

**Space Weather Highlights**  
**01-07 November 1999**

Solar activity ranged from low to moderate levels. Low levels prevailed during most of the period with isolated C-class subflares, mostly from Region 8749 (S18, L = 076, class/area Eao/290 on 05 November). This region gradually grew through 04 November and displayed a moderately complex magnetic structure which included a weak magnetic delta configuration. Activity rose to moderate levels on 05 November due to two M-class events. The first of these, an M1/1F at 05/1718UT, occurred as Region 8749 entered a period of gradual decay (which continued through the rest of the period). The second was a long-duration M3 x-ray flare at 05/1829UT from beyond the northeast limb. The source for the M3 flare rotated onto the visible disk on 06 November and was numbered as Region 8759 (N08, L = 289, class/area Ekc/440 on 07 November). This region appeared to be the return of old Region 8731, which produced an isolated X-class flare during its last rotation.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. There were no significant changes noted in the solar wind flow through 06 November. Coronal hole effects began early on 07 November as velocities rose to 600 km/sec, densities declined, and the solar sector shifted to an away (positive polarity) orientation. In addition, IMF Bz became more variable as we transitioned to the high-speed stream with southward excursions to minus 17 nT (GSM).

No proton events were detected at geosynchronous orbit during the period.

The greater than 2 MeV electron flux was at mostly moderate levels through 05 November, then dropped to normal to moderate levels for the rest of the period.

Geomagnetic field activity was at mostly quiet levels through 06 November. A geomagnetic disturbance began early on 07 November with the onset of coronal hole effects. Unsettled to minor storm levels were detected during the disturbance with brief major storm periods at high latitudes. The disturbance continued at the time of this writing.

**Space Weather Outlook**  
**10 Nov - 06 Dec 1999**

Solar activity is expected to be at low to moderate levels. Frequent C-class flares are likely. Isolated M-class flares will be possible throughout the period. There is also a slight chance for an isolated major flare from Region 8759 until it departs the visible disk on 20 November.

There is a slight chance for a solar proton event at geosynchronous orbit through 20 November.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels through 15 November, then again during 21-23 November.

The geomagnetic field is expected to be at unsettled to minor storm levels through 13 November as coronal hole effects continue. Active to minor storm periods are also possible during 19 - 21 November and 05 - 06 December due to recurrent coronal hole effects.



### Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10 <sup>6</sup> hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	
01 November	151	178	1020	B7.3	7	0	0	15	0	0	0	0
02 November	143	124	680	B6.5	5	0	0	2	0	0	0	0
03 November	143	117	440	B4.1	2	0	0	3	1	0	0	0
04 November	148	108	560	B6.3	5	0	0	6	2	0	0	0
05 November	161	153	810	B6.7	4	2	0	4	1	0	0	0
06 November	150	188	830	C1.8	5	0	0	3	0	0	0	0
07 November	174	185	1000	B8.5	4	0	0	9	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
01	2.8E+5	1.2E+4	2.8E+3		2.2E+7	
02	9.3E+4	1.4E+4	2.7E+3		1.7E+7	
03	3.1E+5	1.3E+4	2.9E+3		2.2E+7	
04	4.0E+5	1.4E+4	3.1E+3		3.1E+7	
05	4.2E+5	1.3E+4	3.1E+3		2.8E+7	
06	6.6E+5	1.3E+4	2.8E+3		5.7E+6	
07	5.2E+5	1.3E+4	2.8E+3		1.3E+6	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	01 November	9	2-2-2-4-2-1-2-1	*	*_*_*_*_*_*_*_*	10
02 November	4	2-1-1-2-0-1-1-1	*	*_*_*_*_*_*_*_*	6	2-1-2-2-2-2-2-2
03 November	4	3-0-0-0-1-2-1-1	*	3-0-*2-0-0-3-0	5	3-0-1-1-1-2-2-2
04 November	5	2-2-1-1-2-1-1-1	2	1-1-1-2-0-0-0-0	5	1-2-1-1-1-2-2-2
05 November	4	2-0-0-0-0-1-2-3	1	0-0-0-0-0-0-2-1	4	1-0-0-0-0-1-2-3
06 November	5	2-1-1-1-1-2-2-1	*	*_*_*_*_*_*_*_*	7	2-1-1-1-1-2-3-2
07 November	20	3-3-3-3-5-4-2-3	*	*_*_*_*_*_*_*_*	24	3-4-5-4-5-4-3-3

