

Space Weather Highlights
25 September – 01 October 2006

SEC PRF 1622
03 October 2006

Solar activity was at very low levels. Only a few minor B-class flares were observed during the period.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 25 – 29 September and again on 01 October

The geomagnetic field ranged from quiet to minor storm levels. Solar wind speed ranged from a high of about 650 km/s early on 25 September to a low of about 300 km/s late on 29 September. The period began under the waning influence of a high speed coronal hole wind stream. Though wind speed was elevated to near 650 km/s, the IMF Bz was weak, not varying much beyond +/-4 nT. These conditions persisted through late on 29 September. During this period, wind speed gradually decayed to about 300 km/s, and as a result, the geomagnetic field was quiet to unsettled at all latitudes. By early on 30 September, wind speed increased to near 450 km/s, the IMF Bz fluctuated between +15 to -10 nT, and both density and temperature increased, all indicative of a co-rotating interaction region in advance of a coronal hole high speed stream. By 30/0600 UTC, the geomagnetic field was unsettled to active and further increased to minor storm levels early on 01 October. The period ended with wind speed decaying to near 500 km/s and the geomagnetic field at unsettled to active levels.

Space Weather Outlook
04 October – 30 October 2006

Solar activity is expected to be at very 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 04 – 07 October, 15 – 20 October, 22 - 26 October, and 28 – 30 October.

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 14 – 15 October, 21 October, and 28 October. Unsettled to minor storm periods are possible on those dates.



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
25 September	70	11	10	<A1.0	0	0	0	1	0	0	0	0
26 September	71	13	30	<A1.0	0	0	0	0	0	0	0	0
27 September	72	11	20	A1.3	0	0	0	0	0	0	0	0
28 September	73	36	120	A1.4	0	0	0	0	0	0	0	0
29 September	77	51	180	A1.3	0	0	0	0	0	0	0	0
30 September	78	38	180	A1.2	0	0	0	1	0	0	0	0
01 October	78	35	130	A1.8	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
	25 September	4.8E+6	1.6E+4	3.4E+3		6.8E+7
26 September	2.6E+6	1.6E+4	3.6E+3		1.3E+8	
27 September	2.0E+6	1.6E+4	3.5E+3		1.2E+8	
28 September	3.0E+6	1.6E+4	3.5E+3		1.5E+8	
29 September	3.3E+6	1.6E+4	3.4E+3		7.1E+7	
30 September	7.8E+5	1.7E+4	3.4E+3		2.0E+6	
01 October	1.3E+6	1.5E+4	3.3E+3		3.9E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	25 September	6	1-2-1-3-2-1-1-2	19	2-1-2-6-5-1-1-1	6
26 September	5	2-2-1-1-1-1-1-2	6	1-3-2-1-2-1-1-2	6	2-3-2-0-1-1-1-2
27 September	2	2-1-0-0-1-1-0-0	2	2-1-0-2-0-0-0-0	4	3-2-0-1-1-0-0-1
28 September	2	0-0-1-1-1-1-1-1	1	0-0-0-2-1-0-0-0	2	0-0-1-1-1-0-0-1
29 September	3	0-1-0-0-1-2-2-1	2	0-0-2-1-0-0-1-0	3	1-1-1-0-0-1-2-1
30 September	9	1-3-2-3-2-2-2-2	18	0-3-4-6-3-1-1-1	12	0-3-3-4-2-2-1-3
01 October	14	4-4-3-3-3-2-1-1	37	4-4-5-6-6-4-1-1	25	5-5-4-4-3-3-1-3

