

**Space Weather Highlights**  
**04 – 10 December 2006**

**SEC PRF 1632**  
**12 December 2006**

Solar activity ranged from very low to high levels. Activity was low during 04 December due to frequent C-class flares as Region 930 (S05, L = 009, class/area Dkc/490 on 06 December) rotated into view. Activity increased to high levels on 05 and 06 December as Region 930 produced three major flares: an X9/2N at 05/1035 UTC associated with Types II (est. velocity 860 km/sec) and IV radio sweeps and a 12000 sfu Tenflare, an M6/SF at 06/0823 UTC associated with a Type IV radio sweep and 340 sfu Tenflare, and an X6/3B at 06/1847 UTC. Activity decreased to moderate levels on 07 December due to an M2/1N flare at 07/1913 UTC from Region 930. Activity ranged from very low to low levels during the rest of the period.

Greater than 10 MeV and greater than 100 MeV proton events were associated with the X9/2N flare of 05 December. The greater than 10 MeV event began at 06/1555 UTC, reached a maximum of 1980 pfu at 07/1930 UTC, and was in progress at the time of this report. The greater than 100 MeV proton event began at 07/1540 UTC, reached a maximum of 19 pfu at 07/1610 UTC, and ended at 08/0650 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels during 07 – 10 December.

Field activity was at quiet levels during 04 – 05 December. Activity increased to unsettled to minor storm levels on 06 December with periods of major to severe storm levels at high latitudes. This increase was due to a recurrent coronal hole high-speed stream. The field remained disturbed for the rest of the period with quiet to active levels and periods of minor to major storm at high latitudes. ACE data showed increased velocities beginning 05 December, which continued through the period. Velocities peaked at 632 km/sec at 07/0553 UTC. Maximum southward IMF Bz during the disturbance was – 11 nT at 06/1057 UTC.

**Space Weather Outlook**  
**13 December 2006 – 08 January 2007**

Solar activity is expected to be at very low to moderate through 18 December with isolated major flare activity possible. Activity is expected to decrease to very low to low levels during 19 - 30 December with the departure of Region 930 on 18 December. Activity is expected to increase to low to moderate levels during 31 December – 08 January with the return of Region 930.

A greater than 10 MeV proton event is possible until Region 930 departs the disk on 18 December. No proton events are expected during the rest of the period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels during 13 and 22 - 25 December and 04 – 08 January.

The geomagnetic field is expected to be at active levels through 14 December. Quiet levels are predicted during 15 – 19 December. Activity is expected to increase to unsettled to minor storm levels during 20 – 23 December and 02 – 04 January due to a recurrent coronal hole high-speed wind stream. Quiet to unsettled levels are expected during the rest of the period.



**Daily Solar Data**

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
04 December	92	43	190	B1.1	11	0	0	1	0	0	0	0
05 December	102	59	620	B4.1	9	1	1	8	1	1	0	0
06 December	103	44	620	B5.3	13	3	1	10	0	0	1	0
07 December	96	48	520	B1.7	5	1	0	3	2	0	0	0
08 December	96	32	470	A9.7	0	0	0	0	0	0	0	0
09 December	92	13	380	A6.5	1	0	0	1	0	0	0	0
10 December	90	23	440	A5.7	0	0	0	2	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)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	04 December	3.8E+5	1.6E+4	3.9E+3		2.3E+7
05 December	1.4E+6	7.7E+4	5.5E+3		2.9E+7	
06 December	3.8E+6	8.8E+5	1.3E+4		1.4E+6	
07 December	2.4E+8	6.7E+7	9.8E+5		7.8E+7	
08 December	7.0E+8	6.5E+7	3.1E+5		1.0E+8	
09 December	1.2E+8	1.8E+7	5.5E+4		5.0E+7	
10 December	6.6E+7	8.6E+6	9.7E+3		1.0E+8	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	04 December	1	0-0-0-0-0-1-1-0	0	0-0-0-0-0-0-0-0	1
05 December	2	0-0-0-0-1-1-1-1	2	0-0-0-1-1-1-1-1	2	0-0-0-0-0-1-1-2
06 December	15	3-3-2-3-3-2-4-3	52	2-4-3-7-6-6-5-3	28	3-4-3-5-5-3-5-3
07 December	14	4-3-4-3-3-2-1-2	46	5-4-6-6-6-4-3-3	25	5-4-5-4-4-3-3-3
08 December	17	4-4-3-3-3-2-3-3	48	4-5-6-6-6-5-3-2	25	3-5-3-5-3-3-3-3
09 December	6	1-1-1-0-0-1-2-4	13	4-3-2-2-0-3-3-3	7	1-1-1-0-0-1-2-4
10 December	8	1-2-1-2-3-3-2-2	29	3-2-3-5-6-5-3-2	14	2-3-1-3-4-4-3-3



### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UTC</u>
04 Dec 2206	WATCH: Geomagnetic A>20	07 Dec
05 Dec 1029	ALERT: X-Ray Flux >M5	05 Nov - 1028
05 Dec 1103	SUMMARY: 10cm Radio Burst	05 Dec - 1030
05 Dec 1105	ALERT: Type II	05 Dec - 1034
05 Dec 1122	SUMMARY: X-ray Event >X1	05 Dec - 1035
05 Dec 1129	ALERT: Type IV	05 Dec - 1034
05 Dec 1206	SUMMARY: 10cm Radio Burst	05 Dec - 1116
05 Dec 1207	SUMMARY: 10cm Radio Burst	05 Dec - 1129
05 Dec 1208	SUMMARY: 10cm Radio Burst	05 Dec - 1146
05 Dec 2104	WATCH: Geomagnetic A>20	08 Dec
06 Dec 0409	WARNING: Geomagnetic K=4	06 Dec 0410 - 1600
06 Dec 0821	ALERT: X-Ray Flux >M5	06 Dec 0820
06 Dec 0934	SUMMARY: X-ray Event >M5	06 Dec 0823
06 Dec 0941	ALERT: Type IV	06 Dec 0915
06 Dec 0943	SUMMARY: 10cm Radio Burst	06 Dec 0836
06 Dec 0945	WARNING: Proton 10MeV Integral Flux >10pfu	06 Dec 0945 - 2359
06 Dec 1041	ALERT: Geomagnetic K=4	06 Dec 1040
06 Dec 1057	ALERT: Geomagnetic K=5	06 Dec 1056
06 Dec 1232	WARNING: Geomagnetic K=5	06 Dec 1232 - 1600
06 Dec 1556	EXTENDED WARNING: Geomagnetic K=5	06 Dec 1232 - 07/1600
06 Dec 1616	ALERT: Proton Event 10MeV Integral Flux >10pfu	06 Dec 1555
06 Dec 1844	ALERT: X-Ray Flux >M5	06 Dec 1843
06 Dec 1904	ALERT: Type IV	06 Dec 1844
06 Dec 1907	SUMMARY: X-ray Event >X1	06 Dec 1847
06 Dec 1928	ALERT: Type II	06 Dec 1842
06 Dec 2018	SUMMARY: 10cm Radio Burst	06 Dec 1945
06 Dec 2321	EXTENDED WARNING: Proton 10MeV Flux >10pfu	07 Dec 2359
07 Dec 0009	WARNING: Proton 100MeV Integral Flux >1pfu	07 Dec 0015 - 1600
07 Dec 0101	CONTINUED ALERT: Proton Event 10MeV Flux >10pfu	06 Dec 1555
07 Dec 0130	ALERT: Proton Event 100MeV Integral Flux >1pfu	07 Dec 0115
07 Dec 0350	ALERT: Proton Event 10MeV Integral Flux >100pfu	07 Dec 0345
07 Dec 1441	ALERT: Electron 2MeV Integral Flux >1000pfu	07 Dec 1350
07 Dec 1547	EXTENDED WARNING: Proton 100MeV Flux >1pfu	08 Dec 1600
07 Dec 1600	ALERT: Proton Event 10MeV Integral Flux >1000pfu	07 Dec 1540
07 Dec 1815	WATCH: Geomagnetic A>30	08 Dec
07 Dec 1816	WATCH: Geomagnetic A>30	09 Dec
07 Dec 1921	SUMMARY: 10cm Radio Burst	07 Dec 1905
07 Dec 2300	WATCH: Geomagnetic A>30	10 Dec
07 Dec 2303	WATCH: Geomagnetic A>30	08 Dec
07 Dec 2313	EXTENDED WARNING: Proton 10MeV Flux >10pfu	08 Dec 2359
08 Dec 0024	WARNING: Geomagnetic K=4	08 Dec 0025 - 1600
08 Dec 0059	ALERT: Geomagnetic K=4	08 Dec 0059
08 Dec 0101	CONTINUED ALERT: Proton Event 10MeV Flux >1000pfu	07 Dec 1540
08 Dec 0103	CONTINUED ALERT: Proton Event 100MeV Flux >1pfu	07 Dec 0115