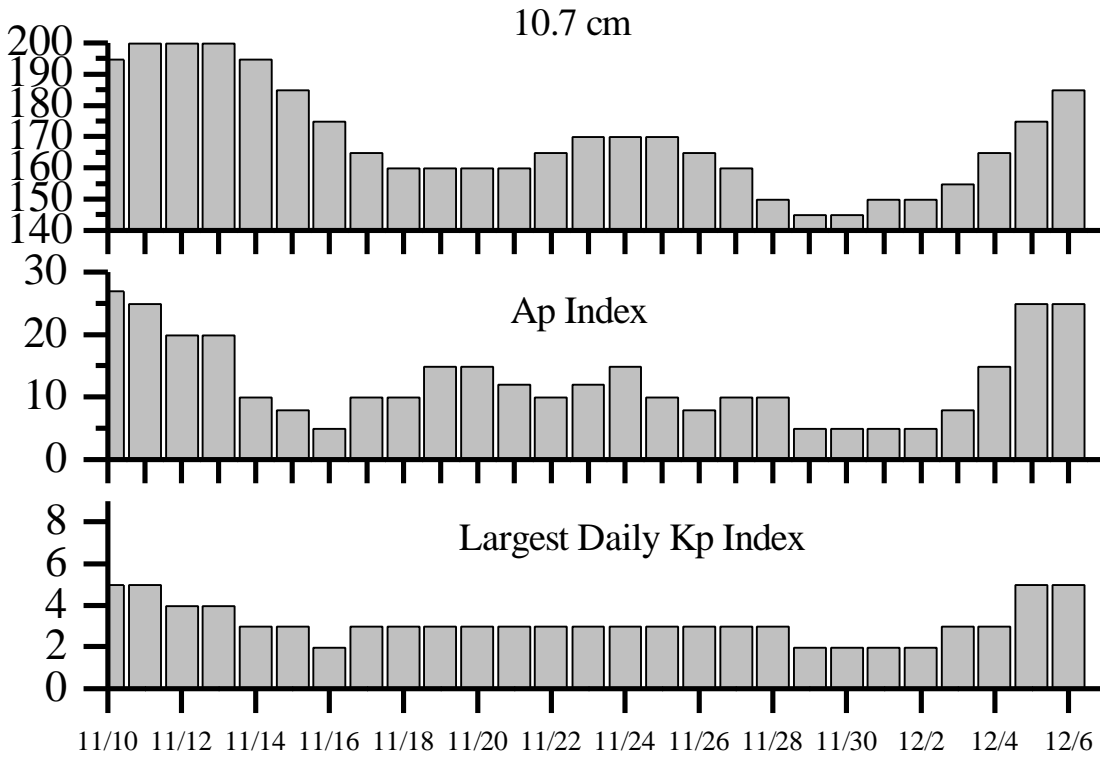


*Alerts and Warnings Issued*

<u>Date and Time of Issue (UT)</u>	<u>Type of Alert or Warning</u>	<u>Date and Time of Event (UT)</u>
01 Nov 0029	2 – 245 MHz Radio Bursts	31 Oct
01 Nov 0029	1 – 245 MHz Radio Noise Storm	31 Oct
01 Nov 0037	Type II Radio Emission	31 Oct 0714
01 Nov 1201	K= 4 Observed	01 Nov 09 - 12
01 Nov 1203	>2MeV Electron Event @ $\geq$ 1000pfu CONTINUED	31 Oct 1535
02 Nov 0015	5 – 245 MHz Radio Bursts	01 Nov
02 Nov 0015	1 – 245 MHz Radio Noise Storm	01 Nov
05 Nov 0043	3 – 245 MHz Radio Bursts	04 Nov
05 Nov 2046	Sudden Impulse Observed at Boulder 13 nT	05 Nov 2010
06 Nov 0034	2 – 245 MHz Radio Bursts	05 Nov
06 Nov 1626	A $\geq$ 20 Watch	09 Nov
07 Nov 0123	K= 4 Warning valid	07 Nov 0130 - 1500
07 Nov 0600	K= 4 Observed	07 Nov 03 - 06
07 Nov 1402	K= 4 Warning was EXTENDED through	10 Nov 1500
07 Nov 1447	K= 5 Warning valid	07 Nov 1445 -1700
07 Nov 1502	K= 5 Observed	07 Nov 12 -15
07 Nov 1805	A $\geq$ 20 Observed	07 Nov 1805
07 Nov 1805	A $\geq$ 20 Watch	08 Nov



