

Space Weather Highlights
02 - 08 July 2001

SWO PRF 1349
03 July 2001

Solar activity was at very low to low levels. Very low activity occurred through 06 July with isolated B-class X-ray flares. Activity increased to low levels during the rest of the period due to isolated C-class subflares from two developing active regions. One of these, Region 9530 (S20, L = 293, class/area Cso/040 on 06 July) produced the largest flare of the period: a C9/Sf at 07/0331 UTC associated with a Type II radio sweep. Region 9530 entered a decay phase on 08 July. Region 9531 (S06, L = 223, class/area Dao/050 on 08 July) emerged on 08 July, then grew at a moderate pace as it produced isolated C-class subflares. The 06 July 10.7 cm solar radio flux reading of 116 was the lowest observed since September 1999.

Data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. There were no high speed stream or CME signatures observed during the period. There was a period of sustained southward IMF Bz during approximately 08/1900 - 09/0230 UTC with deflections to minus 06 nT (GSM).

There were no proton events during the period.

The greater than 2 MeV electron flux at geosynchronous orbit was normal to moderate levels during the period.

Geomagnetic field activity was at quiet to unsettled levels through most of the period.

However, active periods occurred during 08/2100 - 09/0300 UTC associated with a sustained period of southward IMF Bz.

Space Weather Outlook
11 July - 06 August 2001

Solar activity is expected to range from low to moderate levels. Isolated M-class flares will be possible during the period. There will be a slight chance for a major flare during the period.

There will be a slight chance for a proton event during the period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during most of the period.

The geomagnetic field is expected to be at quiet to unsettled levels during most of the period, barring an Earth-directed CME. However, brief active conditions will be possible during 16 - 17 July.



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
02 July	134	130	480	B3.4	0	0	0	0	0	0	0	0
03 July	132	132	550	B3.1	0	0	0	1	0	0	0	0
04 July	127	106	540	B2.7	0	0	0	0	0	0	0	0
05 July	120	101	340	B3.7	0	0	0	1	0	0	0	0
06 July	116	68	260	B2.1	0	0	0	0	0	0	0	0
07 July	118	77	250	B1.9	1	0	0	1	0	0	0	0
08 July	126	101	270	B2.0	6	0	0	4	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
02 July	3.1E+4	1.1E+4	2.3E+3		4.5E+5	
03 July	4.2E+4	1.0E+4	2.2E+3		1.3E+6	
04 July	4.2E+4	1.1E+4	2.1E+3		9.3E+5	
05 July	6.1E+4	1.1E+4	2.3E+3		8.6E+5	
06 July	9.2E+4	1.1E+4	2.3E+3		3.0E+6	
07 July	4.9E+4	1.1E+4	2.4E+3		4.9E+6	
08 July	1.0E+5	1.1E+4	2.4E+3		3.0E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	02 July	4	2-1-0-1-1-0-3-1	*	2-1-1-*-1-1-2-1	8
03 July	5	0-1-2-2-2-1-2-2	10	0-1-2-3-5-2-1-0	9	1-2-2-3-3-3-3-3
04 July	6	2-1-1-1-2-2-2-2	*	2-1-0-2-*-*-1-1	8	2-2-1-2-3-3-2-3
05 July	10	2-2-2-2-3-2-3-3	12	2-2-3-2-5-2-1-1	13	2-3-3-3-3-3-3-3
06 July	7	2-2-1-2-2-2-2-2	*	2-1-1-3-*-2-1-1	10	2-2-1-3-3-3-3-3
07 July	6	1-2-1-2-2-1-2-2	*	2-1-1-1-*-*-1-2	7	2-2-1-2-2-3-2-2
08 July	11	2-3-2-1-1-2-3-4	13	2-2-3-3-4-2-2-3	16	2-3-3-3-3-3-4-4

