

**Space Weather Highlights
02-08 November 1998**

Solar activity ranged from low to high. Region 8375 (N18, L = 182, class/area Ekc/410 on 05 November) grew gradually in size and magnetic complexity during the period and produced numerous flares, the largest of which reached the major category - an M8/2B at 05/1955UT with a significant Type II radio sweep, moderate discrete radio emission, and a full-halo CME (detected by the now fully-functional SOHO/LASCO instrument). Region 8375 also produced numerous C-class subflares and several low-level M-class flares during the period (see the Energetic Events list, p. 5), a few of which were followed by halo or partial-halo CMEs. Region 8375 remained moderately large and complex as it approached the west limb late in the period.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Solar sector orientation was away (phi angle near 135 degrees) during most of the period. CME effects were evident during 07 - 08 November as velocities increased from 420 - 660 km/sec, particle densities increased to 27 p/cc, and Bz became strongly southward (maximum deflections to minus 25 nT (GSM)).

A greater than 10 MeV proton flux enhancement occurred early on 06 November in the wake of the M8/2B flare mentioned above, then briefly reached event threshold during 08/0245 - 0310UT. Proton fluxes declined to background levels late on 08 November.

The greater than 2 MeV electron flux at geosynchronous altitude briefly reached high levels during 02 and 05 November. Otherwise, fluxes were at normal to moderate levels.

The geomagnetic field was at mostly quiet levels through 05 November. The field was disturbed during the remainder of the period as some of the CMEs mentioned above intersected the Earth. Active to minor storm levels occurred during 06 - 07 November with major storm periods detected at high latitudes. Activity increased to active to severe storm levels during 08 November.

**Space Weather Forecast
11 November - 07 December 1998**

Solar activity is expected to be low during most of the period with a fair chance for isolated M-class flares. M-class flare probabilities may increase during the second half of the period with the return of (old) Region 8375 on 24 November.

No significant proton enhancements are expected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at normal to moderate levels during most of the period. However, moderate to high fluxes are expected around 18 - 20 November.

The geomagnetic field is expected to range from quiet to active levels through 14 November due to recent flare/CME activity. Active levels are also possible during 17 - 18 November due to recurrent coronal hole effects.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10^6 hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
02 November	126	76	350	B2.4	1	0	0	1	2	0	0	0
03 November	152	81	540	B2.6	0	1	0	6	0	1	0	0
04 November	141	124	620	B4.8	11	0	0	14	2	0	0	0
05 November	153	137	680	C2.3	11	3	0	22	1	1	0	0
06 November	141	142	730	C1.1	18	1	0	29	2	0	0	0
07 November	149	144	720	B4.6	6	1	0	12	1	0	0	0
08 November	162	137	1220	C1.3	7	2	0	14	5	1	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 November	4.2E+5	1.8E+4	4.5E+3		5.1E+7	
03 November	3.3E+5	1.8E+4	4.7E+3		2.3E+7	
04 November	2.9E+5	1.8E+4	4.6E+3		2.1E+7	
05 November	3.4E+5	1.9E+4	4.4E+3		1.4E+7	
06 November	4.6E+7	2.6E+5	4.3E+3		2.3E+6	
07 November	5.4E+7	2.0E+5	4.2E+3		2.7E+6	
08 November	2.9E+7	2.3E+5	3.0E+3		9.9E+6	

Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
02 November	3	1-1-0-1-1-1-2-0	*	0-2-*-0-0-3-0	5	1-1-0-1-1-1-3-2
03 November	4	1-1-0-2-1-1-1-2	*	*-1-*-2-0-2-1-1	5	1-1-0-2-0-2-2-3
04 November	4	2-0-2-1-2-0-1-0	5	1-0-1-4-0-2-1-0	5	2-0-2-2-1-2-1-2
05 November	7	1-1-2-1-3-2-2-2	*	0-0-*-5-4-2-1	9	1-1-2-2-3-3-3-3
06 November	17	3-3-5-3-2-3-2-3	44	2-5-6-5-5-6-4-3	22	3-3-5-4-4-4-3-3
07 November	13	2-2-2-3-3-3-2-4	55	3-3-2-6-7-7-4-3	25	2-3-2-4-5-5-3-3
08 November	36	5-6-6-4-3-3-2-3	58	5-6-7-6-6-3-2-3	68	5-7-8-6-4-3-2-3

