

**Space Weather Highlights**  
**08-14 February 1999**

Solar activity increased to low to moderate levels. Region 8457 (N16, L = 276, class/area Eki/660 on 13 February), which was the return of old AR 8440, produced two low-level M-class flares during a period of slow growth. The first was an M1/SF at 12/0325UT with associated Type II and IV radio sweeps. The second was a long-duration M1/SF at 14/1045UT. Region 8457 stabilized late in the period. C-class subflares occurred daily from a number of small regions. The daily 10.7 cm solar radio flux rose steeply during the period and reached a peak of 205 SFU on 14 February, which was the highest reading to date of Cycle 23.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Phi data indicated a shift to an away (positive polarity) solar sector on 11 February. Earth remained within an away sector for the rest of the period. Significant changes were detected in the solar wind flow during 11 - 12 February as velocities increased from 330 - 590 km/sec and densities dropped to 02 to 04 p/cc. IMF Bz became more variable during this period as well and ranged from plus to minus 20 nT (GSM). These changes appeared due, at least for the most part, to the effects of a high-speed coronal hole windstream.

There were no significant proton enhancements detected at geo-synchronous altitude.

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

The geomagnetic field was disturbed during 11 - 12 February with active to minor storm levels reported globally. The field was at quiet to unsettled levels during the rest of the week.

**Space Weather Outlook**  
**17 February 1999 - 15 March 1999**

Solar activity is expected to be low during most of the period. A lull in activity is expected during 22 February - 04 March as active solar longitudes depart the visible disk. An increasing trend is expected for the rest of the period with isolated M-class flares possible.

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, fluxes may reach high levels during 11 - 12 March.

The geomagnetic field is expected to be at quiet to unsettled levels during most of the period. However, active levels are possible during 10 - 11 March 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
08 February	125	75	420	B3.4	5	0	0	8	0	0	0	0
09 February	129	57	620	B3.6	3	0	0	3	0	0	0	0
10 February	152	69	1110	B4.1	3	0	0	9	0	0	0	0
11 February	164	84	1270	C1.0	2	0	0	2	0	0	0	0
12 February	188	165	1370	B7.1	10	1	0	15	2	0	0	0
13 February	198	199	1590	B6.8	11	0	0	20	0	0	0	0
14 February	205	211	1610	B7.8	10	1	0	12	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
08 February	9.2E+4	1.8E+4	5.3E+3		2.7E+7	
09 February	1.1E+5	1.9E+4	5.7E+3		3.6E+7	
10 February	1.3E+5	1.7E+4	4.5E+3		2.2E+7	
11 February	7.0E+5	1.6E+4	4.2E+3		5.9E+6	
12 February	6.9E+5	1.5E+4	3.4E+3		4.9E+6	
13 February	1.2E+5	1.5E+4	3.6E+3		1.7E+7	
14 February	8.3E+4	1.4E+4	3.6E+3		7.8E+6	

**Daily Geomagnetic Data**

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
08 February	4	2-1-1-1-2-0-2-0	8	2-0-3-3-3-1-1-1	5	2-1-1-2-2-1-2-1
09 February	2	2-1-1-0-1-1-0-0	2	1-1-1-0-1-1-0-0	5	1-1-1-0-1-1-1-1
10 February	3	1-1-1-0-0-2-2-1	5	0-0-3-0-0-2-2-2	6	1-1-2-0-1-1-2-2
11 February	16	3-2-3-2-4-3-4-3	26	2-2-4-5-5-5-3-2	16	3-2-3-3-4-4-4-3
12 February	15	2-3-4-4-2-3-3-1	30	2-2-5-5-5-5-4-2	21	4-4-4-4-3-4-4-2
13 February	6	1-2-3-2-1-0-2-1	9	2-1-3-4-2-1-1-1	7	1-2-3-2-1-2-2-2
14 February	5	1-0-2-2-2-2-1-2	19	0-0-3-4-5-5-2-2	9	1-1-2-3-3-3-2-2