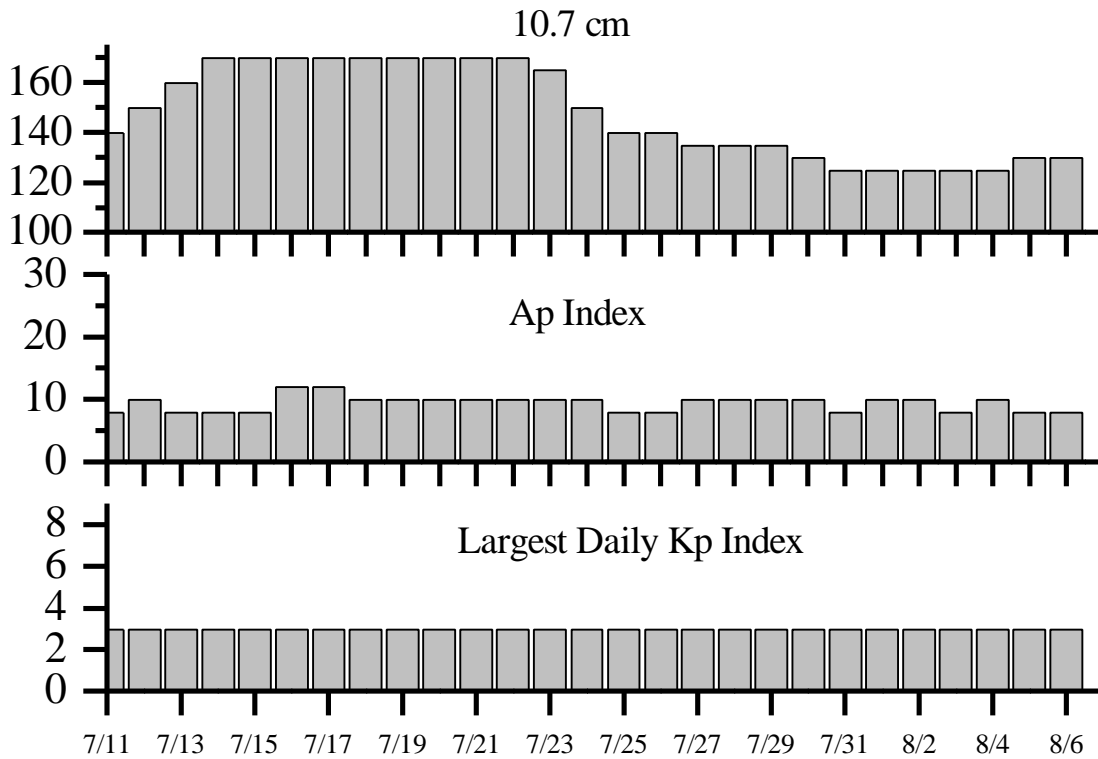


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
04 Jul 0007	1 - 245 MHz Bursts	03 Jul
07 Jul 0438	Type II Radio Emission	07 Jul 0330
08 Jul 0900	K= 4 Warning	08 Jul 0900 - 1500
08 Jul 0901	K= 4 Observed	08 Jul 0600 - 0900



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
11 July	140	8	3	25 July	140	8	3
12	150	10	3	26	140	8	3
13	160	8	3	27	135	10	3
14	170	8	3	28	135	10	3
15	170	8	3	29	135	10	3
16	170	12	3	30	130	10	3
17	170	12	3	31	125	8	3
18	170	10	3	01 Aug	125	10	3
19	170	10	3	02	125	10	3
20	170	10	3	03	125	8	3
21	170	10	3	04	125	10	3
22	165	10	3	05	130	8	3
23	150	10	3	06	130	8	3
24	140	10	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
							Lat	CMD	245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
02 July	No Flares Observed							
03 July	0735	0741	0749	B7.6	SF	N19E50		9525
04 July	0659	0709	0712	B5.9				
05 July	0054	0059	0101		SF	N05E34		9528
06 July	0534	0537	0539	B3.0				
	0558	0601	0603	B3.3				
	2258	2302	2313	B3.6				
07 July	0326	0332	0345	C9.0	SF	S20W28		9530
	1452	1506	1514	B4.8				
	1832	1837	1841	B3.3				
	2148	2151	2155	B2.6				
	2238	2245	2249	B7.3				
08 July	0119	0127	0134	B4.6				
	0145	0150	0154	B4.0				
	1110	1113	1115	B3.4				
	1134	1141	1146	C2.5				
	1340	1350	1403	C1.2	SF	S06E26		9531
	1437	1438	1442	B6.7	SF	S06E25		9531
	1611	1619	1634	C3.4	SF	S07E23		9531
	1702	1703	1708	C1.1	SF	S07E24		9531
2026	2037	2048	C1.3					
2159	2204	2208	C1.3					



