

Solar activity was at low levels. Several moderate sized regions dominated the visible disk and produced numerous C-class flares. Region 409 (N15, L=193, class/area Fkc/490 on 15 July) was prominent early in the period, producing several C-class flares including a C8 at 14/0120 UTC. Activity on 15 – 16 July consisted of minor C-class flares from Regions 409 and 410 (S12, L=194, class/area Eac/620 on 20 July). On 16 July, Region 412 (N16, L=202 class/area Dai/200 on 17 July) appeared on the visible disk and exhibited steady growth for the next two days. By 17 July, it produced a C9/1n flare at 0823 UTC with associated Type II (988 km/s) and Type IV radio sweeps. A faint halo CME was seen but faded within the LASCO/C2 field of view. Decay noted in Region 409 on 18 July was offset by significant development in Region 410, and to a lesser extent Region 412. Region 410 exhibited considerable growth and developed a beta-gamma-delta magnetic configuration on 19 – 20 July. The period 18-20 July was highlighted by frequent C-class flares, primarily from Regions 410, 412, and a new region that emerged rather quickly on 20 July – Region 417 (S22, L=204 class/area Dso/110 on 20 July).

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. The period began with a short-lived return to near ambient solar wind speed (450 km/s). By late on the 14th, a co-rotating interaction region was detected at ACE, marking the onset of yet another high speed coronal hole stream. Solar wind speeds exhibited a gradual rise through early on the 15th and maintained an elevated 600 – 700 km/s through the 18th. Magnetic field measurements on the 16th would suggest that transient flow was embedded in the high speed stream. Solar wind speed returned to near 500 km/s for most of the 18th, but returned to a 600 - 700 km/s range by the 19th – 20th.

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 14 – 15, 17 – 18, and 20 July.

The period began with predominantly unsettled to active levels due to waning effects of a large coronal hole. A second coronal hole high speed stream rotated into a geoeffective position on 15 July. This resulted in minor storm levels on 15 July, major storm levels on 16 July, and an isolated minor storm period on 17 July. Embedded transient flow likely contributed to the most active periods on the 16th. Solar wind speed during this high speed stream reached maximum values near 700 km/s. The 18th saw a return to mostly quiet to unsettled levels with isolated active periods. The period ended with predominantly unsettled to minor storm levels in response to elevated solar wind speeds in the 600 – 700 range.



Space Weather Outlook

23 July – 18 August 2003

Solar activity is expected to be at low to moderate levels, with the possibility of some high intervals. Regions 410 and 412 have the potential for M-class events until they rotate beyond the west limb on 26 July. There is a slight chance of a major event from Region 410. Old Region 397 (N12, L=032) is due to return to the visible disk on 24 July and is expected to have M-class potential. This block of active longitudes currently on the visible disk (L = 190 – 205) will return by mid August and may produce moderate solar activity levels.

There is a slight chance of a greater than 10 MeV proton event at geosynchronous orbit early in the period.

The greater than 2 MeV electron flux is expected to reach high levels on 30 July – 04 August, 09 - 11 August, and again on 12 –17 August, due to recurrent coronal hole high speed streams.