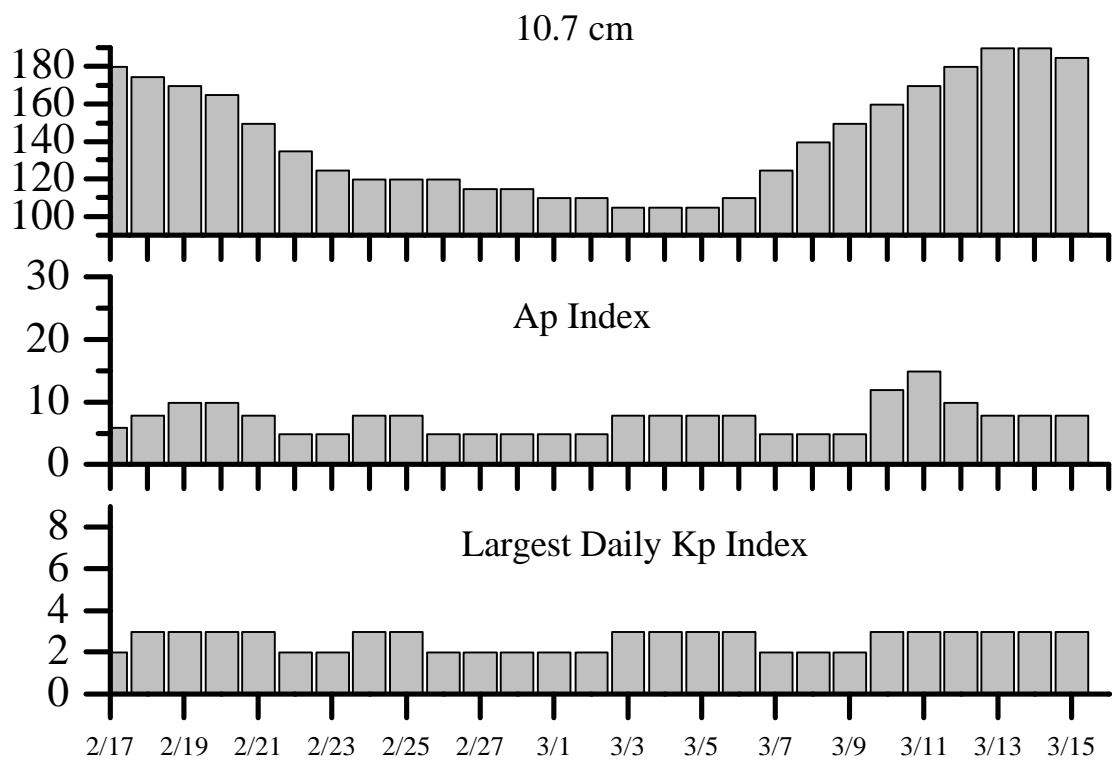
### *Alerts and Warnings Issued*

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<u>Date and Time of Issue (UT)</u>	<u>Type of Alert or Warning</u>	<u>Date and Time of Event (UT)</u>
08 Feb 0007	5-245 MHz Radio Bursts	07 Feb
09 Feb 0053	5-245 MHz Radio Bursts	08 Feb
09 Feb 0053	245 MHz Radio Noise Storm	08 Feb
09 Feb 0558	Type II Radio Emission	09 Feb 0519
10 Feb 0109	4-245 MHz Radio Bursts	09 Feb
10 Feb 0109	245 MHz Radio Noise Storm	09 Feb
11 Feb 0055	245 MHz Radio Noise Storm	10 Feb
11 Feb 0900	K= 4 Observed	11 Feb 06- 09
11 Feb 0900	K= 4 Warning valid	11 Feb 0900 to 2100
11 Feb 2149	CONTINUED K-Index of 4 Warning valid	11 Feb 09-21
12 Feb 0008	A $\geq$ 30 Warning valid	12 Feb 0006 -13 Feb 1500
12 Feb 0157	245 MHz Radio Noise Storm	11 Feb
12 Feb 0355	Type II Radio Emission	12 Feb 0325
12 Feb 0600	A $\geq$ 20 Observed	12 Feb 0600
12 Feb 0620	Type IV Radio Emission	12 Feb 0322
12 Feb 0826	CONTINUED K-Index of 4 Warning valid	11 Feb 09- 21
12 Feb 0856	K= 5 Observed	12 Feb 06-09
13 Feb 0013	2-245 MHz Radio Bursts	12 Feb
13 Feb 0013	245 MHz Radio Noise Storm	12 Feb
14 Feb 0010	6-245 MHz Radio Bursts	13 Feb
14 Feb 0010	245 MHz Radio Noise Storm	13 Feb

