

## **Space Weather Highlights 07 - 13 July 2003**

**SWO PRF 1454  
15 July 2003**

Solar activity was at low to moderate levels. Activity on 07 – 08 July was at low levels with minor C-class flares predominantly from Regions 397 (N11, L=033 class/area Fkc/930 on 06 July) and 400 (N05, L=351, class/area Eki/290 on 06 July). On 07 July, Region 397 began to decay, lost its delta magnetic configuration by 08 July, and rotated beyond the east limb on 10 July. On 08 July, a large filament in the northwest quadrant erupted in parts: a 23-degree section near N30W22 erupted early in the period and a 21-degree section near N38W38 erupted at 08/1500Z. Region 397 produced moderate activity on 09 – 10 July with an M2 on 09 July at 2238 UTC and an M3 on 10 July at 1412 UTC. The M3 was the largest event of the period and was associated with a Type II radio sweep (1030 km/s). Activity was at low levels on 11 July. Before Region 409 (N16, L=194, class/area Eao/250 on 13 July) rotated around the east limb it produced an M1 flare on 12 July at 1906 UTC. This M1 flare was associated with a Type II radio sweep (659 km/s) and centimetric radio bursts. Activity was at low levels on 13 July.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. The period began with declining solar wind speed. Wind speed was near 600 km/s at the beginning of the period and decreased to 400 km/s by 10 July. Late on 10 July, a fifteen-hour period of negative Bz began along with a gradual rise in total field (Bt). This co-rotating interacting region marked the onset of a coronal hole high speed stream that began mid day on 11 July and lasted until late on 13 July. Maximum solar wind speed from the high speed stream reached 700 km/s with average speeds near 600 km/s.

There were no greater than 10 MeV proton events at geosynchronous orbit during the period.

The greater than 2 MeV electron flux at geo-synchronous orbit reached high levels on 07 - 10 July and again on 13 July.

The geomagnetic field ranged from quiet to minor storm levels. A weak transient passed ACE early in the period and resulted in an isolated period of active conditions on 07 July. Other than this one isolated active period, activity on 07 - 10 July was at quiet to unsettled levels with mostly quiet levels on 08 - 10 July. On 11 - 12 July, activity was at active to major storm levels due to a coronal hole driven high speed stream. One period of severe storm levels was observed early on 12 July as high speed stream effects continued. The high speed stream subsided on 13 July with quiet to active levels.

## **Space Weather Outlook 16 July - 11 August 2003**

Solar activity is expected to range from very low to moderate levels with predominantly low level activity. Early in the period, activity is expected to be at low levels with the possibility for an isolated M-class event from Region 409. Regions 397 and 400 are due to return to the visible disk on 23 July and 27 July respectively. These regions may also have the potential for isolated M-class events.

No greater than 10 MeV proton events at geosynchronous orbit are expected during the

The greater than 2 MeV electron flux is expected to reach high levels on 16 – 18 July, 20 - 28 July, 30 July - 02 August and again 09 - 11 August on due to recurrent coronal hole high speed streams.

The geomagnetic field is expected to range from quiet to major storm levels during the period. On 18 - 20 July, a coronal hole is expected to produce minor storm levels. A large southern coronal hole is due to return on 23 - 27 July and may produce periods of major storm levels. The trailing portion of this large coronal hole will be in a geoeffective position on 29 July - 01 August and is expected to produce minor storm levels. A third returning coronal hole is expected to be in a geoeffective position on 07- 09 August and may produce major storm levels.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
07 July	133	140	1180	B3.2	1	0	0	1	0	0	0	0
08 July	131	149	1330	B4.6	7	0	0	9	1	0	0	0
09 July	126	125	730	B6.7	7	1	0	7	0	0	0	0
10 July	123	137	680	B5.9	8	1	0	4	0	0	0	0
11 July	122	127	540	B5.6	4	0	0	1	0	0	0	0
12 July	122	102	430	B5.9	9	1	0	3	0	0	0	0
13 July	127	137	630	B3.8	7	0	0	5	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
07 July	1.2E+6	1.1E+4	2.7E+3		2.5E+8	
08 July	5.6E+5	1.1E+4	2.7E+3		2.0E+8	
09 July	9.0E+5	1.2E+4	2.6E+3		1.9E+8	
10 July	9.9E+5	1.1E+4	2.4E+3		7.0E+7	
11 July	5.0E+5	1.1E+4	2.5E+3		3.0E+6	
12 July	1.4E+6	1.1E+4	2.5E+3		2.1E+7	
13 July	7.9e+5	1.1e+4	2.6e+3		1.2e+8	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	07 July	9	3-2-3-2-2-2-2-1	17	3-3-5-3-4-2-1-2	14
08 July	3	1-0-0-1-1-2-1-1	2	0-0-1-1-2-0-1-0	5	1-1-1-1-2-2-3-2
09 July	3	0-1-0-1-1-0-2-2	4	0-2-2-0-1-1-2-1	6	2-2-1-2-2-2-2-2
10 July	6	1-1-2-2-2-1-1-3	18	2-1-4-5-5-1-1-2	8	2-2-2-2-3-2-3-3
11 July	36	3-4-5-5-4-4-5-5	61	2-4-7-6-6-6-5-4	46	3-5-6-5-5-4-5-5
12 July	25	4-6-4-3-3-2-3-3	33	5-6-5-4-4-3-2-3	46	6-7-6-4-3-3-4-3
13 July	9	3-2-3-2-2-2-2-2	21	4-3-4-4-4-4-2-2	14	3-3-4-3-3-3-2-3