The geomagnetic field is expected to range from quiet to major storm levels during the period. A large, recurrent coronal hole high speed stream is expected to become geoeffective on 28 July – 03 August, and produce active to minor storm levels. Coronal hole effects are expected again on 7 - 9 August and again on 11 – 17 August and occasional minor storm periods are possible. Isolated major storm periods are possible with these high speed streams, but will be mostly confined to high latitudes in local nighttime hours.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
14 July	127	159	690	B3.2	2	0	0	4	0	0	0	0
15 July	126	154	900	B2.6	4	0	0	0	0	0	0	0
16 July	133	164	610	B2.8	4	0	0	3	0	0	0	0
17 July	139	189	630	B3.9	10	0	0	5	2	0	0	0
18 July	140	193	720	B4.2	8	0	0	12	0	0	0	0
19 July	146	178	780	B5.4	13	0	0	7	1	0	0	0
20 July	157	224	1470	B8.9	21	0	0	17	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
	14 July	8.7E+5	1.1E+4	2.5E+3		1.6E+8
15 July	1.2E+6	1.1E+4	2.5E+3		5.0E+7	
16 July	1.0E+6	1.1E+4	2.8E+3		4.0E+6	
17 July	1.4E+6	1.2E+4	2.6E+3		4.5E+7	
18 July	5.5E+5	1.3E+4	2.8E+3		9.9E+7	
19 July	3.8E+5	1.2E+4	2.6E+3		1.5E+7	
20 July	1.5E+6	1.1E+4	2.5E+3		8.4E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	14 July	13	2-3-3-1-3-3-3-3	18	3-4-4-4-3-3-2-2	15
15 July	15	3-4-2-4-2-2-3-3	31	5-5-4-6-3-2-2-3	27	5-5-3-5-3-3-4-4
16 July	23	4-3-4-5-3-2-3-4	63	4-4-6-7-7-5-3-4	48	4-5-6-6-6-4-4-5
17 July	14	4-3-2-2-3-2-3-3	28	4-3-3-5-5-5-3-3	22	5-4-3-3-3-3-4-4
18 July	11	2-3-2-1-2-2-3-4	15	3-4-3-3-3-3-2-2	14	3-3-2-2-2-3-3-4
19 July	20	4-2-2-3-3-3-4-5	33	3-3-3-5-6-5-3-4	26	4-3-3-4-4-4-4-5
20 July	16	4-3-3-3-3-2-3-3	22	5-3-3-5-3-3-2-3	19	5-4-4-3-3-3-3-3