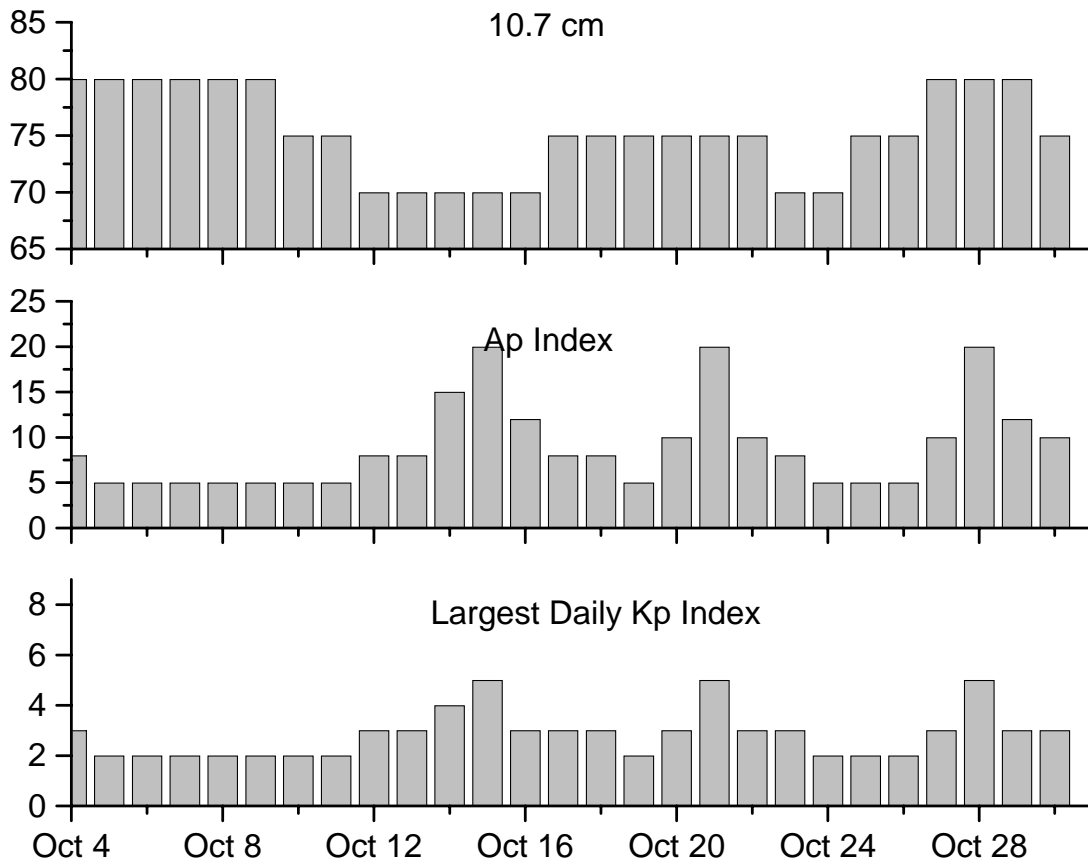


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
25 Sep 0932	WARNING: Geomagnetic K = 4	25 Sep 0935 – 1600
25 Sep 1217	CANCEL WARNING: Geomagnetic K = 4	25 Sep 0935 – 1600
25 Sep 1338	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Sep 1325
26 Sep 0538	WARNING: Geomagnetic K = 4	26 Sep 0538 – 1600
26 Sep 0545	ALERT: Geomagnetic K = 4	26 Sep 0544
26 Sep 0852	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	26 Sep 0830
27 Sep 0922	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	27 Sep 0900
28 Sep 0836	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	28 Sep 0815
29 Sep 1240	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	29 Sep 1225
30 Sep 0558	WARNING: Geomagnetic K = 4	30 Sep 0600 – 1600
30 Sep 0601	ALERT: Geomagnetic K = 4	30 Sep 0600
01 Oct 0204	WARNING: Geomagnetic K = 4	01 Oct 0204 – 1600
01 Oct 0208	ALERT: Geomagnetic K = 4	01 Oct 0206
01 Oct 0353	WARNING: Geomagnetic K = 5	01 Oct 0355 – 1600
01 Oct 0407	ALERT: Geomagnetic K = 5	01 Oct 0405
01 Oct 1549	EXTENDED WARNING: Geomagnetic K = 4	01 Oct 0204 – 2359
01 Oct 1637	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	01 Oct 1615



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
04 Oct	80	8	3	18 Oct	75	8	3
05	80	5	2	19	75	5	2
06	80	5	2	20	75	10	3
07	80	5	2	21	75	20	5
08	80	5	2	22	75	10	3
09	80	5	2	23	70	8	3
10	75	5	2	24	70	5	2
11	75	5	2	25	75	5	2
12	70	8	3	26	75	5	2
13	70	8	3	27	80	10	3
14	70	15	4	28	80	20	5
15	70	20	5	29	80	12	3
16	70	12	3	30	75	10	3
17	75	8	3				



