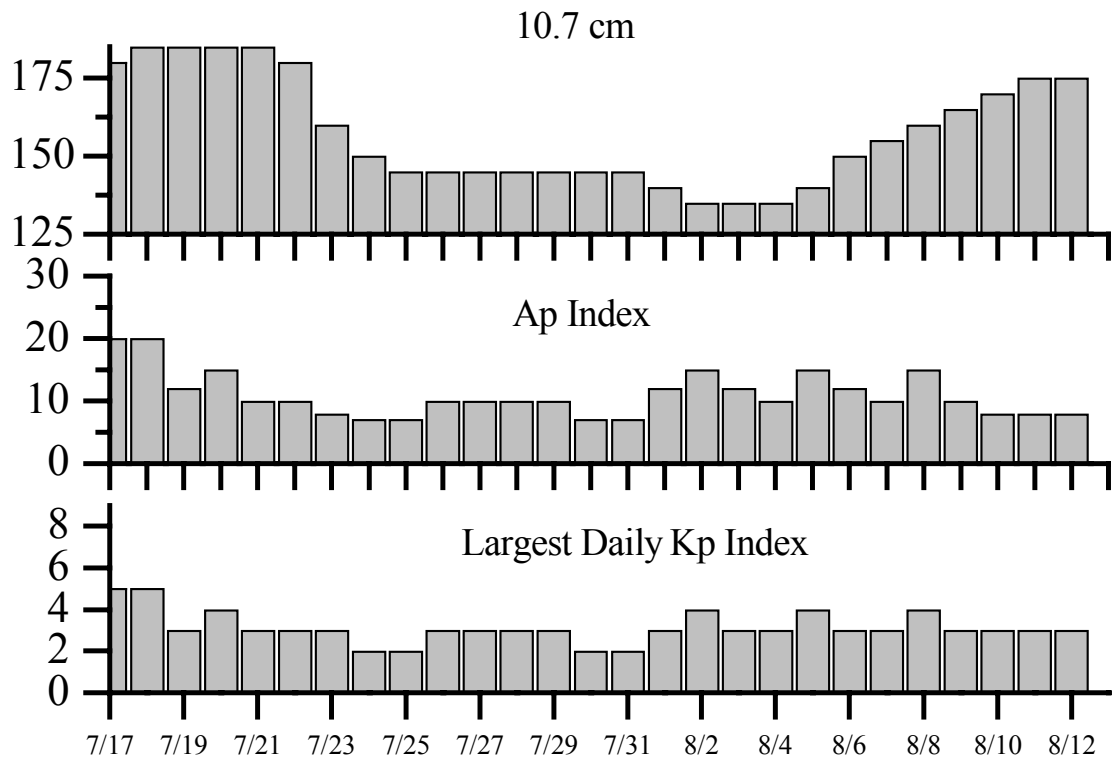
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
08 July	6	2-1-0-2-2-1-2-4	8	2-2-0-3-3-2-1-2	10	3-2-1-3-3-2-2-3
09 July	9	2-2-2-2-2-3-2-3	20	2-3-3-5-3-5-2-2	16	4-3-3-3-2-4-3-3
10 July	7	1-2-3-2-2-1-2-2	18	5-2-3-5-3-1-1-2	11	3-3-3-3-2-2-3-3
11 July	8	2-1-2-2-2-2-2-3	10	2-1-1-4-4-1-1-2	9	2-2-2-2-2-2-3-3
12 July	12	2-3-3-3-3-3-2-2	31	2-2-4-5-5-6-3-3	20	3-3-3-5-5-4-3-2
13 July	5	2-1-1-1-2-2-1-1	15	3-2-2-2-3-3-1-5	8	3-3-2-2-2-2-3-2
14 July	1	0-0-0-0-1-1-0-0	1	0-0-0-0-0-1-1-0	6	2-2-1-1-2-2-3-1

