

**Space Weather Highlights  
18-24 January 1999**

Solar activity ranged from low to high. Activity increased to high levels on 20 January due to a long-duration M5 X-ray flare at 20/2004UT with associated Types II and IV radio sweeps, a 230 SFU Tenflare, and a proton enhancement/event (see the discussion below). The flare source was behind the northeast limb near where old Region 8421 (N27, L = 171) was expected to return. However, the source region rotated into view as a large area of plage. Activity varied from low to moderate during the remaining days as Regions 8439 (S24, L = 268, class/area Ekc/480 on 22 January) and 8440 (N19, L = 265, class/area Fhi/360 on 22 January) each produced isolated, low-level M-class flares, none of which were impressive in radio emission. Both regions, which were moderate in size and magnetic complexity, appeared to be slowly decaying as they crossed the west limb on the last day of the period.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. There was evidence of two CME passages during the summary period. The first occurred on 20 January with a velocity increase from 320 to 520 Km/sec, increased particle densities, and a period of near-sustained southward IMF Bz (maximum southerly deflections to minus 09 nT (GSM)). The second CME passage began with a weak interplanetary shock detected at the ACE spacecraft around 22/2000UT. Velocities increased from 520 - 720 km/sec following the shock and Bz became more variable with a range of plus 18 to minus 11 nT. Densities also increased with a peak of 21 p/cc detected on 23 January. Phi readings indicated that the Earth was within an away sector (positive polarity, phi angle near 135 degrees) during most of the period.

A solar proton event at greater than 10 MeV was detected at geosynchronous altitude following the long-duration M5 of 20 January. It began as an enhancement at about 20/2245UT. Proton fluxes remained enhanced for the rest of the period and briefly crossed event threshold during 23/1105 - 1245UT (maximum flux was 014 PFU at 23/1135UT) followed by a gradual decline.

The greater than 2 MeV electron flux at geosynchronous altitude was at moderate to high levels during 18 January, then declined to mostly normal levels for the rest of the period.

The geomagnetic field was disturbed during 20 and 22 - 24 January with active to minor storm levels detected at all latitudes. Brief major storm periods also occurred at high latitudes during 22 - 23 January. The 23 - 24 January disturbance, which followed a weak interplanetary shock passage at 22/2000UT, was probably related to the long-duration M5 event mentioned above.

**Space Weather Outlook  
27 January 1999 - 22 February 1999**

Solar activity is expected to be low to moderate. M-class flare probabilities may increase after 07 February, given the expected return of (old) Regions 8439 and 8440.

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 with high levels possible during 11 - 13 February.

The geomagnetic field is expected to be at quiet to unsettled levels during most of the period. However, active periods are possible during 10 - 11 February.



### *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
18 January	171	169	730	B9.2	25	1	0	30	3	0	0	0
19 January	176	182	750	C1.0	8	0	0	24	0	0	0	0
20 January	172	156	760	C1.0	5	1	0	7	0	0	0	0
21 January	175	134	880	C6.1	1	0	0	10	0	0	0	0
22 January	178	141	1020	C1.8	8	1	0	32	1	0	0	0
23 January	166	117	760	C1.2	13	0	0	15	2	0	0	0
24 January	162	107	510	C1.0	4	0	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
18 January	8.8E+5	1.3E+4	3.0E+3		1.8E+8	
19 January	7.4E+4	1.4E+4	3.0E+3		7.1E+6	
20 January	3.2E+5	1.6E+4	3.3E+3		1.3E+7	
21 January	2.9E+6	2.4E+5	7.1E+3		2.4E+6	
22 January	5.4E+6	3.4E+5	5.8E+3		2.7E+6	
23 January	2.2E+7	5.8E+5	3.5E+3		3.2E+6	
24 January	1.0E+7	1.8E+5	2.9E+3		7.8E+6	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	18 January	2	0-0-0-0-0-1-2-2	4	0-0-0-0-2-1-3-2	5
19 January	3	1-1-1-2-1-1-0-1	*	1-0-1-*-1-0-*-0	5	1-1-1-3-0-2-2-1
20 January	8	1-1-0-1-3-3-3-2	11	0-0-0-1-3-5-3-1	7	1-0-0-1-2-3-3-2
21 January	5	1-2-1-3-2-0-1-1	*	0-0-0-*-3-2-1-1	5	1-2-1-3-2-1-1-0
22 January	7	2-1-0-1-3-3-2-2	28	0-0-0-0-6-6-5-3	10	1-1-0-1-3-4-3-3
23 January	12	2-2-2-3-1-3-3-4	32	2-2-5-5-4-6-4-3	16	2-3-3-3-3-4-4-4
24 January	11	4-3-3-2-2-2-2-1	24	4-4-3-5-3-4-4-2	13	4-3-3-3-2-3-3-1

