

**Space Weather Highlights
20 – 26 Dec 1999**

Solar activity ranged from low to high levels. Activity was low through 20 December with only C-class subflares. Regions 8806 (N19, L=114, class/area Fhc on 23 Dec) and 8807 (N11, L = 111, class/area Cao on 20 Dec) were the most active. Region 8798 (S13, L = 171, class/area Dkc on 17 Dec) was large and magnetically complex as was Region 8806. Both showed delta configurations. On 21 December activity increased from low to moderate due to an M1/1N at 21/1719UT. The activity level increased to high on 22 December when Region 8806 produced an M5/1B event at 22/1904UT with a 280sfu 10cm flare. Region 8807 produced an M1/2B with parallel ribbons at 22/0216UT and with a Type II sweep event. The level of activity returned to low 23 through 26 December. Minor C-class flares continued from regions 8798, 8806, and 8810. Region 8798 slowly decayed before it rotated from view on December 26. Region 8806 has retained a beta gamma delta configuration. Region 8810 (N35, L = 024, class/area Eko on 26 Dec) rotated into view on 24 December as a large spot group.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Solar wind characteristics commonly associated with CME effects were observed on 24-25 December with velocities as high as 640 km/sec and sustained periods of southward IMF Bz with deflections to minus 18 nT (GSM) early on 24 December. Solar wind flow returned to nominal conditions by 26 December.

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

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels most of the period.

The geomagnetic field was disturbed on 24 and 25 December with brief active to minor storm periods due to CME effects. The geomagnetic field was mostly quiet the remainder of the period.

**Space Weather Outlook
29 December 1999 - 24 January 2000**

Solar activity is expected to range from low to moderate levels. Occasional to frequent C-class flares and isolated M-class flares are likely throughout the period. Region 8806 may provide a chance for an isolated major flare sometime during the first part of the period until the region rotates off the disk on 31 December.

There is a chance for a proton event at geosynchronous orbit from Region 8806.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels during 01 - 05 January. Otherwise, normal to moderate levels are expected.

The geomagnetic field is expected to be at unsettled to minor storm levels during 31 December - 03 January due to recurrent coronal hole effects. Quiet to unsettled levels are expected for the rest of the period, barring any Earth-directed CMEs.



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
20 December	209	149	1860	C1.6	9	0	0	20	1	0	0	0
21 December	217	129	1720	C1.1	7	1	0	9	1	0	0	0
22 December	202	130	1720	C1.4	5	2	0	15	2	1	0	0
23 December	198	112	1780	B8.2	8	0	0	21	0	0	0	0
24 December	182	149	1690	B8.9	17	0	0	8	0	0	0	0
25 December	178	141	1580	B7.0	10	0	0	5	0	0	0	0
26 December	177	125	1550	B8.9	9	0	0	6	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
20 December	4.7E+4	1.4E+4	3.5E+3		1.3E+6	
21 December	3.6E+4	1.3E+4	3.4E+3		1.5E+6	
22 December	4.8E+4	1.3E+4	3.4E+3		2.1E+6	
23 December	4.3E+5	1.4E+4	3.4E+3		3.5E+6	
24 December	2.7E+5	1.4E+4	3.3E+3		9.7E+4	
25 December	1.6E+5	1.3E+4	3.0E+3		1.0E+5	
26 December	6.4E+4	1.2E+4	2.6E+3		1.0E+5	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 December	4	0-0-1-2-2-2-2-2	1	0-0-1-1-0-0-0-0	3
21 December	1	0-0-1-0-1-0-0-0	7	0-0-1-1-0-0-0-5	2	0-0-1-1-1-1-0-1
22 December	1	0-0-0-0-0-0-2-0	0	0-0-0-0-0-0-0-0	2	0-0-0-0-1-1-1-1
23 December	2	0-0-0-1-1-2-0-2		*_*_*_*_*_*_*_*_*_*	5	0-0-0-1-2-2-2-1
24 December	11	3-3-3-2-2-2-2-3		*_*_*_*_*_*_*_*_*_*	10	2-3-3-4-2-2-1-2
25 December	10	2-2-3-2-4-2-1-1	18	1-4-3-3-5-4-1-1	10	1-2-4-2-4-3-1-2
26 December	2	1-0-0-0-1-1-0-2	0	0-0-0-1-0-0-0-0	2	1-0-0-0-0-1-1-1

