

Space Weather Highlights
24 July – 30 July 2006

SEC PRF 1613
01 August 2006

Solar activity was at very low to low levels. Only a single C1.1 x-ray event was observed at 24/1501 UTC from a region on the east limb at S12. The disk remained populated by small, magnetically weak spot groups.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels.

The geomagnetic field was at quiet to major storm levels. Solar wind speed ranged from a low of near 320 km/s late on 25 July to a high of 700 km/s early on 28 July. The period began with the wind speed low around 340 km/s with the IMF Bz fluctuating between +/- 5 nT. The geomagnetic field was mostly quiet with some unsettled and active periods on 24 and 25 July at high latitudes. Midday on 27 July, wind speed began a slow increase from about 300 km/s, while the IMF Bz fluctuated between +/- 7 nT for about 3 hours and then +10 to -15 nT through early on 28 July. By early on the 28th, wind speed reached the period's maximum of 700 km/s. The increase in levels was in response to the onset of a recurrent coronal hole high speed wind stream. As a result, active to major storm levels were observed from late on 27 July through midday on 28 July at all latitudes. From midday on the 28th through the end of the summary period, wind speed slowly decayed and ended the period at 400 km/s, while the IMF Bz did not vary much beyond +/- 3 nT. The geomagnetic field responded with quiet to unsettled conditions.

Space Weather Outlook
02 August – 28 August 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 02 – 05 August.

The geomagnetic field is expected to be mostly quiet to unsettled for the majority of the forecast period. Recurrent coronal hole high speed wind streams are expected to rotate into geoeffective positions on 08 August, 24 August, and 28 August. Unsettled to active periods are possible on 08 August, while active to minor storm periods are possible on 24 August and 28 August.



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
24 July	77	19	110	A4.0	1	0	0	0	0	0	0	0
25 July	76	16	100	A3.4	0	0	0	0	0	0	0	0
26 July	75	20	100	A2.8	0	0	0	0	0	0	0	0
27 July	74	23	70	A2.8	0	0	0	0	0	0	0	0
28 July	73	17	70	A2.5	0	0	0	0	0	0	0	0
29 July	73	19	80	A2.1	0	0	0	0	0	0	0	0
30 July	74	23	40	A2.1	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
	24 July	5.1E+5	1.8E+4	3.9E+3		2.2E+6
25 July	6.4E+5	1.6E+4	3.9E+3		9.9E+5	
26 July	5.0E+5	1.7E+4	3.7E+3		9.1E+5	
27 July	7.5E+5	1.6E+4	3.6E+3		9.5E+5	
28 July	2.4E+6	1.5E+4	3.4E+3		4.0E+6	
29 July	3.8E+6	1.6E+4	3.6E+3		1.3E+7	
30 July	4.9E+6	1.6E+4	3.5E+3		2.6E+7	