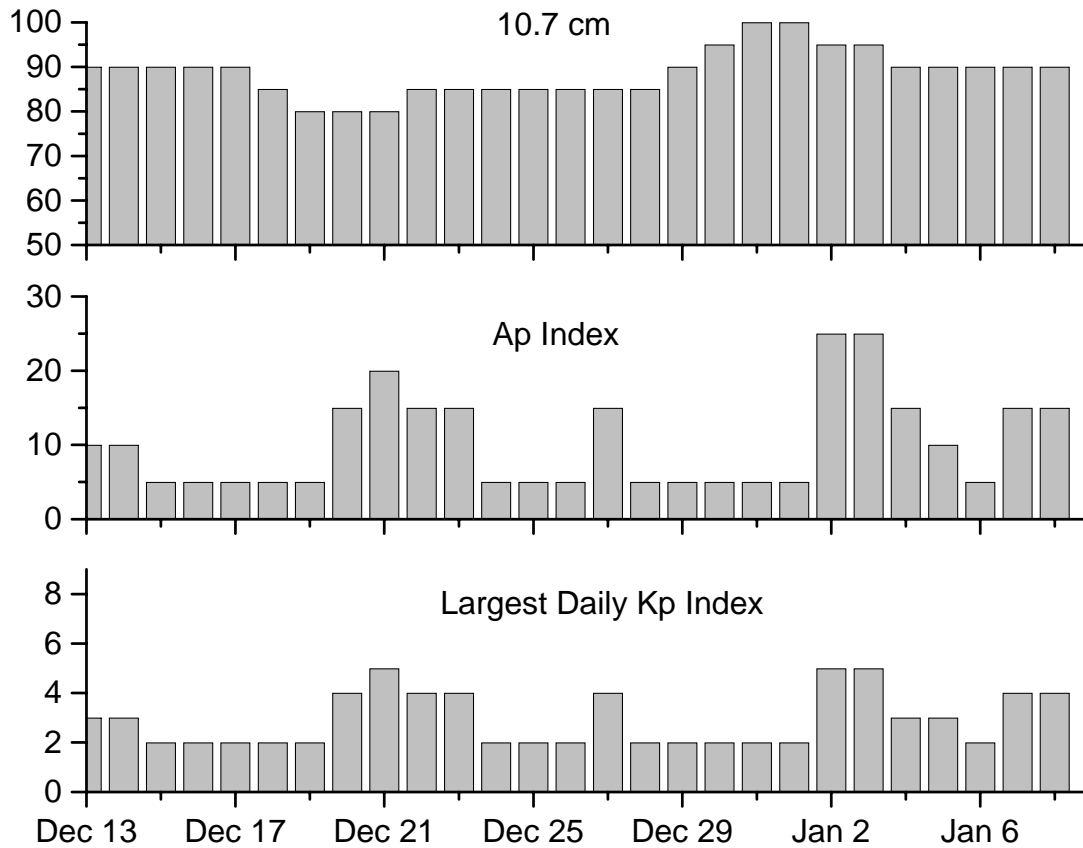


*Alerts and Warnings Issued - Continued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
08 Dec 0336	WARNING: Geomagnetic K=5	08 Dec 0336 - 1600
08 Dec 0405	ALERT: Geomagnetic K=5	08 Dec 0405
08 Dec 0501	ALERT: Electron 2MeV Integral Flux >1000pfu	08 Dec 0500
08 Dec 1509	SUMMARY: Proton Event 10MeV Flux >1000pfu	07 Dec 1540
08 Dec 2317	EXTENDED WARNING: Proton 100MeV Flux >1pfu	09 Dec 1600
08 Dec 2318	EXTENDED WARNING: Proton 10MeV Flux >10pfu	09 Dec 2359
09 Dec 0030	CONTINUED ALERT: Proton Event 100MeV Flux >1pfu	07 Dec 0115
09 Dec 0034	CONTINUED ALERT: Proton Event 10MeV Flux >100pfu	07 Dec 0345
09 Dec 1712	ALERT: Electron 2MeV Integral Flux >1000pfu	09 Dec 1515
09 Dec 1733	SUMMARY: Proton Event 100MeV Flux >1pfu	09 Dec 0735
09 Dec 2232	EXTENDED WARNING: Proton 10MeV Flux >10pfu	10 Dec 2359
10 Dec 0108	CONTINUED ALERT: Proton Event 10MeV Flux >100pfu	07 Dec 0345
10 Dec 1220	ALERT: Electron 2MeV Integral Flux >1000pfu	10 Dec 1205
10 Dec 1314	WARNING: Geomagnetic K=4	10 Dec 1330 - 1600
10 Dec 1408	ALERT: Geomagnetic K=4	10 Dec 1405
10 Dec 1556	EXTENDED WARNING: Geomagnetic K=4	10 Dec 1330 - 2359
10 Dec 2336	EXTENDED WARNING: Proton 10MeV Flux >10pfu	11 Dec 1600
10 Dec 2341	EXTENDED WARNING: Geomagnetic K=4	10 Dec 1330 - 11/1600



**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
13 Dec	90	10	3	27 Dec	85	15	4