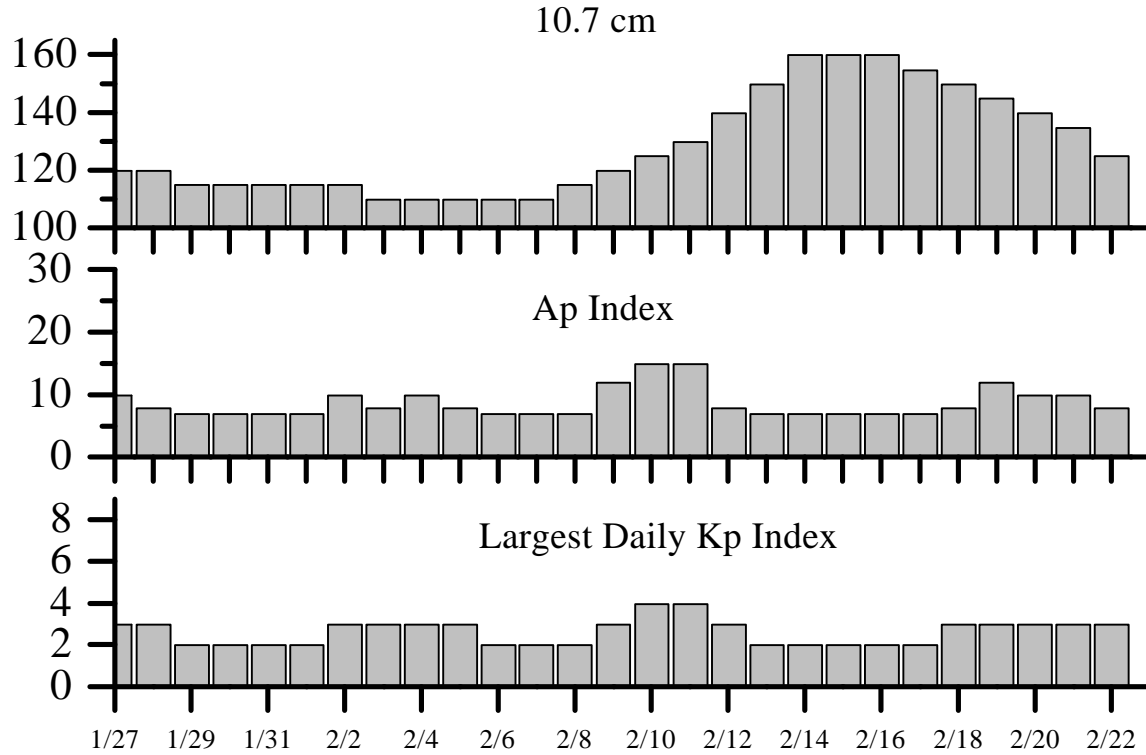


*Alerts and Warnings Issued*

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
18 Jan 1200	CONTINUED >2MeV Electron Event $\geq 1000$ pfu	15 Jan 1450
19 Jan 0013	10 - 245 MHz Bursts	18 Jan
19 Jan 1200	CONTINUED >2MeV Electron Event $\geq 1000$ pfu	15 Jan 1450
20 Jan 1928	10cm Radio Burst 230 s.f.u.	20 Jan 1927
20 Jan 1949	Type II Radio Emission	20 Jan 1914
20 Jan 2003	Type IV Radio Emission	20 Jan 1926
20 Jan 2124	X-Ray event	20 Jan 2003
21 Jan 0109	4 - 245 MHz Bursts	20 Jan
22 Jan 0013	1 - 245 MHz Burst	21 Jan
22 Jan 1800	K = 4 Observed	22 Jan 15 - 18
22 Jan 1800	K = 4 Warning valid	22 Jan 1800 - 23 Jan 0600
23 Jan 0032	6 - 245 MHz Burst	22 Jan
23 Jan 1120	Proton Event $\geq 10$ pfu $\geq 10$ MeV	23 Jan 1105
23 Jan 1202	K= 4 Observed	23 Jan 09- 12
23 Jan 1202	K= 4 Warning valid	23 Jan 1200 - 24 Jan 1200
23 Jan 2231	ENDED Proton Event $\geq 10$ pfu $\geq 10$ MeV	23 Jan 1105
24 Jan 0027	3 - 245 MHz Bursts	23 Jan
25 Jan 0111	2 - 245 MHz Bursts	24 Jan