Energetic Events

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

No Events Observed

Flare List

Date	Time			Optical	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
25 September	1536	1543	1556		Sf	S13W39	910
26 September	<i>No Flares Observed</i>						
27 September	<i>No Flares Observed</i>						
28 September	<i>No Flares Observed</i>						
29 September	1940	1946	1955	B4.3			
30 September	1656	1659	A1743	B7.2	Sf	S06W55	915
01 October	<i>No Flares Observed</i>						

Region Summary

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

Region 910

18 Sep	S08E49	341	0030	01	Hsx	001	A	1									
19 Sep	S09E37	340	0030	01	Hsx	001	A										
20 Sep	S09E24	339	0010	01	Hrx	001	A										
21 Sep	S09E10	340	0010	01	Hsx	001	A										2
22 Sep	S10W04	341	0050	04	Csi	007	B	1									2
23 Sep	S10W18	342	0020	01	Cro	003	B										
24 Sep	S09W32	343	0030	03	Axx	003	A										1
25 Sep	S08W46	343	0010	01	Axx	001	A										1
26 Sep	S08W59	343															
27 Sep	S08W72	343															
28 Sep	S08W85	343															
29 Sep	S08W98	343															
								2	0	0	6	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 341



Region 911

26 Sep	N07E72	212	0030	01	Bxo	003	B
27 Sep	N07E59	212	0020	01	Axx	001	A
28 Sep	N07E43	215					
29 Sep	N07E30	215					
30 Sep	N07E17	215					
01 Oct	N07E04	215					

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 215

Region 912

28 Sep	N06E65	193	0040	05	Bxo	003	B
29 Sep	N03E52	193	0020	01	Axx	001	A
30 Sep	N03E39	193					
01 Oct	N03E26	193					

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 193

Region 913

28 Sep	S18E68	190	0060	03	Hsx	002	A
29 Sep	S18E55	190	0070	03	Hsx	002	A
30 Sep	S18E42	190	0060	03	Cso	003	Bg
01 Oct	S19E27	191	0040	02	Cso	002	Bg

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 191

Region 914

28 Sep	S07E75	183	0020	02	Axx	001	A
29 Sep	S07E62	183	0050	03	Hrx	002	A
30 Sep	S07E49	183	0030	01	Hsx	001	A
01 Oct	S10E36	182	0030	01	Hsx	001	A