14	90	10	3	28	85	5	2
15	90	5	2	29	90	5	2
16	90	5	2	30	95	5	2
17	90	5	2	31	100	5	2
18	85	5	2	01 Jan	100	5	2
19	80	5	2	02	95	25	5
20	80	15	4	03	95	25	5
21	80	20	5	04	90	15	3
22	85	15	4	05	90	10	3
23	85	15	4	06	90	5	2
24	85	5	2	07	90	15	4
25	85	5	2	08	90	15	4
26	85	5	2				



### *Energetic Events*

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
05 Dec	0745	0803	0806	M1.8	.005	Sf	S07E89	930			22	
05 Dec	1018	1035	1045	X9.0	.710	2n	S07E79	930	210000	12000	3	2
06 Dec	0130	0220	0254	M1.1	.038	Sf	S07E69	930				
06 Dec	0802	0823	0903	M6.0	.140	Sf	S07E66	930	350	340		1
06 Dec	1829	1847	1900	X6.5	.480	3b	S06E63	930	30000	5800	3	3
06 Dec	2014	2019	2022	M3.5	.012			930				
07 Dec	1820	1913	1933	M2.0	.037	1n	S07E47	930	85	2600		

### *Flare List*

Date	Time			Optical X-ray Class.	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
04 December	0122	0126	0130	B1.9			926
	0757	0759	0801	B2.6	Sf	S08W37	926
	1022	1026	1030	B2.1			
	1127	1137	1145	C1.9			
	1203	1208	1211	B8.9			
	1211	1215	1218	C1.2			
	1228	1242	1246	C1.4			
	1426	1439	1455	C4.9			
	1546	1555	1601	C1.1			930
	1614	1617	1621	C1.3			930
	1705	1710	1715	C1.2			930
	1821	1827	1840	B9.7			930
	1920	1930	1934	B5.4			930
	2037	2043	2049	C1.2			930
	2111	2117	2127	C1.4			930
	2310	2317	2320	C1.0			930
2324	2330	2338	C2.2			930	



