

Space Weather Highlights
08 – 14 May 2006

SEC PRF 1602
16 May 2006

Solar activity was at very low levels. The most significant event of the period occurred at 11/2316 UTC when Region 883 (S04, L=307, class/area, Cao/010 on 12 May) produced a long duration B3.0/Sf. Shortly before this flare, a filament eruption took place at disk center at 11/2257 UTC. Although LASCO imagery did not show a clear associated CME, the event may have triggered an Earth-directed halo CME.

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

No greater than 2 MeV electron events were observed this period.

The geomagnetic field ranged from quiet to minor storm levels. Solar wind speed ranged from a low of about 400 km/s midday on 10 May to a high of near 680 km/s late on 11 May. The Bz component of the IMF began the period on 08 May very weak, not varying much beyond +/- 3 nT, and persisted through midday on 10 May. During this period, the geomagnetic field was quiet to unsettled at all latitudes, with one isolated period of active conditions observed at high latitudes early in the period. Late on 10 May, wind speed, density, and temperature increased, all indicative of a co-rotating interaction region in advance of a coronal hole high speed wind stream. During this time, the IMF Bz showed signs of this interaction region, generally varying between +/- 8 nT. By the 12th, wind speed increased to about 680 km/s. The geomagnetic field responded with unsettled to active levels beginning early on 11 May, while high latitudes observed unsettled to minor storm conditions. These conditions persisted through about midday on 13 May. For the remainder of the summary period, the field was at quiet to unsettled levels. By early on 13 May, the IMF relaxed with the Bz not varying much beyond +/- 3 nT, while solar wind speed slowly decayed, ending the period at about 450 km/s.

Space Weather Outlook
17 May – 12 June 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 17 – 18 May and again on 04 – 12 June.

Coronal hole high speed wind streams are expected on 18 - 19 May, 01 – 03 June, and again on 07 – 08 June. During these periods, mostly unsettled to active conditions are expected with isolated minor storm levels possible on 02 – 03 June. Otherwise, quiet to unsettled levels will persist.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
08 May	85	53	210	A6.7	0	0	0	0	0	0	0	0
09 May	83	56	180	A5.7	0	0	0	0	0	0	0	0
10 May	78	27	130	A4.5	0	0	0	0	0	0	0	0
11 May	76	36	110	A3.8	0	0	0	1	0	0	0	0
12 May	76	38	30	A5.1	0	0	0	0	0	0	0	0
13 May	74	24	30	A3.2	0	0	0	0	0	0	0	0
14 May	72	11	30	A1.4	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	08 May	5.2E+5	1.6E+4	3.2E+3		1.2E+8
09 May	5.2E+5	1.6E+4	3.6E+3		1.5E+8	
10 May	1.2E+6	1.6E+4	3.7E+3		1.7E+8	
11 May	5.3E+5	1.6E+4	3.3E+3		7.2E+6	
12 May	9.4E+5	1.6E+4	3.5E+3		2.2E+8	
13 May	6.8E+5	1.6E+4	3.6E+3		5.7E+8	
14 May	4.0E+5	1.6E+4	3.7E+3		4.7E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	08 May	5	2-3-2-1-1-0-1-1	11	3-4-3-3-3-0-1-0	8
09 May	2	0-0-1-1-1-0-1-2	3	1-1-1-2-0-0-1-2	4	0-0-1-2-1-1-1-2
10 May	4	0-0-0-1-1-0-2-3	1	0-0-0-0-0-0-1-2	4	0-0-0-1-1-1-1-3
11 May	21	3-4-3-3-3-5-3-3	23	3-5-5-4-4-2-2-2	18	3-4-4-4-3-2-3-4
12 May	10	3-3-3-2-2-2-2-2	27	4-4-5-5-5-2-2-2	16	4-4-4-2-3-2-2-3
13 May	9	3-3-2-2-2-1-2-2	16	3-3-4-4-4-2-1-1	11	3-4-3-2-2-1-2-2
14 May	6	3-3-1-1-1-1-1-1	9	3-3-2-3-2-1-1-1	8	3-4-2-1-1-1-1-2

