

**Space Weather Highlights**  
**06 March – 12 March 2006**

**SEC PRF 1593**  
**14 March 2006**

Solar activity was at very low levels. Two small, magnetically simple spot groups were visible on the disk this period, Region 857 (N08, L=072, class/area, Cso/010 on 05 March) and Region 858 (N18, L=005, class/area, Cro/020 on 12 March).

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

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

During the summary period, quiet to unsettled conditions were observed at middle latitudes, while high latitudes observed quiet to major storm conditions. Unsettled periods at middle latitudes and active to minor storm conditions at high latitudes occurred midday on 06 March to midday on 07 March. From midday on 10 March through midday on 11 March, unsettled conditions were observed at middle latitudes, while high latitudes observed minor to major storm levels. Both periods of activity were due to geoeffective coronal hole wind streams; otherwise quiet conditions predominated. Solar wind speed ranged from a low of about 300 km/s early on 06 March to a high of about 575 km/s early on 11 March. For the majority of the period, the Bz component of the IMF did not vary much beyond +/- 3 nT. However, a 24-hour period of southward Bz to -10 nT occurred beginning midday on 06 March. From midday on 09 March though late on 11 March, the IMF Bz fluctuated between +/- 7 nT. Both occurrences were due to coronal hole wind streams.

**Space Weather Outlook**  
**15 March – 10 April 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 20 – 25 March.

The geomagnetic field is expected to be at quiet to unsettled levels for the majority of the period. From 19 - 21 March, active to minor storm conditions are expected due to effects from a recurrent coronal hole wind stream.



**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	
06 March	74	27	20	<A1.0	0	0	0	0	0	0	0	0	0
07 March	74	25	30	<A1.0	0	0	0	0	0	0	0	0	0
08 March	72	24	30	<A1.0	0	0	0	0	0	0	0	0	0
09 March	73	12	10	<A1.0	0	0	0	0	0	0	0	0	0
10 March	72	12	10	<A1.0	0	0	0	0	0	0	0	0	0
11 March	74	0	0	<A1.0	0	0	0	0	0	0	0	0	0
12 March	73	18	20	<A1.0	0	0	0	0	0	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
	06 March	8.3E+5	1.6E+4	3.8E+3		5.0E+6
07 March	1.7E+5	1.5E+4	3.7E+3		8.2E+5	
08 March	1.7E+5	1.6E+4	3.6E+3		9.6E+5	
09 March	1.6E+5	1.6E+4	3.6E+3		9.8E+5	
10 March	2.6E+5	1.6E+4	3.6E+3		8.3E+5	
11 March	5.5E+5	1.5E+4	3.5E+3		5.5E+6	
12 March	2.2E+5	1.5E+4	3.7E+3		6.3E+6	