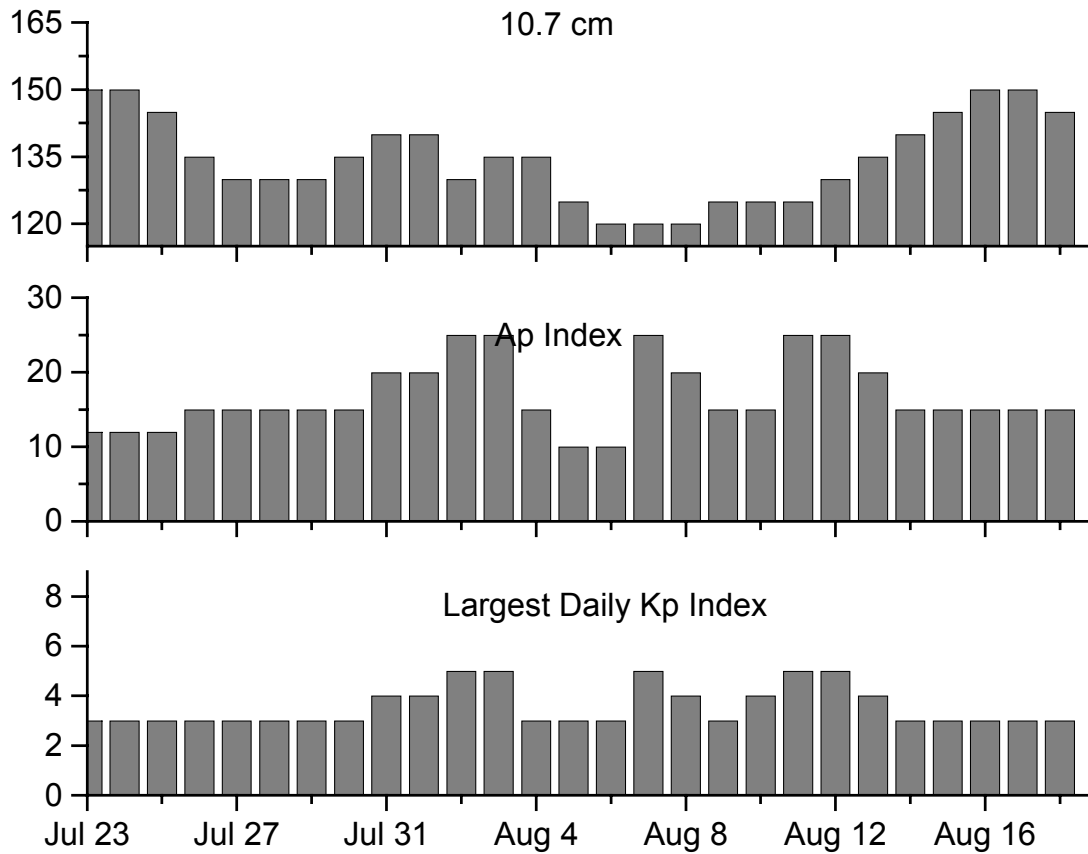


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
14 Jul 0436	WARNING: Geomagnetic K = 4	14 Jul 0437 – 1500
14 Jul 0441	ALERT: Geomagnetic K= 4	14 Jul 0441
14 Jul 1042	ALERT: Electron 2MeV Integral Flux > 1000pfu	14 Jul 1020
14 Jul 1605	WARNING: Geomagnetic K = 4	14 Jul 1610 – 1500
14 Jul 1728	ALERT: Geomagnetic K= 4	14 Jul 1724
15 Jul 0005	3 – 245 MHz Radio Bursts	14 Jul
15 Jul 0251	ALERT: Geomagnetic K= 5	15 Jul 0250
15 Jul 0446	WARNING: Geomagnetic K= 5	15 Jul 0447 – 1500
15 Jul 1257	ALERT: Electron 2MeV Integral Flux > 1000pfu	15 Jul 1235
15 Jul 1457	EXTENDED WARNING: Geomagnetic K = 4	14 Jul 1610 – 16/1500
16 Jul 0745	WARNING: Geomagnetic K= 5	16 Jul 0748 – 1500
16 Jul 0751	ALERT: Geomagnetic K= 5	16 Jul 0748
16 Jul 1034	WARNING: Geomagnetic K= 6	16 Jul 1034 – 1500
16 Jul 1045	ALERT: Geomagnetic K= 6	16 Jul 1042
16 Jul 1455	EXTENDED WARNING: Geomagnetic K = 4	14 Jul 1610 – 17/1600
16 Jul 2118	WATCH: Geomagnetic $A \geq 20$	17 Jul
16 Jul 2317	WARNING: Geomagnetic K= 5	16 2320 – 17/1500
16 Jul 2356	ALERT: Geomagnetic K= 5	16 Jul 2358
17 Jul 0831	SUMMARY: 10cm Radio Burst	17 Jul 0820
17 Jul 0837	ALERT: Type II Radio Emission	17 Jul 0817
17 Jul 0848	ALERT: Type IV Radio Emission	17 Jul 0830
17 Jul 1433	EXTENDED WARNING: Geomagnetic K = 4	14 Jul 1610 – 17/2359
17 Jul 1540	ALERT: Electron 2MeV Integral Flux > 1000pfu	17 Jul 1520
17 Jul 2137	ALERT: Type II Radio Emission	17 Jul 1830
17 Jul 2356	EXTENDED WARNING: Geomagnetic K = 4	14 Jul 1610 – 18/1500
18 Jul 0029	10 – 245 MHz Radio Bursts	17 Jul
18 Jul 1137	ALERT: Electron 2MeV Integral Flux > 1000pfu	18 Jul 1110
18 Jul 2359	ALERT: Geomagnetic K= 4	18 Jul 2356
19 Jul 0023	5 – 245 MHz Radio Bursts	18 Jul
19 Jul 0023	245 MHz Radio Noise Storm	18 Jul
19 Jul 0125	ALERT: Geomagnetic K= 4	19 Jul 0123
19 Jul 0126	WARNING: Geomagnetic K = 4	19 Jul 0126 – 1500
19 Jul 0219	ALERT: Type II Radio Emission	19 Jul 0138
19 Jul 0243	ALERT: Geomagnetic K= 5	19 Jul 0242
19 Jul 1910	WARNING: Geomagnetic K = 4	19 Jul 1911 – 1500
19 Jul 2036	ALERT: Geomagnetic K= 4	19 Jul 2030
19 Jul 2354	ALERT: Geomagnetic K= 5	19 Jul 2352
20 Jul 0013	3 – 245 MHz Radio Bursts	19 Jul
20 Jul 0013	245 MHz Radio Noise Storm	19 Jul
20 Jul 0025	WARNING: Geomagnetic K= 5	20 Jul 0200 – 1500
20 Jul 0217	ALERT: Geomagnetic K= 5	20 Jul 0216
20 Jul 1246	ALERT: Electron 2MeV Integral Flux > 1000pfu	20 Jul 1225
20 Jul 2319	WARNING: Geomagnetic K = 4	20 Jul 2359 – 1500