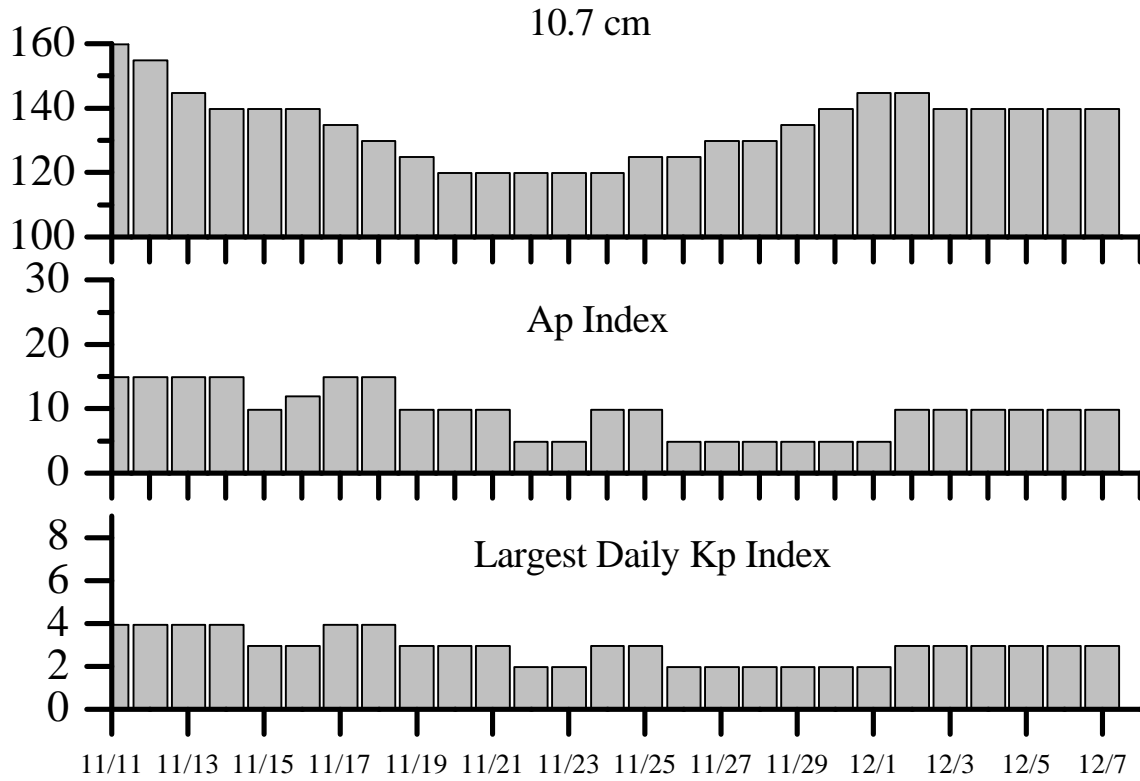


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
02 Nov 1200	CONTINUED >2MeV Electron Event ≥ 1000 pfu	29 Oct 1420
02 Nov 1426	10cm Radio Burst 140 s.f.u.	02 Nov 1357
03 Nov 1200	CONTINUED >2MeV Electron Event ≥ 1000 pfu	29 Oct 1420
04 Nov 1756	A ≥ 20 Watch	05 Nov
04 Nov 1805	A ≥ 20 Watch	06 Nov
05 Nov 1645	>2MeV Electron Event ≥ 1000 pfu	05 Nov 1530
05 Nov 2027	X-Ray event M8/2B/N18W21	05 Nov 1900
05 Nov 2110	10cm Radio Burst 400 s.f.u.	05 Nov 1941
05 Nov 2112	Type II Radio Emission	05 Nov 1951
05 Nov 2141	A ≥ 30 Watch	08 Nov
06 Nov 0031	19-245 MHz Radio Bursts	05 Nov
06 Nov 0031	245 MHz Radio Noise Storm	05 Nov
06 Nov 0902	K= 5 Observed	06 Nov 06-09
06 Nov 2043	A ≥ 20 Watch	09 Nov
07 Nov 0018	Type II Radio Emission	06 Nov 2111
07 Nov 0020	Type II Radio Emission	06 Nov 2339
07 Nov 0031	16-245 MHz Radio Bursts	06 Nov
07 Nov 1504	K= 4 Observed	07 Nov 12-15
07 Nov 1809	K= 5 Observed	07 Nov 15-18
07 Nov 2206	A ≥ 20 Watch for	10 Nov
08 Nov 0028	12-245 MHz Radio Bursts	07 Nov
08 Nov 0028	245 MHz Radio Noise Storm	07 Nov
08 Nov 0300	A ≥ 20 Observed	08 Nov 0300
08 Nov 0314	Proton Event ≥ 10 pfu ≥ 10 MeV	08 Nov 0245
08 Nov 0600	A ≥ 30 Observed	08 Nov 0600
08 Nov 0600	K ≥ 6 Observed	08 Nov 03-06
08 Nov 0901	K ≥ 6 Observed	08 Nov 06-09
08 Nov 1204	A ≥ 50 Observed	08 Nov 1200
08 Nov 1204	CANCELLED Proton Event Warning ≥ 10 pfu ≥ 10 MeV	30 Sep 1631