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
08 Jul 0013	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	07 Jul 1830
08 Jul 0017	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	07/1600 - 08/1800 Jul
08 Jul 0046	1 - 245 MHz Bursts	07 Jul
08 Jul 1521	CANC WARN: Proton 10MeV Integral Flux > 10pfu	07 Jul 1600
08 Jul 1523	SUMMARY: Proton Event 10MeV Integral Flux > 10pfu	07 Jul 1955
08 Jul 2247	ALERT: Geomagnetic K= 4	08 Jul 2245
09 Jul 0841	WARNING: Geomagnetic K= 4	09 Jul 0845 -1500
09 Jul 1653	ALERT: Geomagnetic K= 4	09 Jul 1650
09 Jul 1655	WARNING: Geomagnetic K= 4 expected	09 Jul 1655 -2359
09 Jul 1931	SUMMARY: 10cm Radio Burst	09 Jul 1858
09 Jul 2356	EXT WARNING: Geomagnetic K= 4	09/1655 - 10/1500 Jul
10 Jul 0034	1 - 245 MHz Bursts	09 Jul
11 Jul 1450	ALERT: X-Ray Flux exceeded M5	11 Jul 1450
11 Jul 1503	SUMMARY: X-ray Event exceeded M5	11 Jul 1451
12 Jul 1004	WARNING: Geomagnetic K= 4 expected	12 Jul 1005 -1500
12 Jul 1029	ALERT: Geomagnetic K= 4	12 Jul 1028
12 Jul 1548	WARNING: Geomagnetic K= 4 expected	12/1550 - 13/1500 Jul
12 Jul 1612	ALERT: Geomagnetic K= 4	12 Jul 1609

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
17 Jul	180	20	5	31	145	7	2
18	185	20	5	01 Aug	140	12	3
19	185	12	3	02	135	15	4
20	185	15	4	03	135	12	3
21	185	10	3	04	135	10	3
22	180	10	3	05	140	15	4
23	160	8	3	06	150	12	3
24	150	7	2	07	155	10	3
25	145	7	2	08	160	15	4
26	145	10	3	09	165	10	3
27	145	10	3	10	170	8	3
28	145	10	3	11	175	8	3
29	145	10	3	12	175	8	3
30	145	7	2				

Energetic Events

Date	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
			½		Integ	Imp/Location		Rgn				
	Begin	Max	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II	IV
08 Jul 02	0910	0921	0927	M1.6	.009							
08 Jul 02	2309	2320	2329	M2.3	.017							
09 Jul 02	0855	0905	0911	M1.0	.006							
11 Jul 02	1415	1419	1422	M1.0	.003	Sf	N19E65	30				
11 Jul 02	1444	1451	1457	M5.8	.027	2b	N21E58	30				
12 Jul 02	2354	0008	0020	M1.1	.012	2f	N18E38	30		64		

Flare List

Date	Time			X-ray	Optical		Rgn
					Imp /	Location	
	Begin	Max	End	Class.	Brtns	Lat CMD	
08 July	0910	0921	0927	M1.6			
	1616	1622	1628	B9.3			
	1824	1831	1843	C3.5			
	2017	2022	2028	C1.2			
	2309	2320	2329	M2.3			
09 July	0209	0218	0229	C2.5			
	0359	0413	0443	C8.6			
	0711	0716	0722	C2.5			
	0855	0905	0911	M1.0			
	1428	1437	1444	C1.1			
	1511	1517	1525	C1.2			
10 July	0146	0149	0159	C1.1	Sf	N21E71	0030
	0418	0419	0427	B7.9	Sf	N18E68	0030
	1046	1048	1054	B9.4	Sf	S20E08	0025
	1250	1250	1254	C1.0	Sf	S19E09	0025
	1308	1329	1411	C2.7	Sf	S19E08	0025
	1544	1548	1550	B8.7			
	1823	1828	1832	B6.8	Sf	N21E61	0030
	1846	1850	1855	B7.8			
	1914	1914	1920	C1.4	Sf	N22E69	0030
	1925	1927	1928		Sf	N22E69	0030
11 July	0047	0053	0100	C1.7			
	0235	0240	0242	C1.4			
	0301	0305	0308	B9.1			
	0504	0507	0511	B9.4			
	0710	0712	0718	C2.1	Sf	N19E66	0030
	0811	0818	0905	C1.1			
	1006	1020	1031		Sf	N20E66	0030
	1034	1037	1049	C2.1	Sf	N22E62	0030
	1107	1121	1128	C4.0			
	1204	1208	1215	C2.5			
	1234	1315	1401	C1.7	Sf	N19E62	0030

Flare List- continued.