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 182

Region 915

29 Sep	S06W46	291	0040	05	Cso	006	B
30 Sep	S06W59	291	0090	06	Dso	004	B
01 Oct	S05W72	290	0060	06	Dso	002	B

1
0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 291

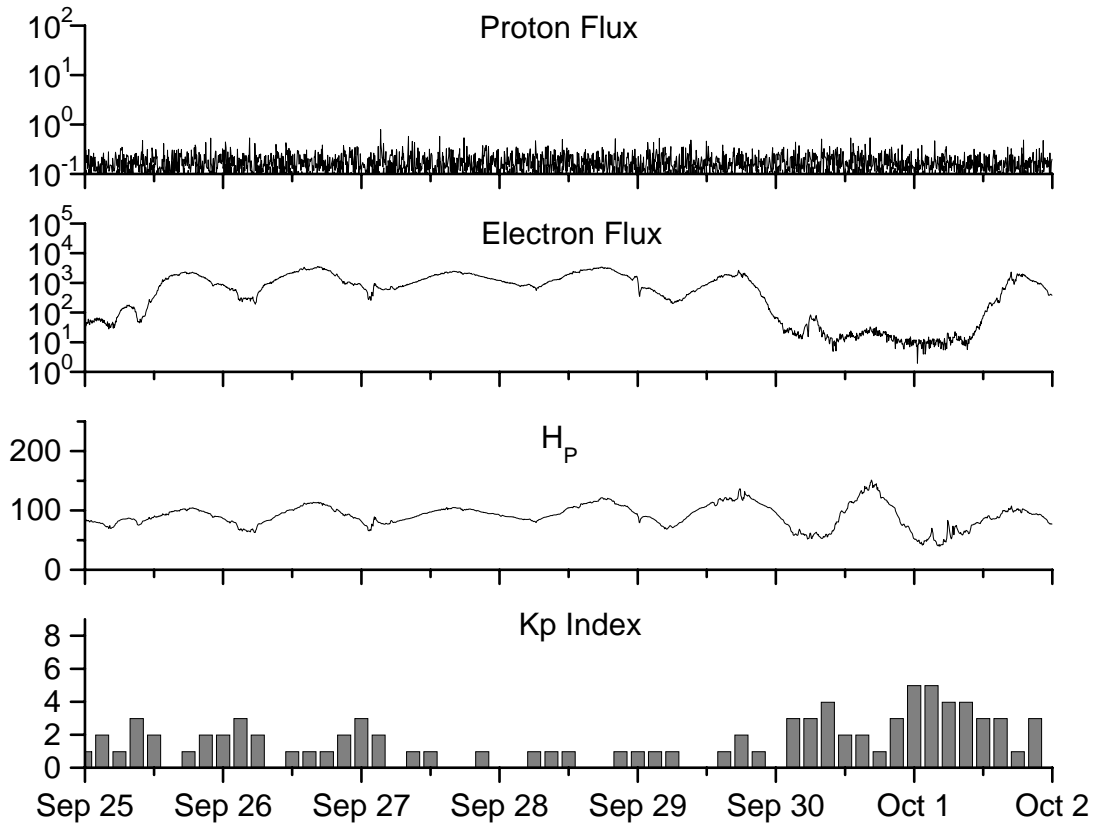


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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									
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	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			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	
August	22.8	12.9	0.57			79.0		9	
September	25.2	14.5	0.58			77.8		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 25 September 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.