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*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
17 Feb	180	6	2	02 Mar	110	5	2
18	175	8	3	03	105	8	3
19	170	10	3	04	105	8	3
20	165	10	3	05	105	8	3
21	150	8	3	06	110	8	3
22	135	5	2	07	125	5	2
23	125	5	2	08	140	5	2
24	120	8	3	09	150	5	2
25	120	8	3	10	160	12	3
26	120	5	2	11	170	15	3
27	115	5	2	12	180	10	3
28	115	5	2	13	190	8	3
01 Mar	110	5	2	14	190	8	3
				15	185	8	3



### *Energetic Events*

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Integ Flux	Imp Brtns	Location		Radio Flux		Intensity	
			Max				Lat	CMD	245	2695	II	IV
12 Feb	0304	0325	0406	M1.5	.038	1N	N18E36		3900	31	2	2
14 Feb	0959	1045	1110	M1.0	.022	SF	N17E05		45	25		

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #	
	Begin	Max	End			Location	Lat		CMD
08 February	0116	0117	0127	C1.0	SF	S27W19		8453	
	0655	0720	0804	C1.6				8453	
	0731	0731	0734		SF	S28W23		8453	
	0846	0851	0916	C1.0					
	1101	1109	1114		SF	N22E65		8456	
	1139	1151	1203		SF	S30W22		8453	
	1603	1612	1638	C1.6	SF	N22E60		8456	
	1650	1653	1658		SF	N22E59		8456	
	1950	1952	2007	C1.6	SF	N22E58		8456	
	2108	2118	A2121		SF	N22E55		8456	
09 February	0012	0013	A0030		SF	N23E56		8456	
	0456	0506	0524	C2.3	SF	S29W36		8453	
	0640	0728	0800	C1.1					
	0801	0805	0809	C1.0					
10 February	1647	1653	1701		SF	N22E47		8456	
	0325	0339	0347	B7.6					
	0607	0616	0653	C1.7	SF	S27E63		8458	
	0913	0919	0939	C1.9					
	1337	1343	1400		SF	S26E58		8458	
	1345	1347	1357		SF	N13E54		8457	
	1541	1551	1607		SF	S22E56		8458	
	1613	1613	1638		SF	S29E62		8458	
	1657	1700	1712		SF	S26W57		8453	
	1659	1700	1703		SF	N13E54		8457	
11 February	1806	1806	1812		SF	S34E58		8458	
	1858	1916	1943		SF	S34E53		8458	
	2241	2346	0020	C3.7					
	0610	0614	0636	C1.4	SF	N20E25		8456	
	1514	1532	1557		SF	N18E21		8456	
	2303	2315	2333	C1.3					
	12 February	0305	0324	0501	M1.5	1N	N18E36		8457
		0723	0726	0732	C2.1				
0816		0821	0828	C3.0					
0952		0956	1013	C1.7					
1044		1049	1053	C2.0					