Date	Time			X-ray	Optical		Rgn
	Begin	Max	End	Class.	Imp / Brtns	Location Lat CMD	
11 July	1336	1349	1405		Sf	N20E62	0030
	1417	1418	1427	M1.0	Sf	N19E65	0030
	1446	1448	1522	M5.8	2b	N21E58	0030
	2203	2206	2210	C1.1			
12 July	0021	0026	0029	C1.1			
	0659	0659	0709	C1.7	Sf	N20E47	0030
	0851	0851	0907	C1.6	Sf	N22E43	0030
	1032	1035	1038	B8.4			
	1217	1217	1226	B7.2	Sf	N18E46	0030
	1334	1339	1350	C1.8	Sf	N17E47	0030
	1351	1352	1354		Sf	N17E45	0030
	1551	1551	1558	B6.5	Sf	N18E41	0030
	1856	1859	1902	B8.4			
	1914	1917	1919	C1.0			
	1942	1945	1949	B8.1			
	2204	2204	2210	B8.3	Sf	N19E40	0030
	2238	2242	2247	B8.3			
	2324	2326	2352	C2.1	Sf	N19E40	0030
	2354	0000	0038	M1.1	2f	N18E38	0030
13 July	0039	0049	0103	C6.7	1f	N22E38	0030
	0330	0334	0337	C1.6			
	0404	0404	0410	C1.4	Sf	N19E37	0030
	0554	0555	0557	C1.7	Sf	N18E36	0030
	0642	0644	0649		Sf	N12E51	0031
	0752	0754	0757	C1.6	Sf	N19E36	0030
	0814	0815	0823	C2.2	Sf	N17E35	0030
	1722	1724	1729	B8.6	Sf	N21E21	0030
	2344	2348	2353	B7.2	Sf	N18E19	0030
14 July	0211	0214	0216	B8.8			
	0517	0517	0532	C1.2	Sf	N17E21	0030
	0644	0644	0652	C1.5	Sf	N19E22	0030
	0655	0659	0702	C1.0			0030
	0712	0715	0719	B9.2			0030
	0733	0737	0741	B9.3			0030
	0843	0846	0848	C1.0			0030
	1357	1400	1407	B7.8	Sf	N20E10	0030
	1456	1509	1556	C1.2	Sf	N17E15	0030
	1612	1612	1617	C1.2	Sf	N20E17	0030

Region Summary

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 19												
29 Jun	S17E72	152	0270	06	Dko	006	B								
30 Jun	S18E61	150	0450	10	Dko	010	Bg				1				
01 Jul	S18E50	148	0600	15	Eki	009	Bg								
02 Jul	S18E34	151	0510	10	Dki	011	Bg	2			2				
03 Jul	S18E20	151	0390	11	Eki	023	Bg	3			3	1			
04 Jul	S17E07	151	0450	12	Eki	027	Bg	3			3				
05 Jul	S18W08	152	0420	13	Eki	018	Bg	1			1				
06 Jul	S17W21	152	0390	11	Eao	009	Bg	1				1			
07 Jul	S19W32	150	0330	11	Eai	010	Bg								
08 Jul	S19W44	148	0280	07	Dai	009	Bg								
09 Jul	S18W57	148	0280	07	Dao	010	Bg								
10 Jul	S19W70	148	0240	08	Dso	006	B								
11 Jul	S19W83	148	0210	06	Dso	001	B								
								10	0	0	10	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 151

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 20												
02 Jul	N01E63	122	0010	02	Bxo	003	B								
03 Jul	N00E50	121	0010	00	Axx	001	A								
04 Jul	N00E35	123	0000	00	Axx	001	A								
05 Jul	N00E22	123													
06 Jul	N00E09	123													
07 Jul	N00W04	123													
08 Jul	N00W17	123													
09 Jul	N00W30	123													
10 Jul	N00W43	123													
11 Jul	N00W56	123													
12 Jul	N00W69	123													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 123