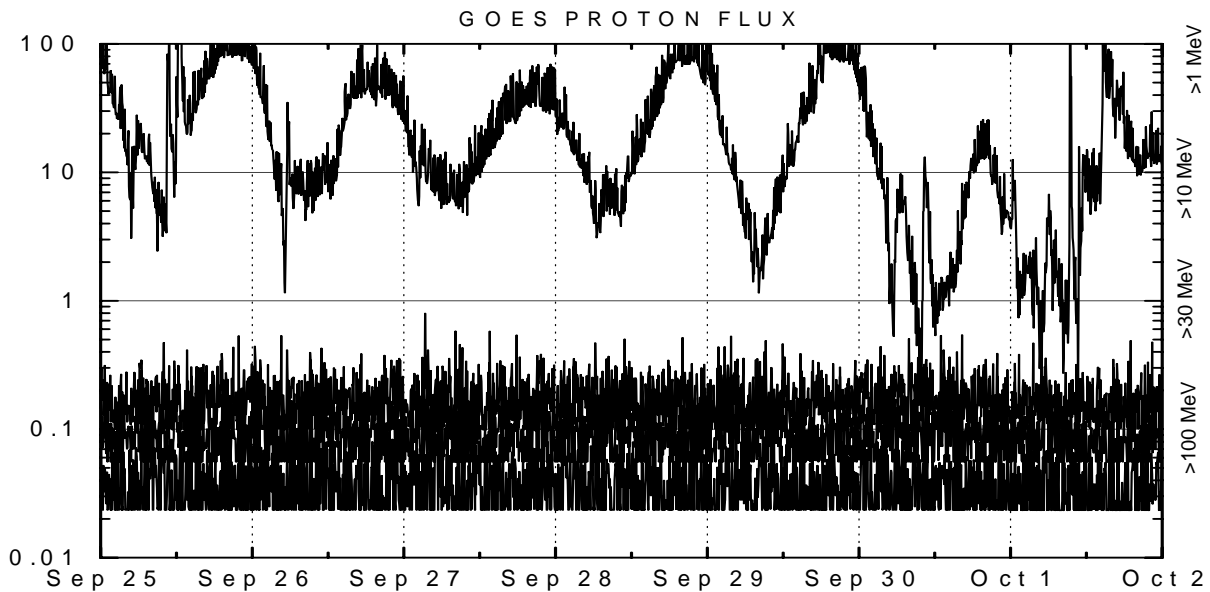
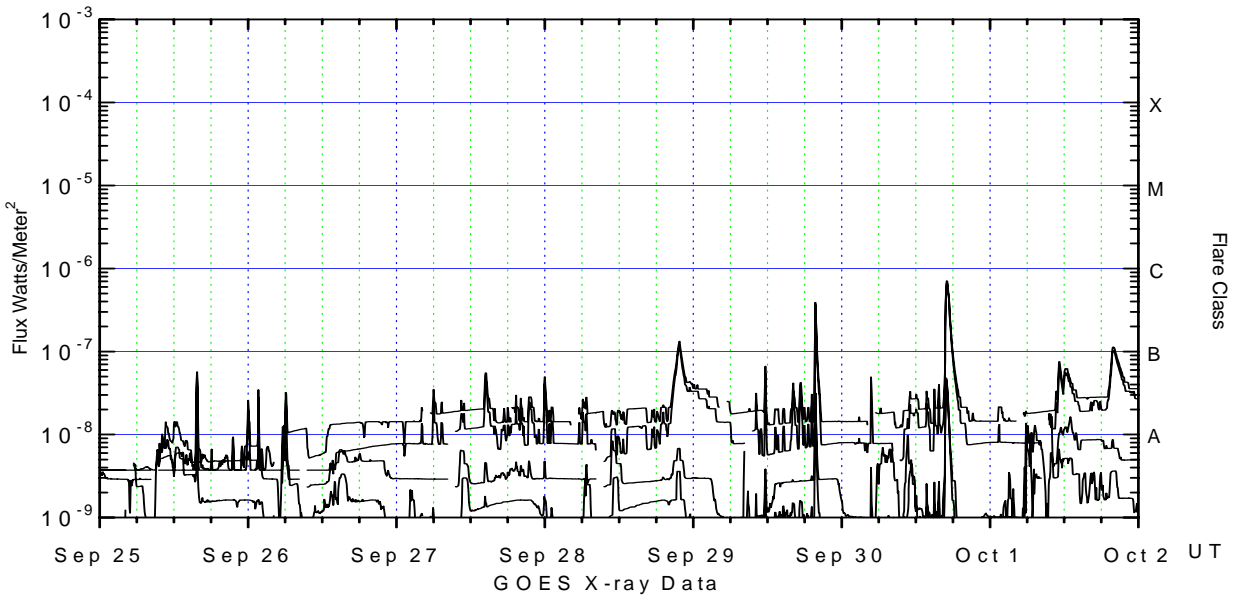
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