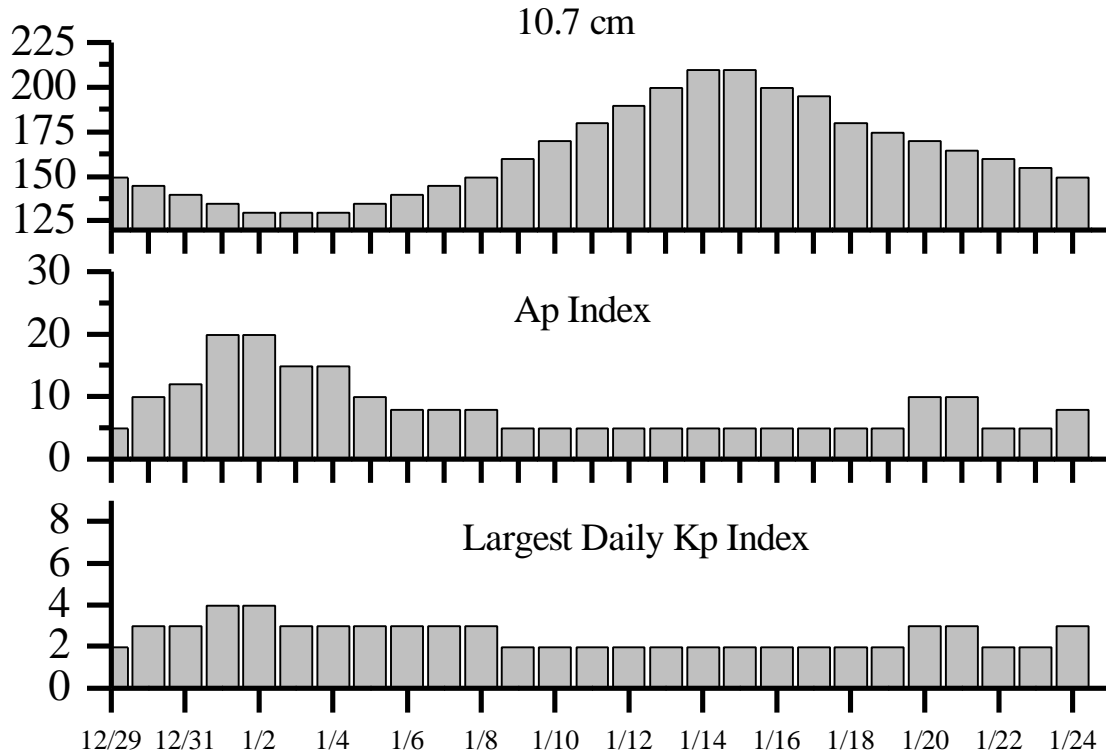


Alerts and Warnings Issued

Date & Time of Issue (UT)	Type of Alert or Warning	Date & Time of Event (UT)
22 Dec 0019	7 - 245 MHz Bursts	21 Dec
22 Dec 0019	245 MHz Noise Storm	21 Dec
22 Dec 0231	Type II Radio Emission	22 Dec 0201
22 Dec 1919	X-Ray event M5/1B	22 Dec 1852
23 Dec 0020	6-245 MHz Bursts	22 Dec
23 Dec 0020	245 MHz Noise Storm	22 Dec
23 Dec 0025	10cm Radio Burst 280 s.f.u.	22 Dec 1901
24 Dec 0016	5-245 MHz Bursts	23 Dec
24 Dec 0016	245 MHz Noise Storm	23 Dec
24 Dec 1205	K= 4 Observed	24 Dec 09- 12
25 Dec 0022	4-245 MHz Bursts	24 Dec
25 Dec 0022	245 MHz Noise Storms	24 Dec
25 Dec 0649	K= 4 Warning	25 Dec 09- 18
25 Dec 0906	K= 4 Observed	25 Dec 06- 09
26 Dec 0045	3-245 MHz Bursts	25 Dec
26 Dec 0045	245 MHz Noise Storms	25 Dec