**Daily Geomagnetic Data**

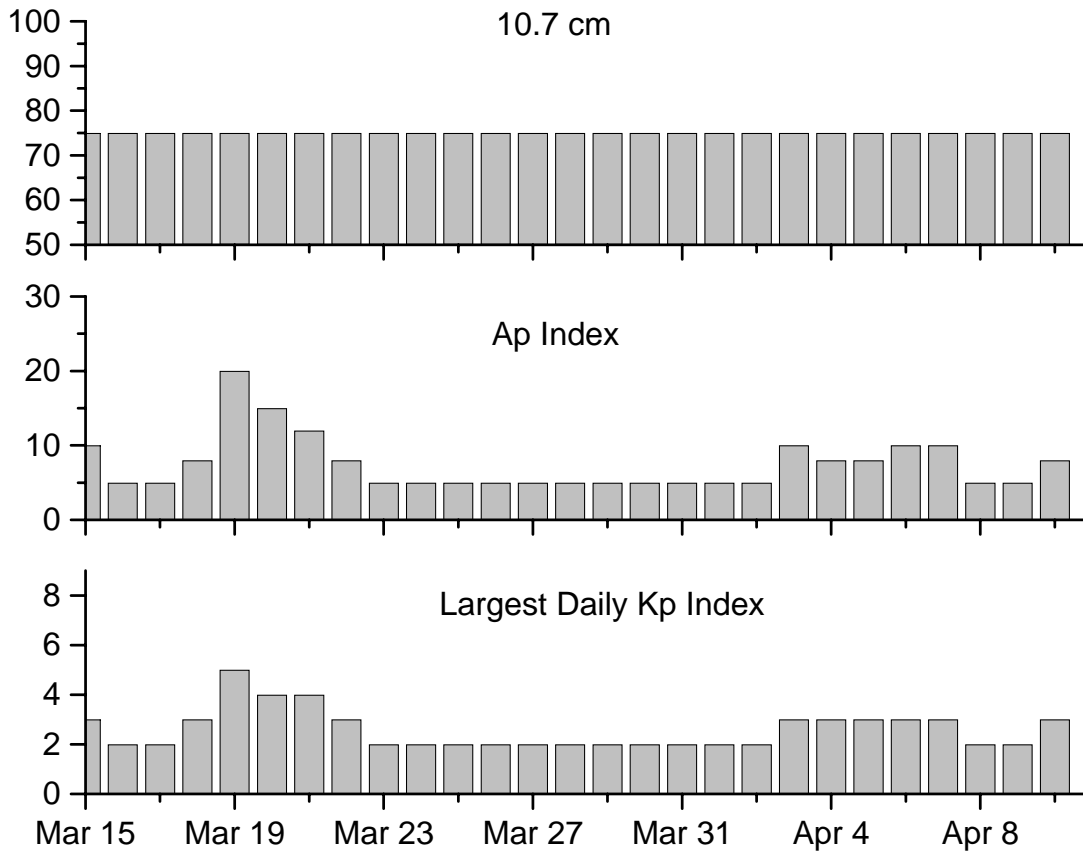
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 March	8	0-0-1-1-3-3-3-3	8	0-0-0-2-4-3-2-2	8
07 March	6	3-2-2-1-1-1-1-1	16	3-3-4-5-3-2-0-0	12	4-4-3-3-2-1-0-1
08 March	3	2-1-0-0-2-1-1-0	2	0-0-0-2-2-0-0-1	4	2-1-0-0-1-1-1-2
09 March	3	0-1-0-0-1-2-2-1	1	0-0-0-0-0-1-1-1	4	0-1-0-0-0-2-3-2
10 March	9	1-2-2-2-3-2-2-3	25	1-1-5-5-5-3-2-4	12	1-3-2-3-3-2-2-4
11 March	9	3-2-3-2-1-3-1-1	26	3-2-6-6-2-3-1-1	12	4-3-3-3-1-3-2-1
12 March	3	0-2-1-1-1-1-2-0	4	0-0-2-3-1-1-0-0	6	0-1-2-1-1-2-2-1

**Alerts and Warnings Issued**

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
06 Mar 2258	WARNING: Geomagnetic K=4	06 Mar 2359- 07Mar 1600
07 Mar 0249	ALERT: Geomagnetic K=4	07 Mar 0247
09 Mar 0224	WARNING: Geomagnetic Sudden Impulse	09 Mar 0300-0400
10 Mar 2304	WARNING: Geomagnetic K=4	10 Mar 2305- 11 Mar 1600
10 Mar 2314	ALERT: Geomagnetic K=4	10 Mar 2312



## 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
15 March	75	10	3	29 March	75	5	2
16	75	5	2	30	75	5	2
17	75	5	2	31	75	5	2
18	75	8	3	01 April	75	5	2
19	75	20	5	02	75	5	2
20	75	15	4	03	75	10	3
21	75	12	4	04	75	8	3
22	75	8	3	05	75	8	3
23	75	5	2	06	75	10	3
24	75	5	2	07	75	10	3
25	75	5	2	08	75	5	2
26	75	5	2	09	75	5	2
27	75	5	2	10	75	8	3
28	75	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 /	Location	Rgn
	Begin	Max	End	X-ray			
				Class.	Brtns	Lat	CMD
06 March	No Flares Observed						
07 March	1515	1614	1902	B2.1			
08 March	No Flares Observed						
09 March	No Flares Observed						
10 March	No Flares Observed						
11 March	1322	1400	1451	B3.4			856
12 March	No Flares Observed						