*Flare List - Continued*

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
05 December	0020	0025	0033	B4.1			930
	0131	0134	0137	B3.2			930
	0141	0148	0150	B8.7			930
	0159	0203	0207	C2.2			930
	0315	0323	0327	B8.7			930
	0335	0340	0348	B7.0			930
	0408	0417	0427	B6.6			930
	0504	0506	0520	C3.8	Sf	S07E90	930
	0522	0527	0531		Sf	S07E90	
	0605	0626	0630	C4.2			930
	0711	0720	0733	B5.1			930
	0801	0802	0812	M1.8	Sf	S07E89	930
	0907	0911	0914	C1.5			930
	1028	1038	1100	X9.0	2n	S07E79	930
	1524	1525	1529		Sf	S07E77	930
	1538	1539	1543		Sf	S05E76	930
	1609	1615	1620	C1.7			930
	1718	1722	1728	C1.2			930
	1903	1957	2305	C5.8	1f	S05E75	930
	2021	2054	2135	C3.7			930
05 December	B2223	2253	2323	Sf		S07E75	930
	2340	2344	2347		Sf	S07E71	930
	2354	2355	0001	C1.5	Sf	S07E71	930



*Flare List - Continued*

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
06 December	0014	0016	0021		Sf	S07E68	930
	0138	0236	0333	M1.1	Sf	S07E69	930
	0337	0338	0341		Sf	S07E69	930
	0539	0540	0545	C2.4	Sf	S08E70	930
	0706	0710	0714	C1.0			930
	0715	0716	0720		Sf	S06E68	930
	0721	0735	0740	C1.5	Sf	S07E67	930
	0734	0737	0740	C1.7			930
	B0857	U0903	0918	M6.0	Sf	S07E66	930
	0919	0923	0927		Sf	S07E66	930
	1253	1258	1303	C4.8			930
	1421	1428	1433	C2.5			930
	1500	1505	1514	C2.1			930
	1554	1558	1600	C1.7			930
	1606	1611	1614	C1.4			
	1615	1621	1626	C4.4			930
	1749	1752	1804	B9.0			
	1818	1818	1827		Sf	S07E61	930
	1832	1845	2135	X6.5	3b	S06E63	930
	2014	2019	2022	M3.5			930
	2144	2152	2155	C7.4			930
	2226	2231	2233	C3.1			930
	2312	2312	2316	C1.7	Sf	S03E57	930
07 December	0031	0034	0037	C1.9			930
	0213	0217	0221	B5.6			926
	0235	0240	0242	B5.3			930
	0323	0324	0326		Sf	S07E56	930
	0335	0336	0347	C2.0	Sf	S07E56	930
	0411	0413	0418		Sf	S07E55	930
	0428	0437	0612	C6.1	1f	S08E55	930
	0750	0755	0759	B3.4			
	0827	0833	0836	B4.3			930
	1049	1148	1257	C1.1			930
1449	1515	1533	C1.2			930	





*Flare List - Continued*

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
07 December	1841	1903	2059	M2.0	1n	S07E47	930
08 December	0105	0110	0115	B4.3			930
	0125	0129	0134	B3.8			930
	0720	0724	0728	B4.4			930
	1019	1023	1026	B2.1			
	1423	1428	1443	B2.3			
	1516	1520	1523	B3.0			930
	1549	1600	1609	B4.3			930
	1733	1736	1738	B1.9			
09 December	1029	1041	1046	B4.5			930
	1048	1059	1105	C1.3			930
	1352	1358	1403	B1.6			930
	1501	1507	1511	B1.8			930
	1703	1708	1710	B1.6			930
	1804	1809	1811	B4.0			
	1912	1919	1926	B2.9			930
	2258	2301	2308	B2.4	Sf	S04E18	930
10 December	0254	0258	0303	B1.9			930
	0518	0523	0532	B2.9	Sf	S03E15	930
	0719	0719	0727	B7.0	Sf	S06E13	930
	1031	1034	1036	B1.1			
	1216	1219	1221	B1.1			
	1310	1313	1315	B1.1			
	1557	1600	1603	B1.1			
	1712	1717	1720	B1.6			930
	1956	1959	2002	B1.0			
	2121	2128	2135	B1.4			930
	2257	2300	2302	B1.3			
	2320	2324	2327	B1.1			
	2331	2335	2338	B1.7			