Daily Geomagnetic Data

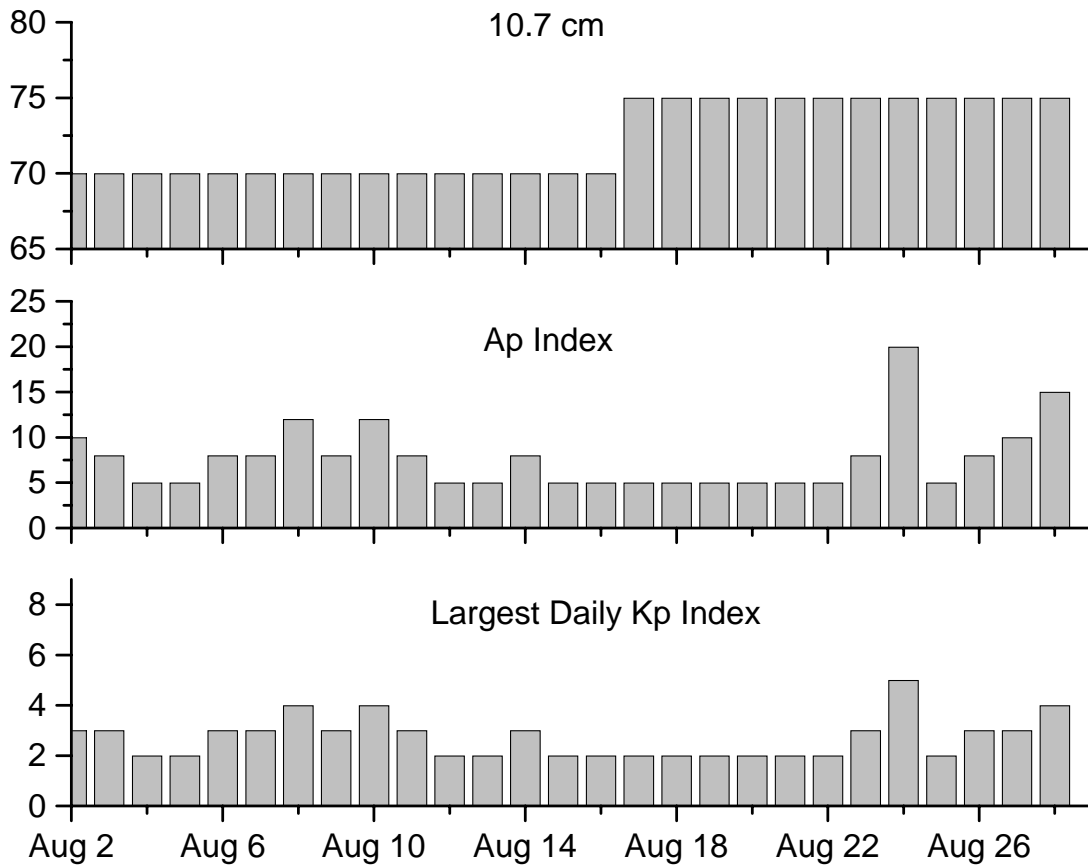
Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
24 July	7	1-0-2-2-3-3-1-2	10	0-0-3-2-4-4-1-1	4	1-0-1-1-2-2-1-2
25 July	5	2-2-1-0-1-2-1-2	9	2-2-3-1-3-2-1-3	6	3-2-1-0-2-1-1-2
26 July	5	3-1-1-1-1-1-1-2	*	*_*_*_*_*_*_*_*	6	3-1-1-1-1-2-1-1
27 July	5	0-0-0-1-1-1-2-4	*	*_*_*_*_*_*_*_*	9	1-0-0-0-2-2-3-4
28 July	26	6-5-5-2-1-3-1-2	*	*_*_*_*_*_*_*_*	29	6-6-4-3-2-2-1-2
29 July	3	2-0-1-1-0-0-2-1	*	*_*_*_*_*_*_*_*	5	3-1-2-1-0-1-1-1
30 July	3	1-1-1-0-0-0-2-2	*	*_*_*_*_*_*_*_*	5	2-2-1-0-0-1-1-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
27 Jul 2155	ALERT: Geomagnetic K = 4	27 Jul 2152
28 Jul 0137	WARNING: Geomagnetic K = 4	28 Jul 0140 – 1600
28 Jul 0238	ALERT: Geomagnetic K = 5	28 Jul 0236
28 Jul 0246	ALERT: Geomagnetic K = 6	28 Jul 0244
28 Jul 0307	WARNING: Geomagnetic K = 5	28 Jul 0310 – 1600
28 Jul 1527	EXTENDED WARNING: Geomagnetic K = 4	28 Jul 0140 – 2359



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
02 August	70	10	3	16 August	70	5	2
03	70	8	3	17	75	5	2
04	70	5	2	18	75	5	2
05	70	5	2	19	75	5	2
06	70	8	3	20	75	5	2
07	70	8	3	21	75	5	2
08	70	12	4	22	75	5	2
09	70	8	3	23	75	8	3
10	70	12	4	24	75	20	5
11	70	8	3	25	75	5	2
12	70	5	2	26	75	8	3
13	70	5	2	27	75	10	3
14	70	8	3	28	75	15	4
15	70	5	2				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq
	Begin	Max	Integ	Imp/	Location	Rgn	Radio Flux		Intensity
			Class	Flux	Lat	CMD	#	245	2695