***Region Summary***

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

*Region 856*

27 Feb S08E69	123	0010	00	Axx	001	A									
28 Feb S09E54	124	0020	01	Axx	001	A									
01 Mar S12E41	125														
02 Mar S12E28	125														
03 Mar S12E15	125														
04 Mar S10E01	125	0010	02	Axx	003	A									
05 Mar S10W12	125	0010	04	Axx	005	A									
06 Mar S10W25	125	0010	02	Axx	004	A									
07 Mar S08W38	125	0010	02	Axx	002	A									
08 Mar S08W50	124	0010	01	Axx	001	A									
09 Mar S08W63	124														
10 Mar S08W76	124														
11 Mar S08W89	124														

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 125



**Region Summary- Continued**

Location		Sunspot Characteristics						X-ray			Optical											
Date	( ° Lat ° CMD)	Helio Lon	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
								C	M	X	S	1	2	3	4							
<i>Region 857</i>																						
05 Mar	N08E41	072	0010	04	Cso	003	B															
06 Mar	N08E26	074	0010	01	Axx	003	A															
07 Mar	N05E14	073	0020	03	Axx	003	A															
08 Mar	N09E00	074	0020	05	Axx	003	A															
09 Mar	N08W13	073	0010	04	Axx	002	A															
10 Mar	N08W28	075	0010	03	Axx	002	A															
11 Mar	N08W41	075																				
12 Mar	N08W54	075																				
Still on Disk.																						
Absolute heliographic longitude: 074																						
<i>Region 858</i>																						
12 Mar	N18E15	005	0020	05	Cro	008	B															
Still on Disk.																						
Absolute heliographic longitude: 005																						

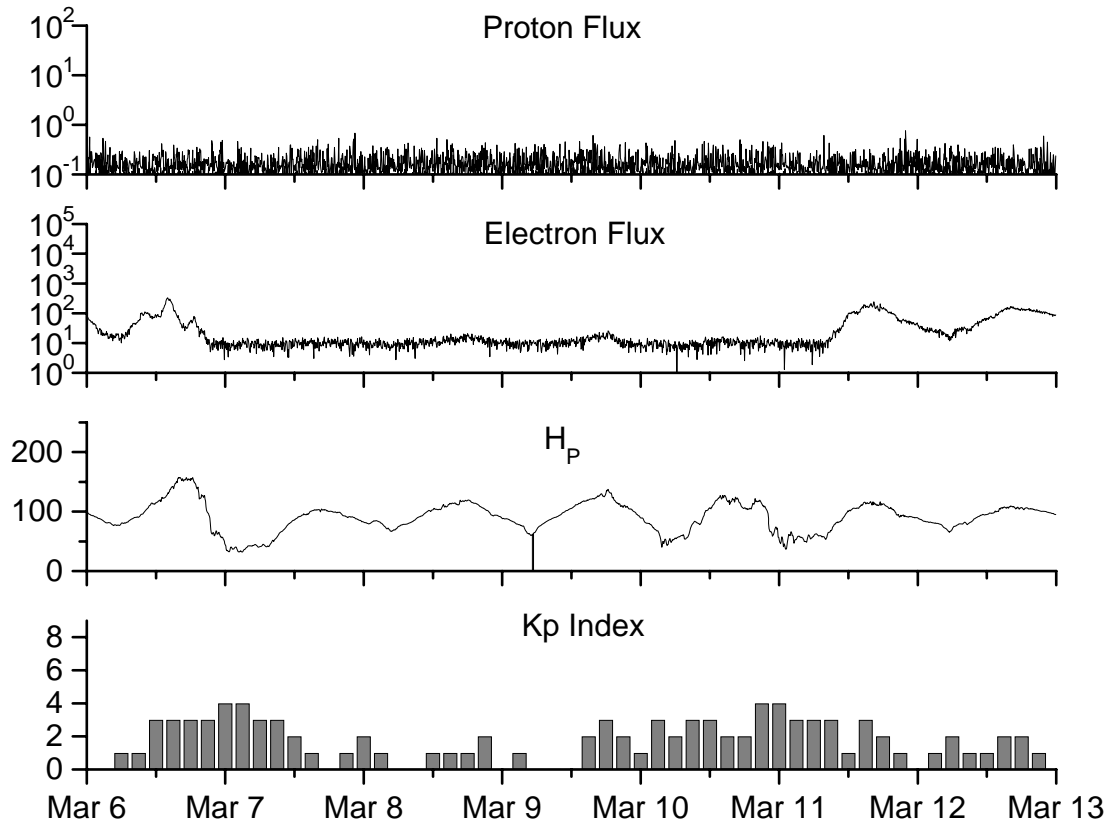


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>									
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	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	45.4	27.5	96.6	89.3	16	12.2
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	
December	62.6	41.2	0.66			90.8		7	
<b>2006</b>									
January	28.0	15.4	0.55			83.8		6	
February	5.3	4.7	0.89			76.6		6	