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
10 Nov	195	27	5	24 Nov	170	15	3
11	200	25	5	25	170	10	3
12	200	20	4	26	165	8	3
13	200	20	4	27	160	10	3
14	195	10	3	28	150	10	3
15	185	8	3	29	145	5	2
16	175	5	2	30	145	5	2
17	165	10	3	01 Dec	150	5	2
18	160	10	3	02	150	5	2
19	160	15	3	03	155	8	3
20	160	15	3	04	165	15	3
21	160	12	3	05	175	25	5
22	165	10	3	06	185	25	5
23	170	12	3				



### *Energetic Events*

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
05 Nov	1712	1718	1722	M1.2	.004	1F	S19W45		8749	60			
05 Nov	1804	1829	1944	M3.0	.130					150			

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Lat	CMD	
01 Nov	0022	0035	0048	C1.7	SF	N09E12		8747
	0133	0142	0221	C3.7	SF	S19E15		8749
	0443	0451	0511	C1.4	SF	S18E14		8749
	0649	0653	0707	C2.4	SF	S19E13		8749
	1144	1145	1200	C1.3	SF	S18E09		8749
	B1307	U1307	A1322	C1.1	SF	N09E05		8747
	1413	1416	1440		SF	S20E10		8749
	1517	1522	1528		SF	S19E10		8749
	1854	1856	1901		SF	S24W71		8741
	1931	1934	1939		SF	S24W64		8741
	2039	2040	2045		SF	S23W67		8741
	2116	2118	2123	B8.9	SF	S24W69		8741
	B2116	U2117	A2123	B9.9	SF	S23W70		8741
	2234	2235	2241	B9.4	SF	S24W71		8741
	2310	2311	2316	B8.6	SF	S24W70		8741
2331	2336	2339	C1.8					
02 Nov	0037	0043	0052	C2.8				
	0158	0202	0206	C1.1				
	0558	0602	0604	B6.9				
	0613	0617	0620	C1.0				
	0947	0948	0955	C1.4	SF	S19W03		8749
1246	1250	1255		SF	S19W04		8749	
1316	1321	1327	C1.4					
03 Nov	0830	0833	0843		SF	N09W16		8747
	1214	1214	1220		SF	N10W17		8747
	1925	1926	1930		SF	S14W29		8749
	1941	1949	2002	C1.2				
	2247	2248	2309	C8.9	1F	S19W23		8749



*Flare List-continued*

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
04 Nov	0054	0103	0114	C2.2	SF	S19W22	8749
	0131	0143	0157	C2.9	SF	S19W25	8749
	0236	U0259	A0350	C5.2	1F	S19W25	8749
	0423	0502	0533	C7.9	1N	S19W26	8749
	0434	0435	0440		SF	N11W26	8747
	0540	0540	0555		SF	S19W25	8749
	2123	2123	2128		SF	S12W48	8745
	2249	2254	2356	C4.8	SF	S18W36	8749
05 Nov	0338	0402	0414	C1.6			
	0448	0509	0519	C1.4			
	0607	0639	0707	C3.3			
	1111	1117	1126	C1.9			
	1142	1144	1205		SF	N09W41	8747
	1715	1716	1811	M1.2	1F	S19W45	8749
	1804	1829	1944	M3.0			
	1905	1907	1910		SF	S16W61	8745
06 Nov	1913	1918	2007		SF	S13W64	8745
	2116	2118	2125		SF	S24W50	8749
	0329	0331	0339		SF	S17W66	8745
	0628	0636	0648	C4.6			
	1056	1100	1104	C2.0			
	1701	1706	1709	C5.0			
	2031	2038	2047	C3.7	SF	S22W55	8749
	2300	2301	2307	C2.9	SF	N09E82	8759
07 Nov	0114	0136	0222		SF	N38W06	8757
	0254	0258	0311		SF	N38W05	8757
	0312	0317	0348		SF	N38W05	8757
	0338	0357	0402		SF	S17W65	8749
	0425	0437	0502		SF	N37W06	8757
	0433	0437	0456	C3.1	SF	S18W66	8749
	0732	0737	0743	C3.1			
	1025	1029	1032	C1.8			
	B1105	U1107	1137		SF	N16E53	8758
	2302	2302	2313	C1.4	SF	N19E64	8758
2343	2353	0007		SF	N20E18	8753	