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

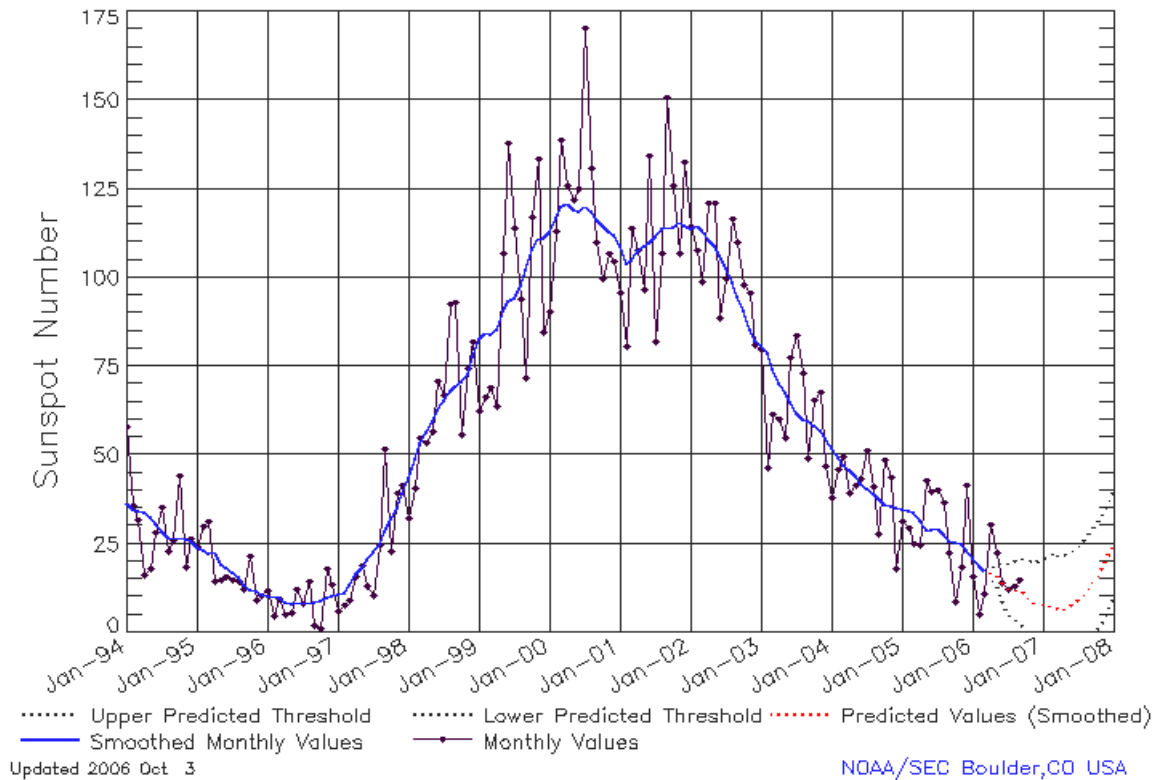
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 (W075) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

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 30 Sep 06



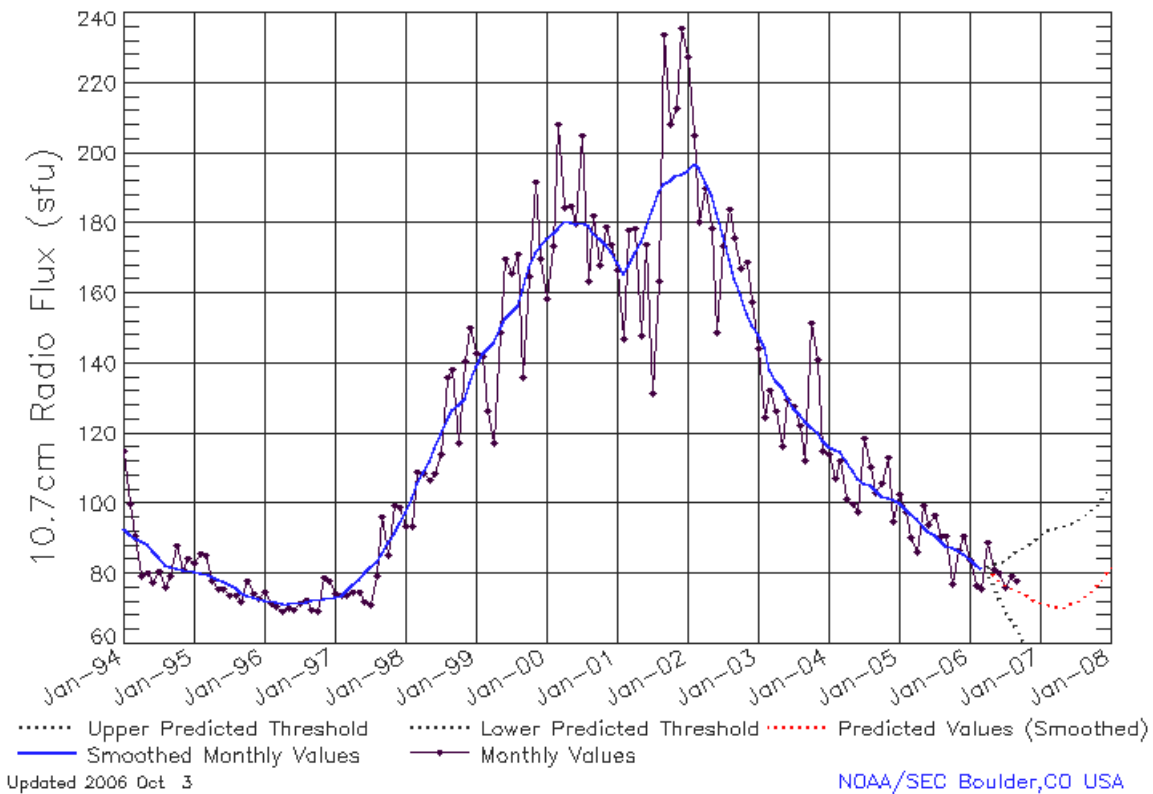
SEC Prediction of Smoothed Sunspot Number