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

Region 9513

21 Jun	N21E76	031	0040	02	HSX	001	A												
22 Jun	N22E66	028	0120	10	DAO	004	B												
23 Jun	N23E56	025	0160	16	FAO	013	B												
24 Jun	N23E44	023	0200	14	EAO	019	B												
25 Jun	N22E31	023	0200	16	FAI	031	B												
26 Jun	N22E17	024	0180	16	FSO	022	B	1				2							
27 Jun	N22E05	023	0150	16	FSO	024	B												
28 Jun	N22W10	025	0090	10	DAO	009	B												
29 Jun	N21W25	026	0060	14	CSO	006	B												
30 Jun	N22W40	028	0040	09	CAO	005	B												
01 Jul	N22W52	027	0040	08	CSO	003	B												
02 Jul	N23W69	031	0020	01	HSX	001	A												
03 Jul	N22W80	029	0030	01	HSX	002	A												

1 0 0 2 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 023

Region 9515

23 Jun	S06E46	035	0070	04	CAO	005	B					1							
24 Jun	S06E32	035	0140	06	DAO	012	B												
25 Jun	S07E19	035	0130	07	DAO	017	B												
26 Jun	S06E05	036	0070	07	DAO	012	B												
27 Jun	S07W09	037	0090	07	DSO	012	B												
28 Jun	S05W23	038	0060	05	CSO	006	B												
29 Jun	S06W38	039	0050	02	HSX	001	A												
30 Jun	S06W52	040	0040	03	CAO	002	B												
01 Jul	S07W66	041	0040	01	HSX	001	A												
02 Jul	S05W81	043	0040	01	HAX	001	A												
03 Jul	S06W91	040	0000	00	AXX	001	A												

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 036



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 9516

23 Jun	N12E70	011	0090	05	HAX	001	A											
24 Jun	N11E55	012	0090	03	HSX	002	A											
25 Jun	N12E42	012	0100	05	CSO	002	B											
26 Jun	N11E27	014	0120	02	HSX	001	A											
27 Jun	N11E14	014	0120	04	CSO	003	B											
28 Jun	N12E01	014	0120	05	CSO	003	B											
29 Jun	N12W14	015	0110	03	CSO	002	B											
30 Jun	N12W26	014	0090	05	CAO	004	B											
01 Jul	N12W39	014	0080	02	HSX	001	A											
02 Jul	N11W54	016	0100	04	CSO	004	B											
03 Jul	N10W66	015	0110	02	HSX	001	A											
04 Jul	N11W80	015	0120	02	HSX	001	A											
05 Jul	N12W92	016	0060	02	HSX	001	A											

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 014

Region 9518

27 Jun	S48E45	343	0070	08	DSO	005	B	1			5							
28 Jun	S47E34	341	0030	07	DSO	003	B											
29 Jun	S47E22	339	0010	05	DSO	002	B											
30 Jun	S47E12	336	0010	01	AXX	001	A											
01 Jul	S46W04	339	0010	01	AXX	001	A											
02 Jul	S48W12	334	0010	03	BXO	004	B											
03 Jul	S48W25	334																
04 Jul	S50W37	334	0030	04	BXO	003	B											
05 Jul	S46W49	334	0020	03	BXO	002	B											
06 Jul	S46W61	324																
07 Jul	S46W74	324																
08 Jul	S46W87	324																

1 0 0 5 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 339



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 9519

27 Jun	N17E23	005	0020	03	BXO	004	B										
28 Jun	N18E11	004	0020	03	BXO	005	B										
29 Jun	N18W02	004															
30 Jun	N18W15	004															
01 Jul	N18W28	004															
02 Jul	N18W41	004															
03 Jul	N18W54	004															
04 Jul	N18W67	004															
05 Jul	N18W80	004															
06 Jul	N18W93	004															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 004

Region 9521

28 Jun	S06E48	327	0010	02	AXX	002	A										
29 Jun	S06E35	327															
30 Jun	S06E22	327															
01 Jul	S06E09	327															
02 Jul	S06W04	327															
03 Jul	S06W17	327															
04 Jul	S06W30	327															
05 Jul	S06W43	327															
06 Jul	S06W56	327															
07 Jul	S06W69	327															