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 Nov	160	15	4	25	125	10	3
12	155	15	4	26	125	5	2
13	145	15	4	27	130	5	2
14	140	15	4	28	130	5	2
15	140	10	4	29	135	5	2
16	140	12	3	30	140	5	2
17	135	15	3	01 Dec	145	5	2
18	130	15	4	02	145	10	3
19	125	10	4	03	140	10	3
20	120	10	3	04	140	10	3
21	120	10	3	05	140	10	3
22	120	5	2	06	140	10	3
23	120	5	2	07	140	10	3
24	120	10	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp Brtns	Location		Rgn #	Radio Flux		Intensity	
							Lat	CMD		245	2695	II	IV
03 Nov	1911	1933	1955	M1.0	.022	2N	N21E02	8375		30			
05 Nov	1330	1336	1339	M1.5	.004	1B	N15W17	8375	270	52			
05 Nov	1820	1825	1827	M3.7	.006				300				
05 Nov	1900	1955	2012	M8.4	.110	2B	N22W18	8375	190	400	2		
06 Nov	1507	1511	1513	M1.7	.003	1B	N15W32	8375	67000	150			
07 Nov	1102	1106	1109	M2.4	.005								
08 Nov	1704	1712	1722	M2.7	.018	1N	N19W58	8375					
08 Nov	2237	2256	2310	M1.1	.014	1F	N21W61	8375					

Flare List

Date	Time			X-ray Class.	Optical		Rgn #	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
02 November	0956	0959	1003	B5.8				
	1348	1358	1518		1F	S25E45		
	B1402	U1406	1604		1N	S25E44		
	2017	2021	2029		SF	N19E16	8375	
03 November	1159	1202	1204	B5.3				
	1330	1331	1335		SF	N17E08	8375	
	1753	1756	1811		B9.2	N18E05	8375	
	1832	1833	1836		B9.4	N17E08	8375	
	1852	1924	2028		M1.0	2N	N21E02	8375
	B2013	U2014	2021		SF	N20E02	8375	
	2135	2138	2140		SF	N16E06	8375	
04 November	2336	2338	2342		SF	N15E01	8375	
	0033	0034	0037	B9.4	SF	N16E05	8375	
	0314	0317	0407	C5.2	SF	N17E01	8375	
	0615	0620	0627		SF	N17W01	8375	
	0717	0719	0746	C1.6	SF	N17W01	8375	
	0853	0902	0916	C1.7	SF	N17W03	8375	
	0925	0925	0934		SF	S28E23	8376	
	1036	1044	1049	C2.0				
	1205	1206	1209		SF	N15W01	8375	
	1206	1208	1222		SF	S19W22	8379	
	1225	1231	1404	C5.0	1N	N16W04	8375	
	1312	1312	1319		SF	S19W23	8379	
	1525	1548	1605	C2.4	SF	N18W08	8375	
	1623	1625	1634		SF	N13E67	8378	
	1654	1657	1700	C1.6				
1802	1806	1808	C1.6					
2002	2005	2011	C1.6	SF	N18W11	8375		
2208	2210	2230	C2.4	1F	N19W08	8375		



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
04 November	2241	2252	2255	B8.4			8378
	2242	2247	2256		SF	N13E64	8378
	2242	2243	2254		SF	N16W12	8375
	2344	0125	0132	C4.6	SN	N19W10	8375
05 November	0121	0124	0128	C7.1			
	0133	0134	0142		SF	N19W10	8375
	0236	0236	0249		SF	S29E14	8376
	0259	0302	0308	C5.4	SF	N19W11	8375
	0457	0459	0503	C7.7	SN	N19W12	8375
	0608	0615	0620	C2.7	SF	N16W14	8375
	0644	0644	0649		SF	N19W13	8375
	0655	0656	0700		SF	N19W13	8375
	0804	0806	0812	C2.5	SF	N19W13	8375
	0845	0847	0851	B9.2	SF	N19W14	8375
	0901	0902	0904		SF	N19W14	8375
	0923	0923	0926		SF	N16W16	8375
	0944	0945	0949	B8.9	SF	S23E66	8380
	0953	0959	1001	C2.0			
	B1051	U1052	1106	C1.0	SF	N16W15	8375
	1108	1109	1123	C1.3	SF	N16W15	8375
	B1138	U1139	1158	C2.8	SF	N15W17	8375
	1303	1305	1321	C1.2	SF	N16W17	8375
	1333	1335	1345	M1.5	1B	N15W17	8375
	1510	1511	1515		SF	N17W15	8375
	1704	1710	1717	C1.2			
	1820	1825	1827	M3.7			
	B1831	1950	A2334	M8.4	2B	N22W18	8375
	2101	2107	2115		SF	S18W41	8379
	2157	2159	2212		SF	S21E58	8380
	B2215	U2219	2239		SF	N19W21	8375
	2248	2249	2302		SF	S18W42	8379
2255	2301	2317		SF	N19W22	8375	
2313	2314	2317		SF	N11E48	8378	
06 November	0242	0243	0254	C4.4	SF	N19W24	8375
	0307	0307	0310		SF	N19W24	8375
	0417	0417	0421		SF	N19W24	8375
	0442	0446	0448	C1.1	SF	N19W25	8375
	0452	0458	0502	C1.4	SF	N19W25	8375
	0508	0522	0528		SF	N19W25	8375
	0709	0712	0719	C1.6			
	0757	0759	0802	C2.4	SF	N20W26	8375
	0831	0833	0837	C3.5	SF	N19W27	8375