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
27 Jan	120	10	3	10 Feb	125	15	4
28	120	8	3	11	130	15	4
29	115	7	2	12	140	8	3
30	115	7	2	13	150	7	2
31	115	7	2	14	160	7	2
01 Feb	115	7	2	15	160	7	2
02	115	10	3	16	160	7	2
03	110	8	3	17	155	7	2
04	110	10	3	18	150	8	3
05	110	8	3	19	145	12	3
06	110	7	2	20	140	10	3
07	110	7	2	21	135	10	3
08	115	7	2	22	125	8	3
09	120	12	3				



### *Energetic Events*

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Flux	Imp Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
			Max						245	2695	II	IV
18 Jan 99	0752	0804	0823	M2.0	.027	1N	N19E11	8440	120			
20 Jan 99	1906	2004	2100	M5.2	.250					230	1	2
22 Jan 99	1705	1724	1736	M1.4	.015	SF	N19W44	8440		70		

### *Flare List*

Date	Time			X-ray Class	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
18 January	0008	0015	0018	C5.0				
	0047	0050	0100	C1.6	SF	S22E11		8439
	0116	0117	0126	C1.2	SF	S21E10		8439
	0145	0147	0152	C1.3	SF	S24E14		8439
	0153	0204	0213		SF	S22E08		8439
	0226	0235	0314	C4.8	SF	S24E13		8439
	0312	0315	0326	C4.8	SF	N21E14		8440
	0321	0349	0403	C5.9	1F	S22E09		8439
	0425	0432	0436	C1.8	SF	S24E12		8439
	0437	0443	0446		SF	S22E09		8439
	0455	0456	0501		SF	S22E08		8439
	0510	0513	0533	C4.1	SF	N21E11		8440
	0527	0531	0543	C2.1	SF	S24E12		8439
	0558	0558	0603		SF	S24E11		8439
	0605	0614	0622		SF	S24E11		8439
	0635	0640	0655	C4.6	SN	S24E11		8439
	0755	0759	A0827	M2.0	1N	N19E11		8440
	0804	0804	0815		SF	S24E10		8439
	0852	0855	0859		SF	S24E10		8439
	B0914	U0935	A0951	C1.6	SF	S22E05		8439
	1007	1009	1016	C2.5	SF	S23E07		8439
	B1024	U1031	A1046		SF	S23E06		8439
	B1046	U1049	A1114		SF	N21E10		8440
	B1056	U1104	A1115	C1.1	SF	S22E07		8439
	1236	1238	1255	C1.7	SF	N19E10		8440
	1311	1312	1356	C4.8	SF	S24E06		8439
	1331	1334	1354	C2.5	SF	N20E06		8440
	1425	1426	1430	C1.1	SF	S23E02		8439
	1439	1440	1445		SF	S23E02		8439
	1505	1521	1529	C1.4				
	1604	1606	1608	C3.6				
	1717	1719	1720		SF	N19E08		8439
	1811	1811	1827	C1.4	SF	S22E01		8439
	1840	1841	1844	C1.8	SF	N26W26		8442