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location	Rgn
	Begin	Max	End	X-ray Class.		Lat	
24 July	1254	1257	1259	B1.1			
	1446	1501	1528	C1.1			
25 July	0432	0451	0505	B2.2			901
26 July	0836	0845	0851	B2.2			
27 July	1057	1103	1109	B3.2			901
	1241	1248	1252	B1.7			901
	1637	1641	1644	B3.7			901
28 July	<i>No Flares Observed</i>						
29 July	2244	2248	2254	B1.0			
30 July	<i>No Flares Observed</i>						

Region Summary

Date	Location		Sunspot Characteristics					Flares		X-ray		Optical				
	° Lat	° CMD	Helio Lon	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S	1	2	3	4

Region 900

14 Jul	S05E43	139	0040	05	Cso	005	B									
15 Jul	S05E30	139	0050	10	Cao	007	B									
16 Jul	S06E16	140	0040	08	Bxo	010	B									
17 Jul	S05E02	140	0040	07	Bxo	013	B									
18 Jul	S05W12	141	0090	08	Dsi	016	B									
19 Jul	S04W25	141	0090	09	Dso	014	B									
20 Jul	S04W38	141	0020	06	Bxo	004	B									
21 Jul	S06W52	142	0010	02	Bxo	002	B									
22 Jul	S06W65	142														
23 Jul	S06W78	142														
24 Jul	S06W91	142														

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 140



Region Summary

Location		Sunspot Characteristics												
Date	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 901

22 Jul	N06E70	006	0040	06	Cso	006	B									
23 Jul	N06E56	007	0130	08	Dao	011	B									
24 Jul	N05E42	008	0110	08	Dao	009	B									
25 Jul	N06E28	009	0100	08	Dao	006	B									
26 Jul	N06E15	009	0100	09	Cao	010	B									
27 Jul	N05E00	011	0070	09	Cso	013	B									
28 Jul	N05W12	009	0070	09	Cso	007	B									
29 Jul	N06W26	009	0080	09	Cso	009	B									
30 Jul	N06W43	013	0010	01	Hsx	001	A									
											0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 011