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
06 November	0852	0852	0857	C3.0	SF	N19W27	8375
	0909	0910	0925	C4.2	SN	N19W27	8375
	0929	0929	0937	C1.3	SF	N19W27	8375
	B1109	U1110	1119	C2.3	SN	N16W29	8375
	1203	1204	1217	C6.4	SB	N15W30	8375
	1315	1318	1321		SF	N15W31	8375
	1321	1323	1339		SF	N21E26	8377
	1347	1351	1353	C1.2			
	1510	1511	1533	M1.7	1B	N15W32	8375
	1525	1528	1531	C1.4			
	1624	1624	1641		SF	N19W30	8375
	1825	1825	1836		SF	N18W37	8375
	1849	1851	1858	C3.1	SF	N15W35	8375
	1903	1903	1916		SF	N20E24	8377
	1919	1921	1923		SF	N14W36	8375
	1920	1921	1923		SF	S20W53	8379
	1955	1958	2007	C1.6	1F	N19W34	8375
	2007	2008	2016		SF	S20W54	8379
	2046	2046	2053		SF	N17W36	8375
	2057	2102	2111		SF	N17W36	8375
	2110	2110	2118		SF	S20W54	8379
	2202	2209	2226	C9.4	SN	N15W37	8375
	2210	2219	2226		SF	S19W56	8379
	2229	2229	2235	C1.0	SF	N16W35	8375
	2241	2254	2300		SF	N19W35	8375
	2303	2303	2312		SF	N19W34	8375
	2314	2325	2331		SF	N18W36	8375
	2331	2340	2350		SF	N20E21	8377
	2334	2334	2339	C3.2	SF	N15W33	8375
	2353	2358	0000	B8.5			8377
07 November	0112	0112	0115		SF	N19W36	8375
	0202	0203	0206	B7.7	SF	N19W36	8375
	0549	0551	0554	C1.3	SF	N15W40	8375
	0941	0946	0949	C2.3			
	1102	1106	1109	M2.4			
	1212	1216	1219	C1.1			
	1414	1416	1420		SF	N20W44	8375
	1426	1426	1436		SF	N19W44	8375
	1446	1450	1453	C1.1			
	1603	1609	1621		SF	N18W46	8375
	1659	1700	1707		SF	N18W43	8375



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
07 November	1742	1749	1814	C5.3	1F	N19W48	8375
	1829	1830	1832		SF	N19W47	8375
	1934	1934	1945		SF	N22W48	8375
	2009	2018	2035	C2.4	SF	S20W67	8379
	2042	2043	2047		SF	N19W47	8375
	2142	2142	2146		SF	N19W47	8375
08 November	0151	0152	0203	C2.5	SF	N22W49	8375
	0235	0236	0238		SF	N20W51	8375
	0311	0314	0317		SF	N20W53	8375
	0426	0439	0505	C6.9	1F	N20W52	8375
	0515	0515	0518		SF	N23W49	8375
	0733	0734	0736	C2.1	SF	N19W53	8375
	0913	0916	0930		SF	N21W53	8375
	1055	1115	1131	C5.9			
	1253	1254	1258		SF	N15W61	8375
	1316	1322	1340	C2.8	1F	S22W70	8373
	1337	1337	1344		SF	N14W58	8375
	1427	1712	1921		2B	N19W58	8375
	1529	1626	1651	C6.0	SF	N20W59	8375
	1708	1714	1745		M2.7	1N	N19W58
	1750	1847	1905		SF	N19W60	8375
	1940	1941	1950		SF	N20W60	8375
	1956	2009	2055	C4.8	1F	N20W59	8375
	2112	2212	2219		SF	N22W59	8375
	2155	2158	2203		SF	S28W35	8376
	2246	2248	2323	M1.1	1F	N21W61	8375
2327	2333	2350	SF		N19E17	8378	