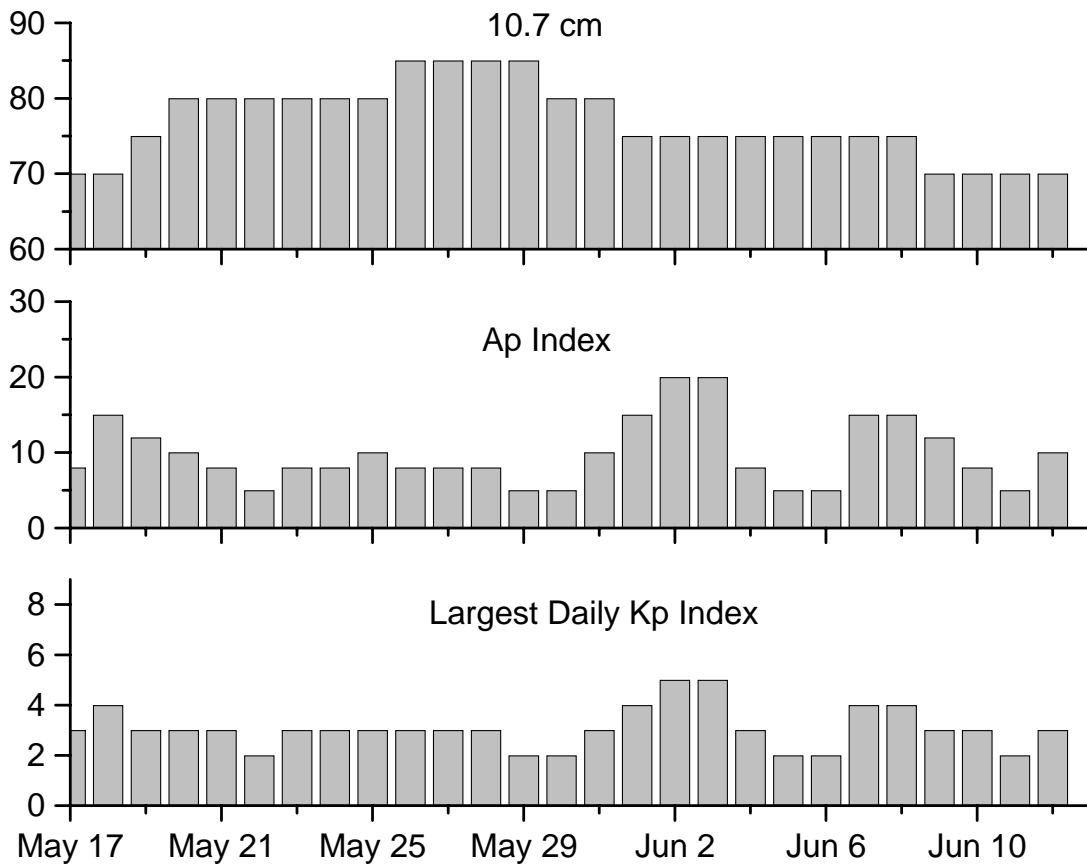


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
08 May 0347	ALERT: Geomagnetic K = 4	08 May 0345
08 May 0926	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	08 May 0925
08 May 2203	WATCH: Geomagnetic A-index ≥ 20	11 May
09 May 0513	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	09 May 0500
09 May 2029	WATCH: Geomagnetic A-index ≥ 20	12 May
10 May 0500	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	10 May 0500
11 May 0322	WARNING: Geomagnetic K = 4	11 May 0322 – 1600
11 May 0325	ALERT: Geomagnetic K = 4	11 May 0324
11 May 1556	EXTENDED WARNING: Geomagnetic K = 4	11 May 0322 – 2359
11 May 2303	EXTENDED WARNING: Geomagnetic K = 4	11 May 0322 – 12/1600
12 May 1206	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	12 May 1145
12 May 1556	EXTENDED WARNING: Geomagnetic K = 4	11 May 0322 – 12/2359
13 May 0502	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	13 May 0500
14 May 0535	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	14 May 0510