Region 902

30 Jul	S10W21	351	0030	04	Cso	002	B									
											0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 351

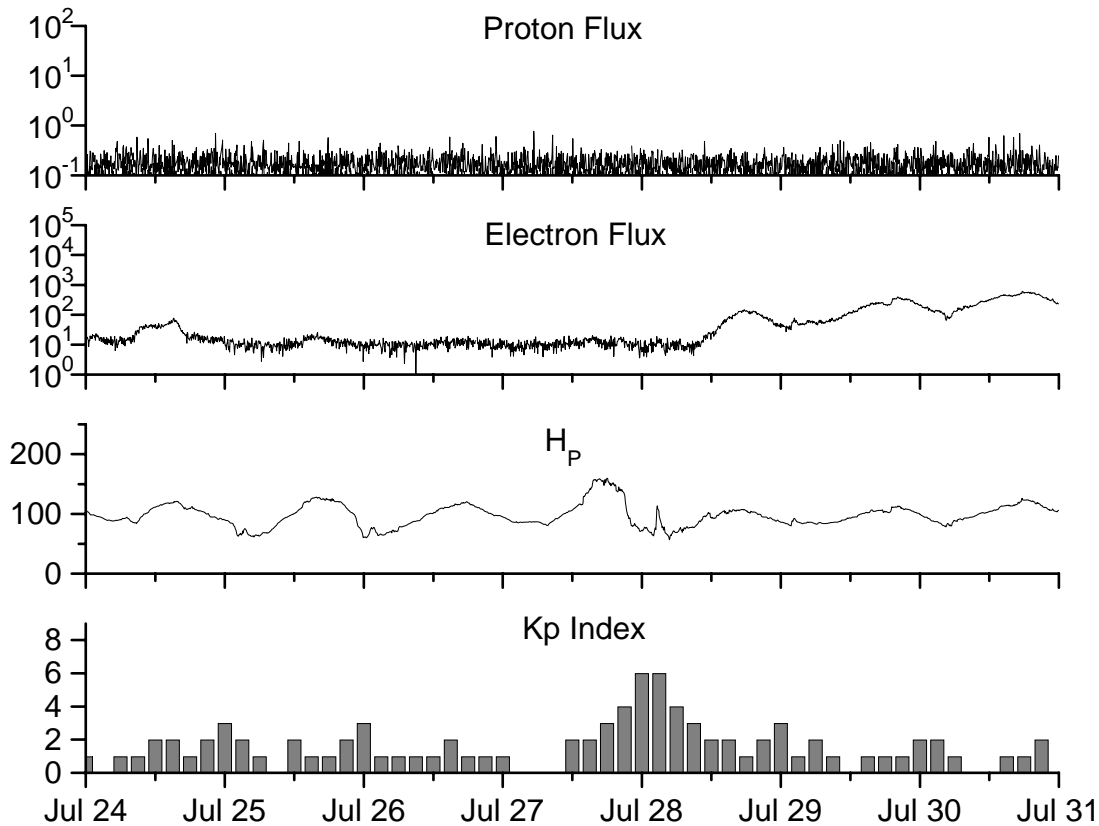


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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									
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	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
2006									
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			76.6		6	
March	21.3	10.8	0.51			75.5		8	
April	55.2	30.2	0.55			89.0		11	
May	39.6	22.2	0.56			81.0		8	
June	37.7	13.9	0.37			80.1		8	
July	22.6	12.2	0.54			75.8		7	

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 24 July 2006*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

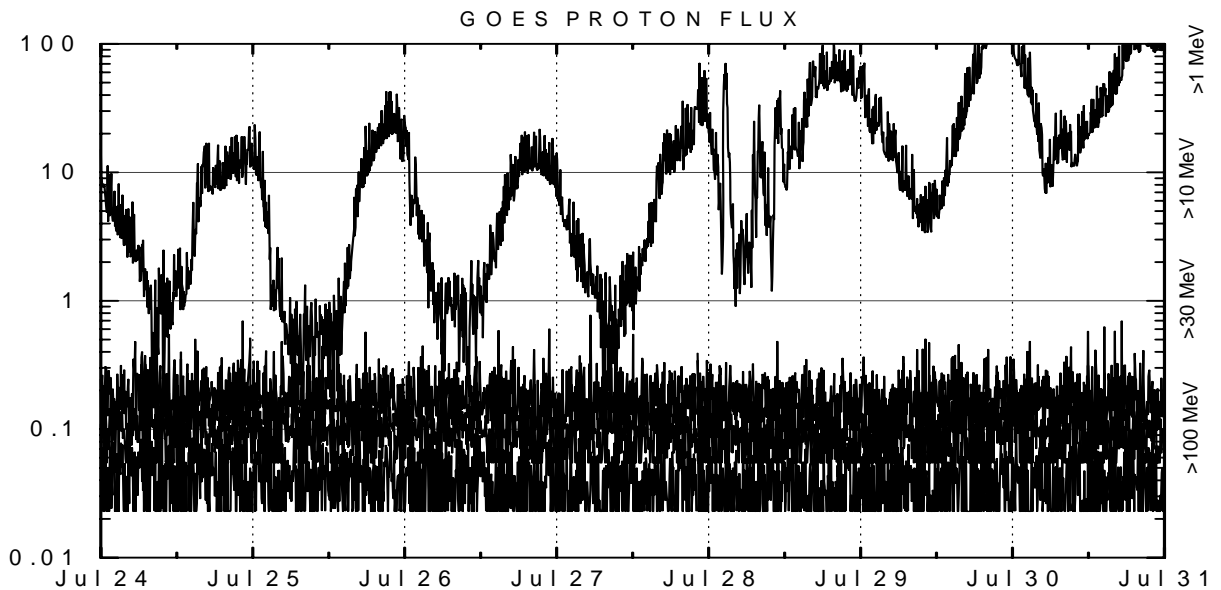
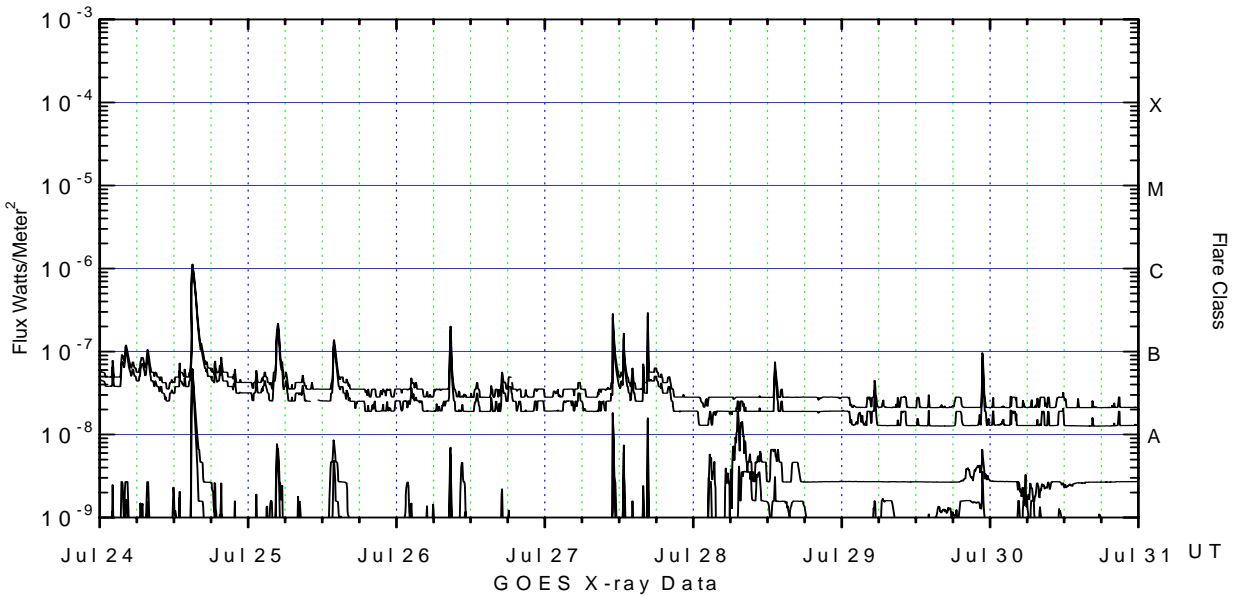
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