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 327



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 9522

28 Jun	S08E66	309	0030	02	HSX	001	A										
29 Jun	S08E52	309	0030	01	HSX	001	A										
30 Jun	S08E38	310	0030	01	HAX	001	A										
01 Jul	S08E24	311	0020	01	HSX	001	A										
02 Jul	S08E12	310	0010	02	HSX	001	A										
03 Jul	S08W01	310	0010	01	HRX	001	A										
04 Jul	S08W14	310															
05 Jul	S09W26	307	0000	04	BXO	003	B										
06 Jul	S09W39	307															
07 Jul	S09W52	307															
08 Jul	S09W65	307															

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 310

Region 9523

29 Jun	S48E35	326	0030	04	CSO	004	B										1
30 Jun	S49E23	325	0130	06	DAO	009	B										
01 Jul	S49E11	324	0110	07	DAO	005	B										
02 Jul	S50W02	324	0050	08	DSO	006	B										
03 Jul	S48W13	322	0080	09	DSO	009	B										
04 Jul	S50W25	320	0070	10	DAO	006	B										
05 Jul	S49W39	320	0010	03	BXO	002	B										
06 Jul	S49W52	320															
07 Jul	S49W65	320															
08 Jul	S49W78	320															

0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 324

Region 9524

30 Jun	N15E41	307	0010	00	AXX	001	A										
01 Jul	N15E28	307															
02 Jul	N15E15	307															
03 Jul	N15E02	307															
04 Jul	N15W11	307															
05 Jul	N15W24	307															
06 Jul	N15W37	307															
07 Jul	N15W50	307															

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 307



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 9525</i>																		
30 Jun	N19E72	276	0040	02	HSX	001	A											
01 Jul	N19E60	275	0050	03	CAO	002	B											
02 Jul	N18E47	275	0040	03	CAO	003	B											
03 Jul	N20E34	275	0050	05	CAO	005	B						1					
04 Jul	N20E23	272	0070	06	DAO	008	B											
05 Jul	N19E10	271	0030	05	CSO	007	B											
06 Jul	N18W03	271	0030	04	CSO	005	B											
07 Jul	N20W16	271	0020	03	BXO	004	B											
08 Jul	N19W30	272	0000	01	AXX	002	A											
								0	0	0	1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 271

<i>Region 9526</i>																		
01 Jul	N09E64	271	0040	01	HSX	002	A											
02 Jul	N08E53	269	0030	07	CAO	003	B											
03 Jul	N09E37	272	0010	01	AXX	001	A											
04 Jul	N08E24	271	0010	01	HSX	001	A											
05 Jul	N08E11	271																
06 Jul	N08W02	271																
07 Jul	N08W15	271																
08 Jul	N08W28	271																
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 271

<i>Region 9527</i>																		
01 Jul	S16E74	261	0070	02	HAX	002	A											
02 Jul	S17E60	262	0110	05	CAO	004	B											
03 Jul	S17E50	259	0130	07	CAO	006	B											
04 Jul	S17E36	259	0120	06	CAO	004	B											
05 Jul	S18E22	259	0130	02	HAX	003	A											
06 Jul	S18E08	260	0110	03	HAX	003	A											
07 Jul	S18W05	260	0100	03	HAX	003	A											
08 Jul	S17W17	259	0070	07	CAO	007	B											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 260



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 9528</i>																	
02 Jul	N04E59	263	0070	03	CAO	003	B										
03 Jul	N06E47	262	0050	05	CAO	005	B										
04 Jul	N04E32	263	0040	02	CAO	002	B										
05 Jul	N04E19	262	0020	01	AXX	002	A						1				
06 Jul	N04E05	263	0010	04	BXO	002	B										
07 Jul	N04W09	264	0000	00	AXX	001	A										
08 Jul	N04W22	264															
									0	0	0	1	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 263																	
<i>Region 9529</i>																	
03 Jul	N07E72	237	0080	02	HAX	001	A										
04 Jul	N07E58	237	0080	02	HAX	001	A										
05 Jul	N07E46	235	0070	02	HSX	001	A										
06 Jul	N06E32	236	0070	02	HSX	003	A										
07 Jul	N06E17	238	0090	05	DSO	009	B										
08 Jul	N07E03	239	0110	05	DSO	012	B										
									0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 239																	
<i>Region 9530</i>																	
06 Jul	S19W25	293	0040	05	CSO	005	B										
07 Jul	S20W39	294	0040	06	CSO	010	B	1				1					
08 Jul	S20W52	294	0030	06	CSO	005	B										
								1	0	0	1	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 293																	
<i>Region 9531</i>																	
08 Jul	S06E19	223	0050	07	DAO	013	BG	3				4					
								3	0	0	4	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 223																	
<i>Region 9532</i>																	
08 Jul	N09W46	288	0010	02	BXO	002	B										
									0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 288																	