*Flare List - continued.*

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
18 January	1859	1905	1931	C3.0	1F	N21E04	8440
	2120	2122	2133	C1.4	SF	N22E04	8440
	2238	2241	2243	C2.4			
19 January	0103	0105	0115		SF	S21W05	8439
	0112	0114	0118		SF	N19W01	8440
	0128	0129	0209	C7.6	SF	S24E01	8439
	0307	0307	0309		SF	N20W02	8440
	0503	0503	0518	C2.6	SF	N19E00	8440
	0615	0619	0630		SF	S21W08	8439
	0641	0642	0645		SF	S21W08	8439
	0717	0717	0724		SF	N17E01	8440
	0804	0804	0817	C3.3	SF	N22E05	8440
	0849	0859	0914		SF	N21W02	8440
	0914	0914	0920		SF	S21W11	8439
	1014	1031	1049		SF	N19W02	8440
	1023	1024	1111		SF	S23W09	8439
	1119	1122	1200	C3.9	SF	S23W08	8439
	1127	1138	1149		SF	N21W03	8440
	1408	1409	A1425	C2.9	SF	S22W13	8439
	1456	1510	1521	C2.5	SF	S23W13	8439
	1536	1536	1540		SF	N18E25	8444
	1605	1610	1619		SF	S24W06	8439
	1629	1630	1641		SF	S23W10	8439
	1647	1657	1701		SF	S23W09	8439
	1723	1725	1739		SF	S25W06	8439
	2019	2029	2045	C2.8	SF	S23W14	8439
2241	2247	2252	C3.5				
2349	2350	0000		SF	N20W12	8440	
20 January	0147	0151	0157	C1.4			
	0203	0207	0210	C2.0			
	0732	0743	0759	C2.2			
	0945	0946	0952		SF	S23W21	8439
	B1137	U1138	1141		SF	S24W21	8439
	1249	1250	1300	C2.1	SF	N21W21	8440
	1416	1428	1501		SF	S22W26	8439
	1419	1433	1459	C2.0			8439
	1457	1457	1459		SF	S23W26	8439
	1545	1546	1554		SF	S16E52	8443
	1906	2004	2100	M5.2			
2123	2124	2133		SF	S24W25	8439	



*Flare List - continued.*

Date Begin	Time		Class.	X-ray Brtns	Optical		Rgn
	Max	End			Imp / Lat CMD	Location #	
21 January	B0110	U0115	A0131		SF	S24W25	8439
	0459	0459	0505	C5.1	SF	N19W26	8440
	0906	0912	0915		SF	N23W58	8442
	1224	1225	1227		SF	N20E05	8444
	1242	1246	1251		SF	S25W37	8439
	1304	1305	1311		SF	N24W61	8442
	1652	1653	1658		SF	S24W40	8439
	1832	1832	1836		SF	S25W39	8439
	1837	1837	1842		SF	N17W32	8440
	2026	2027	2031		SF	S24W42	8439
	22 January	0221	0228	0249	C5.3	SF	N19W02
0537		0539	0548	C3.1	SF	S23W45	8439
0625		0627	0636		SF	N20W41	8440
0641		0641	0645		SF	N20W40	8440
0701		0705	0710	C2.7			
0821		0821	0824		SF	N20W42	8440
0844		0847	0851		SF	N20W42	8440
0857		0859	0901		SF	N20W42	8440
0916		0922	0926	C3.5	SF	N19W13	
0941		0941	0950		SF	S26W53	8439
0957		0959	1006		SF	N21W42	8440
1047		1050	1052		SF	N25W77	8442
1059		1059	1101		SF	S22W45	8439
1123		1126	1126		SF	N24W74	8442
1126		1126	1128		SF	N21W42	8440
1239		1240	1247		SF	S26W52	8439
1258		1300	1314		SF	S24W49	8439
1327		1330	1355	C5.3	1N	S24W50	8439
1411		1413	1442		SF	N22W75	8442
1413		1419	1427		SF	N16W42	8440
1417		1421	1433		SF	S26W54	8439
1513		1513	1515		SF	S24W53	8439
1547		1602	1636		SF	S25W53	8439
1638		1651	1655		SF	S25W54	8439
1708		1708	1716	M1.4	SF	N19W44	8440
1719		1724	1759		SF	N23W78	8442
1822		1824	1828		SF	N20W45	8440
22 January	2052	2052	2100	C1.7	SF	N19W18	8447
	2213	2213	2218		SF	S24W56	8439
	2300	2301	2306		SF	S24W56	8439
	2309	2310	2312		SF	N22W49	8440
	2329	2330	2334	C2.1	SF	S22W59	8439