*Flare List - continued.*

Date	Time			X-ray	Optical		Rgn Lat CMD #	
	Begin	Max	End		Imp / Class.	Location Brtns		
12 February	1217	1223	1232		SF	N13E28	8457	
	1242	1244	1251		SF	N17E40		
	1302	1303	1311		SF	S26E38	8458	
	1320	1404	1543		1N	S27E30	8458	
	1326	1326	1339		SF	N12E28	8457	
	1340	1343	1348	C7.7	SF	N15E33	8457	
	1423	1437	1518		SF	S27E29	8458	
	1522	1524	1619	C5.7	SF	N12E27	8457	
	1543	1543	1553		SF	N21E09	8456	
	1647	1701	1712		SF	N16E27	8457	
	1656	1657	1702	C2.4	SF	N22E05	8456	
	1737	1738	1744		SF	N17E28	8457	
	1816	1819	1851		SF	N16E25	8457	
	1817	1818	A1835	C2.5	SF	N15E28	8457	
	1857	1912	1931	C3.2	SF	N17E27	8457	
	2239	2241	2247	C2.3	SF	N19E35	8462	
	13 February	0122	0127	0146	C1.5			
		0334	0345	0351	C4.5	SF	N22W02	8456
		0454	0458	0501	C1.5			
0714		0729	0740	C2.6				
0906		0907	0913	C2.4	SF	N21W04	8456	
1214		1215	1258	C2.6	SF	N19E27	8462	
1301		1301	1308		SF	N20E29	8462	
1327		1331	1336		SF	N20E28	8462	
1408		1409	1427		SF	N20E27	8462	
1507		1536	1606		SF	S27E15	8458	
1517		1521	1527		SF	N21W08	8456	
1609		1611	1647	C9.4	SN	N19E24	8462	
1615		1622	1641		SF	N17E16	8457	
1621		1623	1626		SF	N21W09	8456	
1708		1708	1717		SF	N24W07	8456	
1813		1814	1824	C1.2	SF	N20E25	8462	
1905		1906	1914		SF	N19E26	8462	
1919		1927	1934		SF	S26E19	8458	
1924		1925	1929	C2.6	SF	N20E22	8462	
1929		1930	1939		SF	N15E12	8457	
1952		1953	2004	C2.7	SF	N19E24	8462	
2011		2016	2025		SF	N18E24	8462	
2052		2053	2103	C1.8	SF	N20E24	8462	



**Flare List - continued.**

Date	Begin	Time		Class.	X-ray Brtns	Imp / Lat CMD	Optical		Rgn
		Max	End				Location	#	
14 February		0206	0207	0212	C1.1	SF	S26E17		8458
		0239	0239	A0254	C3.4	SF	N11E66		8462
		0435	0447	0458	C1.5				
		0654	0656	0659	C1.7	SF	N21W15		8456
		0711	0717	0726	C1.4				
		0930	0936	0944	C2.4				
		1008	U1034	A1039	M1.0	SF	N17E05		8457
		B1113	U1114	A1136		SF	N16E09		8457
		B1444	1450	1616	C5.3	SF	S27E04		8458
		1624	1627	1633		SF	S27E02		8458
		1705	1708	1722	C2.5	SF	N17E10		8462
		2252	2252	2255	C3.3	SF	N20E08		8462
		2338	2339	2344	C3.4	SF	S21E06		8458
		2338	2340	0010		SF	N13W06		8457
		2355	2356	0012		SF	N22W22		8456

**Region Summary**

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

*Region 8453*

02 Feb	S26E44	027	0020	07	BXO	014	B				2							
03 Feb	S26E32	026	0080	06	DAO	009	B											
04 Feb	S23E19	026	0190	06	CAO	010	B											
05 Feb	S26E04	028	0020	05	CSO	005	B											
06 Feb	S26W10	029	0040	04	CAO	005	B											
07 Feb	S26W21	026	0020	06	CSO	004	B											
08 Feb	S25W35	027	0010	01	AXX	002	A	1			3							
09 Feb	S25W48	027						1			1							
10 Feb	S25W61	027									1							
11 Feb	S25W74	027																
12 Feb	S25W87	027																
											2	0	0	7	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 028



**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 8454*

02 Feb	S22E16	055	0010	03	BXO	002	B												
03 Feb	S22E04	054	0010	02	CRO	002	B												
04 Feb	S22W09	054																	
05 Feb	S22W22	054																	
06 Feb	S22W35	054																	
07 Feb	S22W48	054																	
08 Feb	S22W61	054																	
09 Feb	S22W74	054																	
																			0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 054

*Region 8455*

06 Feb	S19E33	346	0010	01	HRX	002	A												
07 Feb	S18E19	346	0000	00	AXX	001	A												
08 Feb	S18E05	347	0010	00	AXX	001	A												
11 Feb	S18W34	347																	
12 Feb	S18W47	347																	
13 Feb	S18W60	347																	
14 Feb	S18W73	347																	
																			0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 347