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
23 Jul	150	12	3	06 Aug	120	10	3
24	150	12	3	07	120	25	5
25	145	12	3	08	120	20	4
26	135	15	3	09	125	15	3
27	130	15	3	10	125	15	4
28	130	15	3	11	125	25	5
29	130	15	3	12	130	25	5
30	135	15	3	13	135	20	4
31	140	20	4	14	140	15	3
01 Aug	140	20	4	15	145	15	3
02	130	25	5	16	150	15	3
03	135	25	5	17	150	15	3
04	135	15	3	18	145	15	3
05	125	10	3				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Integ	Imp/ Brtns	Location		Radio Flux		Intensity	
			Class		Flux	Lat	CMD	245	2695	II
No Events Observed										

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
14 July	0058	0120	0134	C8.7				409
	0230	0240	0253	C1.0				409
	0602	0608	0615	B7.8				409
	1506	1507	1509	B5.5	Sf	N18E56		409
	1616	1620	1625	B6.3				409
	1644	1649	1657	B7.3				
	1711	1712	1723		Sf	N18E55		409
	2054	2057	2102		Sf	N16E62		409
15 July	2304	2304	2309	B6.3	Sf	N16E63		409
	0038	0042	0053	B7.6				
	0110	0122	0126	C1.6				409
	0151	0207	0218	C2.0				409
	0218	0221	0224	C1.6				409
	0259	0304	0308	C1.6				409
	0405	0410	0418	B6.9				
	0546	0553	0605	B7.6				
16 July	0927	0930	0941	B3.9				
	1159	1202	1205	B4.4				
	0029	0039	0053	B7.0				
	0523	0530	0534	B5.4				
	1220	1223	1240	C1.3	Sf	S15E29		410
	1342	1344	1402	B8.1	Sf	S11E31		410
	1355	1408	1425	C1.2				406
	1604	1609	1625	C1.2	Sf	S11E30		410
17 July	1628	1635	1642	C2.9				410
	0211	0246	0308	C1.1				
	0819	0821	0857	C9.8	1n	N15E21		412
	0858	0914	0923	C2.3				410
	1338	1350	1407	B8.8				
	B1530	U1530	1545	C2.6	Sf	S14E15		410
	1620	1628	1635	B9.1				
	1651	1651	1700	C1.4	Sf	S12E18		410
	1742	1743	1755	C2.8	Sf	S12E18		410
	1753	1818	1834	C2.2	Sf	N16E10		412
1838	1840	1849	C3.8	Sf	S12E17		410	
2010	2013	2017	C1.3					
2215	2224	2230	B8.2					