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
29 Dec	150	5	2	12	190	5	2
30	145	10	3	13	200	5	2
31	140	12	3	14	210	5	2
01 Jan 2000	135	20	4	15	210	5	2
02	130	20	4	16	200	5	2
03	130	15	3	17	195	5	2
04	130	15	3	18	180	5	2
05 Jan	130	10	3	19	175	5	2
06	140	8	3	20	170	10	3
07	145	8	3	21	165	10	3
08	150	8	3	22	160	5	2
09	160	5	2	23	155	5	2
10	170	5	2	24	150	8	3
11	180	5	2				



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
21 Dec	1712	1719	1722	M1.1	.004	1N	N24E34	8806	190	70		
22 Dec	0150	0216	0232	M1.8	.027	2B	N10E30	8807	57	2		
22 Dec	1852	1904	1908	M5.3	.018	1B	N24E19	8806	210	280		

Flare List

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
20 December	0104	0108	0116	C4.8	SF	S15W06	8798
	0126	0130	0133		SF	N23E52	8806
	0143	0144	0148	C4.6	SF	N18E47	8806
	0154	0157	0201		SF	N18E55	8806
	0206	0207	0210	SF	N18E52	8806	
	0223	0224	0230	SF	N18E52	8806	
	0242	0242	0257	SF	S13W17	8803	
	0413	0416	0420	C4.4	SF	N18E49	8806
	0435	0437	0442		SF	N18E45	8806
	0816	0819	0829	SF	N18E43	8806	
	0820	0823	0828	SF	S13W11	8798	
	0856	0907	0931	C2.8	1F	N10E54	8807
	1017	1020	1027				
	1325	1326	1331	SF	N22E45	8806	
	1509	1510	1518	SF	S16W16	8798	
	1512	1520	1529	C3.3	SF	N10E49	8807
	1604	1606	1617		SF	N18E44	8806
	1924	1937	1954	C1.5	SF	N20E42	8806
	1950	1953	2000		SF	S12W16	8798
	2027	2038	2058	SF	S12W18	8798	
2113	2116	2120	SF	N20E41	8806		
2230	2231	2240	C2.5	SF	N20E40	8806	
21 December	0102	0108		0109	C3.2	SF	N18E34
	0239	0241	0246	C1.3	SF	N10E44	8807
	0302	0314	0331	C1.4			
	0736	0738	0747	SF	N18E36	8806	
	0830	0832	0849	C1.5	SF	N19E36	8806
	B1032	U1035	1041	C2.0	SF	S15W26	8798
	1522	1524	1541		SF	N20E32	8806
	1714	1719	1805	M1.1	1N	N24E34	8806
	B1854	U1854	A1907		SF	N22E37	8806
	2141	2146	2149	C2.6			
2332	2333	2342	C3.4	SF	S13W43	8803	
2358	2359	0008		SF	N18E21	8806	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
22 December	0001	0009	0015	C4.3	SF	S13W43	8803
	0112	0121	0133	C2.7	SF	N10E27	8807
	B0147	U0155	0300		1F	N29E29	
	0207	0213	0306	M1.8	2B	N10E30	8807
	0236	0238	0250		SF	N19E26	8806
	0409	0411	0416		SF	N18E19	8806
	0428	0439	0533		SF	N19E18	8806
	0445	0506	0520		SF	S13W46	8803
	0501	0512	0527		SF	S14W39	8798
	0642	0643	0659		SF	N15E18	8806
	0843	0843	0847		SF	S14W38	8798
	1050	1056	1101	C6.3			
	1246	1249	1253	C2.2			
	1350	1358	1412	C3.1	SF	S15W53	8803
	1415	1416	1422		SF	N24E22	8806
	1624	1625	1633		SF	N25E24	
	1838	1841	1845		SF	S18W27	8808