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

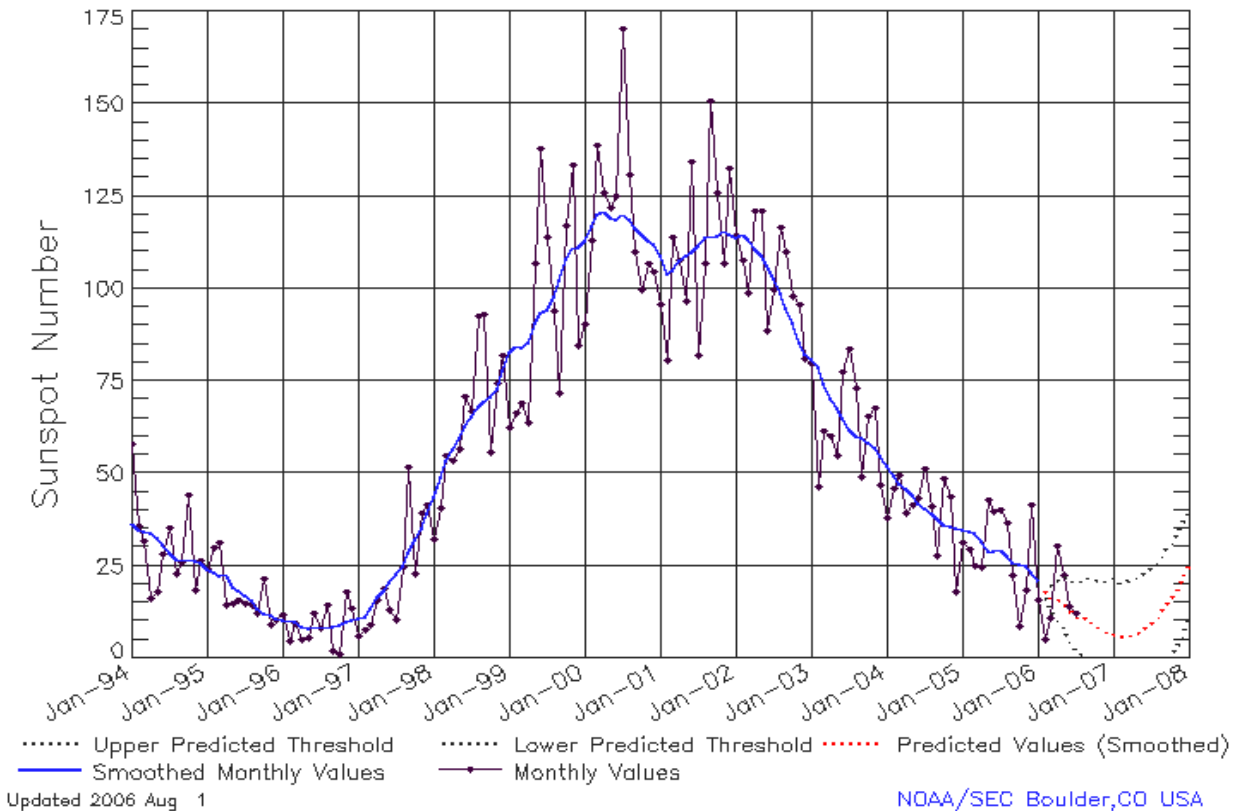
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 (W075) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-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/cm²-sec-sr) at greater than 10 MeV.



