

**Space Weather Highlights**  
**28 November – 04 December 2005**

**SEC PRF 1579**  
**06 December 2005**

Solar activity was very low to high this summary period. Activity levels were very low to low until late on 30 November when new Region 826 (S02, L=249, class/area, Ekc/490 on 02 December) produced the first of five M-class flares, an impulsive M1.4 at 30/1752 UTC. The largest flare of the period was an M7.8/1n at 02/1012 UTC. The event had an associated Tenflare (490 sfu) and a Type II radio sweep with an estimated shock velocity of 824 km/s. There was a very faint, partial halo CME associated with this flare, first seen on LASCO imagery at 02/1045 UTC. Early in its development, the region displayed significant growth in areal coverage and magnetic complexity, exhibiting a strong east-west neutral line through the delta spot in the center of the sunspot cluster. Since 03 December, Region 826 showed decay in both size and magnetic complexity, and as a result, only C-class activity was observed. No other significant activity occurred.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels 02 – 04 December.

The geomagnetic field ranged from quiet to active at middle latitudes, while at high latitudes, isolated minor to major storm conditions were observed. Solar wind speed ranged from a low of approximately 360 km/s late on 28 November to a high of near 775 km/s midday on 01 December. During the majority of the period, the IMF Bz did not vary much beyond +/- 3 nT. Late on 29 November, ACE detected an increase in temperature, density, and wind velocity, all indicative of a co-rotating interaction region in advance of a recurrent coronal hole high speed wind stream. From late on 30 November to late on 01 December, wind speed gradually increased from about 400 km/s to near 700 km/s, while the Bz component of the IMF fluctuated between +/- 12 nT. During this period, the geomagnetic field responded with mostly unsettled to active conditions at middle latitudes, while active to major storm levels were observed at high latitudes. From late on 01 December through the remainder of the summary period, wind speed remained elevated at between 600 to 700 km/s, while the IMF Bz became mostly neutral, not varying much beyond +/- 3 nT. During this period, the geomagnetic field was mostly quiet to unsettled with isolated active periods midday on 02 – 04 December.

**Space Weather Outlook**  
**07 December - 02 January 2006**

Solar activity is expected to be at very low to low levels.

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 07 – 08 December, 22 – 24 December, and 29 December – 02 January.

The geomagnetic field is expected to range from quiet to active levels. Isolated active periods are possible on 28 – 29 December due to effects from a recurrent coronal hole wind stream. Otherwise, quiet to unsettled conditions are expected for the majority of the forecast 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	
28 November	82	27	100	A4.6	0	0	0	0	0	0	0	0	0
29 November	85	27	90	A4.7	1	0	0	1	0	0	0	0	0
30 November	95	57	240	B1.3	0	1	0	0	0	0	0	0	0
01 December	98	79	390	B2.6	6	0	0	1	0	0	0	0	0
02 December	106	98	720	B3.6	3	4	0	0	2	0	0	0	0
03 December	101	75	550	B2.3	5	0	0	2	2	0	0	0	0
04 December	95	91	580	B1.1	1	0	0	1	1	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
	28 November	8.7E+5	1.4E+4	3.2E+3		1.9E+7
29 November	9.2E+5	1.5E+4	3.3E+3		6.2E+6	
30 November	1.3E+6	1.5E+4	3.1E+3		4.4E+6	
01 December	1.2E+6	1.5E+4	3.1E+3		1.0E+7	
02 December	1.5E+6	1.5E+4	3.1E+3		4.9E+7	
03 December	2.2E+6	1.4E+4	3.0E+3		1.4E+8	
04 December	5.9E+5	1.4E+4	3.0E+3		6.9E+7	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	28 November	6	0-1-2-2-2-2-2-2	24	0-1-3-6-6-2-1-1	9
29 November	6	1-0-1-1-0-2-2-4	3	1-0-0-2-0-1-1-2	5	2-0-0-1-0-2-1-3
30 November	9	2-2-2-3-2-1-2-3	25	2-2-4-5-6-3-2-2	10	3-2-2-4-3-1-2-3
01 December	12	4-1-1-3-2-2-2-4	17	3-2-1-5-3-3-2-4	13	4-2-1-2-2-2-2-4
02 December	10	2-3-3-3-2-2-2-2	15	3-3-3-4-4-2-2-2	12	3-4-3-3-2-1-3-2
03 December	9	3-2-1-2-2-3-2-2	17	2-3-1-4-4-4-3-3	11	4-2-1-2-2-3-3-3
04 December	3	1-0-1-1-1-1-2-1	9	3-1-1-1-4-2-2-1	5	1-0-1-1-2-1-2-1