### 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 8739</i>																	
20 Oct	S14E71	165	0050	09	CAO	003	B	1			1						
21 Oct	S12E58	165	0130	09	DAO	008	B	2			3						
22 Oct	S13E43	167	0220	10	DAI	019	B	1				1					
23 Oct	S12E30	167	0440	13	EKI	023	B				1						
24 Oct	S12E16	168	0420	13	EKI	036	BG										
25 Oct	S12E03	167	0570	14	EHI	055	BGD	3			5	1					
26 Oct	S11W10	167	0800	16	FKC	062	BGD	4	2		15	2					
27 Oct	S12W23	167	0650	16	FKC	042	BGD	1			6						
28 Oct	S11W37	168	0590	16	FKI	035	BG	1			2						
29 Oct	S12W49	167	0500	17	FHI	026	BG	3			8						
30 Oct	S10W64	169	0390	17	FAI	022	B	1			3						
31 Oct	S11W78	169	0180	16	FAO	008	B										
01 Nov	S12W89	167	0180	15	EAI	010	B										
								17	2	0	44	4	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 167

<i>Region 8741</i>																	
22 Oct	S25E64	146	0080	12	CAO	007	B										
23 Oct	S25E50	147	0210	13	EAO	017	B	4			6						
24 Oct	S26E36	148	0220	13	EAO	017	B	1			2						
25 Oct	S25E22	148	0280	13	EAO	018	B	2	1		8	1					
26 Oct	S25E09	148	0140	11	EAO	011	B				1						
27 Oct	S25W03	147	0190	13	EAO	019	B				1						
28 Oct	S25W16	147	0150	13	EAO	019	B										
29 Oct	S24W29	147	0200	12	EAI	022	BG										
30 Oct	S24W42	147	0150	12	EAO	013	B										
31 Oct	S25W54	145	0140	12	EAC	007	B				1						
01 Nov	S25W67	145	0150	12	EAO	005	B				7						
02 Nov	S25W80	145	0100	10	DAO	004	B										
03 Nov	S25W93	145															
								7	1	0	26	1	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 147



**Region Summary-continued**

Date	Location		Sunspot Characteristics				Flares											
	( ° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<i>Region 8742</i>																		
23 Oct	N06E82	115	0250	03	HKX	001	A											
24 Oct	N08E68	116	0280	12	EKO	008	B											2
25 Oct	N08E54	116	0450	15	EKO	019	B	1										4
26 Oct	N09E43	114	0480	13	EKI	024	B											
27 Oct	N08E29	115	0480	12	EKI	025	B	1										1
28 Oct	N08E17	114	0460	13	EKI	029	B											
29 Oct	N10E03	115	0430	14	EKO	033	B											
30 Oct	N10W11	116	0370	13	EAO	034	B											
31 Oct	N09W24	115	0200	13	EAO	020	B											
01 Nov	N08W38	116	0170	11	EAO	012	B											
02 Nov	N08W51	116	0120	10	DSO	004	B											
03 Nov	N08W68	120	0070	02	HSX	002	A											
04 Nov	N08W80	119	0100	02	HSX	003	A											
05 Nov	N09W93	119	0060	02	HAX	001	A											
								2	0	0	0	6	1	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 115

<i>Region 8743</i>																		
25 Oct	S15E20	150	0010	03	BXO	004	B											
26 Oct	S18E08	149	0050	07	BXO	008	B											
27 Oct	S14W07	151	0020	05	DAO	003	B											
28 Oct	S15W18	149	0010	03	BXO	004	B											
29 Oct	S14W33	151	0040	06	DSO	008	B											
30 Oct	S14W47	152	0090	08	DSO	010	B											2
31 Oct	S15W61	152	0110	12	EAO	005	B											
01 Nov	S16W73	151	0110	15	ESO	005	B											
02 Nov	S16W83	148	0060	02	HSX	001	A											
								0	0	0	0	2	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 151









**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

*Region 8749*

29 Oct	S21E49	069	0000	00	AXX	001	A														
30 Oct	S21E31	074	0010	09	BXO	004	B						2								
31 Oct	S18E15	076	0060	08	DSO	015	B	6				9	2								
01 Nov	S18E02	076	0160	12	EAO	023	B	4				6									
02 Nov	S18W11	076	0210	13	EAO	027	BG	1				2									
03 Nov	S18W26	078	0210	13	ESO	026	BG	1				1	1								
04 Nov	S18W39	078	0230	13	EAO	014	BG	5				4	2								
05 Nov	S18W51	076	0290	13	EAO	015	BG		1			1	1								
06 Nov	S18W64	076	0260	14	ESO	012	BG	1				1									
07 Nov	S18W76	075	0140	14	EAO	005	B	1				2									
								19	1	0	28	6	0	0	0	0					

Still on Disk.