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
18 July	2352	0009	0034	C5.1	1n	S11E13	410
	B0010	U0010	0037	C5.4	Sf	S10E15	410
	0148	0152	0155	B9.2			
	0246	0251	0258	B7.2			
	0408	0418	0423	C2.0	Sf	S11E11	410
	0535	0536	0546	B9.9	Sf	N14E02	412
	0722	0723	0727	B8.0	Sf	S11E09	410
	0738	0740	0748	C1.2	Sf	S12E09	410
	1337	1338	1342		Sf	S14E06	410
	1349	1350	1356	C1.3	Sf	N16E02	412
	1447	1450	1518		Sf	S13E05	410
	1523	1523	1527		Sf	N16W02	412
	1826	1827	1843	C4.8	Sf	S12E04	410
	1951	1953	2009	C2.4	Sf	N14W06	412
	2052	2055	2058	B9.8			
	2236	2242	2249	C1.8	Sf	N16W05	412
	2321	2324	2328	C1.4			
19 July	0130	0134	0156	C1.8	Sf	N14W09	412
	0320	0321	0326		Sf	S12E00	410
	0930	0930	0938	C3.4	1f	S12W06	410
	1117	1123	1127	C1.1			
	1442	1446	1452	C1.4			
	1523	1525	1531	C1.4	Sf	S14W07	410
	1552	1554	1555		Sf	S11W09	410
	1733	1733	1738	C1.7	Sf	N13E33	415
	1823	1826	1828	C1.3			
	1839	1842	1849	C1.2			
	1906	1909	1912	C1.3			
	2016	2018	2032	C2.4	Sf	S11W13	410
	2219	2225	2230	C3.0			
	2253	2258	2304	C1.7			
2358	0000	0009	C2.7	Sf	N12E30	415	
20 July	0009	0010	0013		Sf	S11W13	410
	0026	0029	0046	C1.8	Sf	S11W13	410
	0057	0116	0129	C2.8	Sf	S11W13	410
	0338	0339	0351		Sf	N12E28	415
	0349	0351	0416	C3.9	Sf	S12W15	410
	0436	0439	0443	C1.1			
	0518	0523	0526	C1.2			
	0546	0550	0602	B9.0			
	0619	0625	0635	C1.4			
	0819	0823	0828	C2.5			
	0835	0836	0840	C2.0	Sf	S22W27	417



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
20 July	0945	1002	1008	C2.4			
	1152	1155	1157	C1.7			
	1200	1206	1223	C2.1			
	1401	1401	1408		Sf	S12W21	410
	1414	1414	1422		Sf	S12W21	410
	1448	1451	1456	C3.7	Sf	S12W22	410
	1553	1554	1557	C1.8	Sf	S12W33	410
	1605	1611	1627	C5.6	Sf	S11W22	410
	1645	1646	1656	C3.7	Sf	S12W23	410
	1725	1726	1744	C3.9	Sf	S11W22	410
	1756	1758	1803	C3.6	Sf	S11W24	410
	1806	1811	1817	C3.1			
	1858	1911	1934	C4.4	Sf	S11W24	410
	1906	1910	1921		Sf	S21W34	417
	2106	2108	2115	C2.7	Sf	S11W27	410
	2337	2341	2344	C1.6			



Region Summary

Date	Location		Sunspot Characteristics				Flares															
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
		Lon						C	M	X	S	1	2	3	4							
<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															
14 Jul	S09W45	292	0140	08	Dao	014	B															
15 Jul	S10W57	291	0100	08	Dso	007	B															
16 Jul	S09W73	294	0040	02	Hsx	001	A															
17 Jul	S09W90	297	0010	01	Axx	002	A															
								1	0	0	3	0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 292

<i>Region 403</i>																						
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																				
14 Jul	S17W38	286																				
15 Jul	S17W51	286																				
16 Jul	S17W64	286																				
17 Jul	S17W77	286																				
								0	0	0	0	0	0	0	0	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 288



Region Summary - continued.

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

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						
14 Jul	S08W34	281	0020	04	Cro	003	B										
15 Jul	S11W41	275	0000	01	Axx	001	A										
16 Jul	S11W54	275															
17 Jul	S11W67	275															
18 Jul	S11W80	275															
19 Jul	S11W93	275															
										1	0	0	1	0	0	0	0

Crossed West Limb.