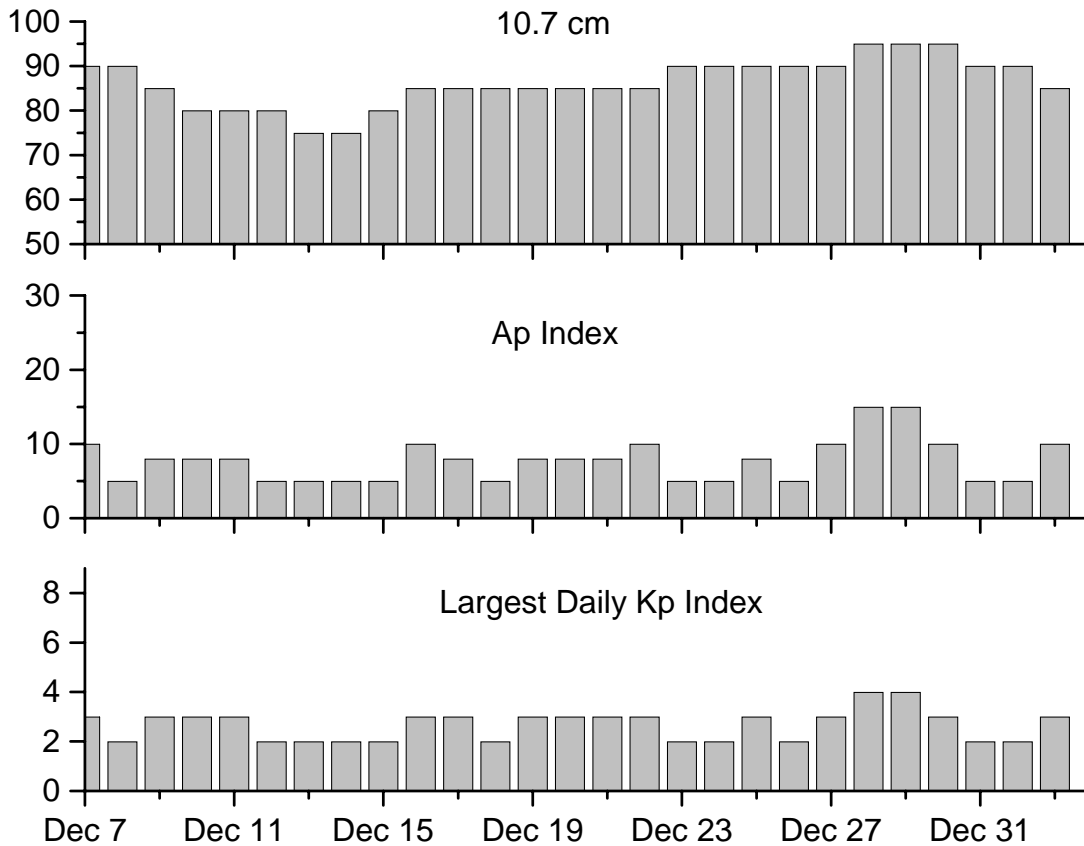


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
29 Nov 2243	WARNING: Geomagnetic K=4	29 Nov 2315-30 Nov 1600
30 Nov 1016	ALERT: Geomagnetic K-index= 4	30 Nov 1014
01 Dec 0049	WARNING: Geomagnetic K=4	01 Dec 0050-1600
01 Dec 0055	ALERT: Geomagnetic K=4	01Dec 0054
01 Dec 0258	ALERT: Type II Radio Emission	01 Dec 0024
01 Dec 2315	WARNING: Geomagnetic K=4	01 Dec 2315-02 Dec 1600
01 Dec 2319	ALERT: Geomagnetic K=4	01 Dec 2318
01 Dec 2329	WARNING: Geomagnetic K=5	01 Dec 2330-02 Dec 1600
01 Dec 2334	ALERT: Geomagnetic K=5	01 Dec 2332
02 Dec 0252	ALERT: X-Ray Flux M5	02 Dec 0251
02 Dec 0305	SUMMARY: 10cm Radio Burst	02 Dec 0248-0256
02 Dec 0310	SUMMARY: X-ray Flux $\geq$ M5	02 Dec 0242
02 Dec 1012	ALERT: X-Ray Flux M5	02 Dec 1011
02 Dec 1029	SUMMARY: X-ray Flux $\geq$ M5	02 Dec 1005
02 Dec 1032	SUMMARY: 10cm Radio Burst	02 Dec 1010
02 Dec 1041	ALERT: Type II Radio Emission	02 Dec 1026
02 Dec 1441	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	02 Dec 1420
02 Dec 1540	EXTENDED WARNING: Geomagnetic K=4	01 Dec 2315-02 Dec 2359
03 Dec 0144	WARNING: Geomagnetic K=4	03 Dec 0145-1600
03 Dec 0240	ALERT: Geomagnetic K=4	03 Dec 0235
03 Dec 1146	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	03 Dec 1125
04 Dec 1246	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	04 Dec 1225