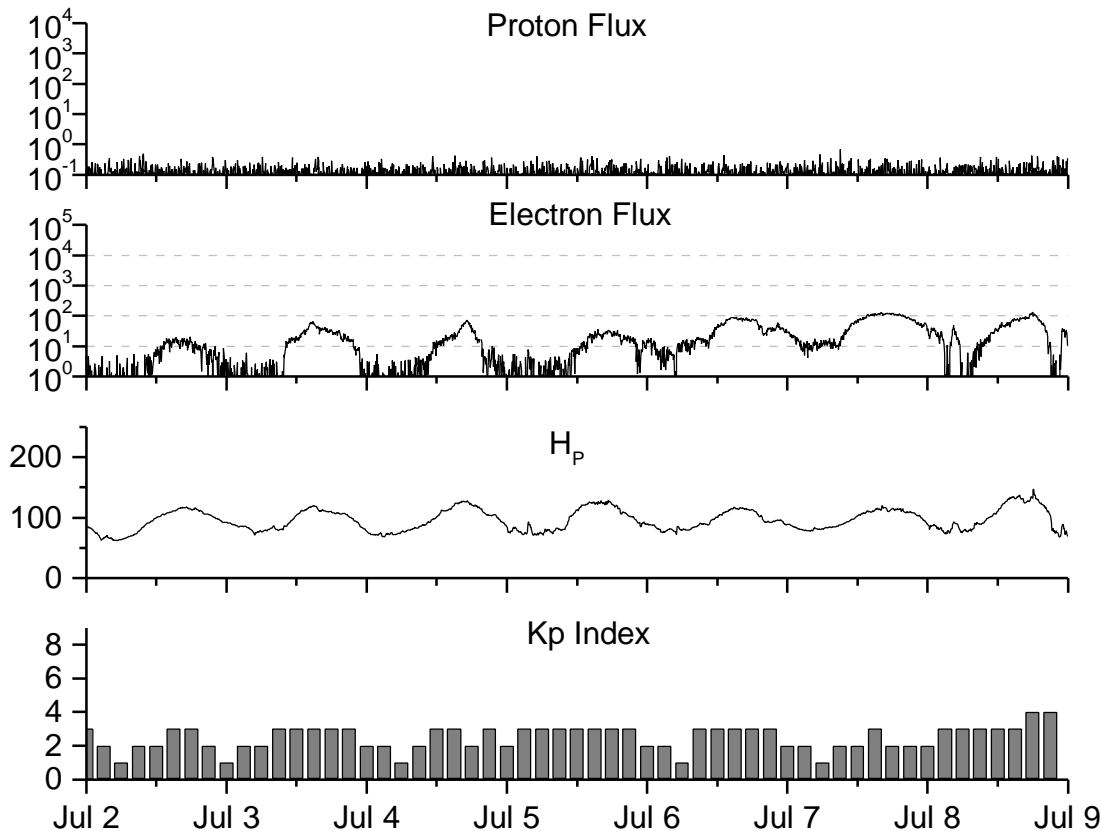


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
1999									
July	169.2	113.5	0.67	138.0	94.3	165.6	154.4	10	12.6
August	136.1	93.7	0.69	142.8	97.5	170.8	156.3	15	12.9
September	107.4	71.5	0.67	150.0	102.3	135.7	161.0	19	12.8
October	167.7	116.7	0.70	158.5	107.8	164.8	167.2	19	12.7
November	199.3	133.2	0.67	164.7	110.0	191.5	171.5	14	13.1
December	123.5	86.4	0.69	165.9	111.1	169.8	173.4	10	13.8
2000									
January	140.8	90.1	0.64	168.0	112.9	158.1	175.5	13	14.5
February	161.9	112.9	0.70	172.1	116.7	173.2	176.8	15	15.0
March	203.6	138.5	0.68	175.4	119.9	208.2	178.4	09	15.0
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
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			166.7		08	
February	131.0	80.1	0.61			147.3		06	
March	166.7	114.2	0.69			177.7		17	
April	163.6	108.2	0.66			178.3		18	
May	135.1	97.3	0.72			148.7		12	
June	196.7	134.0	0.68			173.7		12	