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 May	70	8	3	31 May	80	10	3
18	70	15	4	01 June	75	15	4
19	75	12	3	02	75	20	5
20	80	10	3	03	75	20	5
21	80	8	3	04	75	8	3
22	80	5	2	05	75	5	2
23	80	8	3	06	75	5	2
24	80	8	3	07	75	15	4
25	80	10	3	08	75	15	4
26	85	8	3	09	70	12	3
27	85	8	3	10	70	8	3
28	85	8	3	11	70	5	2
29	85	5	2	12	70	10	3
30	80	5	2				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	1/2		Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
	Begin	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II
<i>No Events Observed</i>										

Flare List

Date	Time			Optical	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
08 May	<i>No Flares Observed</i>						
09 May	<i>No Flares Observed</i>						
10 May	0850	0853	0856	B1.0			
	1656	1702	1713	B1.2			882
	2153	2200	2207	B2.1			882
11 May	1710	1722	1737	B1.5			
	1929	1932	1935	B1.1			
	2304	2304	2313	B3.9	Sf	S06E00	883
12 May	0720	0724	0727	B1.1			882
	0748	0752	0754	B1.5			882
13 May	<i>No Flares Observed</i>						
14 May	<i>No Flares Observed</i>						

Region Summary

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

Region 878

30 Apr N14E60	035	0060	02	Bxo	003	B									
01 May N14E46	036	0070	02	Cso	003	B									
02 May N13E31	037	0060	03	Cso	002	B									
03 May N14E18	037	0040	02	Hsx	001	A									
04 May N14E05	036	0040	02	Hsx	001	A									
05 May N14W09	037	0020	01	Hsx	002	A									
06 May N14W22	037	0010	04	Cso	003	B									
07 May N12W35	036	0010	01	Axx	001	A									
08 May N12W48	036														
09 May N12W61	036														
10 May N12W74	036														
11 May N12W87	036														

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 036



Region Summary-Continued

Location		Sunspot Characteristics						X-ray			Optical			
Date	(° 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 879

02 May	N16E07	061	0050	04	Dao	004	B										
03 May	N17W05	060	0100	05	Dso	006	B										
04 May	N16W18	059	0070	06	Chi	006	B										
05 May	N16W31	059	0020	04	Cso	003	B										
06 May	N16W47	062	0010	01	Axx	001	A										
07 May	N15W60	062															
08 May	N15W73	062															
09 May	N15W86	062															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 060

Region 880

04 May	S08E63	338	0080	03	Hhx	001	A										
05 May	S08E50	338	0100	04	Cso	002	B										
06 May	S08E37	338	0050	03	Cso	003	B										
07 May	S09E22	339	0050	01	Hsx	002	A										
08 May	S09E08	340	0060	02	Hax	001	A										
09 May	S09W04	339	0040	02	Hax	003	A										
10 May	S09W17	339	0020	02	Hax	002	A										
11 May	S09W29	338	0020	01	Hsx	002	A										
12 May	S09W42	338	0020	01	Cso	003	B										
13 May	S08W57	339	0020	02	Hax	002	A										
14 May	S09W71	340	0030	02	Axx	001	A										

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 339



Region Summary-Continued

Location		Sunspot Characteristics						X-ray			Optical			
Date	(° 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 881

05 May	S12E75	313	0000	01	Axx	001	A											
06 May	S12E68	307	0070	08	Dao	007	B											
07 May	S10E50	311	0050	05	Cso	005	B											
08 May	S10E33	315	0010	01	Axx	002	A											
09 May	S08E17	318	0010	01	Axx	001	A											
10 May	S08E04	318																
11 May	S08W09	318																
12 May	S08W22	318	0000	01	Axx	001	A											
13 May	S12W29	312																
14 May	S12W42	312																