*Region 8456*

07 Feb	N23E65	300	0000	00	AXX	001	A												
08 Feb	N23E55	297	0080	10	CSO	008	B	2											
09 Feb	N24E42	297	0140	11	ESO	009	B												
10 Feb	N23E30	296	0220	12	ESI	013	B												
11 Feb	N23E16	297	0220	11	EAI	016	BG	1											
12 Feb	N23E04	295	0170	11	EAO	027	BG	2											
13 Feb	N23W09	295	0060	11	ESO	028	B	2											
14 Feb	N23W22	295	0030	10	CSO	014	B	1											
																			8 0 0 19 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 295





**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 8457*

08 Feb	N18E73	279	0070	02	HSX	001	A											
09 Feb	N18E61	278	0090	07	CSO	003	B											
10 Feb	N17E48	278	0200	09	DAO	008	B					2						
11 Feb	N16E36	277	0290	11	EAO	016	B											
12 Feb	N15E23	276	0350	13	EAI	026	BG	3	1			9	1					
13 Feb	N15E10	276	0660	13	EKI	036	BG					2						
14 Feb	N15W03	276	0660	13	EKI	032	BG		1			3						
								3	2	0		16	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 276

*Region 8458*

08 Feb	S23E76	276	0250	05	HHX	002	A											
09 Feb	S22E65	274	0390	06	HHX	003	A											
10 Feb	S19E55	271	0640	10	DHO	007	B	1				6						
11 Feb	S22E42	271	0660	08	DKO	009	BGD											
12 Feb	S23E29	270	0650	09	DKO	014	BG					2	1					
13 Feb	S22E16	270	0560	08	DKO	016	BG					2						
14 Feb	S22E03	270	0590	10	DKO	030	B	3				4						
								4	0	0		14	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 270

*Region 8459*

08 Feb	S29E48	304	0000	00	AXX	001	A											
09 Feb	S30E39	300	0000	00	AXX	002	A											
10 Feb	S30E26	300																
11 Feb	S30E13	300																
12 Feb	S30E00	300																
13 Feb	S30W13	300																
14 Feb	S30W30	303	0070	05	DRO	006	B											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 300

*Region 8460*

10 Feb	S17E70	256	0050	02	HSX	001	A											
11 Feb	S17E61	252	0100	14	ESO	003	B											
12 Feb	S16E50	249	0050	03	CSO	005	B											
13 Feb	S16E30	256	0030	03	HSX	004	A											
14 Feb	S17E17	256	0030	04	CSO	009	B											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 256



*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 8461*

12 Feb	S32E27	272	0010	03	CSO	004	B										
13 Feb	S31E10	276	0000	03	BXO	002	B										
14 Feb	S31W03	276															
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 276

*Region 8462*

12 Feb	N20E34	265	0030	05	CRO	007	B	1		1							
13 Feb	N21E21	265	0050	07	DSO	016	B	6		11							
14 Feb	N20E07	266	0080	08	DAO	021	B	3		3							
								10	0	0	0	15	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 266

*Region 8463*

12 Feb	S16E59	240	0040	02	HSX	001	A										
13 Feb	S15E45	241	0070	02	HSX	001	A										
14 Feb	S16E33	240	0060	01	HSX	001	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 240

*Region 8464*

12 Feb	N19E64	235	0070	13	EAO	001	B										
13 Feb	N21E55	231	0160	13	ESO	004	B										
14 Feb	N20E42	231	0090	12	CSO	007	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 231

*Region 8465*

13 Feb	S33W60	346	0000	03	BXO	002	B										
14 Feb	S32W76	349	0000	00	AXX	001	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 346