## 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
07 Dec	90	10	3	21 Dec	85	8	3
08	90	5	2	22	85	10	3
09	85	8	3	23	90	5	2
10	80	8	3	24	90	5	2
11	80	8	3	25	90	8	3
12	80	5	2	26	90	5	2
13	75	5	2	27	90	10	3
14	75	5	2	28	95	15	3
15	80	5	2	29	95	15	3
16	85	10	3	30	95	10	3
17	85	8	3	31	90	5	2
18	85	5	2	01 Jan	90	5	2
19	85	8	3	02	85	10	3
20	85	8	3				



### *Energetic Events*

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
			Max				Lat	CMD	245	2695	II	IV
30 Nov 05	1746	1752	1755	M1.4	.005							
02 Dec 05	0242	0252	0300	M6.5	.036				60	460		
02 Dec 05	1005	1012	1025	M7.8	.050	1n	S04E13	826	57	490	2	
02 Dec 05	2001	2030	2052	M1.0	.014	1n	S03E07	826				
02 Dec 05	2057	2119	2137	M2.0	.033							

### *Flare List*

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
28 November	0823	0944	1033	B2.4			
29 November	1643	1655	1739	C4.0	Sf	S12W45	824
	2322	2327	2335	B2.6			826
30 November	0154	0157	0204	B1.3			
	0610	0616	0630	B9.3			826
	1019	1026	1047	B8.8			826
	1104	1108	1111	B7.4			826
	1732	1739	1745	B4.0			826
	1746	1752	1755	M1.4			826
	01 December	0009	0018	0028	C1.4		
0218		0238	0257	C2.1			824
0449		0504	0512	C5.7			826
0741		0750	0802	B9.8			826
0815		0837	0850	C6.0			826
1210		1221	1230	C1.5			826
1244		1248	1250	B9.8			826
1351		1357	1403	B4.5			826
1443		1448	1502	B4.1			826
1532		1533	1542	C2.2	Sf	S02E24	826
1625		1631	1638	B4.2			826
1806		1810	1815	B4.5			826
1830		1834	1837	B4.0			826
02 December	0028	0034	0036	C1.7			826
	0108	0113	0115	B9.9			826
	0208	0211	0218	C1.3			826
	0242	0252	0300	M6.5			826
	0552	0600	0609	C4.9			826
	1010	1013	1042	M7.8	1n	S04E13	826
	B2027	2113	2209	M1.0	1n	S03E07	826
2057	2119	2137	M2.0				



*Flare List*

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
03 December	0430	0439	0442	B6.4			
	B0538	0543	0555	C3.6	1f	S03E00	826
	0725	0737	0744	C5.3			830
	0848	0849	0907	C3.5	1f	S05E01	826
	0908	0913	0920	C2.1	Sf	S06W01	826
	1110	1123	1141	B6.6			826
	1257	1302	1307	B4.1			826
	1358	1358	1403	B5.5	Sf	S06W02	826
	1521	1525	1531	B3.1			826
	1542	1546	1551	B4.5			
	1610	1614	1619	B3.9			826
	1632	1640	1645	B3.2			826
	1656	1703	1712	B4.1			826
	1753	1805	1814	C1.7			826
	04 December	1952	2001	2012	B5.1		
2152		2207	2217	B4.3			826
0255		0302	0308	B2.7			826
0534		0540	0549	B3.9			826
0832		0929	1017	C2.1	1f	S06W15	826
1048		1049	1054	B8.3	Sf	S06E09	828
1548		1553	1557	B2.3			826
1721		1728	1735	B6.2			826
1833		1840	1846	B4.3			826
1900		1906	1918	B4.2			826



### 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	4			
<i>Region 824</i>																		
20 Nov	S13E68	347	0090	02	Hax	001	A											
21 Nov	S12E57	345	0080	08	Cao	004	B											
22 Nov	S12E46	343	0120	09	Dao	005	B											
23 Nov	S14E32	345	0090	09	Dao	009	B											
24 Nov	S13E19	345	0070	06	Cso	006	B											
25 Nov	S12E05	346	0070	03	Cso	004	B											
26 Nov	S14W06	343	0070	07	Dso	006	B											
27 Nov	S14W20	344	0060	05	Cso	004	B											
28 Nov	S14W35	346	0070	05	Cso	004	B											
29 Nov	S14W48	346	0060	05	Cso	003	B	1				1						
30 Nov	S14W61	346	0050	04	Cso	002	B											
01 Dec	S14W75	346	0070	03	Cro	003	B	1										
02 Dec	S14W88	346	0020	01	Axx	001	A											
								2	0	0	1	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude:346