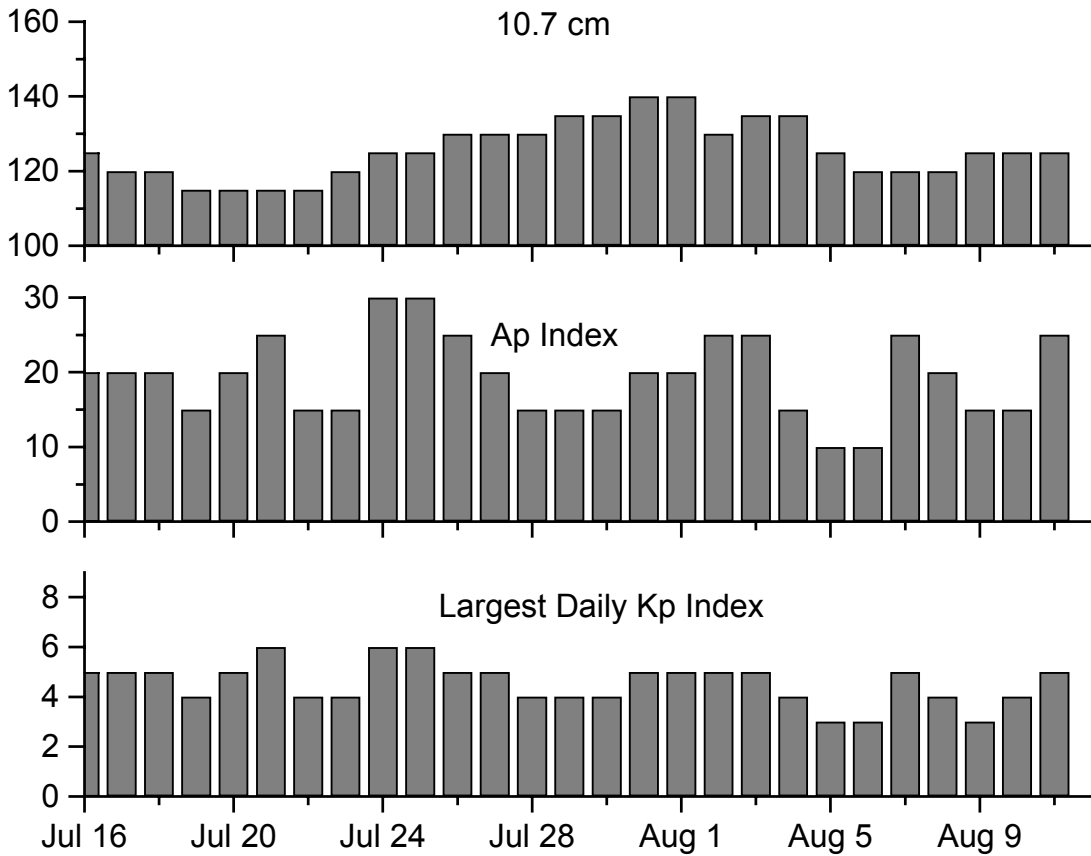


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
07 Jul 0015	5 - 245 MHz Radio Bursts	06 Jul
07 Jul 0015	1 - 245 MHz Radio Noise Storm	06 Jul
07 Jul 0536	ALERT: Electron 2MeV Integral Flux > 1000pfu	07 Jul 0500
07 Jul 0800	ALERT: Geomagnetic K= 4	07 Jul 0800
07 Jul 1448	EXTENDED WARNING: Geomagnetic K= 4	06 Jul 0001 - 07 Jul 2359
08 Jul 0008	3 - 245 MHz Radio Bursts	07 Jul
08 Jul 0008	1 - 245 MHz Radio Noise Storm	07 Jul
08 Jul 0500	ALERT: Electron 2MeV Integral Flux > 1000pfu	08 Jul 0500
08 Jul 2151	WATCH: Geomagnetic A ≥ 20	11 Jul
09 Jul 0007	3 - 245 MHz Radio Bursts	08 Jul
09 Jul 0502	ALERT: Electron 2MeV Integral Flux > 1000pfu	09 Jul 0500
09 Jul 1741	ALERT: Type II Radio Emission	09 Jul 1637
10 Jul 0007	1 - 245 MHz Radio Burst	09 Jul
10 Jul 0631	ALERT: Electron 2MeV Integral Flux > 1000pfu	10 Jul 0610
10 Jul 1413	SUMMARY: 10cm Radio Burst	10 Jul 1357
10 Jul 1418	ALERT: Geomagnetic K= 4	10 Jul 1416
10 Jul 1431	ALERT: Type II Radio Emission	10 Jul 1402
11 Jul 0037	2 - 245 MHz Radio Bursts	10 Jul
11 Jul 0337	ALERT: Geomagnetic K= 4	11 Jul 0335
11 Jul 0535	ALERT: Geomagnetic K= 5	11 Jul 0530
11 Jul 0541	WARNING: Geomagnetic K= 5	11 Jul 0541 - 1500