Absolute heliographic longitude: 076

*Region 8750*

29 Oct	S18E10	108	0020	02	HRX	002	A													
30 Oct	S18W04	109	0010	03	BXO	004	B													
31 Oct	S16W18	109	0000	03	BXO	003	B													
01 Nov	S16W31	109																		
02 Nov	S16W44	109																		
03 Nov	S16W57	109																		
04 Nov	S16W70	109																		
								0	0	0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 109

*Region 8751*

30 Oct	N20E66	039	0030	01	HSX	001	A													
31 Oct	N21E54	037	0040	01	HSX	001	A													
01 Nov	N21E40	038	0030	01	HSX	001	A													
02 Nov	N21E28	037	0040	02	HSX	001	A													
03 Nov	N23E14	038	0040	03	HSX	002	A													
04 Nov	N21E02	037	0040	05	CSO	003	B													
05 Nov	N22W10	035	0080	06	CSO	006	B													
06 Nov	N22W23	035	0060	06	CSO	009	B													
07 Nov	N23W36	035	0030	05	CAO	003	B													
								0	0	0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 037



**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

*Region 8752*

03 Nov	S14E01	051	0000	00	AXX	001	A											
04 Nov	S13W14	053	0010	03	BXO	005	B											
05 Nov	S13W27	052	0020	04	BXO	007	B											
06 Nov	S13W39	051	0020	03	CRO	002	B											
07 Nov	S13W52	051																

Still on Disk.

Absolute heliographic longitude: 051

*Region 8753*

03 Nov	N21E63	349	0000	00	AXX	001	A											
04 Nov	N21E50	349																
05 Nov	N21E37	349																
06 Nov	N20E29	343	0020	05	CSO	007	B											
07 Nov	N20E16	343	0020	07	DRO	010	B											

Still on Disk.

Absolute heliographic longitude: 343

*Region 8754*

04 Nov	S08E66	333	0050	02	HSX	001	A											
05 Nov	S09E55	330	0060	03	CSO	003	B											
06 Nov	S09E41	331	0060	03	CSO	005	B											
07 Nov	S09E26	333	0030	04	CSO	005	B											

Still on Disk.

Absolute heliographic longitude: 333

*Region 8755*

05 Nov	N19E71	314	0120	08	DAO	003	B											
06 Nov	N21E57	315	0080	01	HSX	001	A											
07 Nov	N21E42	317	0100	03	HAX	001	A											

Still on Disk.

Absolute heliographic longitude: 317

*Region 8756*

05 Nov	N18E11	014	0010	04	BXO	004	B											
06 Nov	N18W02	014	0010	03	BXO	004	B											
07 Nov	N18W18	017	0000	01	BXO	002	B											

Still on Disk.

Absolute heliographic longitude: 014



**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 8757</i>																														
05 Nov	N38E09	016	0010	05	BXO	004	B																							
06 Nov	N38W03	015	0030	07	CRO	009	B																							
07 Nov	N38W16	015	0120	09	DAO	015	B					4																		
								0	0	0	0	4				0	0	0	0											
Still on Disk.																														
Absolute heliographic longitude: 015																														
<i>Region 8758</i>																														
06 Nov	N18E64	308	0100	04	CSO	004	B																							
07 Nov	N17E52	307	0080	06	CAO	005	B	1				2																		
								1	0	0	0	2				0	0	0	0											
Still on Disk.																														
Absolute heliographic longitude: 307																														
<i>Region 8759</i>																														
06 Nov	N10E78	294	0110	05	CSO	003	B	1				1																		
07 Nov	N08E70	289	0440	15	EKC	016	BG					1																		
								1	0	0	0	1				0	0	0	0											
Still on Disk.																														
Absolute heliographic longitude: 289																														
<i>Region 8760</i>																														
07 Nov	N13E35	324	0010	03	BXO	010	B																							
								0	0	0	0	0				0	0	0	0											
Still on Disk.																														
Absolute heliographic longitude: 324																														