	1855	1903	1929	M5.3	1B	N24E19	8806
	2131	2132	2141		SF	S18W32	8808
	2133	2137	2149		SF	S14W47	8798
23 December	0033	0033	0036		SF	N23E16	8806
	0109	0112	0120		SF	S13W51	8798
	0126	0126	0133		SF	S13W51	8798
	0132	0132	0138		SF	S18W34	8808
	0241	0244	0246	C1.5			
	0314	0315	0325	C1.6	SN	N24E15	8806
	0339	0340	0400		SF	S14W59	8803
	0420	0421	0426		SF	N33E17	
	0432	0435	0454		SF	S13W59	8803
	0506	0507	0515		SF	N20E07	8806
	0546	0551	0558		SF	N33E15	
	0627	0628	0634		SF	N20E06	8806
	0702	0711	0719	C2.5			
	0809	0810	0822		SF	S13W51	8798
	0842	0847	0900		SF	S13W51	8798
	1007	1008	1017	C2.9	SF	N23E11	8806
	1103	1107	1112	C2.8			
	1521	1529	1533		SF	S15W58	8803
1725	1729	1825	C1.5	SF	S15W58	8803	
1726	1733	1739		SF	S13W55	8798	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
23 December	1921	1923	1940		SF	S15W71	8803
	1933	1936	1946	C3.4	SF	N24E06	8806
	1954	1955	2000	C3.7	SF	S19W45	8808
	2358	0004	0022		SF	N12E01	8807
24 December	0053	0102	0111	C2.8			
	0217	0224	0230	C3.7			
	0409	0409	0417		SF	N11W01	8807
	0423	U0431	0442		SF	N11W01	8807
	0456	0501	0508		SF	N11W02	8807
	B0530	U0532	A0538	C3.1	SN	N20W06	8806
	0556	0600	0604	C2.6			
	0621	0626	0629	C2.3			
	0803	0807	0822	C2.1			
	0928	0934	0943	C8.4			
	1204	1210	1223	C1.9			
	1245	1252	1254		SF	N15W14	8806
	1311	1314	1317	C1.2			
	1443	1446	1448	C1.3			
	1459	1504	1509	C1.8			
	1511	1516	1521	C1.9			
	1548	1551	1617	C1.7	SF	N20W13	8806
	1642	1643	1651	C2.4	SF	S15W71	8798
	1830	1831	1851	C4.4	SF	S16W73	8798
	2211	2216	2221	C1.7			
	2243	2247	2253	C1.4			
	25 December	0132	0135	0144	C1.1		
0146		0155	0158	C1.9			
0615		0627	0632	C1.2			
0633		0643	0652	C1.5			
1005		1005	1009		SF	N20W22	8806
1014		1015	1025		SF	N37E68	8810
1124		1129	1133	C6.2			
1200		1204	1208	C1.2			
1718		1732	1811	C3.3	SF	N21W28	8806
1722		1722	1731		SF	N38E71	8810
2052		2057	2121	C2.4	SF	N09W29	8807
2207		2211	2213	C1.6			
2220	2224	2230	C1.6				



Flare List-continued

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn #
	Begin	Max	End			Location Lat CMD	
26 December	0206	0207	0210		SF	N20W31	8806
	0426	0427	0431	C2.2	SF	N19W36	8806
	0554	0559	0602	C1.2			
	0754	0756	0759		SF	N36E64	8810
	0901	0901	0908	C3.3	SF	N36E59	8810
	0954	0956	1000		SF	N22W33	8806
	1126	1130	1135	C2.2			
	1336	1342	1350	C2.3			
	1616	1619	1625	C1.7	SF	N21W26	8806
	1655	1702	1709	C2.0			
	1916	1924	1951	C2.7			
	2142	2146	2149	C1.6			