11 Jul 0839	ALERT: Geomagnetic K= 6	11 Jul 0838
11 Jul 1455	WARNING: Geomagnetic K = 4	11 Jul 1500 - 2359
11 Jul 1502	ALERT: Geomagnetic K = 4	11 Jul 1501
11 Jul 1749	ALERT: Geomagnetic K = 5	11 Jul 1748
11 Jul 2149	WATCH: Geomagnetic A ≥ 30	14 Jul
11 Jul 2226	WARNING: Geomagnetic K= 5	11 Jul 2227 - 12 Jul 1500
11 Jul 2230	ALERT: Geomagnetic K= 5	11 Jul 2229
12 Jul 0104	1 - 245 MHz Radio Burst	11 Jul
12 Jul 0357	WARNING: Geomagnetic K= 6	12 Jul 0357 - 1500
12 Jul 0359	ALERT: Geomagnetic K= 6	12 Jul 0359
12 Jul 1456	EXTENDED WARNING: Geomagnetic K= 4	11 Jul 1500 -12 Jul 2359
12 Jul 1943	ALERT: Geomagnetic K = 4	12 Jul 1941
12 Jul 2019	ALERT: Geomagnetic K = 5	12 Jul 2018
12 Jul 2046	ALERT: Type II Radio Emission	12 Jul 1907
12 Jul 2356	EXTENDED WARNING: Geomagnetic K = 4	11 Jul 1500 -13 Jul 1500
13 Jul 0001	WATCH: Geomagnetic A ≥ 20	13 Jul
13 Jul 0028	2 - 245 MHz Radio Bursts	12 Jul
13 Jul 1107	ALERT: Electron 2MeV Integral Flux > 1000pfu	13 Jul 1050
13 Jul 1755	CANCEL WATCH: Geomagnetic A ≥ 30	11 Jul 2149
13 Jul 1801	ALERT: Geomagnetic K = 4	13 Jul 1756
13 Jul 2015	WATCH: Geomagnetic A ≥ 20	14 Jul
13 Jul 2019	WATCH: Geomagnetic A ≥ 20	15 Jul
13 Jul 2031	WATCH: Geomagnetic A ≥ 20	16 Jul