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 21												
03 Jul	S29E06	165	0010	03	Cro	003	B								
04 Jul	S29W08	166	0040	06	Dso	008	B								
05 Jul	S29W21	165	0070	07	Dao	009	B	3			9				
06 Jul	S29W34	165	0090	08	Dso	011	B								
07 Jul	S29W46	164	0080	07	Dao	010	B								
08 Jul	S29W60	164	0080	08	Dao	009	B								
09 Jul	S28W72	163	0060	07	Dao	004	B								
10 Jul	S28W87	165	0030	01	Hax	001	A								
								3	0	0	9	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		165													
			Region 22												
03 Jul	S20E30	141	0010	04	Bxo	003	B								
04 Jul	S20E20	138	0040	06	Cso	011	B				1				
05 Jul	S20E05	139	0030	03	Cro	007	B				1				
06 Jul	S20W09	140	0020	03	Bxo	007	B								
07 Jul	S19W23	141	0020	03	Bxo	004	B								
08 Jul	S19W36	140	0000	02	Axx	003	A								
09 Jul	S18W46	137	0000	00	Axx	001	A								
10 Jul	S18W59	137	0000	00	Axx	001	A								
11 Jul	S18W72	137													
12 Jul	S18W85	137													
13 Jul	S18W98	137													
								0	0	0	2	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		139													

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 23												
03 Jul	S23E52	119	0010	01	Hrx	001	A								
04 Jul	S23E42	116	0020	06	Cro	006	B								
05 Jul	S22E30	114	0030	06	Bxo	006	B								
06 Jul	S24E19	112	0010	02	Axx	003	A								
07 Jul	S24E04	114	0020	04	Bxo	004	B								
08 Jul	S22W13	116	0010	03	Axx	004	A								
09 Jul	S22W26	117	0010	01	Axx	002	A								
10 Jul	S22W38	116	0010	01	Hrx	002	A								
11 Jul	S22W51	116													
12 Jul	S22W64	116													
13 Jul	S22W77	116													
14 Jul	S22W90	116													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 114

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 24												
03 Jul	S34E61	110	0010	04	Cro	003	B				1				
04 Jul	S33E50	108	0090	08	Dao	008	B								
05 Jul	S33E37	107	0190	07	Dao	008	B								
06 Jul	S34E24	107	0190	07	Dao	004	B								
07 Jul	S34E11	107	0150	07	Dao	007	B								
08 Jul	S34W02	106	0090	07	Dao	012	B								
09 Jul	S34W14	105	0070	06	Dao	008	B								
10 Jul	S35W26	104	0020	04	Cso	004	B								
11 Jul	S35W39	104													
12 Jul	S35W52	104													
13 Jul	S35W65	104													
14 Jul	S35W78	104													
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 106

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 25												
04 Jul	S18E75	083	0050	02	Hsx	001	A								
05 Jul	S19E63	081	0080	02	Hsx	001	A								
06 Jul	S22E52	079	0070	09	Cso	003	B								
07 Jul	S21E37	081	0060	01	Hax	001	A				1				
08 Jul	S20E24	080	0030	03	Cso	004	B								
09 Jul	S20E09	082	0030	02	Hsx	001	A								
10 Jul	S20W03	081	0030	01	Hsx	001	A	2			3				
11 Jul	S20W16	081	0030	02	Hsx	001	A								
12 Jul	S20W29	081	0020	01	Hsx	001	A								
13 Jul	S20W42	081	0020	01	Hsx	001	A								
14 Jul	S20W55	081	0020	01	Hsx	001	A								
								2	0	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 81

			Region 27												
07 Jul	S15E26	092	0020	03	Bxo	004	B								
08 Jul	S15E13	092													
09 Jul	S15E00	092													
10 Jul	S15W13	092													
11 Jul	S15W26	092													
12 Jul	S15W39	092													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 92

			Region 28												
08 Jul	S17E42	062	0020	01	Hrx	001	A								
09 Jul	S16E26	065	0010	01	Hrx	001	A								
10 Jul	S16E12	066	0010	03	Bxo	002	B								
11 Jul	S16W01	066	0020	04	Cro	004	B								
12 Jul	S16W14	066	0000	04	Bxo	002	B								
13 Jul	S16W27	066	0000	00		000									
14 Jul	S16W40	066	0010	01	Axx	002	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 66