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 318

Region 882

06 May	S12W19	034	0020	03	Dao	005	B											
07 May	S12W32	033	0030	04	Cro	005	B											
08 May	S12W45	033	0130	07	Dao	007	B											
09 May	S12W58	033	0120	10	Dao	010	B											
10 May	S12W70	032	0110	13	Eao	005	B											
11 May	S12W82	031	0090	09	Dao	003	B											
12 May	S12W95	031																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 034

Region 883

07 May	S04E56	305	0020	01	Axx	001	A											
08 May	S04E43	305	0010	07	Bxo	003	B											
09 May	S04E26	309	0010	02	Bxo	002	B											
10 May	S04E13	309																
11 May	S04E02	307	0000	01	Axx	001	A											
12 May	S04W10	307	0010	03	Cao	004	B											
13 May	S02W27	309	0010	02	Bxo	002	B											
14 May	S02W40	309																

0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 307

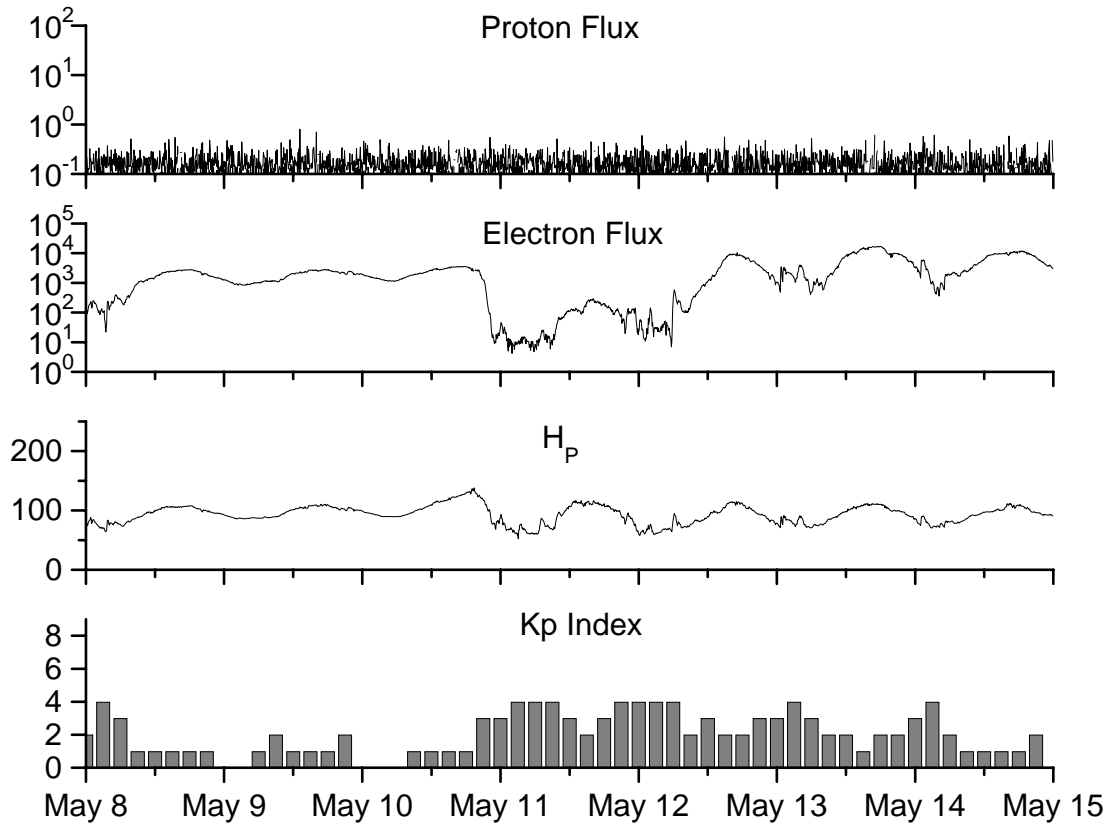


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2004									
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
2005									
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	42.9	25.9	96.6	87.8	16	11.8
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			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		8	
December	62.6	41.2	0.66			90.8		7	
2006									
January	28.0	15.4	0.55			83.8		6	
February	5.3	4.7	0.89			76.6		6	
March	21.3	10.8	0.51			75.5		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 08 May 2006