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										
14 Jul	S11E28	219	0070	07	Dao	019	B										
15 Jul	S11E13	221	0100	07	Dso	011	B										
16 Jul	S11E01	220	0050	07	Cso	005	B										
17 Jul	S10W16	223	0020	02	Cso	003	B										
18 Jul	S10W29	223	0040	04	Hsx	004	A										
19 Jul	S10W43	224	0030	02	Hsx	002	A										
20 Jul	S11W57	225	0020	01	Hsx	001	A										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 220

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										
14 Jul	S18W51	298	0030	04	Cso	004	B										
15 Jul	S18W66	300	0030	01	Hsx	001	A										
16 Jul	S17W78	299	0010	01	Axx	001	A			1							
										1	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 298



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ 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											
14 Jul	N09W12	259	0030	06	Cso	008	B											
15 Jul	N09W24	258	0030	05	Cao	006	B											
16 Jul	N10W36	257	0010	03	Cro	003	B											
17 Jul	N10W49	257																
18 Jul	N10W62	257																
19 Jul	N10W75	257																
20 Jul	N10W88	257																

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						
14 Jul	N13E08	239	0020	03	Cao	005	B											
15 Jul	N13W04	238	0020	03	Cso	004	B											
16 Jul	N14W17	238	0010	01	Hrx	001	A											
17 Jul	N12W31	238	0020	03	Cso	002	B											
18 Jul	N13W45	239	0010	00	Hsx	001	A											
19 Jul	N13W58	239																
20 Jul	N13W71	239																

1 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 238

<i>Region 409</i>																		
13 Jul	N16E66	194	0250	11	Eao	011	B	5				3						
14 Jul	N15E55	192	0350	15	Eko	023	Bg	2				4						
15 Jul	N15E41	193	0490	18	Fkc	029	B	4										
16 Jul	N16E30	191	0300	16	Fki	034	B											
17 Jul	N15E18	189	0210	14	Eai	045	Bg											
18 Jul	N15E05	189	0160	11	Eao	036	B											
19 Jul	N15W08	189	0120	12	Eao	026	B											
20 Jul	N15W22	190	0160	06	Dao	015	B											

11 0 0 7 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 189



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 410</i>																		
13 Jul	S13E63	197	0040	05	Cso	002	B											
14 Jul	S13E49	198	0030	05	Cso	003	B											
15 Jul	S12E38	196	0020	05	Cso	003	B											
16 Jul	S12E28	193	0070	06	Dso	008	Bg	3				3						
17 Jul	S12E12	195	0160	08	Dac	029	Bg	6				4	1					
18 Jul	S11W01	195	0220	10	Dai	042	Bg	4				7						
19 Jul	S12W13	194	0310	11	Eac	038	Bg	3				4	1					
20 Jul	S12W26	194	0620	11	Eac	044	Bgd	11				14						
								27	0	0	0	32	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 195

Region 411

15 Jul	N16E62	172	0110	05	Dso	002	B											
16 Jul	N15E53	168	0060	02	Hsx	002	A											
17 Jul	N14E38	169	0040	02	Hsx	001	A											
18 Jul	N14E26	168	0060	02	Hax	001	A											
19 Jul	N15E13	168	0040	02	Hsx	001	A											
20 Jul	N15E01	167	0030	02	Hsx	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 171

Region 412

16 Jul	N16E19	202	0030	04	Cso	008	B											
17 Jul	N16E05	202	0060	05	Dai	015	B	2				1	1					
18 Jul	N17W06	200	0100	09	Dai	027	Bg	3				5						
19 Jul	N16W20	201	0110	09	Dac	017	Bg	1				1						
20 Jul	N16W34	202	0200	08	Dsi	014	Bg											
								6	0	0	0	7	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 202

Region 413

16 Jul	N18E49	172	0030	01	Hsx	001	A											
17 Jul	N18E35	172	0020	01	Hsx	001	A											
18 Jul	N20E22	172	0010	01	Axx	001	A											
19 Jul	N18E09	172	0020	01	Axx	001	A											
20 Jul	N19W03	171	0010	01	Axx	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 171



Region Summary - continued.