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 8373</i>																	
29 Oct	S24E57	198	0000	01	AXX	002	A										
30 Oct	S24E43	199	0010	02	BXO	002	B										
31 Oct	S24E29	200	0010	06	BXO	003	B										
01 Nov	S26E20	195	0010	04	BXO	004	B						1				
02 Nov	S24E06	196	0010	04	BXO	002	B										
03 Nov	S25W05	194	0020	04	BXO	003	B										
04 Nov	S22W20	196	0050	05	DSO	011	B										
05 Nov	S22W31	194	0040	05	CSO	007	B										
06 Nov	S22W45	195	0010	05	BXO	007	B										
07 Nov	S22W58	195	0000	00		000											
08 Nov	S22W71	195	0000	00		000		1					1				
								1	0	0	1	1	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 194

<i>Region 8374</i>																	
29 Oct	S18E67	188	0060	02	HAX	001	A										
30 Oct	S18E51	191	0040	02	HSX	002	A										
31 Oct	S18E39	190	0010	03	BXO	003	B										
01 Nov	S18E25	190	0010	02	AXX	003	A										
02 Nov	S20E12	190															
03 Nov	S20W01	190															
04 Nov	S20W14	190															
05 Nov	S20W27	190															
06 Nov	S20W40	190															
07 Nov	S20W53	190															
08 Nov	S20W66	190															
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 190



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 8375</i>																							
29 Oct	N18E71	184	0190	05	CSO	003	B																
30 Oct	N17E58	184	0250	09	CHO	005	B																
31 Oct	N17E45	184	0250	08	CKO	006	B																
01 Nov	N17E32	183	0280	08	CHO	006	B						2										
02 Nov	N19E20	182	0280	09	CSO	018	BG						1										
03 Nov	N18E07	182	0300	10	CHO	022	BG		1			6			1								
04 Nov	N18W07	183	0330	10	DSI	028	BG	8				10	2										
05 Nov	N18W21	184	0410	11	EKC	041	BGD	8	2			17	1	1									
06 Nov	N18W35	185	0370	12	EKI	039	BGD	15				26	2										
07 Nov	N18W49	185	0320	11	EAI	040	BGD	2				11	1										
08 Nov	N19W62	185	0720	12	EKI	034	BG	5	2			12	4	1									
								38	5	0	85	10	3	0	0								

Still on Disk.

Absolute heliographic longitude: 182

Region 8376

02 Nov	S27E41	161																			
03 Nov	S27E28	161																			
04 Nov	S27E15	161										1									
05 Nov	S27E02	161										1									
06 Nov	S27W11	161																			
07 Nov	S27W24	161																			
08 Nov	S27W37	161											1								
								0	0	0	3	0	0	0	0	0					

Still on Disk.

Absolute heliographic longitude: 161

Region 8377

02 Nov	N22E75	127	0040	02	AXX	002	A														
03 Nov	N22E63	126	0120	04	CAO	004	B														
04 Nov	N22E49	127	0090	04	CAO	006	B														
05 Nov	N22E36	127	0100	02	CAO	003	B														
06 Nov	N22E24	126	0150	05	CAO	007	B					3									
07 Nov	N22E10	126	0150	04	CAO	006	B														
08 Nov	N23E00	123	0160	08	CSO	013	B														
								0	0	0	3	0	0	0	0	0					

Still on Disk.

Absolute heliographic longitude: 123



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

Region 8378

03 Nov	N17E76	113	0090	03	HAX	001	A										
04 Nov	N14E63	113	0120	02	HAX	002	A										2
05 Nov	N14E50	113	0070	02	HSX	001	A										1
06 Nov	N13E36	114	0130	02	HSX	001	A										
07 Nov	N14E23	113	0130	03	HSX	002	A										
08 Nov	N17E11	112	0140	04	HSX	005	A										1
								0	0	0	0	4	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 112

Region 8379

04 Nov	S18W28	204	0030	03	CSO	005	B										2
05 Nov	S18W42	205	0050	06	CSO	009	B										2
06 Nov	S18W55	205	0060	09	CAI	013	B										4
07 Nov	S18W70	206	0090	11	CAO	008	B	1									1
08 Nov	S19W79	202	0130	08	CAO	005	B										
								1	0	0	0	9	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 204

Region 8380

04 Nov	S20E65	111	0000	00	AXX	001	A										
05 Nov	S20E51	112	0000	00	AXX	001	A										2
06 Nov	S22E38	112	0000	00	AXX	001	A										
07 Nov	S22E30	106	0010	03	BXO	007	B										
08 Nov	S22E17	106	0000	00		000											
								0	0	0	0	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 106

Region 8381

05 Nov	N22E16	147	0010	04	BXO	005	B										
06 Nov	N21E02	148	0010	03	BXO	004	B										
07 Nov	N22W11	147	0010	04	BXO	005	B										
08 Nov	N22W23	146	0010	04	BXO	003	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 148