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W103) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

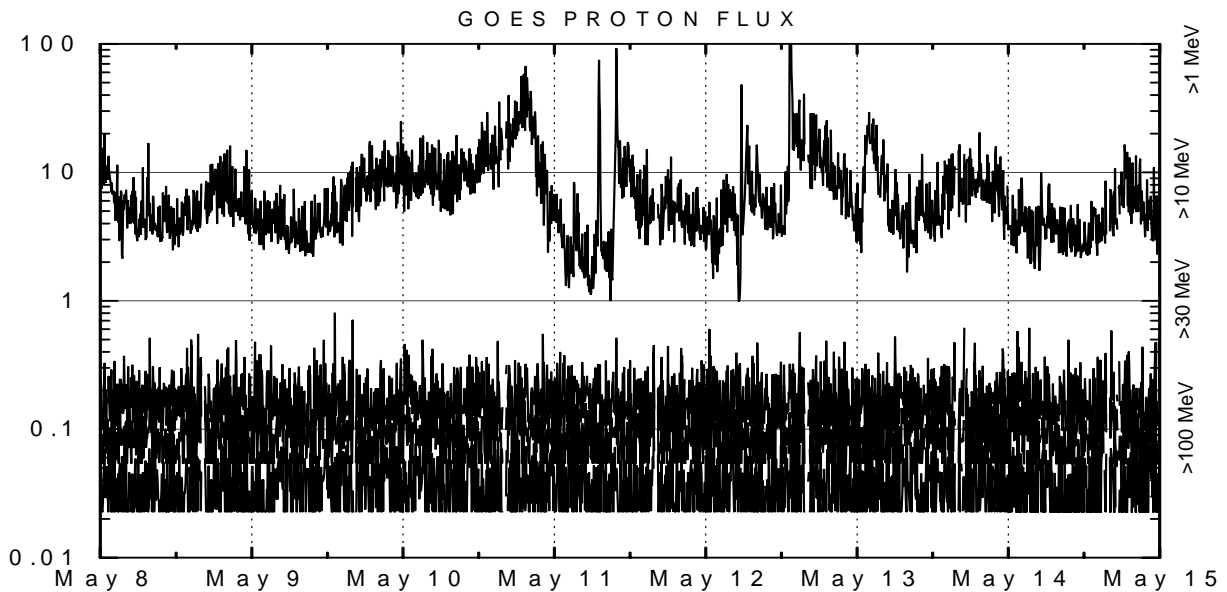
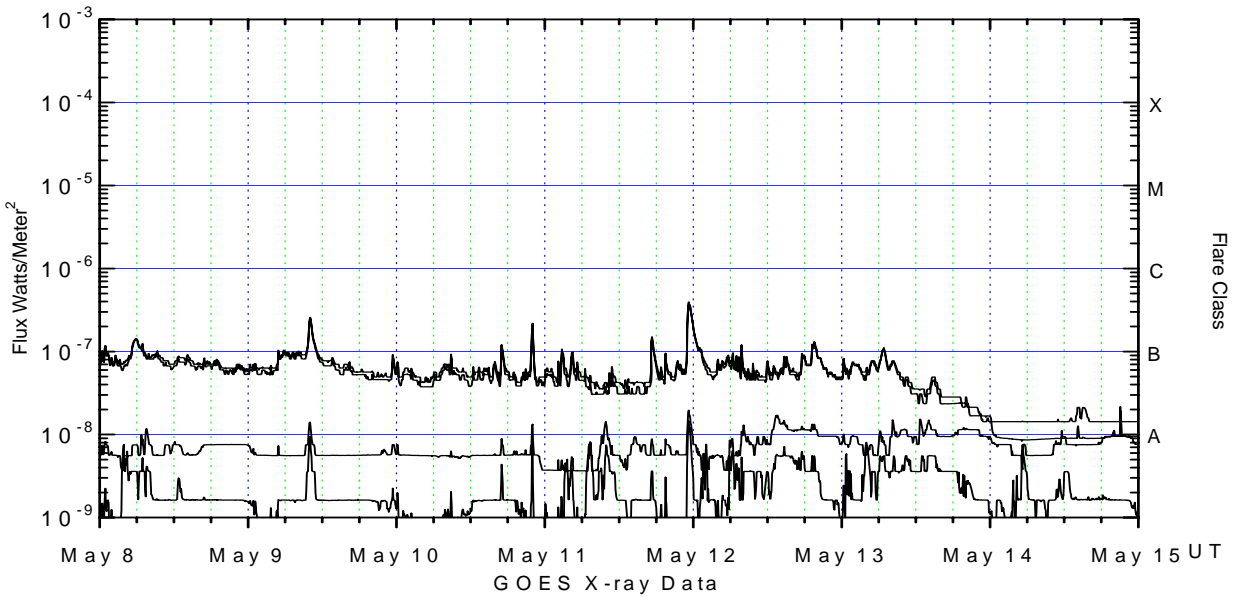
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p 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_p 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_p 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_p 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