#### *Region 825*

25 Nov	S06E12	339	0020	05	Dao	004	B											
26 Nov	S06E00	337	0010	05	Bxo	004	B											
27 Nov	S03W10	334	0010	02	Axx	002	A											
28 Nov	S03W23	334																
29 Nov	S03W36	334																
30 Nov	S03W49	334																
01 Dec	S03W62	334																
02 Dec	S03W75	334																
								0	0	0	0	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude:337



**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

*Region826*

28 Nov	S02E62	249	0030	04	Cro	003	B											
29 Nov	S02E49	249	0030	05	Cso	004	B											
30 Nov	S02E36	249	0140	09	Dac	022	Bg		1									
01 Dec	S02E22	249	0210	11	Ekc	022	Bgd	5			1							
02 Dec	S02E09	249	0490	13	Ekc	032	Bgd	3	3			2						
03 Dec	S03W10	255	0380	13	Ekc	021	Bg	4			2	2						
04 Dec	S04W21	253	0380	12	Ekc	025	Bg	1				1						
								13	4	0	3	5	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 249

*Region 827*

30 Nov	N08E56	229	0050	04	Dso	003	B											
01 Dec	N08E42	229	0050	04	Dro	006	B											
02 Dec	N08E29	229																
03 Dec	N08E16	229																
04 Dec	N08E03	229																
								0	0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 229

*Region 828*

01 Dec	S04E42	229	0060	05	Dso	008	B											
02 Dec	S04E29	229	0080	07	Dao	008	B											
03 Dec	S04E16	229	0070	06	Cao	008	B											
04 Dec	S04E04	228	0060	06	Cso	009	B				1							
								0	0	0	1	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 228

*Region 829*

02 Dec	N11E02	256	0040	06	Dso	005	B											
03 Dec	N11W12	257	0030	03	Dso	004	B											
04 Dec	N10W26	258	0010	00	Axx	001	A											
								0	0	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	4								
<i>Region 830</i>																							
02 Dec	N14E78	180	0090	02	Hax	002	A																
03 Dec	N14E64	181	0070	06	Cso	002	B	1															
04 Dec	N13E51	181	0100	07	Cao	003	B																
									1	0	0	0	0	0	0	0	0	0	0	0	0		
Still on Disk.																							
Absolute heliographic longitude: 181																							
<i>Region 831</i>																							
04 Dec	S06W07	239	0030	04	Dso	003	B																
									0	0	0	0	0	0	0	0	0	0	0	0	0		
Still on Disk.																							
Absolute heliographic longitude: 239																							