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

Region 414

17 Jul	S02E71	136	0090	03	Hax	001	A											
18 Jul	S02E58	136	0120	02	Hax	001	A											
19 Jul	S01E45	136	0110	02	Hax	002	A											
20 Jul	S02E32	136	0130	03	Hsx	001	A											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 136

Region 415

19 Jul	N13E30	151	0040	06	Dao	011	B	2			2							
20 Jul	N13E16	152	0110	07	Dso	009	B				1							
								2	0	0	3	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 152

Region 416

20 Jul	S09W42	210	0030	04	Dso	004	B											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 210

Region 417

20 Jul	S22W36	204	0110	06	Dso	021	B	1			2							
								1	0	0	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 204

Region 418

20 Jul	S05W08	176	0020	03	Cso	003	B											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 176

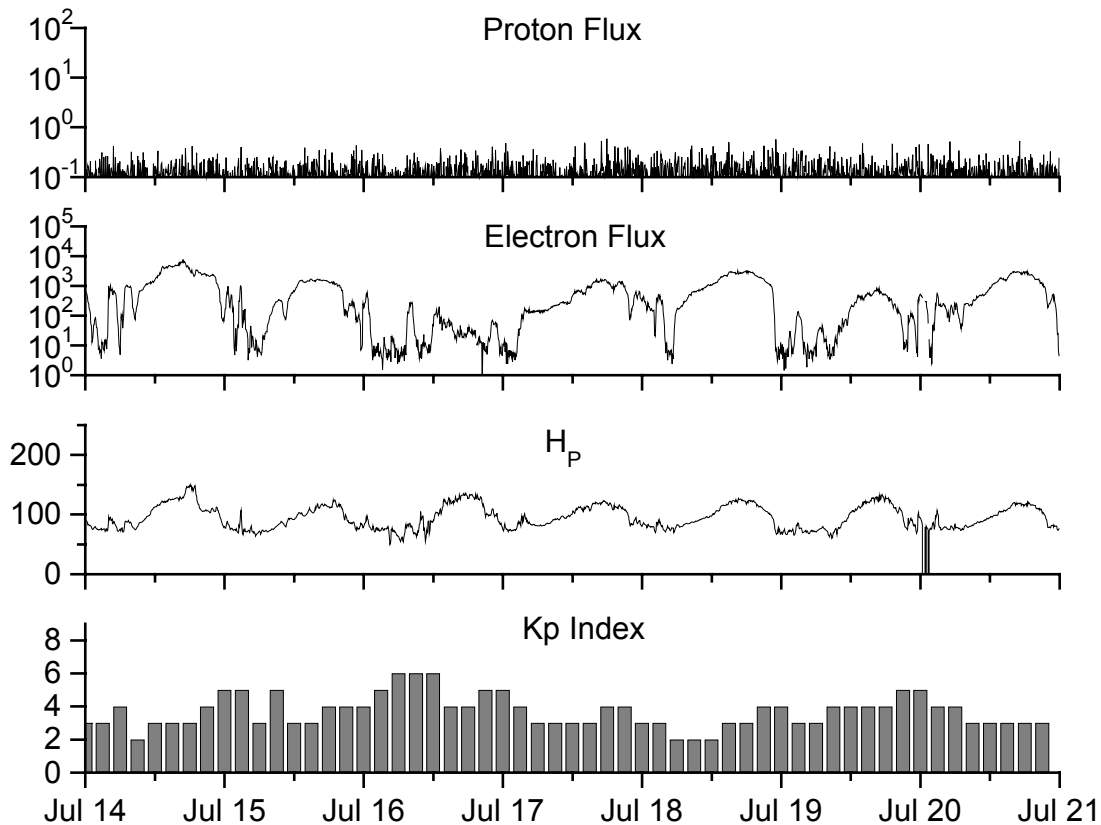


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2001									
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
2002									
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
2003									
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 14 Jul 2003*