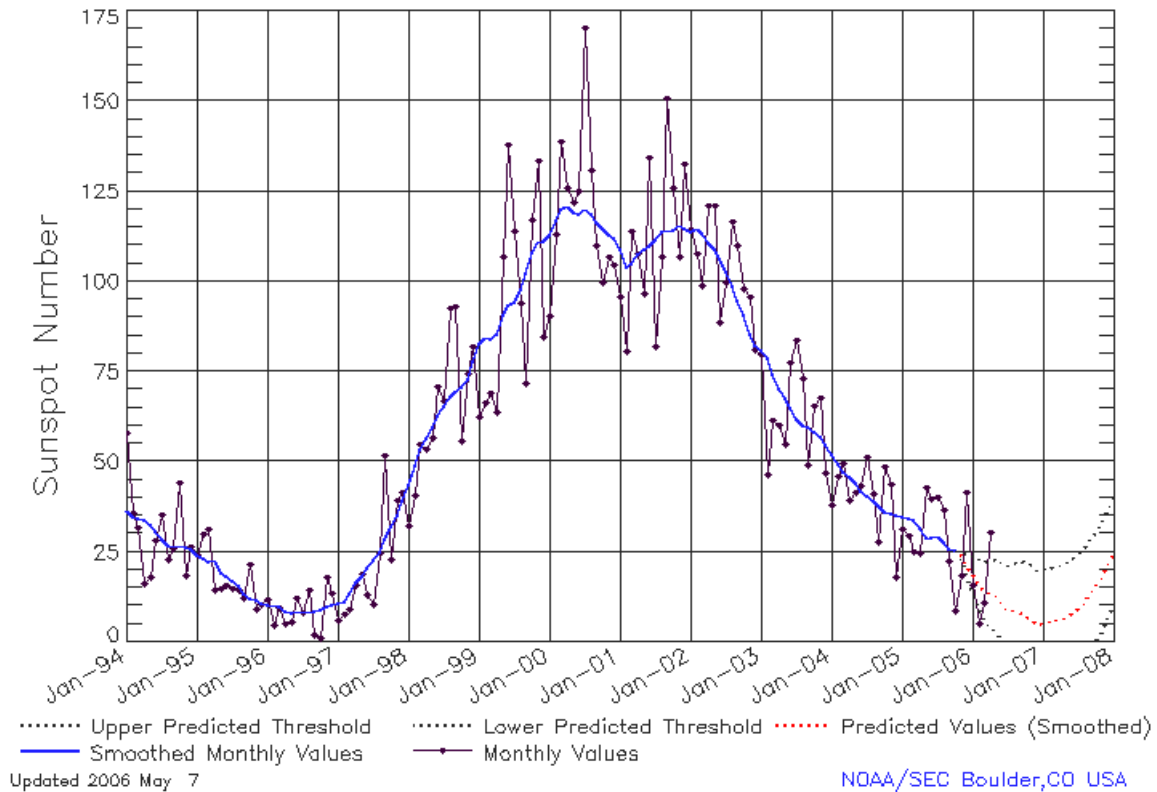
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W103) 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.