### Region Summary

Location		Sunspot Characteristics						Flares						
Date	( ° 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 926

25 Nov S08E73	140	0260	04	Hkx	002	A												
26 Nov S08E60	140	0160	04	Hkx	002	A												
27 Nov S08E47	140	0250	10	Cko	006	B												
28 Nov S10E35	139	0170	09	Cao	006	B												
29 Nov S10E19	141	0210	08	Cao	005	B												
30 Nov S10E09	138	0200	11	Eao	012	B												
01 Dec S09W04	138	0170	10	Dai	013	B												1
02 Dec S09W18	140	0200	11	Eac	018	Bg	3											4
03 Dec S10W25	133	0180	11	Eao	011	Bg	1											2
04 Dec S10W43	138	0100	11	Eao	010	B												1
05 Dec S09W57	138	0140	11	Eao	011	B												
06 Dec S08W70	138	0070	11	Eao	005	B												
07 Dec S08W82	137	0020	04	Bxo	002	B												
							4	0	0	8	0	0	0	0	0			

Crossed West Limb.

Absolute heliographic longitude: 138

#### Region 927

27 Nov N08E59	128	0030	03	Cro	004	B												3
28 Nov N10E46	128	0070	06	Cso	008	B												
29 Nov N10E32	128	0120	04	Cai	008	B	1											
30 Nov N10E19	128	0120	07	Cai	014	B												
01 Dec N09E06	128	0110	06	Dsi	012	B												
02 Dec N09W08	129	0060	05	Cso	006	B												1
03 Dec N08W21	129	0060	04	Cso	003	B												
04 Dec N08W35	130	0060	02	Hax	001	A												
05 Dec N08W50	131	0080	02	Hsx	001	A												
06 Dec N08W62	130	0060	02	Hsx	001	A												
07 Dec N07W76	131	0070	02	Hsx	002	A												
08 Dec N08W88	130	0050	01	Axx	001	A												
							1	0	0	4	0	0	0	0	0			

Crossed West Limb.

Absolute heliographic longitude: 128



### Region Summary - Continued

Location		Sunspot Characteristics												
Date	Helio		Flares				X-ray			Optical				
	( ° Lat ° CMD)	Lon	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S	1	2	3

#### Region 928

30 Nov	S07W32	179	0020	03	Cso	003	B								
01 Dec	S08W45	179	0030	02	Cso	003	B								
02 Dec	S07W58	179	0020	01	Hsx	001	A								
03 Dec	S07W72	180	0020	02	Axx	002	A								
04 Dec	S07W85	180													
05 Dec	S07W98	180													
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 179

#### Region 929

04 Dec	N02E67	028	0030	03	Bxo	002	B	4							
05 Dec	N03E54	027	0010	05	Bxo	002	B								
06 Dec	N03E41	027													
07 Dec	N03E28	027													
08 Dec	N03E15	027													
09 Dec	N03E02	027													
10 Dec	N03W11	027													
								4	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 027

#### Region 930

04 Dec	S07E79	016	0000	00			000	7							
05 Dec	S06E72	009	0390	04	Dko	005	B	9	1	1	7	1	1		
06 Dec	S05E60	008	0490	07	Dkc	008	Bgd	12	3	1	10			1	
07 Dec	S06E45	010	0430	08	Dki	014	Bgd	5	1	3		2			
08 Dec	S05E32	010	0420	08	Cko	011	Bg								
09 Dec	S04E19	010	0380	06	Cko	003	B	1	1						
10 Dec	S05E06	009	0440	07	Cki	013	Bgd	2							
								34	5	2	23	3	1	1	0

Still on Disk.