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	4

Region 8382

07 Nov N18W32 168 0010 05 BXO 006 B

08 Nov N18W45 168 0020 07 BXO 005 B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 168

Region 8383

08 Nov S14E76 047 0040 05 BXO 002 B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 047



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

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Smooth values RI/SWO	Smooth values SWO	Smooth values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
1996									
November	26.7	17.9	0.67	15.4	09.8	78.7	73.0	08	09.1
December	21.1	13.3	0.63	16.2	10.4	77.8	73.3	07	09.3
1997									
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2
March	14.4	08.7	0.60	20.4	13.5	73.5	75.1	08	08.9
April	24.5	15.5	0.63	24.0	16.5	74.5	76.8	10	08.6
May	28.6	18.5	0.65	26.4	18.3	74.6	78.4	08	08.6
June	22.1	12.7	0.57	29.0	20.3	71.7	80.1	07	08.6
July	17.0	10.4	0.61	32.4	22.6	71.1	81.8	06	08.5
August	36.7	24.4	0.66	35.9	25.0	79.0	83.4	07	08.3
September	52.8	51.3	0.88	40.5	28.3	96.2	85.7	10	08.4
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	08.6
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
1998									
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	11.2*
April	73.6	53.4	0.73	77.7	56.5*	108.3	109.1*	10	11.4*
May	74.3	56.3	0.76			106.7		18	
June	93.6	70.7*	0.76*			108.4*		10	
July	98.3	66.2*	0.67*			114.0*		11*	
August	118.6	91.7*	0.77*			136.0*		18*	
September	119.0	92.9*	0.78*			138.4*		14*	
October	77.0	55.6*	0.72*			121.9*		13*	

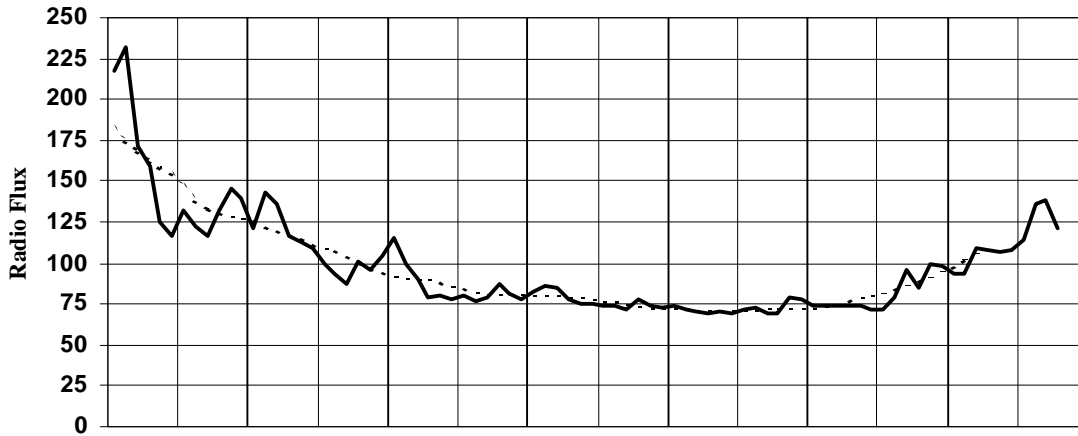
*Preliminary estimates.

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.

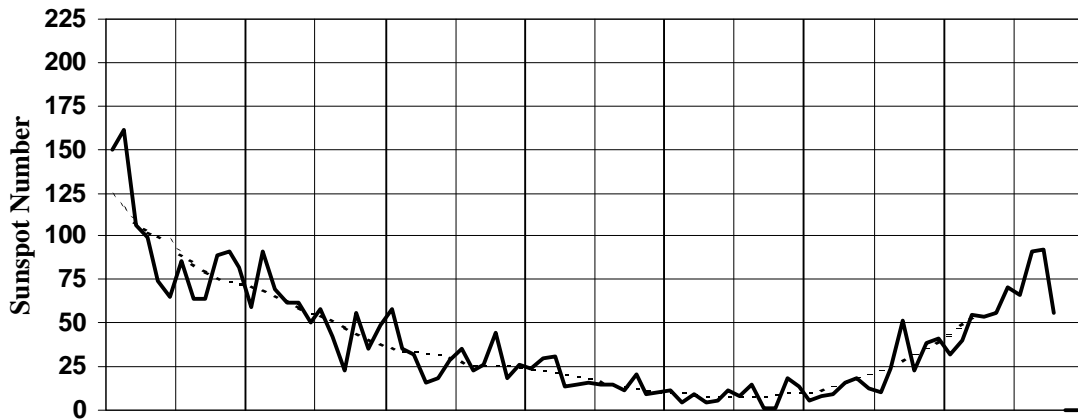
** From June 1991 onward, the 10.7-cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