*Flare List - continued.*

Date	Time		Class.	X-ray Brtns	Optical		Rgn
	Max	End			Imp / Lat CMD	Location #	
22 January	2347	2348	2352		SF	S22W56	8439
	2347	2350	2353	C4.5	SF	N21W48	8440
23 January	0117	0117	0126	C2.9	SF	S25W56	8439
	0443	0443	0448	C1.3	SF	S25W58	8439
	0939	0941	0947	C1.4	SF	S23W61	8439
	1107	1111	1119	C1.1	SF	S24W65	8439
	1202	1203	1207		SF	S24W63	8439
	1323	1325	1331		SF	S24W63	8439
	1327	1330	1419		SF	N18W27	8447
	1340	1351	1432	C2.2	SF	S24W64	8439
	1501	1504	1508	C1.8			8439
	1510	1515	1521	C5.6	1N	S24W70	8439
	1532	1533	1546	C5.6	SF	S24W65	8439
	1621	1624	1702		SF	S24W67	8439
	1734	1737	1741	C3.4	1F	S24W71	8439
	1808	1812	1817	C1.6			
	1834	1835	1842		SF	S24W70	8439
	B1848	1852	1900		SF	N20W28	8447
	1912	1916	1921	C2.3			
	2050	2050	A2105		SF	S24W73	8439
	2122	2127	2135	C2.8			
2227	2228	2234		SF	S23W72	8439	
2346	2354	2359	C3.6	SF	S23W75	8439	
24 January	0455	0501	0509	C4.3			
	0816	0819	0831	C5.5	SF	N19W32	8444
	1106	U1121	A1205		SF	N21W30	8444
	1230	1231	1235		SF	N21W69	8440
	1235	1237	1247	C2.0	SF	S25W68	8439
	1523	1524	1529		SF	N21W71	8440
	1528	1539	1601		SF	N20W35	8444
	1555	1712	1920	C3.9			
24 January	1650	1650	1712		SF	S29W84	8439
	1810	1812	1820		SF	N20W33	8444
	1909	1911	1924		SF	N20W38	8444
	2026	2028	2035		SF	N19W43	8447
	2102	2103	2109		SF	N20W40	8444
	2109	2110	2115		SF	N14E22	8446





### 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

#### Region 8436

09 Jan	S30E64	323	0010	01	AXX	001	A										
10 Jan	S31E51	323	0010	01	AXX	001	A										
11 Jan	S30E38	323															
12 Jan	S30E25	323															
13 Jan	S30E12	323															
14 Jan	S30W01	322															
15 Jan	S30W14	322															
16 Jan	S30W27	322															
17 Jan	S30W40	322															
18 Jan	S30W53	322															

0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 322

#### Region 8437

10 Jan	N11E68	306	0090	02	HSX	001	A										
11 Jan	N11E55	305	0090	02	HSX	001	A										
12 Jan	N11E42	305	0080	02	HSX	001	A										
13 Jan	N11E29	305	0090	02	HSX	001	A										
14 Jan	N10E16	305	0100	02	HSX	001	A										
15 Jan	N10E03	305	0100	02	HSX	001	A										
16 Jan	N10W11	305	0080	02	HSX	001	A										
17 Jan	N10W24	305	0070	02	HSX	001	A										
18 Jan	N11W37	305	0090	02	HSX	001	A										
19 Jan	N11W50	305	0070	02	HSX	001	A										
20 Jan	N11W64	306	0070	02	HSX	001	A										
21 Jan	N11W77	306	0060	02	HSX	001	A										
22 Jan	N11W89	304	0050	02	HSX	001	A										

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 305

#### Region 8438

12 Jan	S18E07	340	0020	04	CSO	005	B											1
13 Jan	S18W06	340	0030	06	CRO	008	B											
14 Jan	S18W16	337	0000	02	AXX	002	A											
15 Jan	S18W28	336	0000	00	AXX	001	A											
16 Jan	S18W41	336																
17 Jan	S18W54	336																
18 Jan	S18W67	336																