	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	19	17	16	16	14	12	11	11	10	8	8
	(**)	(**)	(**)	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)
2007	7	7	6	6	7	8	10	11	13	16	18	21
	(13)	(14)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 30 Sep 06



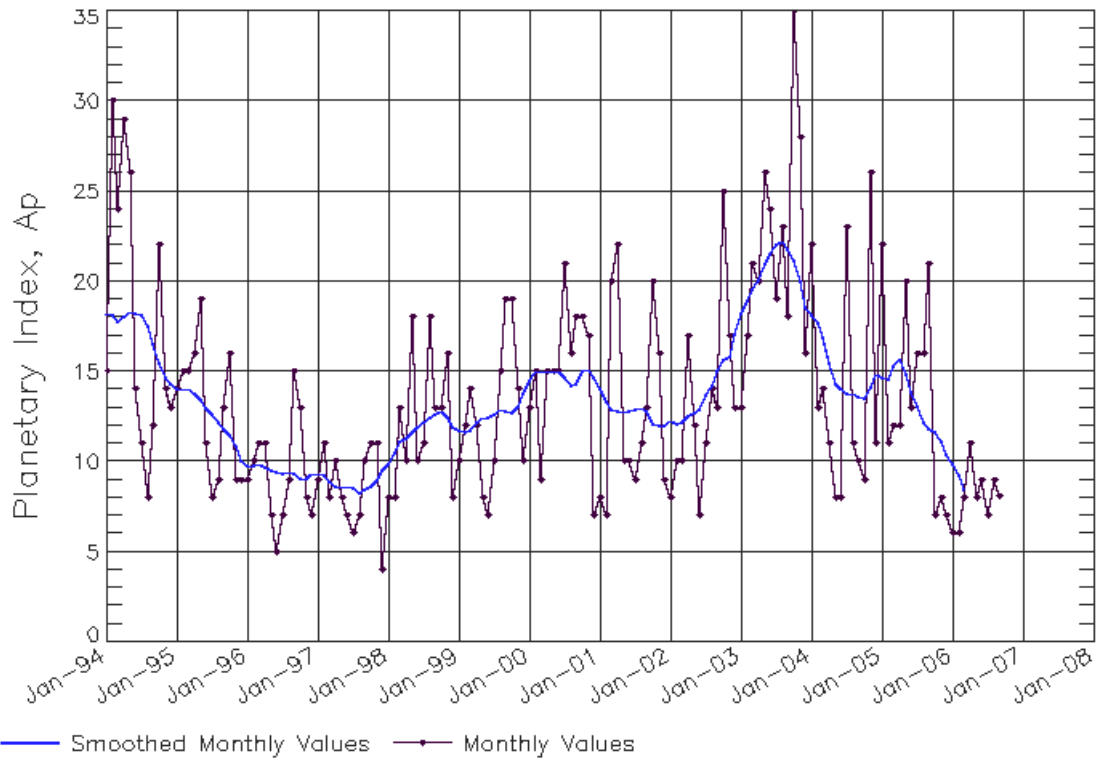
SEC Prediction of Smoothed F10.7cm Radio Flux

	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	83	82	80	79	78	76	75	75	74	73	72
	(***)	(***)	(***)	(1)	(3)	(5)	(7)	(9)	(13)	(13)	(14)	(14)
2007	71	70	70	71	71	71	72	73	74	76	77	79
	(13)	(12)	(11)	(10)	(10)	(10)	(10)	(10)	(10)	(11)	(11)	(12)



ISES Solar Cycle Ap Progression

Data Through 30 Sep 06



Updated 2006 Oct 3

NOAA/SEC Boulder, CO USA