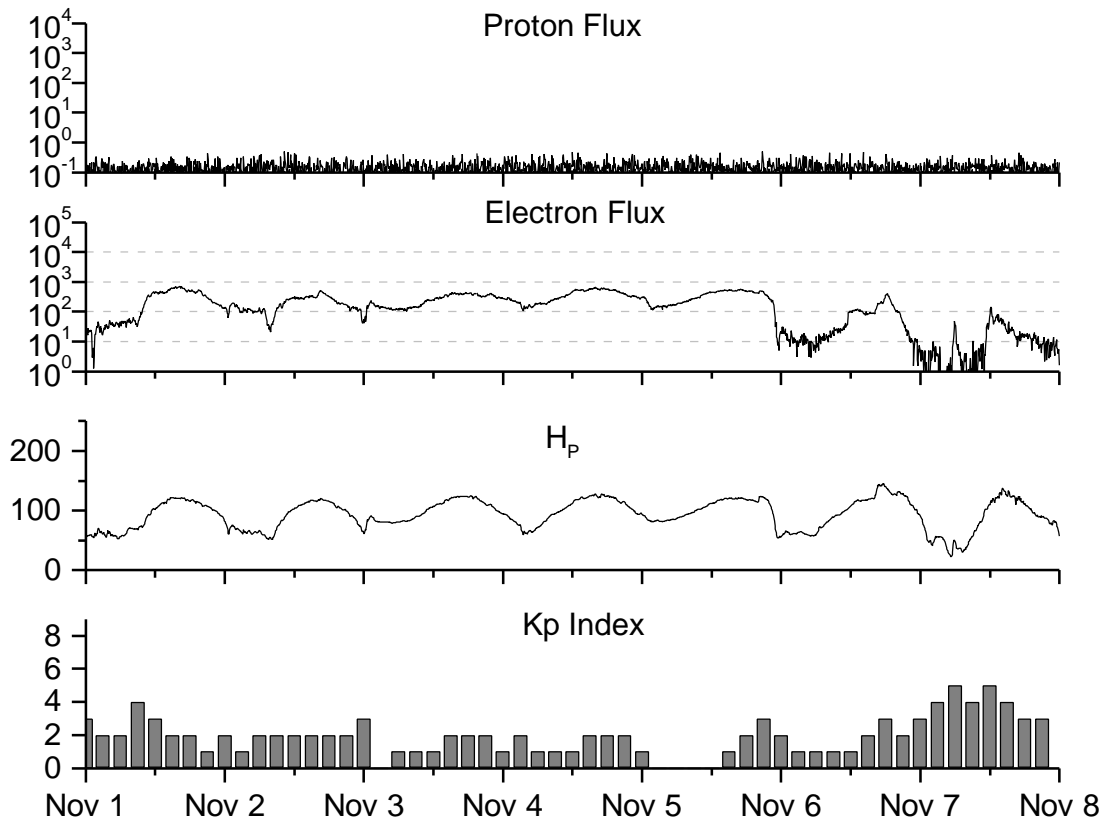


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
<b>1997</b>									
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
<b>1998</b>									
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.4	138.4	126.8	13	12.5
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.9	0.69	108.8	77.9	150.1	134.3	08	11.9
<b>1999</b>									
January	94.3	62.4	0.66	116.5	82.6	142.6	139.0	10	11.7
February	93.4	66.3	0.71	120.2	84.6	142.0	142.6	12	11.6
March	100.5	68.8	0.68	120.5	83.8	126.3	144.0	14	11.6
April	092.9	063.9	0.69	123.8	85.4	117.2	145.8	12	12.1
May	140.5	106.3	0.76			148.6		08	
June	208.3	137.4	0.66			169.8		07	
July	169.2	113.5	0.67			165.6		10	
August	136.1	93.7	0.69			170.8		15	
September	107.4	70.9	0.66			135.7		18	
October	167.7	116.4	0.69			164.9		18	

**NOTE:** All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates. The lowest smoothed sunspot indices 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 01 November 1999*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr ) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