Absolute heliographic longitude: 009

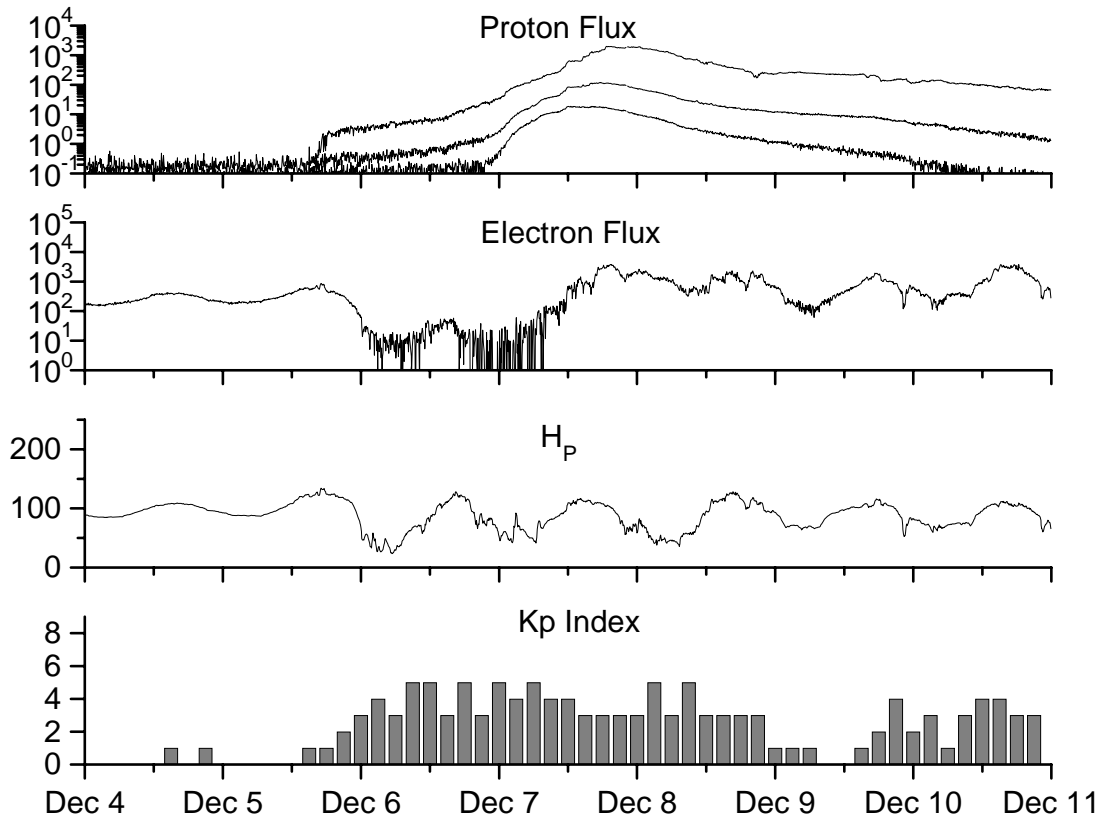


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	Observed SEC	values RI	Ratio RI/SEC	Smooth SEC	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2004</b>									
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
<b>2005</b>									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
<b>2006</b>									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37			80.1		8	
July	22.6	12.2	0.54			75.8		7	
August	22.8	12.9	0.57			79.0		9	
September	25.2	14.5	0.58			77.8		8	
October	15.7	10.4	0.66			74.3		7	
November	31.5	21.5	0.68			86.4		8	

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 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 23, RI= 120.8, occurred April 2000. \*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 04 December 2006*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