### 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
16 Jul	125	20	5	30	135	15	4
17	120	20	5	31	140	20	5
18	120	20	5	01 Aug	140	20	5
19	115	15	4	02	130	25	5
20	115	20	5	03	135	25	5
21	115	25	6	04	135	15	4
22	115	15	4	05	125	10	3
23 Jul	120	15	4	06	120	10	3
24	125	30	6	07	120	25	5
25	125	30	6	08	120	20	4
26	130	25	5	09	125	15	3
27	130	20	5	10	125	15	4
28	130	15	4	11	125	25	5
29	135	15	4				



### ***Energetic Events***

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	1/2 Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
09 Jul 03	2159	2238	2245	M2.0	.014			397		67		
10 Jul 03	1354	1412	1423	M3.6	.041			397	640	140	3	
12 Jul 03	1857	1906	1913	M1.4	.008	Sf	N16E79		270	55	2	

### ***Flare List***

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn
	Begin	Max	End				
07 July	1127	1130	1133	B5.7			397
	1424	1433	1454	B8.7			397
	1742	1746	1749	B6.2			397
	1908	1910	1921	C2.3	Sf	N16W42	397
08 July	2102	2105	2108	B9.4			400
	0057	0103	0108	C2.1			397
	0101	0102	0107		Sf	N13W66	397
	0228	0228	0231	C2.3	Sf	N13W66	397
	0244	0251	0301	C1.5			400
	0356	0408	0415	C2.0			397
	0458	0501	0503	B7.7			
	0551	0557	0623	B9.5	Sf	S11W48	402
	0724	0727	0743	C5.2	1f	S11W48	402
	1150	1157	1209	B9.3			
	1355	1356	1401		Sf	S12W53	402
	1557	1557	1601	B6.5	Sf	S13W51	402
	1612	1629	1641	C3.2	Sf	S12W52	402
	1621	1621	1624		Sf	N05W16	400
	1905	1908	1911	B8.2			
	2112	2117	2126	B7.1			400
	2130	2135	2138	C1.0			400
	2342	2344	2346		Sf	N16W58	397
	2349	2350	2354		Sf	N16W58	397
	09 July	0638	0639	0642		Sf	S11W59
1126		1133	1135		Sf	N03W36	400
1443		1446	1456	C2.4	Sf	S11W68	402
1521		1521	1536		Sf	N05W28	400
1629		1629	1633	C5.8	Sf	N12W82	397
1912		1918	1921	C1.3			397
1924		1930	1938	C1.8			397
1942		1947	1950	C2.6			397
2011		2027	2033	C2.5			397
2042		2050	2053	C5.4			397
2102		2108	2126		Sf	S08E26	401
2159		2238	2245	M2.0			397
2209	2210	2218		Sf	N05W35	400	



*Flare List - continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
10 July	0044	0051	0101	C2.8			397
	0225	0234	0246	C2.1			397
	0321	0322	0335	C2.9	Sf	N06W42	400
	0434	0441	0447	C3.1			
	0630	0645	0653	C5.2			
	0847	0854	0907	C1.3			397
	1133	1140	1146	C1.2			397
	1354	1412	1423	M3.6			397
	1425	1425	1430		Sf	N13W91	397
	1625	1630	1640	C1.4			397
	1744	1746	1748		Sf	S10E12	401
	2356	2357	0000	B8.8	Sf	S10E13	401
	11 July	0420	0427	0446	C1.9		
0636		0739	0838	C2.9			401
1036		1037	1039	C1.1	Sf	N16W90	397
1147		1214	1251	C1.5			397
12 July	0242	0248	0259	C3.1			
	0626	0630	0634	C2.9			
	0949	0957	1002	C1.9			
	1319	1322	1326	C1.4			
	1341	1344	1346	C1.2			
	1424	1428	1431	C1.5			
	1616	1617	1624	C2.9	Sf	N16E90	
	1904	1911	1920	M1.4	Sf	N16E79	
	2047	2048	2052	C4.6	Sf	N15E91	
	2238	2242	2247	C1.0			
13 July	0121	0125	0130	C1.4	Sf	S11W01	404
	0633	0636	0640	B5.8			409
	1052	1100	1103	C1.0			409
	1215	1226	1236	C1.5			409
	1620	1621	1626	B7.8	Sf	N16E68	409
	1738	1741	1745	B7.0			
	1752	1756	1805	B9.0			
	1914	1918	1923	B5.9			
	1936	1950	2000	C1.1			409
	2048	2051	2053	B7.8			
	2159	2203	2206	B8.6			
	2211	2213	2220	B9.0	Sf	N15E75	409
	13 July	2240	2252	2256	C2.2		
2308		2310	2314	C2.9	Sf	N16E73	409
2351		2356	0013	C1.4	Sf	N14E22	408