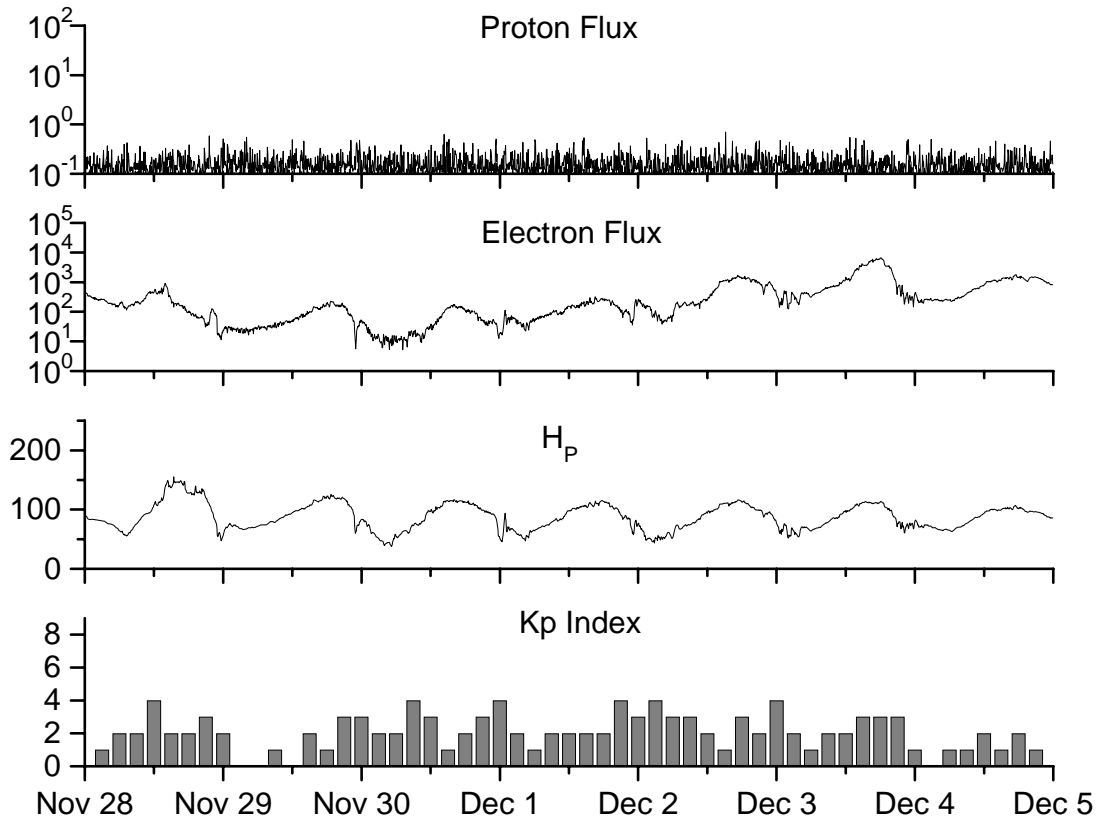


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>2003</b>									
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
<b>2004</b>									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
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			93.7		13	
July	71.0	39.9	0.56			96.6		16	
August	65.6	36.4	0.55			90.7		16	
September	39.2	22.1	0.56			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		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 28 November 2005*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W110) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

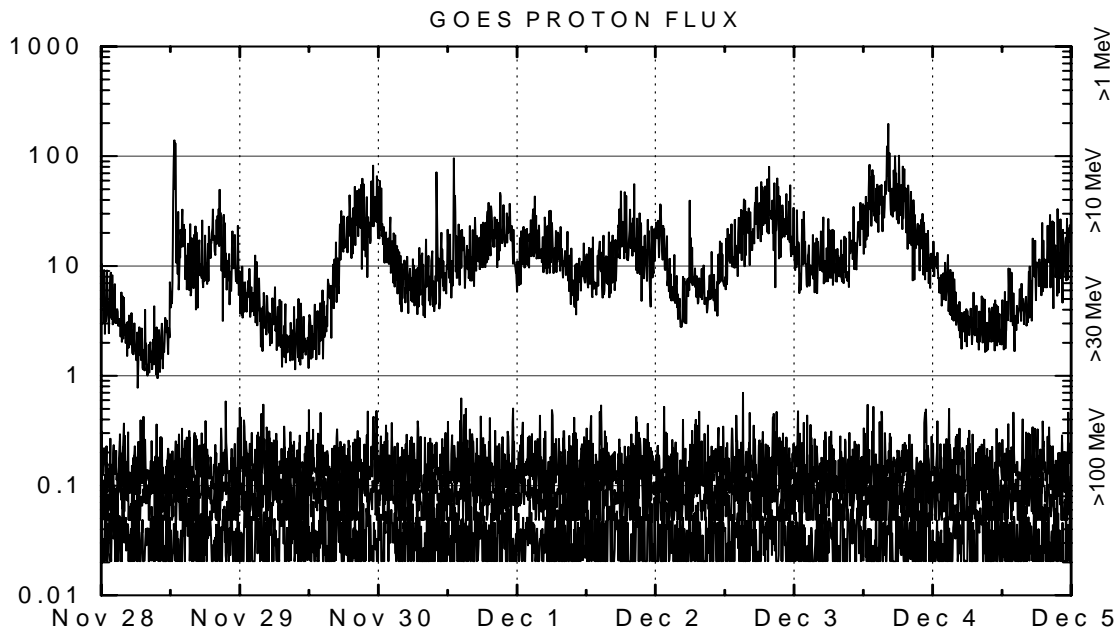
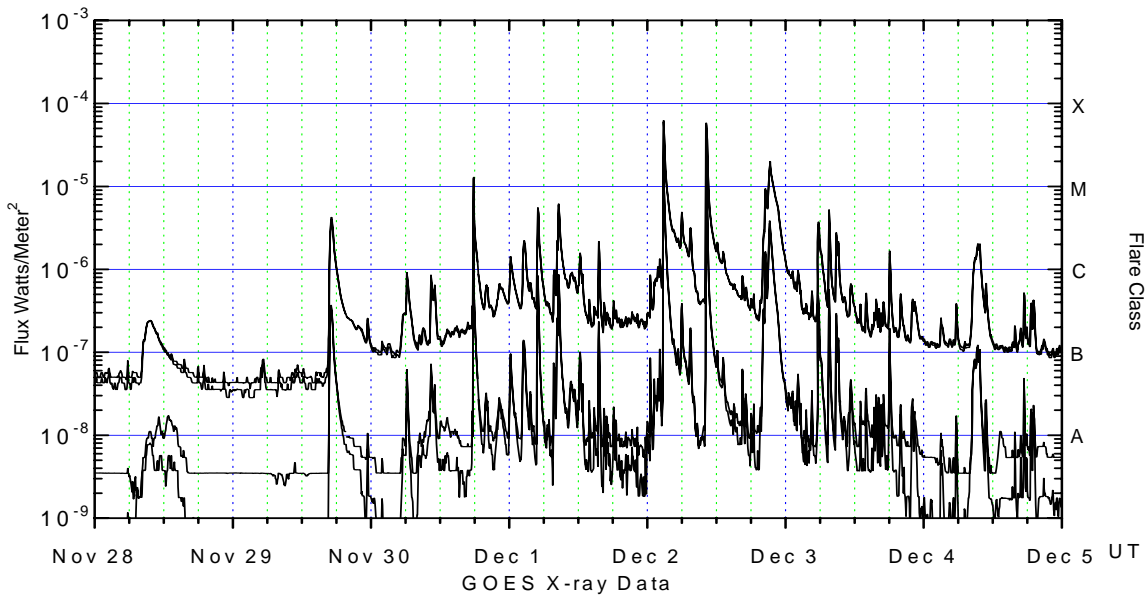
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*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*