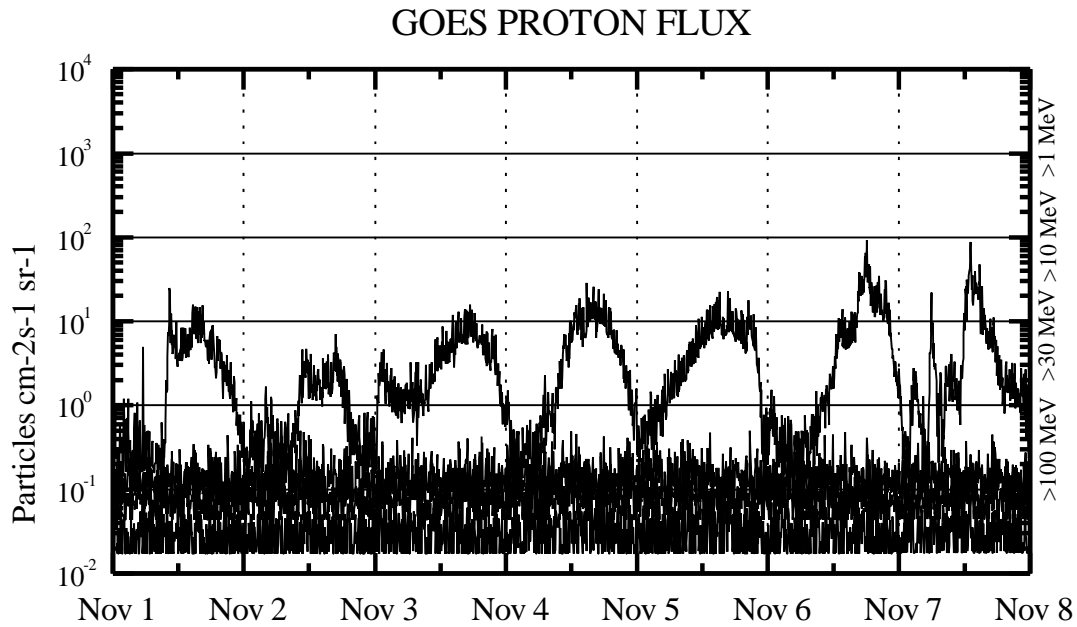
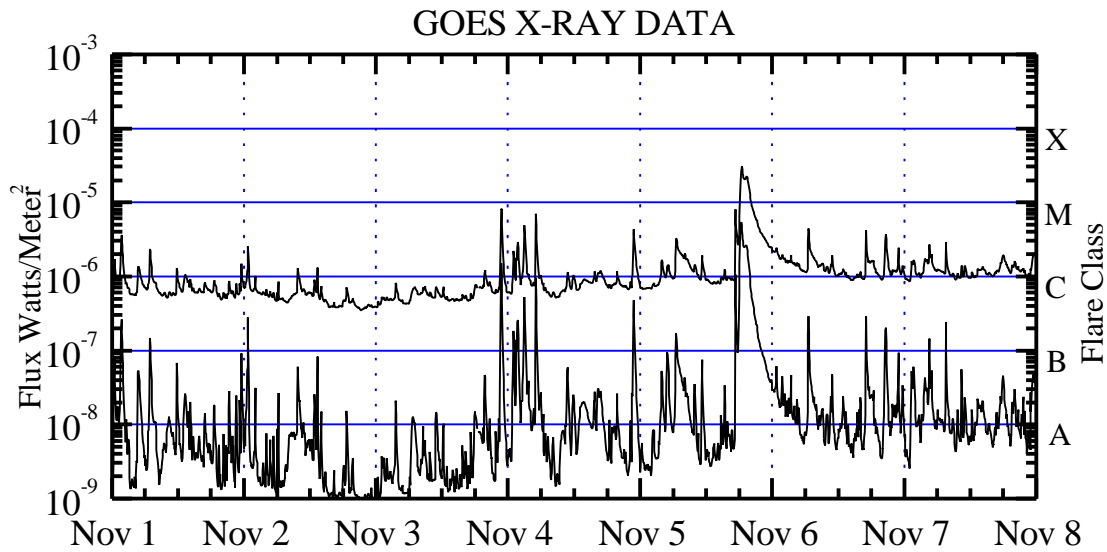
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup> -sec -sr) with energies greater than 2 MeV at GOES-8.

*H<sub>p</sub>* 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<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> Space Weather Squadron) 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>p</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 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<sup>2</sup> –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<sup>2</sup>-sec-sr) at greater than 10 MeV.