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 29												
08 Jul	S16E52	052	0020	03	Bxo	003	B								
09 Jul	S15E38	053	0040	04	Cro	007	B								
10 Jul	S14E25	053	0040	05	Dso	006	B								
11 Jul	S14E12	053	0050	06	Dao	011	B								
12 Jul	S14W01	053	0030	06	Cso	004	B								
13 Jul	S14W14	053	0050	08	Dao	007	B								
14 Jul	S14W29	053	0020	03	Cao	003	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		53													
			Region 30												
09 Jul	N18E74	017	0280	04	Cko	005	B								
10 Jul	N19E62	016	0460	11	Eko	005	Bg	2			5				
11 Jul	N19E49	016	0540	16	Fki	021	Bgd	3	2		5		1		
12 Jul	N19E37	015	0690	18	Fki	035	Bgd	4	1		8		1		
13 Jul	N19E24	015	0730	19	Fkc	066	Bgd	5			6	1			
14 Jul	N19E12	013	0780	20	Fkc	071	Bgd	6			5				
								20	3	0	29	1	2	0	0
Still on Disk.															
Absolute heliographic longitude:		13													
			Region 31												
11 Jul	N10E65	000	0010	01	Axx	001	A								
12 Jul	N10E50	002	0010	01	Axx	001	A								
13 Jul	N10E37	002	0010	02	Hrx	002	A				1				
14 Jul	N10E23	002	0000	00	Axx	001	A								
								0	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		2													
			Region 32												
13 Jul	S20W14	053	0010	02	Axx	003	A								
14 Jul	S20W26	053	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		53													

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 33													
13 Jul	N08E00	039	0020	02	Axx	002	A								
14 Jul	N08W14	039	0010	01	Axx	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 39

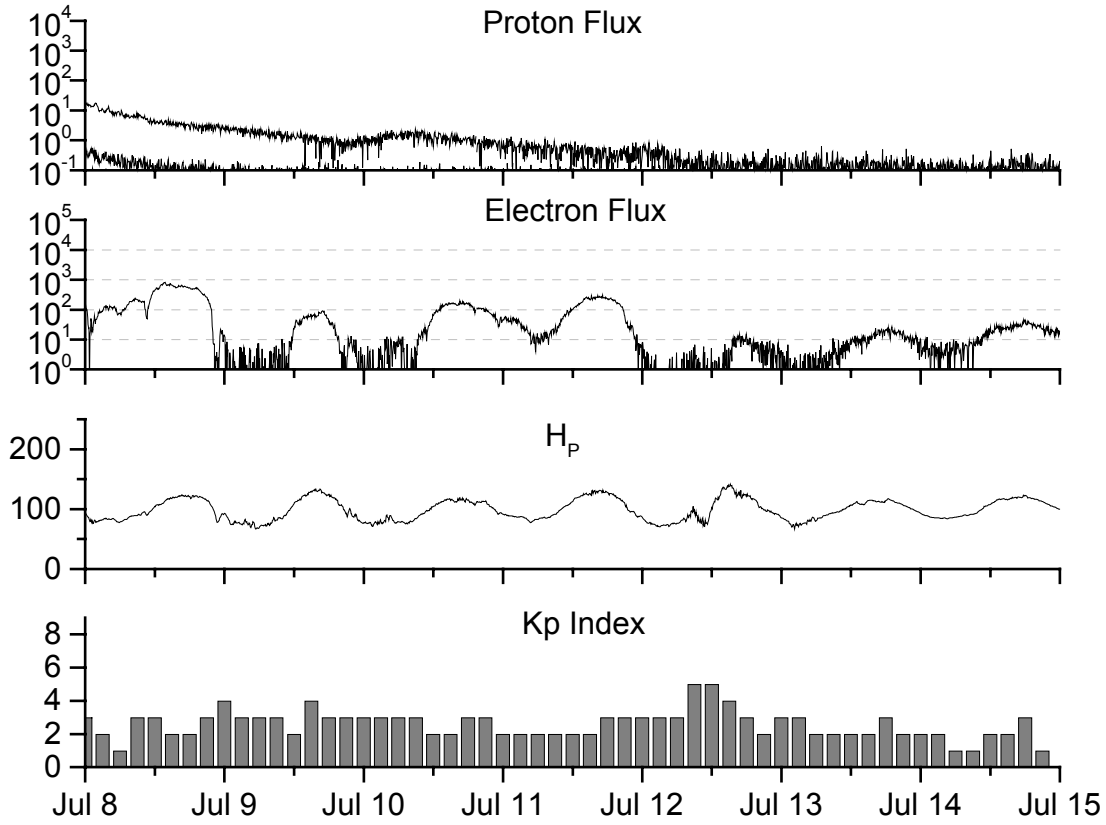
Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
		Region 34													
14 Jul	S20E05	020	0010	03	Cro	003	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 20