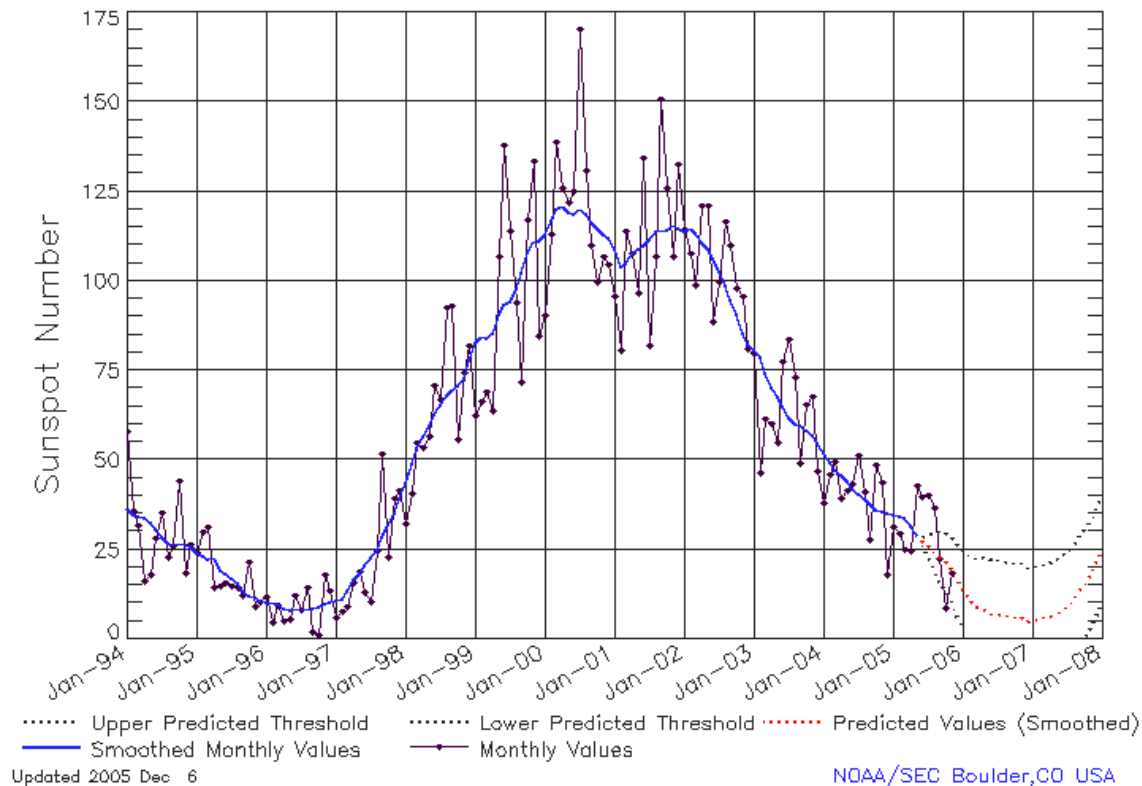
X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W110) 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.