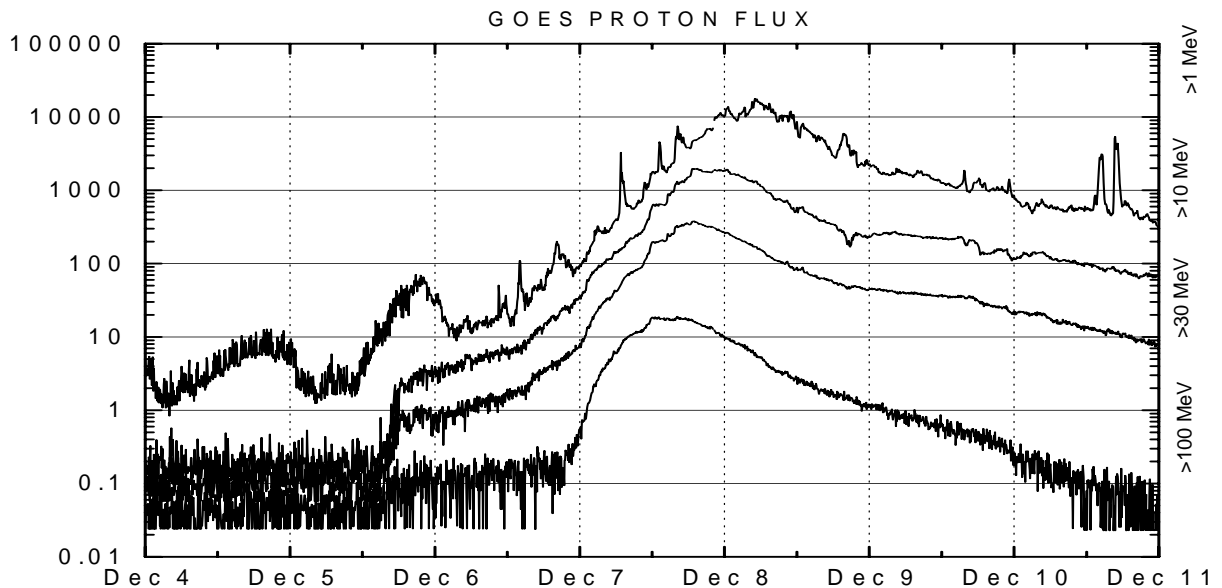
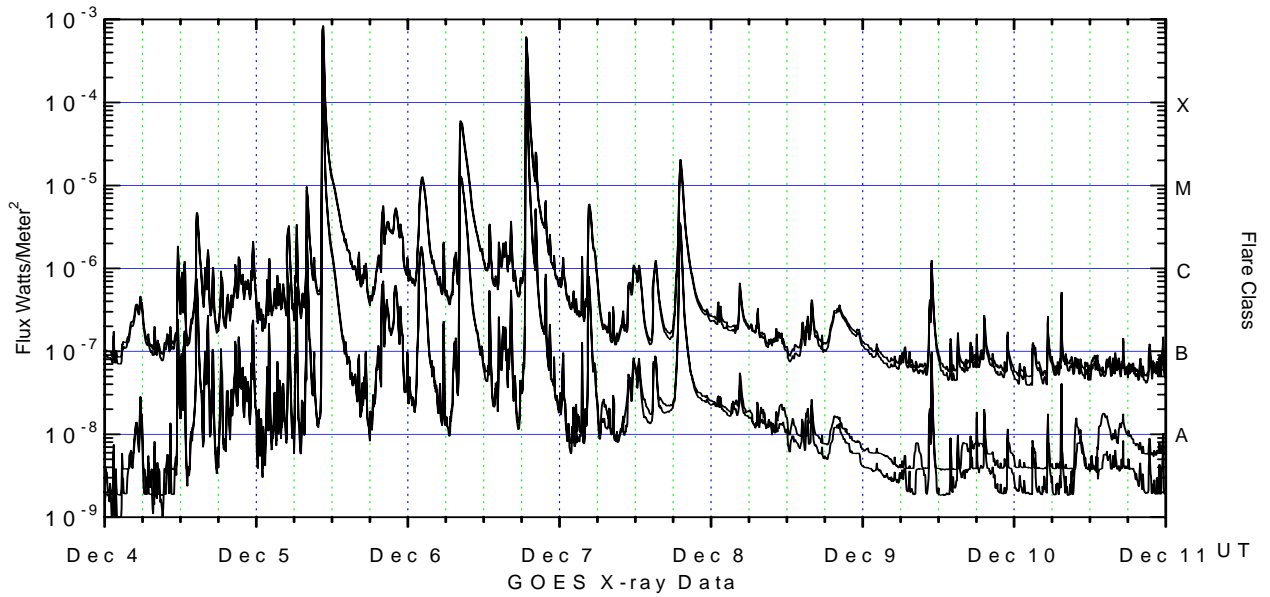
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. 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 Air Force Weather Agency) 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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 SEC 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 parallel 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 12 (W075) and GOES 11 (W135) 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-11 (W135) 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.