### Region Summary

Date	Location		Sunspot Characteristics				Flares															
	( ° Lat ° CMD)	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
		Lon						C	M	X	S	1	2	3	4							
<i>Region 397</i>																						
27 Jun	N09E72	041	0170	05	Hax	001	A															
28 Jun	N10E65	035	0510	16	Fkc	007	B															
29 Jun	N12E53	034	0790	18	Fho	014	B															
30 Jun	N11E40	034	0850	18	Fhi	030	Gd	1				1	1									
01 Jul	N12E26	034	0770	15	Eki	028	Gd	4				1										
02 Jul	N10E13	034	0630	17	Fki	035	Bg		1			1	1									
03 Jul	N12E00	034	0660	15	Eki	045	Bg	3				8										
04 Jul	N12W14	035	0790	17	Fkc	049	Bg	4				7										
05 Jul	N11W26	033	0890	18	Fkc	041	Bgd	7				4										
06 Jul	N11W39	033	0930	17	Fkc	040	Bgd	4				5										
07 Jul	N12W52	032	0810	17	Fkc	038	Bgd	1				1										
08 Jul	N12W65	032	0790	17	Fki	030	Bg	3				4										
09 Jul	N14W76	034	0360	16	Fsi	018	Bg	6	1			1										
10 Jul	N12W87	028	0260	10	Dao	013	B	5	1			1										
								38	3	0	34	2	0	0	0	0						

Crossed West Limb.

Absolute heliographic longitude: 034

#### *Region 398*

30 Jun	N04E66	008	0010	01	Axx	002	A														
01 Jul	N04E52	008	0010	01	Axx	001	A														
02 Jul	N02E40	007	0010	03	Bxo	003	B														
03 Jul	N03E29	005	0010	03	Bxo	003	B														
04 Jul	N02E16	005	0010	01	Axx	002	A														
05 Jul	N03E03	004	0010	03	Bxo	002	B														
06 Jul	N03W14	008	0010	02	Bxo	005	B														
07 Jul	N03W27	008																			
08 Jul	N03W40	008																			
09 Jul	N03W53	008																			
10 Jul	N03W66	008																			
								0	0	0	0	0	0	0	0	0	0				

Crossed West Limb.

Absolute heliographic longitude: 004



**Region Summary - continued.**

Date	Location		Sunspot Characteristics				Flares											
	Helio		Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4			
<i>Region 400</i>																		
01 Jul	N05E69	351	0080	02	Hsx	001	A											
02 Jul	N04E58	349	0090	08	Dso	013	B	2				2						
03 Jul	N05E44	350	0100	10	Dsi	022	B	2				3						
04 Jul	N05E31	350	0230	09	Dao	023	B	1					1					
05 Jul	N05E18	349	0280	09	Dki	015	Bd	1				1						
06 Jul	N05E03	351	0290	11	Eki	026	Bg	1	1			3						
07 Jul	N05W10	350	0210	11	Eai	022	Bg											
08 Jul	N05W23	350	0220	11	Eki	028	Bg	2				1						
09 Jul	N05W37	351	0150	12	Eao	025	Bg	1	1			3						
10 Jul	N06W51	352	0120	12	Eai	025	Bg	1				1						
11 Jul	N06W65	352	0110	11	Eai	012	Bg											
12 Jul	N05W78	351	0050	10	Bxo	007	B											
								11	2	0	14	1	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 351

<i>Region 401</i>																		
06 Jul	S10E66	288	0020	02	Axx	003	A											
07 Jul	S10E52	288	0030	04	Cso	006	B											
08 Jul	S10E37	290	0040	04	Bxo	008	B											
09 Jul	S09E22	292	0020	05	Dso	006	B					1						
10 Jul	S09E09	292	0100	07	Dao	023	B					2						
11 Jul	S09W05	292	0210	08	Dao	021	B	1										
12 Jul	S10W17	290	0190	08	Dao	020	B											
13 Jul	S10W31	291	0170	08	Dao	019	B											
								1	0	0	3	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 292