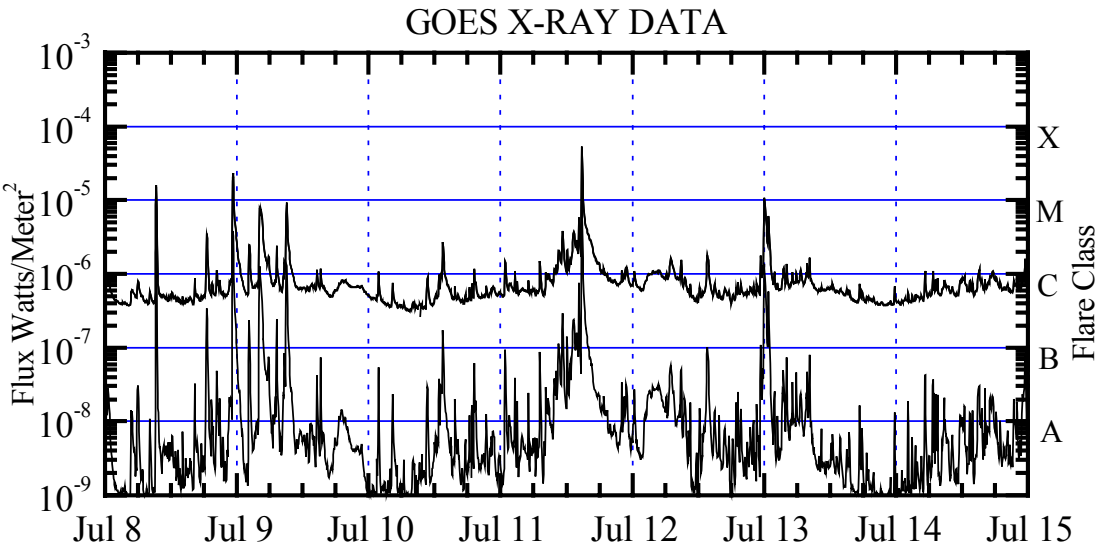
Recent Solar Indices (preliminary)
of the observed monthly mean values

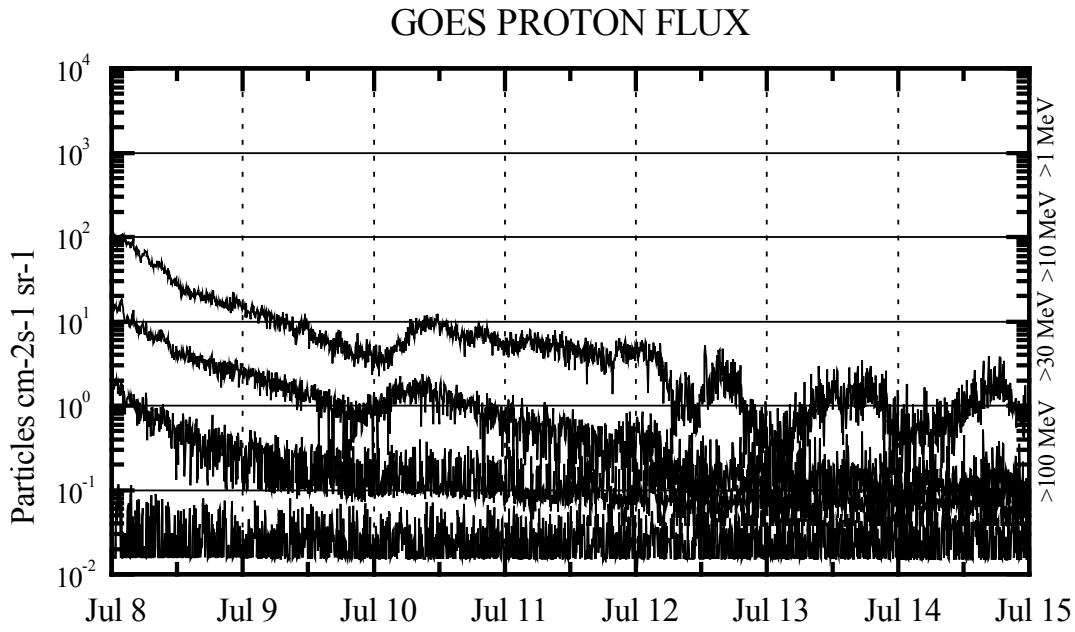
	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
					2000				
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	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			226.4		07	
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	

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 08 July 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.





We*ekly 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.