**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 06 March 2006*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W105) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

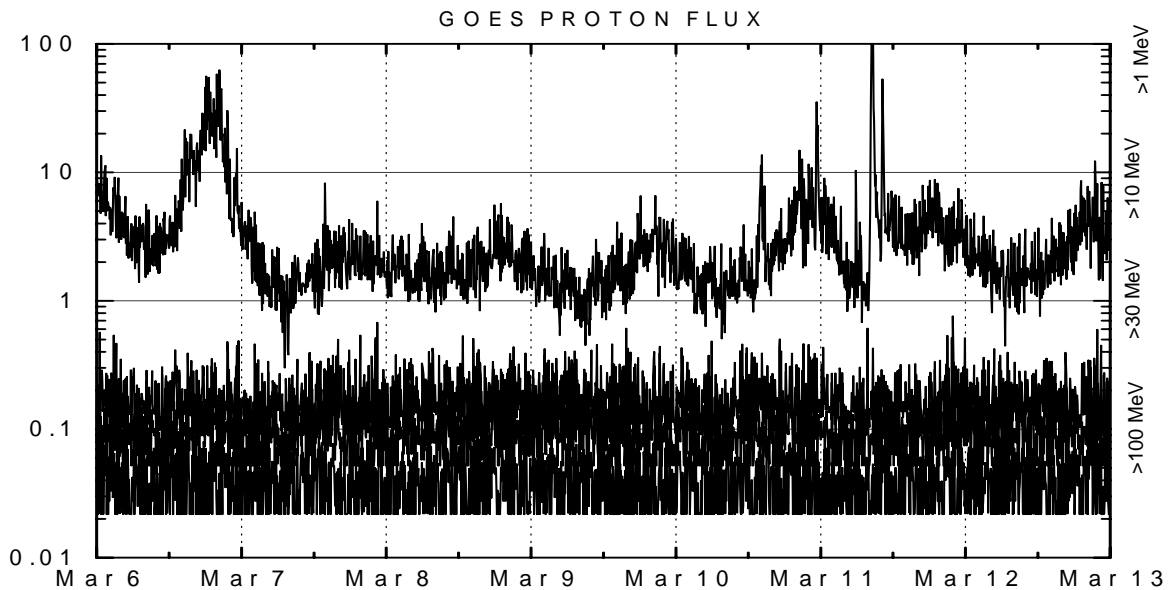
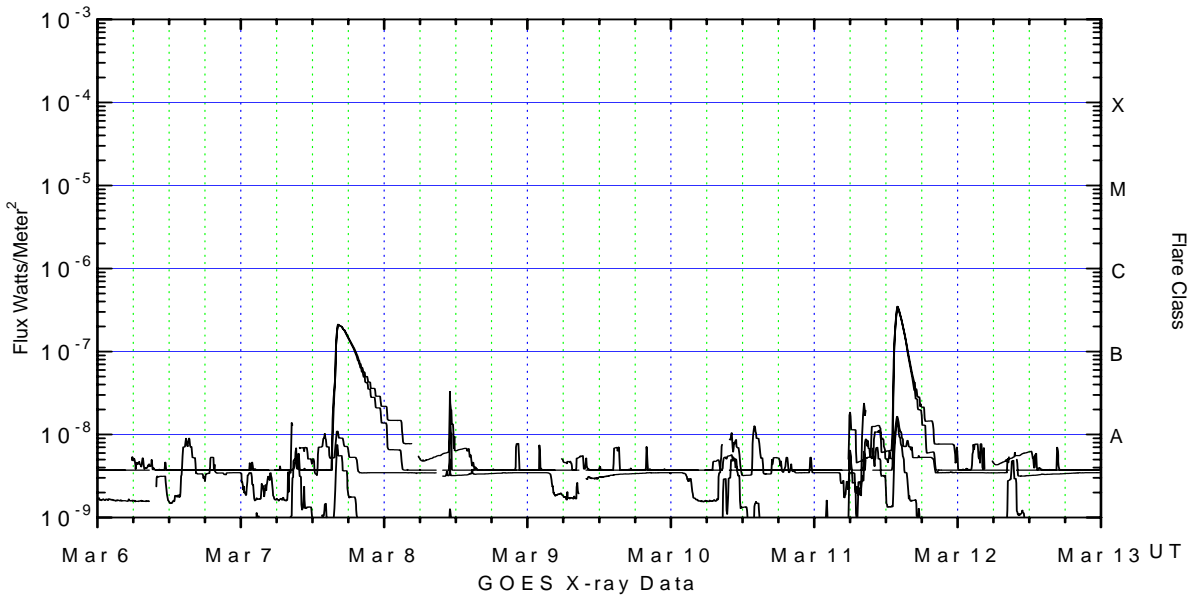
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*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 (W136) 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.