<i>Region 402</i>																		
07 Jul	S12W44	024	0020	04	Cso	005	B											
08 Jul	S12W58	025	0180	08	Dso	014	B	2				4	1					
09 Jul	S12W70	024	0150	10	Dso	010	Bg	1				2						
10 Jul	S12W82	023	0170	11	Cao	010	B											
11 Jul	S12W96	025	0080	04	Hax	003	A											
								3	0	0	6	1	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 024





***Region Summary - continued.***

Date	Location		Sunspot Characteristics				Flares							
	Helio		Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
	( ° Lat ° CMD)	Lon						C	M	X	S	1	2	3

*Region 403*

07 Jul	S18E54	286	0050	04	Dso	003	B										
08 Jul	S17E39	288	0040	03	Hsx	003	A										
09 Jul	S17E26	288	0020	01	Hrx	003	A										
10 Jul	S16E13	288	0010	04	Bxo	003	B										
11 Jul	S16W00	288	0010	01	Axx	004	A										
12 Jul	S17W12	286															
13 Jul	S17W25	286															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 288

*Region 404*

07 Jul	S10E64	276	0060	08	Dso	006	B										
08 Jul	S10E51	276	0060	10	Dro	006	B										
09 Jul	S10E37	277	0030	08	Dso	003	B										
10 Jul	S10E22	279	0020	05	Cso	003	B										
11 Jul	S10E08	279	0020	01	Hsx	001	A										
12 Jul	S09W06	279	0010	02	Axx	002	A										
13 Jul	S08W20	280	0020	03	Cso	002	B			1			1				
										1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 279

*Region 405*

11 Jul	S10E66	221	0080	03	Hax	002	A										
12 Jul	S10E52	221	0120	07	Cao	003	B										
13 Jul	S11E41	219	0090	07	Cao	010	B										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 219

*Region 406*

11 Jul	S19W11	298	0020	02	Hsx	002	A										
12 Jul	S18W24	297	0040	04	Cao	006	B										
13 Jul	S18W38	298	0030	04	Cso	005	B										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 298



***Region Summary - continued.***

Date	Location		Sunspot Characteristics				Flares															
	( ° Lat ° CMD)	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
		Lon						C	M	X	S	1	2	3	4							
<i>Region 407</i>																						
11 Jul	N09E31	256	0010	04	Hsx	002	A															
12 Jul	N10E19	254	0020	04	Cso	004	B															
13 Jul	N10E03	257	0010	03	Cso	003	B															
								0	0	0	0	0	0	0	0	0	0	0	0			
Still on Disk.																						
Absolute heliographic longitude: 257																						
<i>Region 408</i>																						
13 Jul	N13E23	237	0020	05	Cso	005	B	1			1											
								1	0	0	1	0	0	0	0	0	0	0	0			
Still on Disk.																						
Absolute heliographic longitude: 237																						
<i>Region 409</i>																						
13 Jul	N16E66	194	0250	11	Eao	011	B	5			3											
								5	0	0	3	0	0	0	0	0	0	0	0			
Still on Disk.																						
Absolute heliographic longitude: 194																						
<i>Region 410</i>																						
13 Jul	S13E63	197	0040	05	Cso	002	B															
								0	0	0	0	0	0	0	0	0	0	0	0			
Still on Disk.																						
Absolute heliographic longitude: 197																						