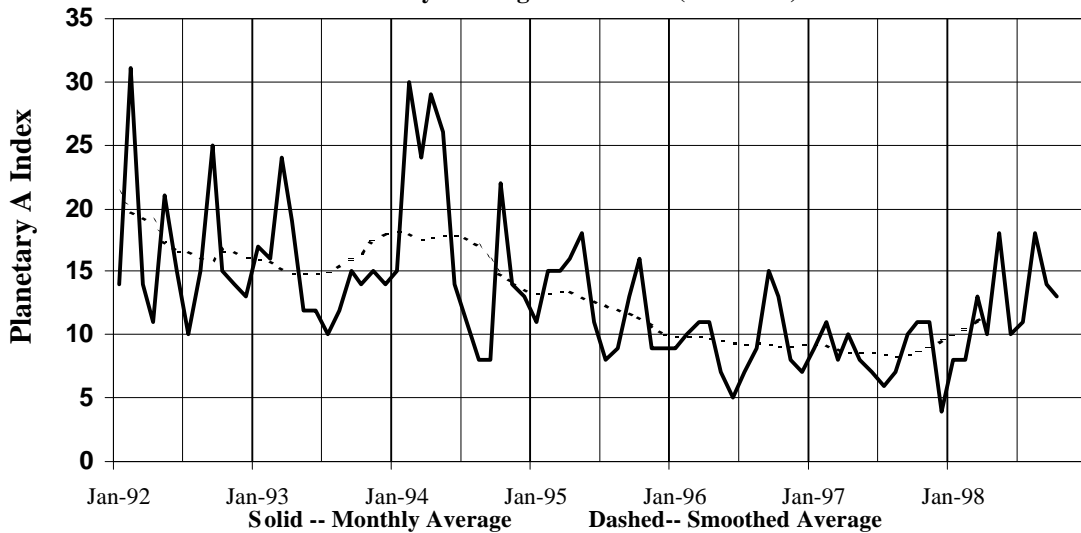
Penticton (DRAO) Radio Flux 2800MHz (10.7cm)
 (With data through 1 Nov 98 for all graphs)

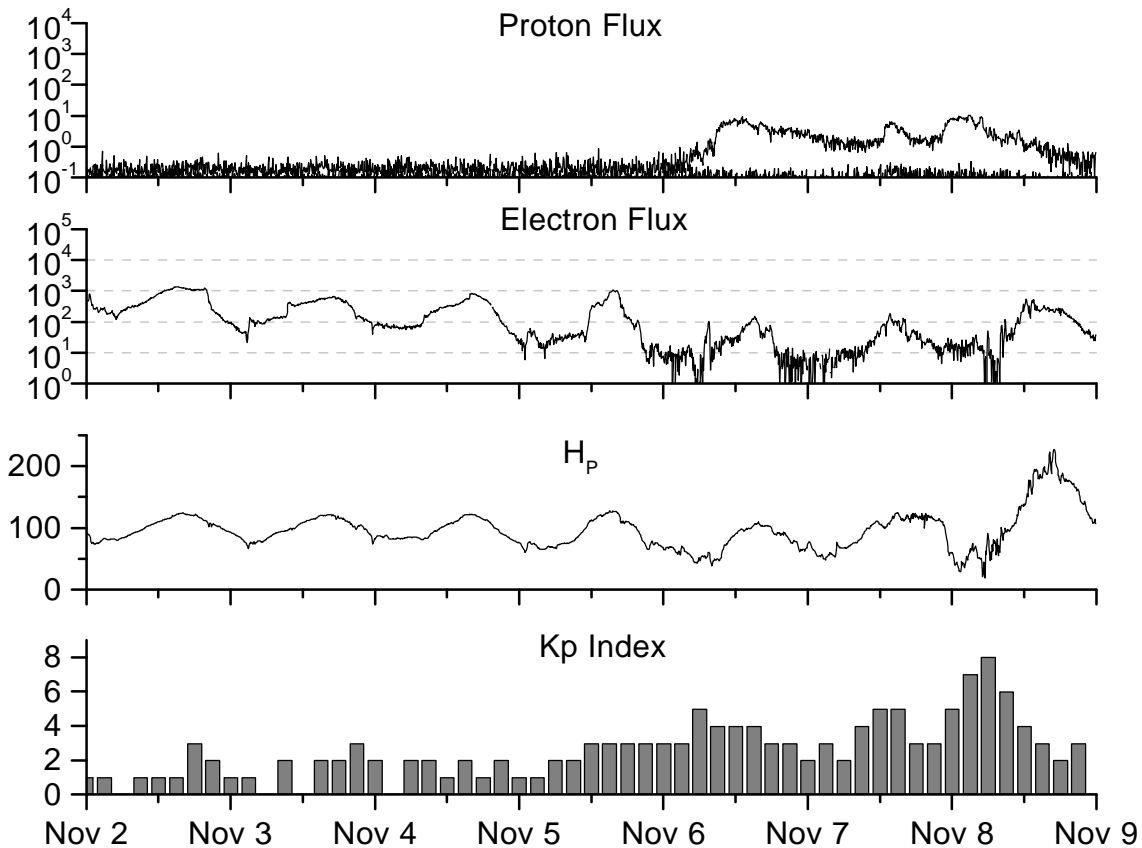


International Sunspot Number



Planetary Geomagnetic A Index (Estimated)





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 02 November 1998*

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.