ISES Solar Cycle Sunspot Number Progression

Data Through 30 Apr 06



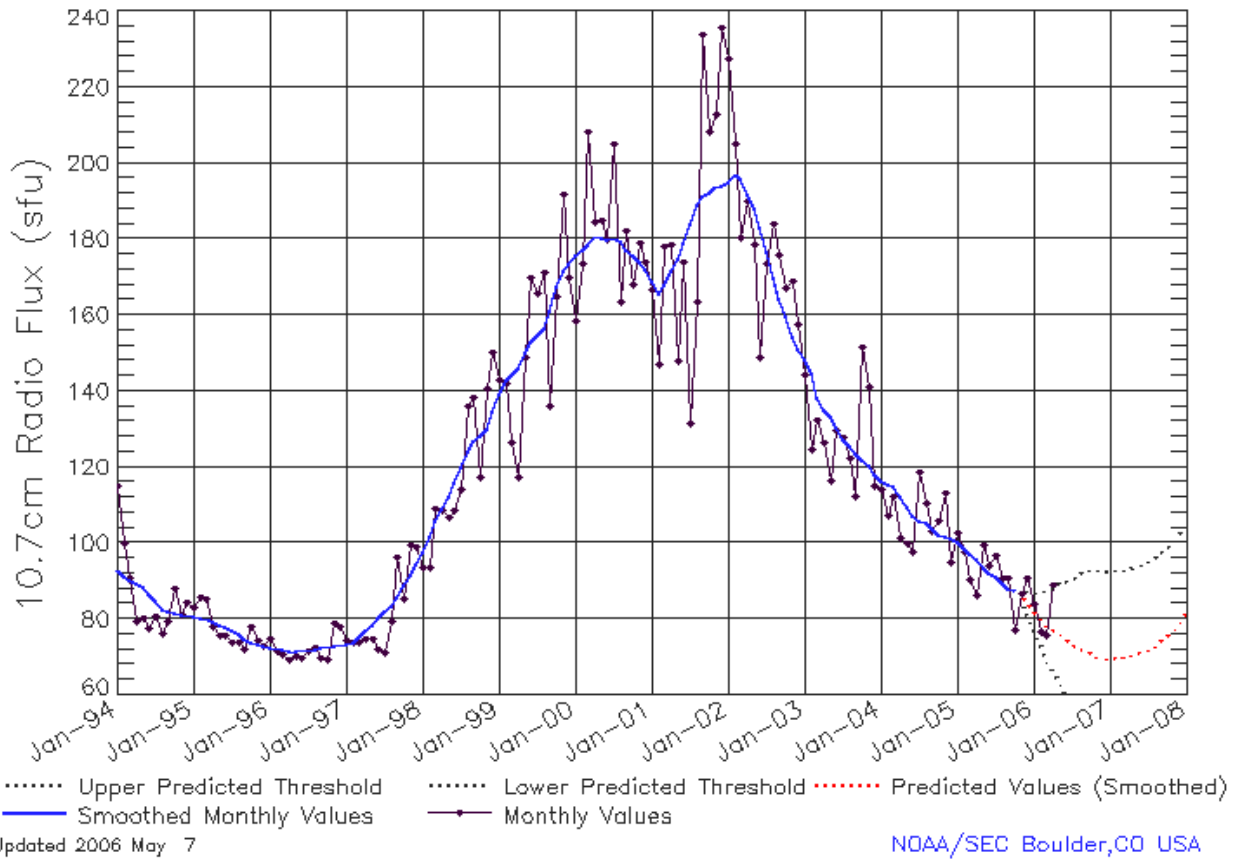
SEC Prediction of Smoothed Sunspot Number

	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	29	29	28	26	25	23	20
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(3)	(5)
2006	17	15	13	12	11	9	7	7	7	6	6	5
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(15)	(15)	(15)
2007	5	6	6	6	7	8	10	11	13	16	18	21
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 30 Apr 06