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

Region 8794

08 Dec	S14E74	236	0030	03	HSX	001	A										
09 Dec	S15E58	239	0050	01	HSX	001	A	1			1						
10 Dec	S14E44	240	0030	01	HSX	001	A				1						
11 Dec	S15E31	240	0030	03	CSO	002	B	1			1						
12 Dec	S14E19	239	0030	03	CSO	002	B										
13 Dec	S13E05	239	0020	05	CSO	005	B										
14 Dec	S13W08	239	0010	01	HSX	001	A										
15 Dec	S14W20	238	0020	09	BXO	006	B										
16 Dec	S14W27	232	0030	11	BXO	010	B	1			1						
17 Dec	S14W40	232	0020	09	BXO	010	B										
18 Dec	S16W53	231	0000	01	AXX	002	A										
19 Dec	S16W66	231						1			2						
20 Dec	S16W79	231															
21 Dec	S16W92	231															
								4	0	0	6	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 239



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 8797

13 Dec	S35E10	234	0000	04	BXO	004	B										
14 Dec	S34W02	233	0080	06	DAO	007	B										
15 Dec	S33W16	234	0090	07	DSO	010	B										
16 Dec	S32W29	234	0090	07	DSO	011	B										
17 Dec	S33W41	233	0060	08	DSO	010	B										
18 Dec	S32W57	235	0010	01	AXX	002	A										
19 Dec	S32W65	230	0000	00	AXX	001	A										
20 Dec	S32W78	230															
21 Dec	S32W91	230															
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 233

Region 8798

13 Dec	S14E74	170	0020	05	BXO	004	B										
14 Dec	S13E60	171	0100	05	DAO	005	B	1				4					
15 Dec	S14E48	170	0280	07	DKC	014	B	2				7					
16 Dec	S14E34	171	0410	08	DKC	026	B	2				5					
17 Dec	S13E21	171	0550	10	DKC	048	BGD	4				6	3				
18 Dec	S13E07	171	0490	11	EKI	055	BGD	2				4	1				
19 Dec	S13W06	171	0500	11	EKI	041	BGD	1				3					
20 Dec	S14W21	173	0460	12	EAI	043	BD	1				5					
21 Dec	S13W33	172	0450	11	EKC	031	BGD	1				1					
22 Dec	S13W47	173	0350	11	EKI	030	BGD					3					
23 Dec	S14W59	172	0370	09	DKO	013	BG					5					
24 Dec	S13W73	172	0280	09	DAO	012	BG	2				2					
25 Dec	S13W86	172	0240	07	DAO	006	B										
									16	0	0	45	4	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 171



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 8800

14 Dec	N11E60	171	0020	01	HRX	001	A										
15 Dec	N09E47	171	0000	00	AXX	001	A										
16 Dec	N09E33	172	0010	00	AXX	001	A										
17 Dec	N10E18	174	0000	00	AXX	001	A										
18 Dec	N10E04	174	0000	00	AXX	001	A										
19 Dec	N10W09	174															
20 Dec	N10W22	174															
21 Dec	N10W35	174															
22 Dec	N10W48	174															
23 Dec	N10W61	174															
24 Dec	N10W74	174															
25 Dec	N10W87	174															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 174

Region 8801

14 Dec	S23W01	232	0000	02	BXO	002	B										
15 Dec	S22W13	231	0010	05	BXO	004	B										
16 Dec	S22W26	231															
17 Dec	S22W39	231															
18 Dec	S22W52	231															
19 Dec	S22W65	231															
20 Dec	S22W78	231															
21 Dec	S22W91	231															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 232

Region 8802

16 Dec	S23E04	201	0010	03	BXO	004	B										
17 Dec	S23W09	201															
21 Dec	S23W61	201															
22 Dec	S23W74	201															
23 Dec	S23W87	201															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 201



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			
	<i>Region</i>	<i>8803</i>																
16 Dec	S14E24	181	0040	04	CRO	012	B											
17 Dec	S13E10	182	0070	06	DAO	012	B	1			1							
18 Dec	S13W02	180	0100	06	DAO	019	BG											
19 Dec	S13W16	181	0070	06	DAO	013	B											
20 Dec	S13W31	183	0030	04	DSO	008	B				1							
21 Dec	S13W43	182	0020	04	BXO	007	B	1			1							
22 Dec	S14W57	183	0050	06	DAO	006	B	2			3							
23 Dec	S14W69	182	0030	06	DSO	004	B	1			5							
24 Dec	S13W80	179	0000	03	BXO	003	B											
									5	0	0	11	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 180