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 02 July 2001

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

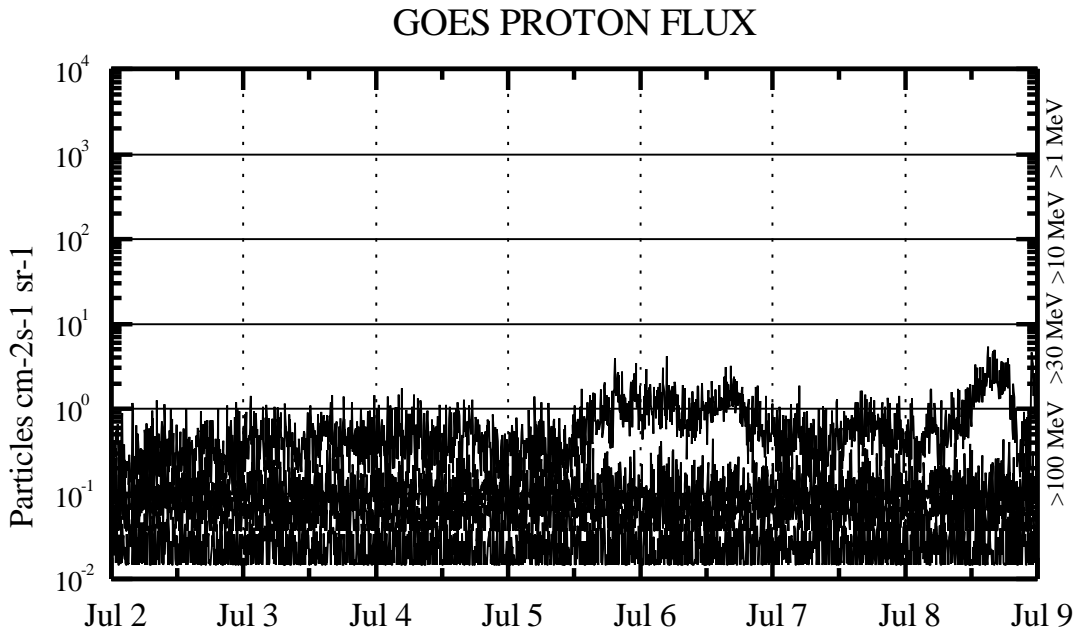
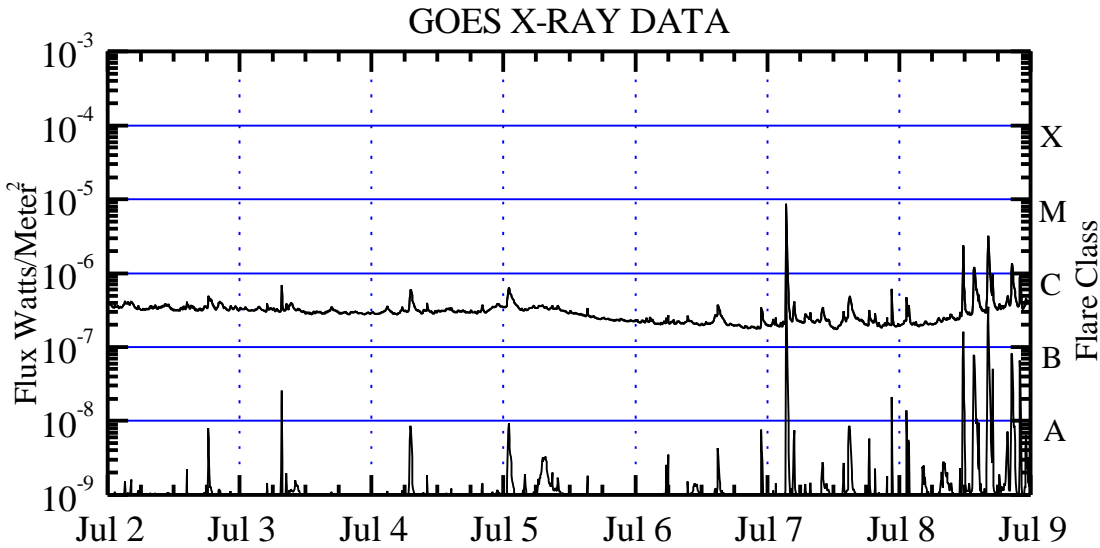
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

H_p 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.

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_{parallel} 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 8 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

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