0 0 0 1 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 340



**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 8439</i>																	
12 Jan	S24E75	277	0160	08	CAO	005	B					4					
13 Jan	S24E65	269	0260	12	EAI	011	BG	3					5				
14 Jan	S24E53	268	0270	14	EAI	019	B	2					5				
15 Jan	S24E41	267	0270	14	EAI	024	BG	1				1	1				
16 Jan	S24E28	266	0270	15	EAI	031	B	2					3				
17 Jan	S24E14	267	0210	16	FAO	040	B	4					7				
18 Jan	S24E00	268	0240	16	FAI	046	BG	14	1			23	1				
19 Jan	S23W13	268	0300	17	FAI	044	BG	5					14				
20 Jan	S24W28	270	0290	16	FAI	034	BG	1					5				
21 Jan	S23W42	271	0410	14	EAC	023	BG						5				
22 Jan	S23W57	272	0480	12	EKC	020	BG	3					14	1			
23 Jan	S23W70	272	0390	13	EHC	023	BG	10					13	2			
24 Jan	S23W82	271	0260	15	EKO	012	BG	1					2				
								46	1	0	101	5	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 268

<i>Region 8440</i>																	
13 Jan	N21E70	264	0060	04	CAO	005	B	4					9	2			
14 Jan	N19E56	265	0190	07	DAO	012	B	7	2				17	1			
15 Jan	N20E42	266	0300	10	DAI	026	BG	14	1				16	4			
16 Jan	N19E29	265	0360	12	EAI	031	BG	13	1				14	1			
17 Jan	N19E16	265	0300	14	EAI	042	BG	9					15				
18 Jan	N19E03	265	0310	16	FSI	054	B	6	1				6	2			
19 Jan	N19W10	265	0300	15	EAI	049	BG	2					9				
20 Jan	N19W24	266	0300	16	FAI	039	BG	1					1				
21 Jan	N19W37	266	0330	16	FAI	025	B	1					2				
22 Jan	N19W50	265	0360	17	FHI	021	BG	1	1				12				
23 Jan	N19W63	265	0270	17	FAI	017	BG										
24 Jan	N19W79	268	0150	16	FSO	007	BG						2				
								58	6	0	103	10	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 265



***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 8441***

14 Jan	N18E28	293	0000	02	AXX	002	A												
15 Jan	N17E14	294	0010	03	BXO	004	B												
16 Jan	N17E00	294	0010	03	BXO	003	B												
17 Jan	N17W13	294																	
18 Jan	N17W26	294																	
19 Jan	N17W39	294																	
20 Jan	N18W49	291																	
21 Jan	N18W62	291																	
22 Jan	N18W75	291																	
																			0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 294

***Region 8442***

17 Jan	N24W16	297	0030	04	DSO	008	B												
18 Jan	N25W29	297	0080	07	DAO	015	B	1				1							
19 Jan	N24W41	296	0070	06	DAO	011	BGD												
20 Jan	N24W55	297	0100	07	CAO	007	B												
21 Jan	N24W69	298	0040	04	CSO	004	B							2					
22 Jan	N25W80	295	0040	02	CRO	003	B							4					
																			1 0 0 7 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 297

***Region 8443***

18 Jan	S18E65	203	0010	15	BXO	003	B												
19 Jan	S17E55	200	0010	11	BXO	003	B												
20 Jan	S17E45	197	0000	01	AXX	001	A							1					
21 Jan	S16E34	195	0010	01	HRX	001	A												
22 Jan	S17E20	195	0000	01	AXX	002	A												
23 Jan	S18E07	195	0010	01	CRO	002	B												
24 Jan	S15W04	193	0000	03	BXO	002	B												
																			0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 193



**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 8444*

19 Jan	N19E20	235	0000	01	AXX	002	A											1
20 Jan	N19E05	237	0000	01	AXX	002	A											
21 Jan	N20W04	233	0020	06	CSO	007	B											1
22 Jan	N19W14	229	0060	06	DAO	008	B	1										1
23 Jan	N20W27	229	0070	07	DAO	010	BG											
24 Jan	N20W39	228	0070	06	DSO	008	B	1										6
								2	0	0	0	9	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 233

*Region 8445*

19 Jan	N10E25	230	0000	03	BXO	002	B											
20 Jan	N12E10	232	0000	03	BXO	002	B											
21 Jan	N12W03	232																
22 Jan	N12W16	232																
23 Jan	N12W29	232																
								0	0	0	0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 232

*Region 8446*

21 Jan	N14E60	169	0010	04	BXO	003	B											
22 Jan	N15E46	169	0000	03	BXO	002	B											
23 Jan	N14E33	169	0010	01	AXX	002	A											
24 Jan	N15E19	170	0000	01	AXX	001	A											1
								0	0	0	1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 170