# ISES Solar Cycle Sunspot Number Progression

Data Through 30 Nov 05



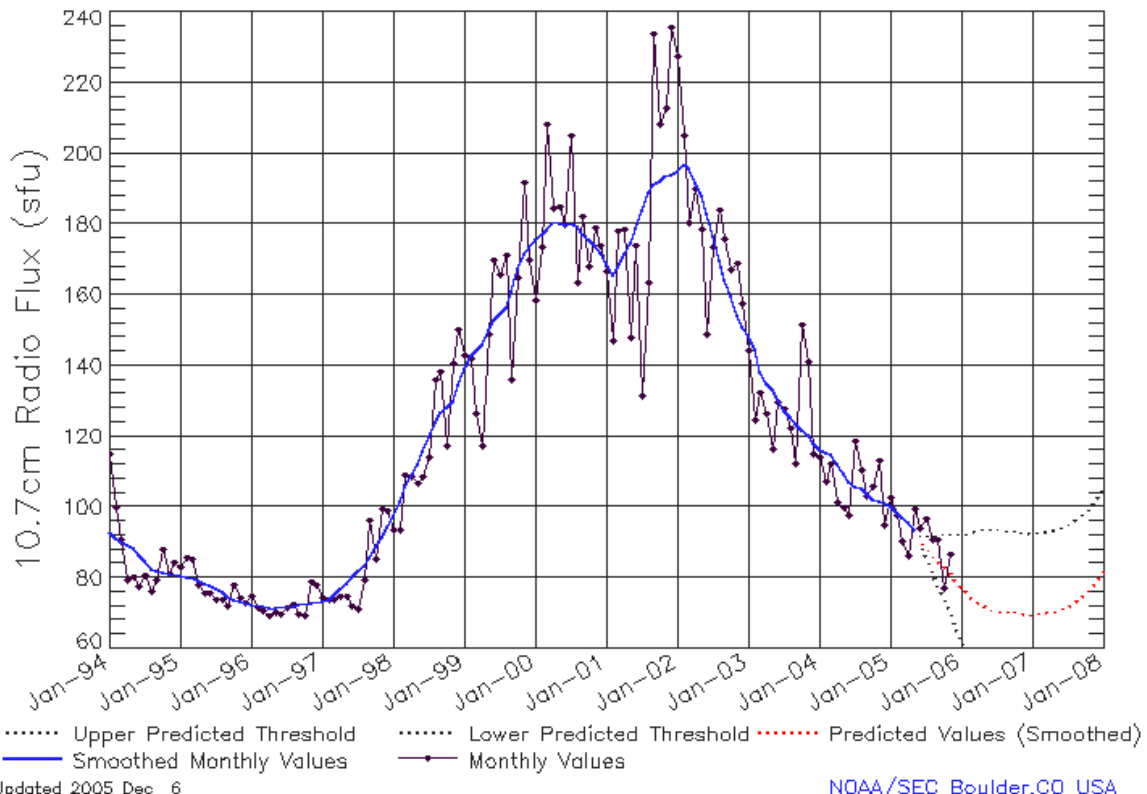
## SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	44 (***)	49 (***)	53 (***)	57 (***)	59 (***)	63 (***)	66 (***)	68 (***)	70 (***)	71 (***)	73 (***)	78 (***)
1999	83 (***)	85 (***)	84 (***)	86 (***)	91 (***)	93 (***)	94 (***)	98 (***)	102 (***)	108 (***)	111 (***)	111 (***)
2000	113 (***)	117 (***)	120 (***)	121 (***)	119 (***)	119 (***)	120 (***)	119 (***)	116 (***)	115 (***)	113 (***)	112 (***)
2001	109 (***)	104 (***)	105 (***)	108 (***)	109 (***)	110 (***)	112 (***)	114 (***)	114 (***)	114 (***)	116 (***)	115 (***)
2002	114 (***)	115 (***)	113 (***)	111 (***)	109 (***)	106 (***)	103 (***)	99 (***)	95 (***)	91 (***)	85 (***)	82 (***)
2003	81 (***)	79 (***)	74 (***)	70 (***)	68 (***)	65 (***)	62 (***)	60 (***)	60 (***)	58 (***)	57 (***)	55 (***)
2004	52 (***)	49 (***)	47 (***)	46 (***)	44 (***)	42 (***)	40 (***)	39 (***)	38 (***)	36 (***)	35 (***)	35 (***)
2005	35 (***)	34 (***)	34 (***)	32 (***)	29 (***)	<b>28</b> (1)	<b>26</b> (3)	<b>25</b> (5)	<b>23</b> (7)	<b>22</b> (8)	<b>20</b> (9)	<b>17</b> (10)
2006	<b>14</b> (11)	<b>11</b> (12)	<b>10</b> (13)	<b>9</b> (14)	<b>8</b> (15)	<b>7</b> (15)	<b>7</b> (15)	<b>7</b> (15)	<b>7</b> (15)	<b>6</b> (15)	<b>6</b> (15)	<b>5</b> (15)
2007	<b>5</b> (15)	<b>6</b> (15)	<b>6</b> (15)	<b>6</b> (15)	<b>7</b> (15)	<b>8</b> (15)	<b>10</b> (15)	<b>11</b> (15)	<b>13</b> (15)	<b>16</b> (15)	<b>18</b> (15)	<b>21</b> (15)



## ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 30 Nov 05



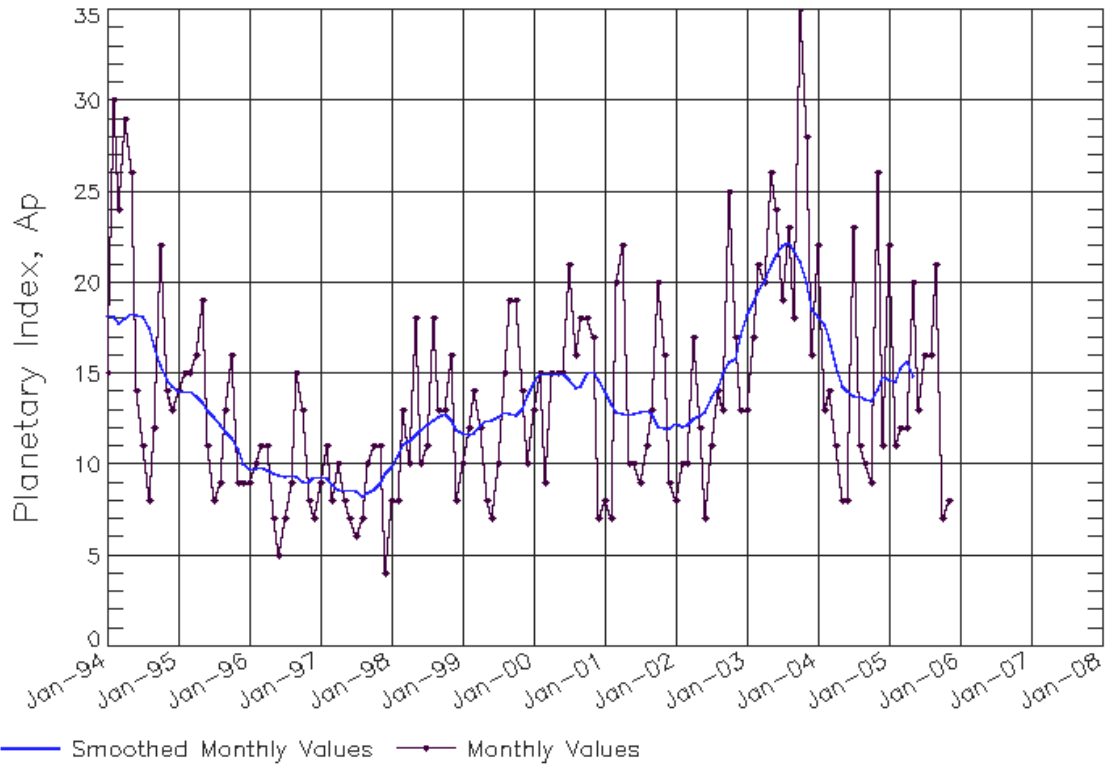
### SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	98	102	106	109	112	116	120	124	127	128	130	134
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1999	139	143	144	146	150	153	154	156	161	167	172	173
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2000	176	177	178	181	180	180	180	179	177	176	174	172
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2001	169	166	168	172	175	179	184	189	191	192	194	194
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2002	195	197	196	192	188	183	176	170	164	159	154	151
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2003	148	145	138	135	133	130	127	125	124	122	120	118
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2004	116	116	115	112	109	107	106	105	104	102	102	101
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2005	100	99	97	96	93	<b>91</b>	<b>89</b>	<b>87</b>	<b>85</b>	<b>83</b>	<b>82</b>	<b>79</b>
	(***)	(***)	(***)	(***)	(***)	(1)	(3)	(5)	(7)	(9)	(11)	(13)
2006	<b>77</b>	<b>76</b>	<b>74</b>	<b>73</b>	<b>72</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>70</b>	<b>70</b>	<b>70</b>	<b>70</b>
	(15)	(16)	(14)	(13)	(12)	(11)	(11)	(11)	(10)	(10)	(10)	(10)
2007	<b>70</b>	<b>70</b>	<b>70</b>	<b>70</b>	<b>71</b>	<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>76</b>	<b>77</b>	<b>79</b>
	(10)	(10)	(10)	(10)	(11)	(11)	(12)	(13)	(14)	(16)	(17)	(19)



# ISES Solar Cycle Ap Progression

Data Through 30 Nov 05



Updated 2005 Dec 6

NOAA/SEC Boulder, CO USA