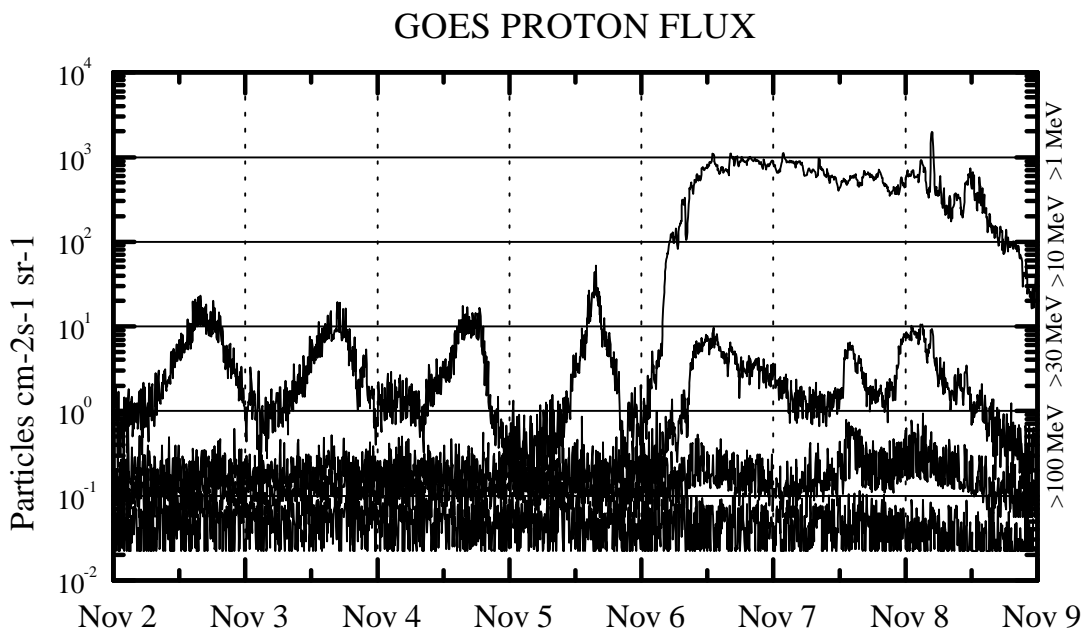
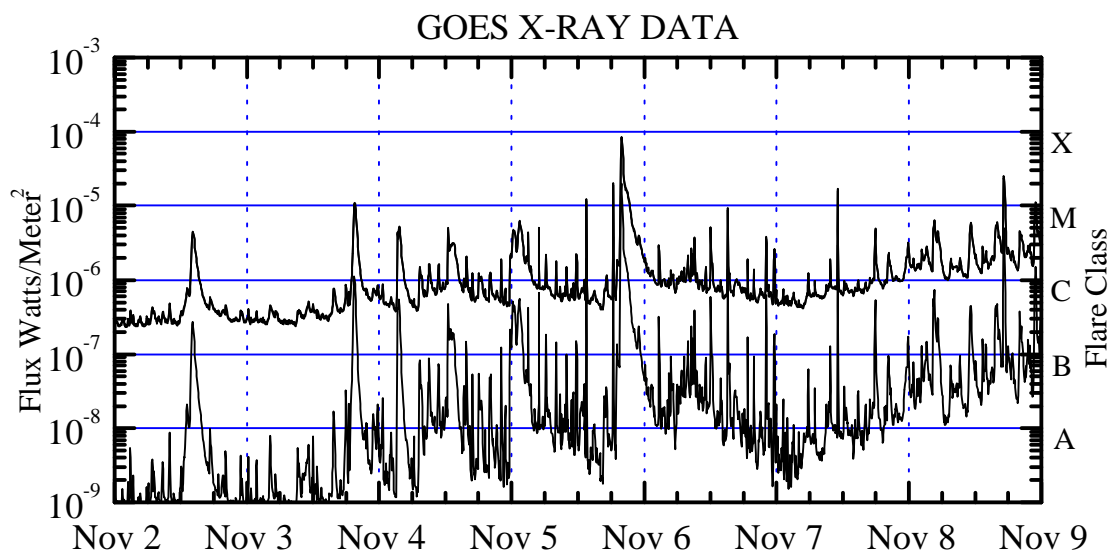
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm² -sec-sr) with energies greater than 2 MeV at GOES-8.

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 USAF 55th 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_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_pparallel is subject to a 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.