Region 8804

16 Dec	S18E78	127	0120	05	HSX	001	A											
17 Dec	S17E66	126	0150	03	HAX	001	A											
18 Dec	S19E54	124	0210	05	CHO	003	B											
19 Dec	S19E43	122	0250	05	CHO	003	B											
20 Dec	S20E29	123	0290	07	CHO	002	B											
21 Dec	S18E15	124	0280	03	HHX	001	A											
22 Dec	S18E02	124	0240	03	HSX	001	A											
23 Dec	S18W11	124	0250	03	HHX	001	A											
24 Dec	S18W25	124	0300	05	HHX	002	A											
25 Dec	S17W38	124	0220	07	CHO	003	B											
26 Dec	S17W51	124	0260	08	CHO	005	B											
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 124

Region 8805

17 Dec	N18W27	219	0010	01	AXX	002	A											
18 Dec	N18W41	219	0000	00	AXX	001	A											
19 Dec	N18W54	219																
20 Dec	N18W67	219																
21 Dec	N18W80	219																
									0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 219



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 8806

17 Dec	N18E71	121	0320	16	FHO	004	B											1	
18 Dec	N19E62	116	0630	17	FKI	013	BG	6	1			12	3						
19 Dec	N19E50	115	0890	17	FKC	020	BG	4				6							
20 Dec	N19E37	115	1040	19	FKI	028	BGD	5				13							
21 Dec	N19E24	115	0940	19	FHC	033	BGD	2	1			6	1						
22 Dec	N19E12	114	1050	19	FKC	037	BG			1		5	1						
23 Dec	N19W01	114	1100	20	FHC	028	BGD	3				6							
24 Dec	N20W14	113	1050	19	FKC	048	BD	2				3							
25 Dec	N20W28	114	0930	19	FKC	043	BGD	1				2							
26 Dec	N21W41	114	0900	19	FKC	039	BGD	2				4							
								25	3	0	58	5	0	0	0				

Still on Disk.

Absolute heliographic longitude: 114

Region 8807

18 Dec	N11E68	110	0030	06	CSO	004	B												
19 Dec	N11E57	108	0040	04	CSO	004	B	1				3							
20 Dec	N10E44	108	0040	06	CAO	006	B	2				1	1						
21 Dec	N11E29	110	0030	05	CSO	007	B	1				1							
22 Dec	N10E16	110	0030	05	DAO	006	B	1	1			1		1					
23 Dec	N11E02	111	0020	05	CAO	005	B					1							
24 Dec	N12W11	110	0020	08	BXO	010	B					3							
25 Dec	N11W23	109	0010	06	BXO	006	B	1				1							
26 Dec	N11W37	110	0010	06	BXO	005	B												
								6	1	0	11	1	1	0	0				

Still on Disk.

Absolute heliographic longitude: 111

Region 8808

19 Dec	S19E06	159	0000	03	BXO	002	B												
20 Dec	S18W08	160	0000	01	AXX	002	A												
21 Dec	S18W21	160																	
22 Dec	S18W34	160										2							
23 Dec	S18W47	160	0010	01	HAX	001	A	1				2							
24 Dec	S18W60	160																	
25 Dec	S18W73	160																	
26 Dec	S18W86	160																	
								1	0	0	4	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 159



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 8809

24 Dec	N21E67	032	0010	06	BXO	003	B												
25 Dec	N21E54	032	0030	06	CSO	006	B												
26 Dec	N21E41	032	0030	07	BXO	007	B												
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 032

Region 8810

24 Dec	N35E75	024	0030	01	HSX	001	A												
25 Dec	N36E64	022	0150	13	ESO	005	B												
26 Dec	N36E54	019	0350	15	EKO	008	B												
												1							
												1	0	0	4	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 019

Region 8811

25 Dec	S28W16	102	0000	01	AXX	002	A												
26 Dec	S28W29	102	0000	00	AXX	001	A												
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 102