*Region 8447*

22 Jan	N19W20	235	0030	03	CRO	004	B	1										1
23 Jan	N19W34	236	0010	03	BXO	003	B											2
24 Jan	N20W46	235	0030	05	BXO	006	B											1
								1	0	0	4	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 235

*Region 8448*

24 Jan	S16E22	167	0000	01	AXX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 167



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

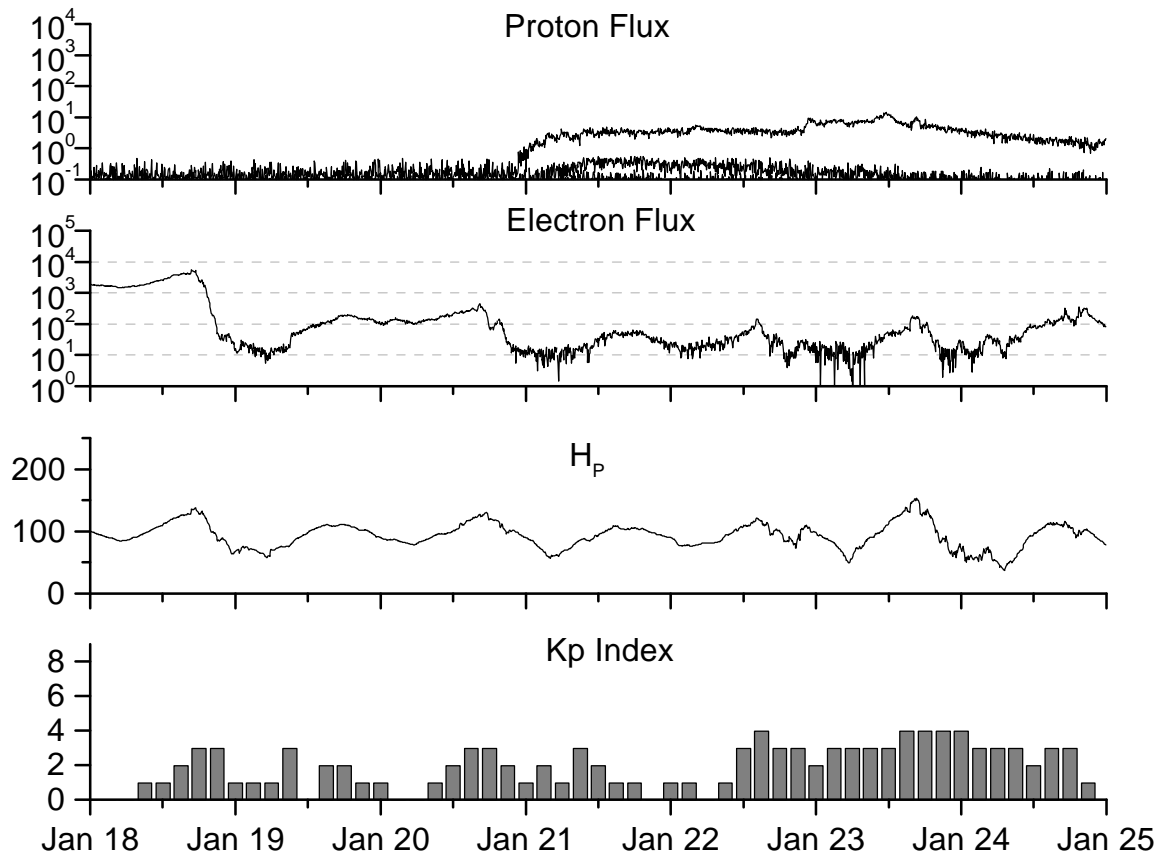
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>1997</b>									
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	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
<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			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*	
November	99.5	73.6*	0.74*			140.2*		16*	
December	120.8	81.6*	0.68*			150.1*		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 18 January 1999*