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

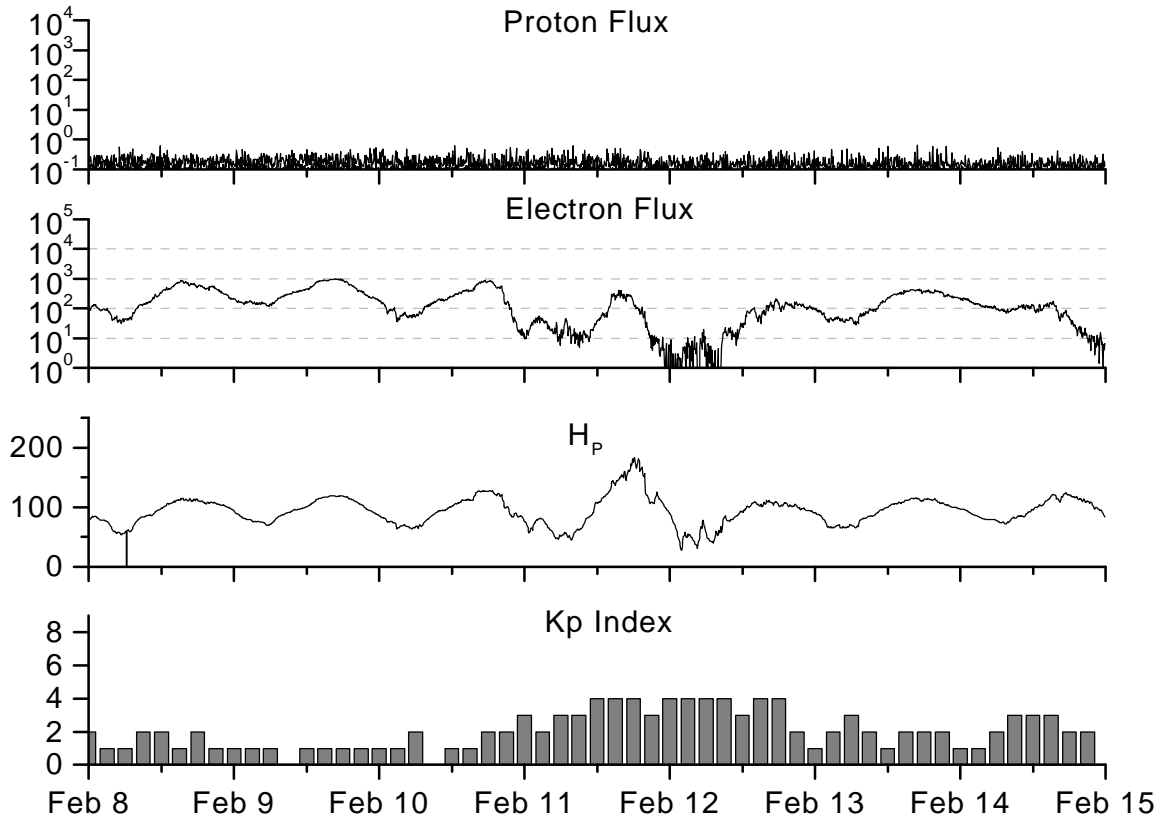
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>1997</b>									
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2
March	14.4	08.7	0.60	20.4	13.5	73.5	75.1	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
<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	11.2*
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	81.4	59.3*	106.7	112.4*	18	11.7*
June	93.6	70.7*	0.76*	85.9	62.4*	108.4*	116.2*	10	12.0*
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*			136.0*		18*	
September	119.0	92.9*	0.78*			138.4*		14*	
October	77.0	55.6*	0.72*			121.9*		13*	
November	99.5	73.6*	0.74*			140.2*		16*	
December	120.8	81.6*	0.68*			150.1*		08*	
<b>1999</b>									
January	94.3	62.4*	0.66*			140.6*		08*	

\*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.





*Weekly Geosynchronous Satellite Environment Summary*  
*Week Beginning 08 February 1999*