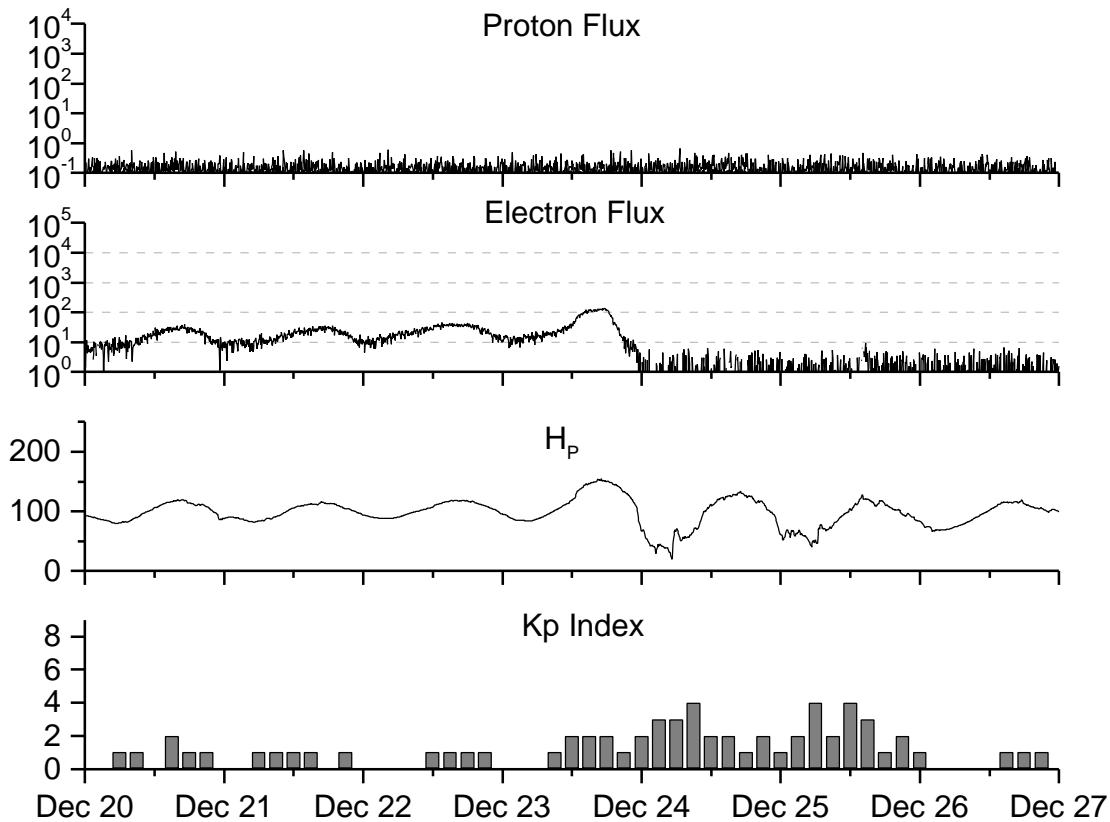


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
1997									
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	11.1
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
1999									
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	131.7	90.4	148.6	150.0	08	12.1
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	
November	199.3	132.7	0.67			191.7		12	

NOTE: All smoothed values after January 1998 and monthly values after September 1998 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 20 December 1999

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.