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

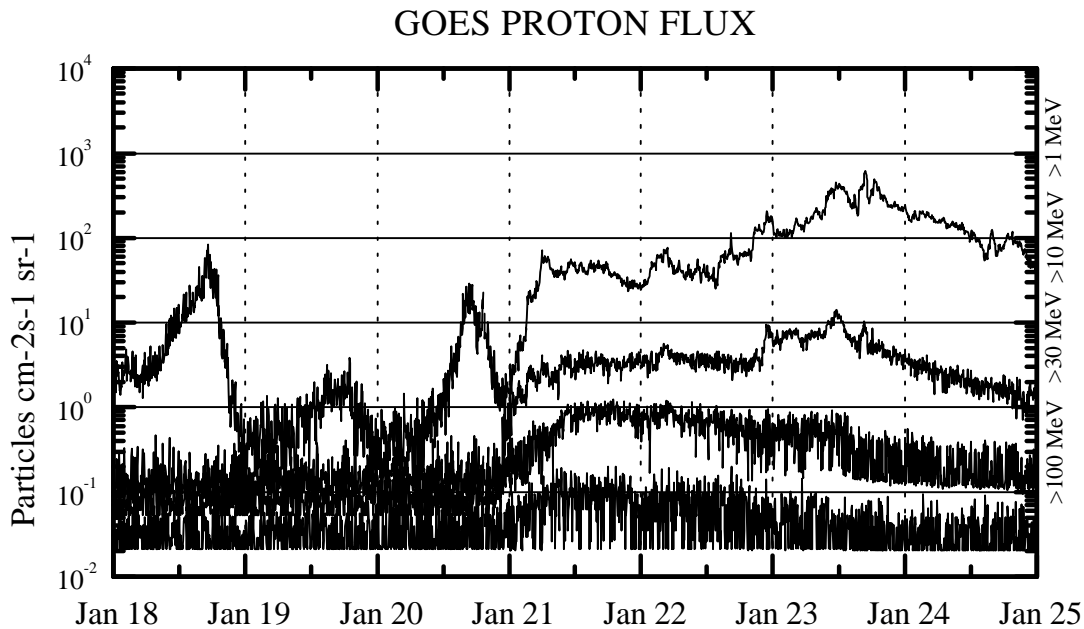
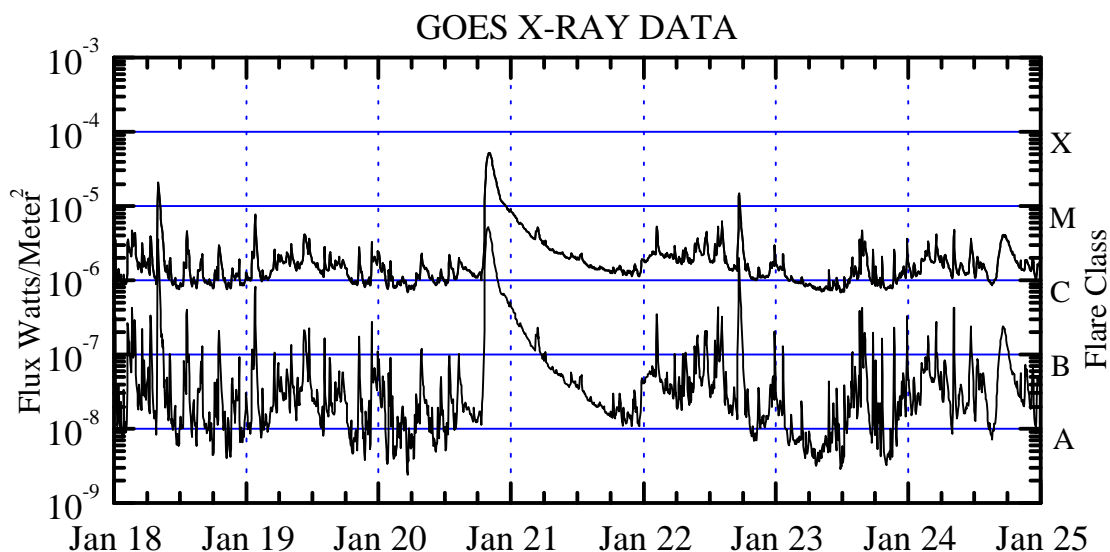
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/  $\text{cm}^2$ -sec-sr) with energies greater than 2 MeV at GOES-8.

*$H_p$*  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.

*Kp* 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 Kp 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 Kp are "global" parameters that are applicable to a first order approximation over large areas.  $H_{\text{parallel}}$  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/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.