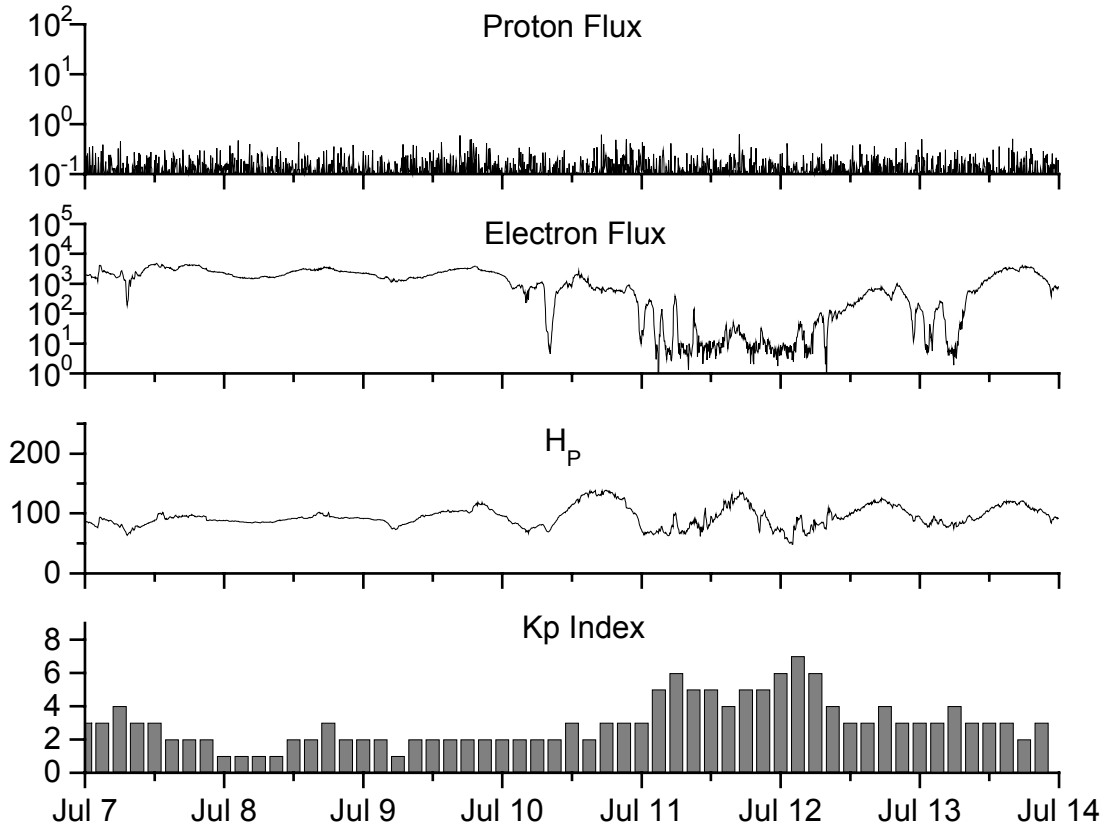


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2001</b>									
July	124.6	81.1	0.66	172.1	111.7	131.3	183.9	9	12.9
August	159.4	106.4	0.67	176.7	113.6	163.1	188.8	11	13.0
September	229.1	150.7	0.66	178.8	114.1	233.8	191.3	13	12.8
October	197.3	125.5	0.64	179.5	114.0	208.1	191.9	20	12.0
November	178.6	106.5	0.60	183.7	115.5	212.7	193.7	16	12.0
December	217.5	132.2	0.61	184.5	114.6	235.6	193.9	09	12.2
<b>2002</b>									
January	189.0	114.1	0.60	184.8	113.5	227.3	194.6	08	12.4
February	194.5	107.4	0.55	188.6	114.7	205.0	197.2	10	12.8
March	153.1	98.4	0.64	188.9	113.4	180.3	195.7	10	13.0
April	194.9	120.7	0.62	186.2	110.5	189.8	191.5	15	13.2
May	204.1	120.8	0.59	183.6	108.9	178.4	188.0	15	13.3
June	146.0	88.3	0.60	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.9	0.54	175.4	102.7	173.5	173.5	13	13.9
August	191.0	116.4	0.61	169.3	98.7	183.9	169.5	16	14.3
September	206.4	109.6	0.53	163.4	94.6	175.8	164.2	14	14.9
October	153.9	97.5	0.63	158.7	90.5	167.0	159.5	23	15.5
November	159.8	95.5	0.60	150.5	85.3	168.7	154.3	16	16.1
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
<b>2003</b>									
January	149.3	79.5	0.53			144.6		13	
February	87.9	46.2	0.53			124.6		15	
March	119.7	61.5	0.51			132.3		19	
April	114.3	60.0	0.52			126.5		20	
May	89.6	55.2	0.62			116.2		25	
June	118.4	77.4	0.65			129.4		24	