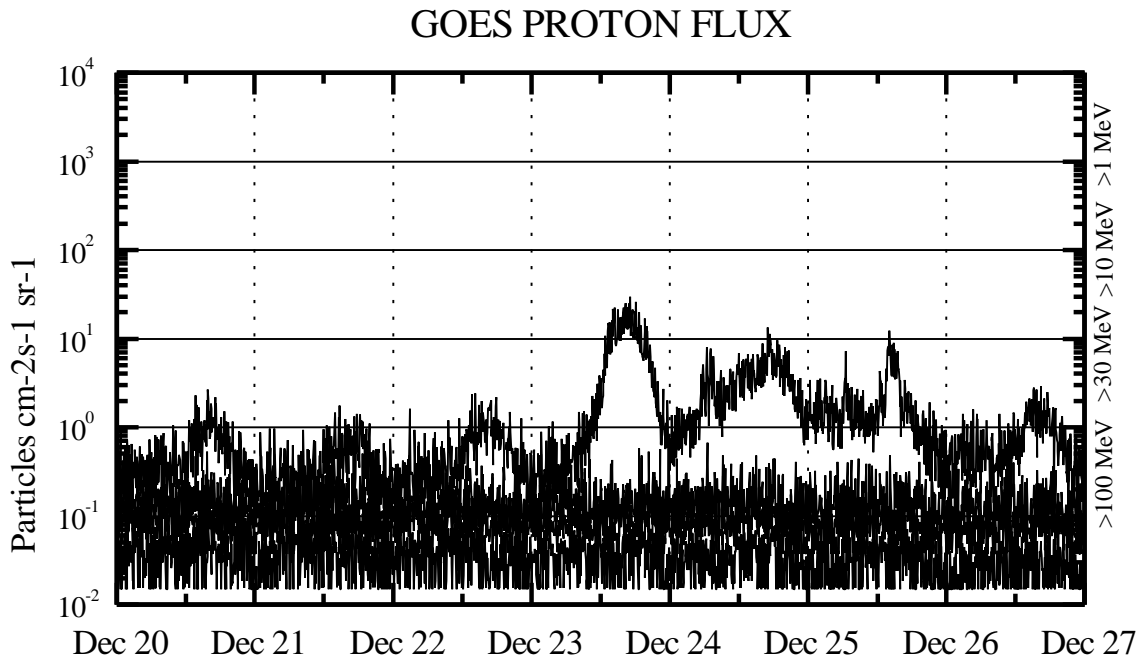
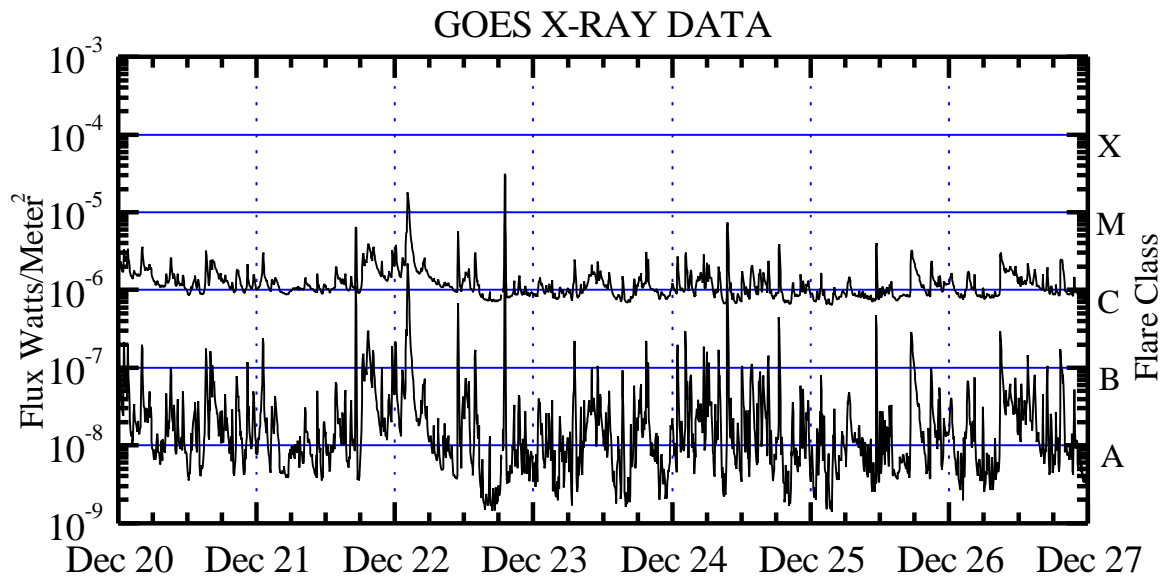
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

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_p 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.