ISES Solar Cycle Sunspot Number Progression

Data Through 31 Jul 06



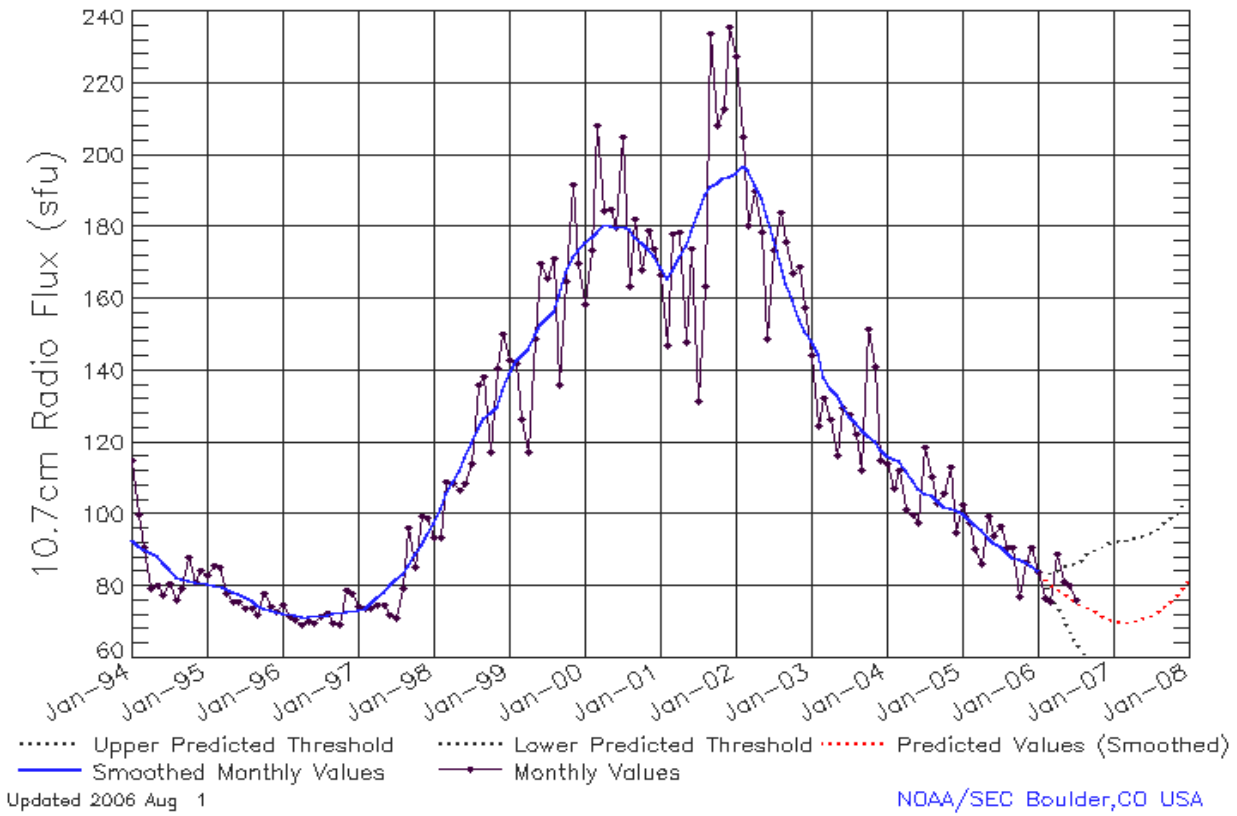
SEC Prediction of Smoothed Sunspot Number