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

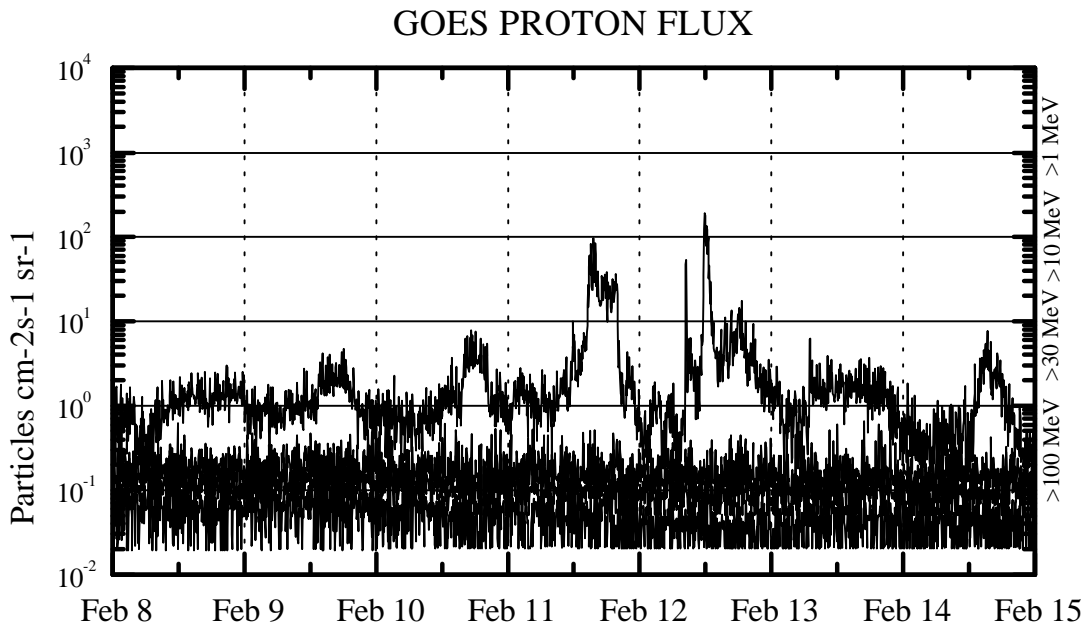
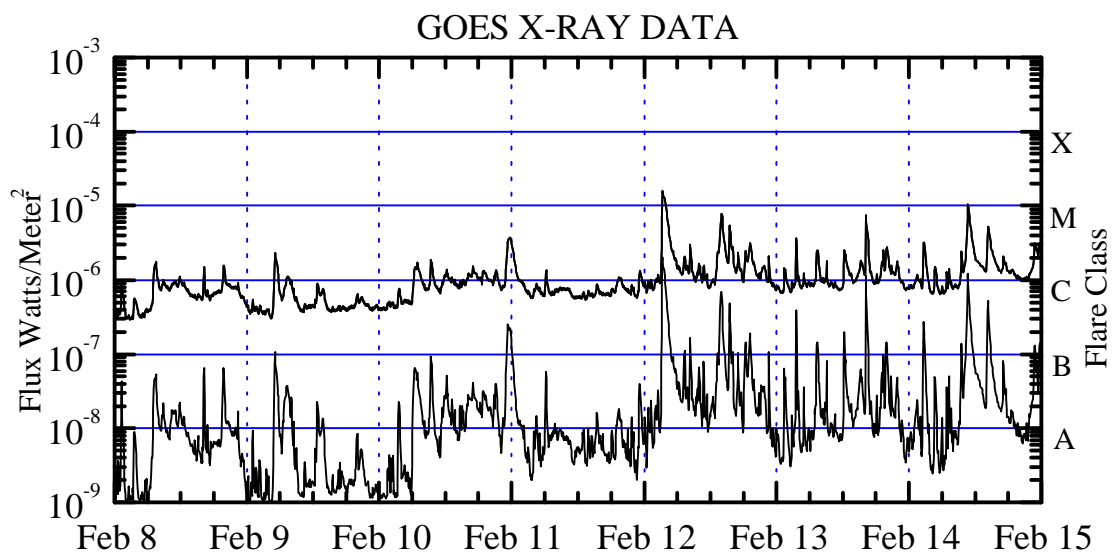
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/  $\text{cm}^2\text{-sec-sr}$ ) with energies greater than 2 MeV at GOES-8.

*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 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 ( $\text{watts/m}^2$ ) 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 ( $\text{protons/cm}^2\text{-sec-sr}$ ) as measured by GOES-8 (W75) for each of the energy thresholds:  $>1$ ,  $>10$ ,  $>30$  and  $>100$  MeV. P10 event threshold