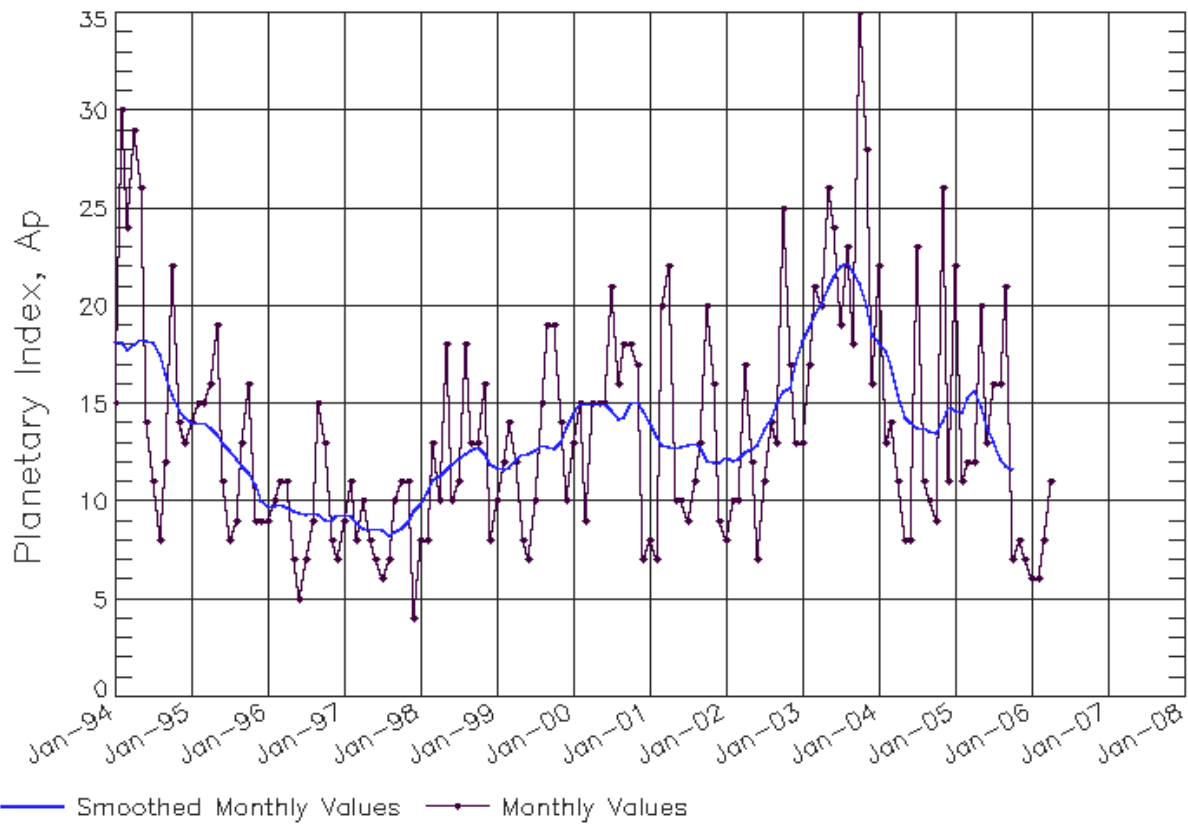
SEC Prediction of Smoothed F10.7cm Radio Flux

	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 (***)	92 (***)	91 (***)	89 (***)	87 (***)	86 (1)	84 (3)	82 (5)
2006	80 (7)	78 (9)	76 (12)	75 (13)	74 (15)	73 (15)	71 (14)	71 (13)	70 (11)	70 (11)	70 (10)	70 (10)
2007	70 (10)	70 (10)	70 (10)	70 (10)	71 (10)	71 (10)	72 (11)	73 (11)	74 (12)	76 (13)	77 (14)	79 (16)



ISES Solar Cycle Ap Progression

Data Through 30 Apr 06



Updated 2006 May 7

NOAA/SEC Boulder, CO USA