**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 07 Jul 2003*

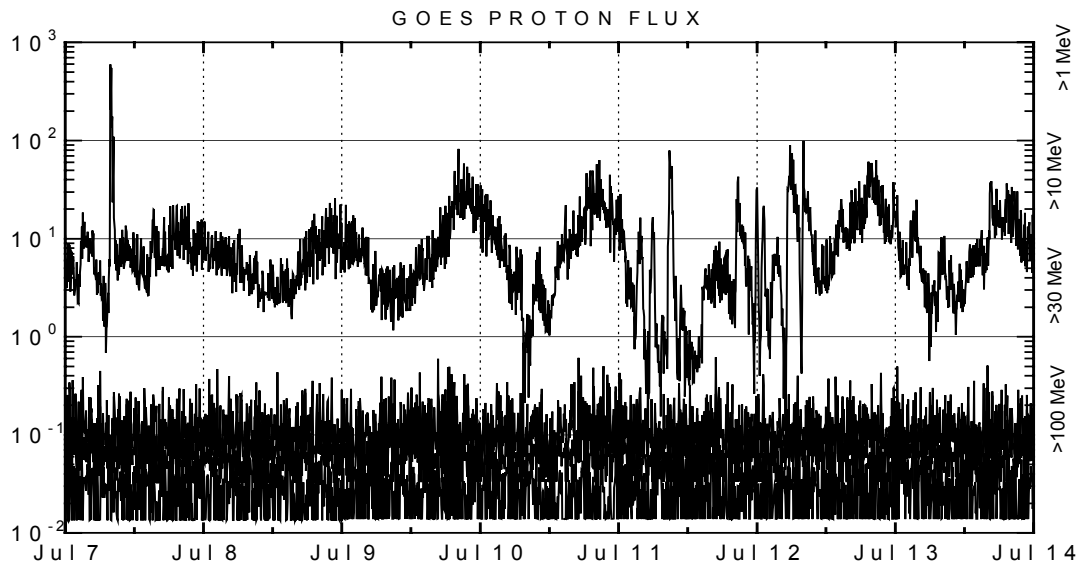
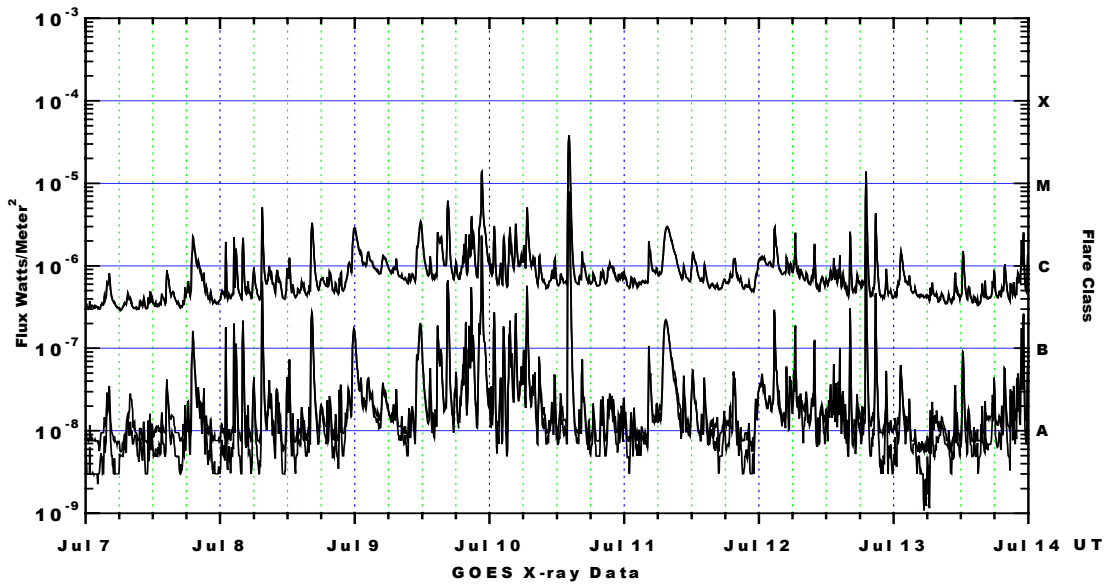
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The primary proton instrument was switched from GOES-8 to GOES-11 on 19 June 2003 (See details at <http://www.sec.noaa.gov/GOES.html>).

*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12.

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* 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 K<sub>p</sub> 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 K<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H<sub>parallel</sub> 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<sup>2</sup>) as measured by GOES 12 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<sup>2</sup>-sec-sr) as measured by GOES-11 (W113) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV. The primary proton instrument was switched from GOES-8 to GOES-11 on 19 June 2003 (See details at <http://www.sec.noaa.gov/GOES.html>).