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



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Jul 06



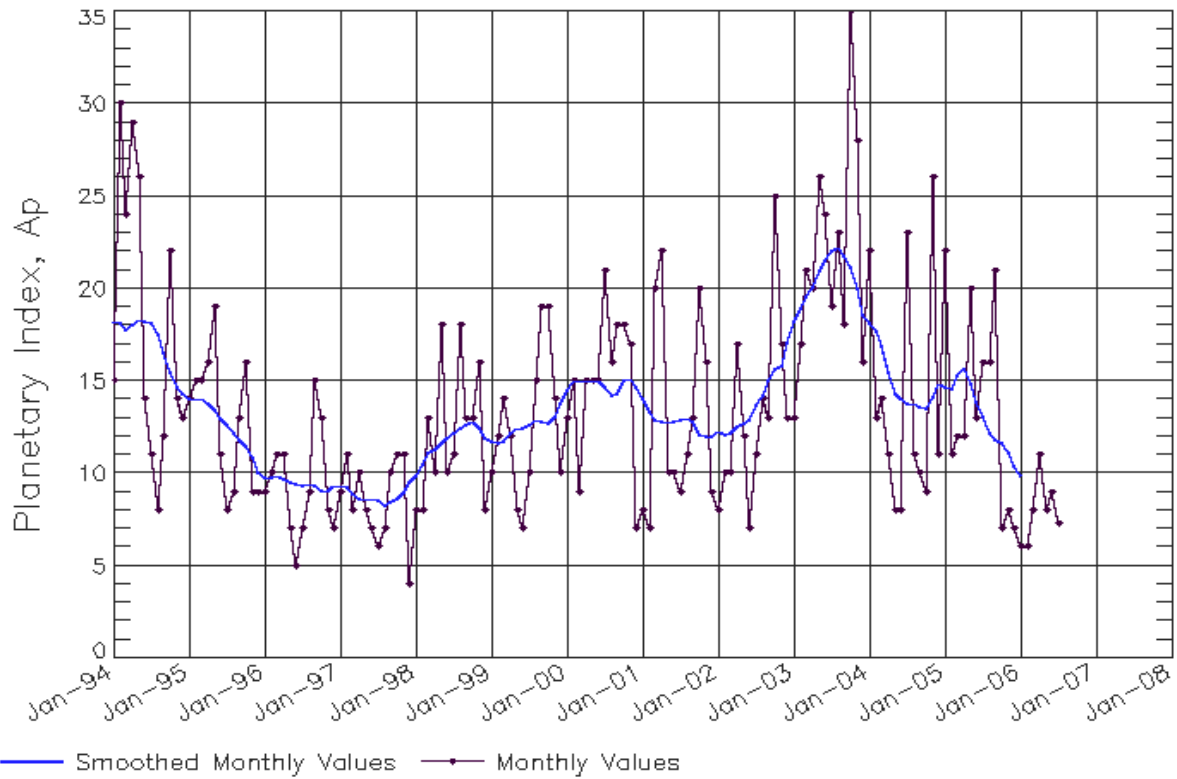
SEC Prediction of Smoothed F10.7cm Radio Flux

	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 (***)	88 (***)	87 (***)	87 (***)	85 (***)
2006	84 (***)	82 (1)	80 (3)	79 (5)	78 (7)	77 (9)	75 (11)	74 (13)	74 (14)	73 (14)	72 (13)	71 (12)
2007	70 (11)	70 (10)	70 (10)	70 (10)	71 (10)	71 (10)	72 (10)	73 (11)	74 (11)	76 (12)	77 (13)	79 (14)



ISES Solar Cycle Ap Progression

Data Through 31 Jul 06



Updated 2006 Aug 1

NOAA/SEC Boulder, CO USA