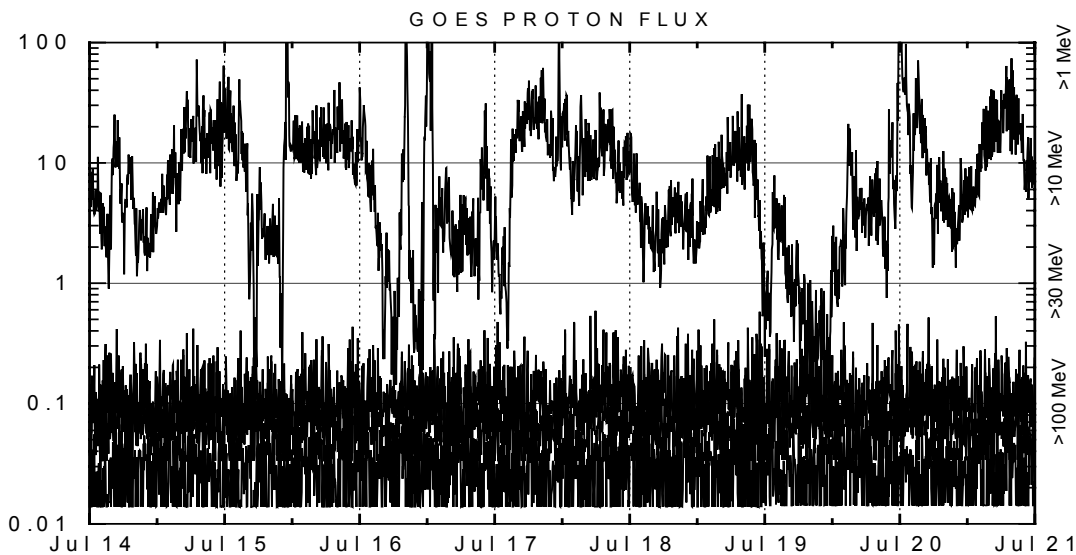
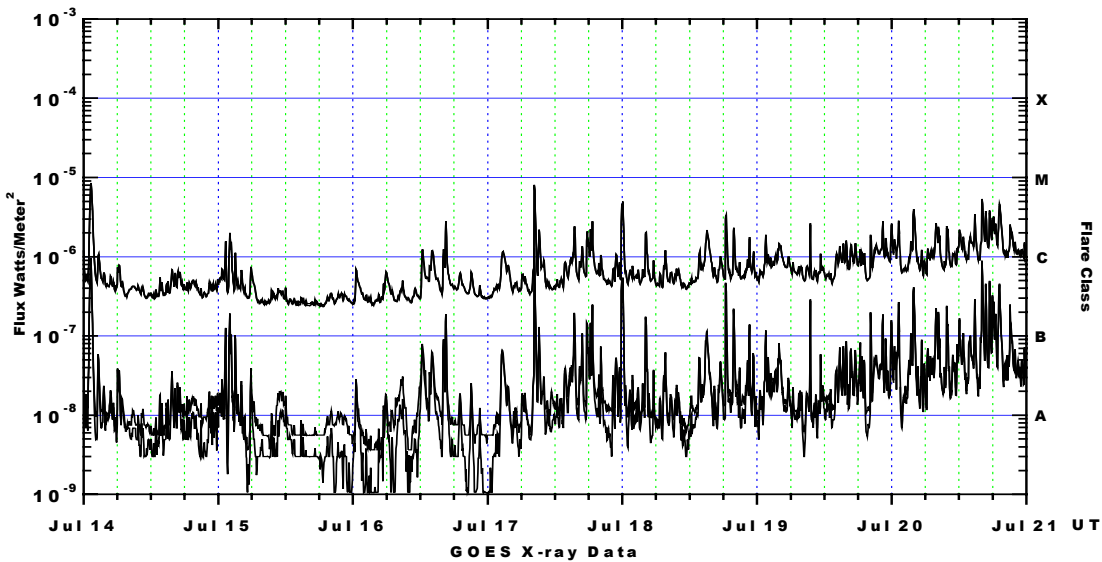
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12.

H_p 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_p 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_p 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_p are "global" parameters that are applicable to a first order approximation over large areas. H_p 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/m²) 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/cm²-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/cm²-sec-sr) at greater than 10 MeV.