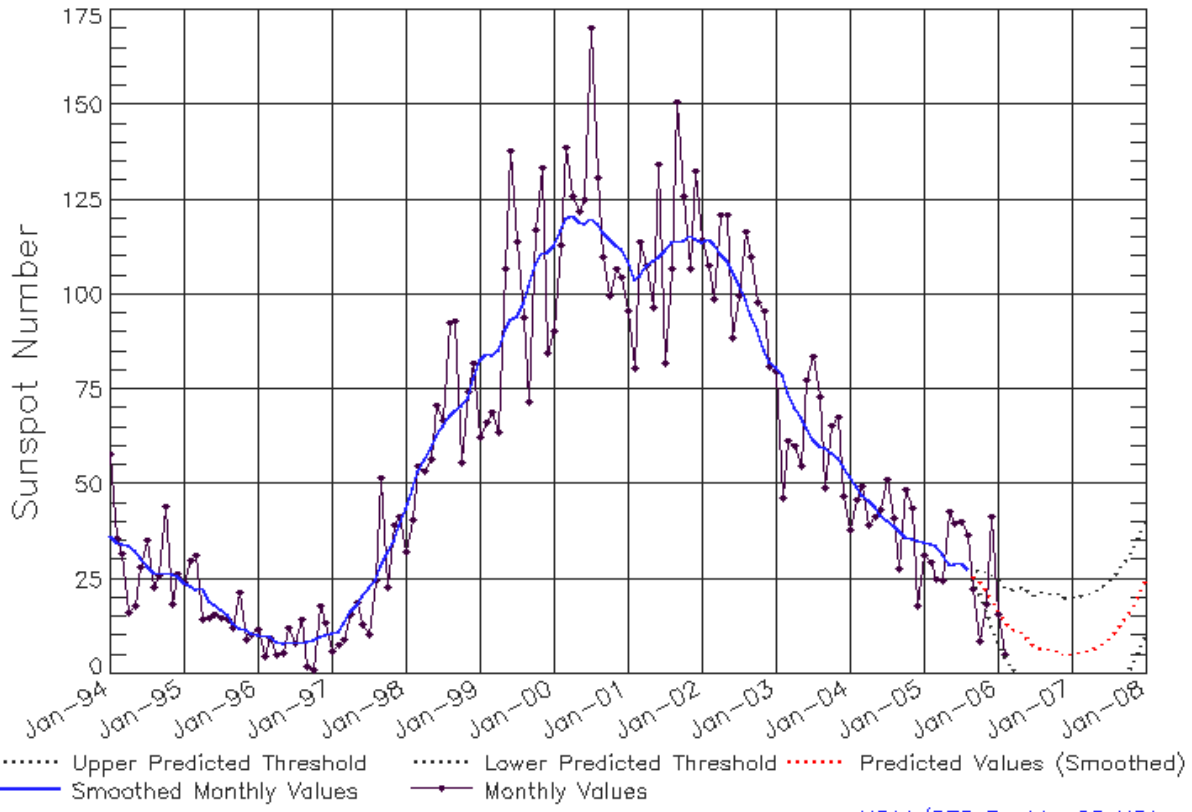
Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W105) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.





# ISES Solar Cycle Sunspot Number Progression

Data Through 28 Feb 06



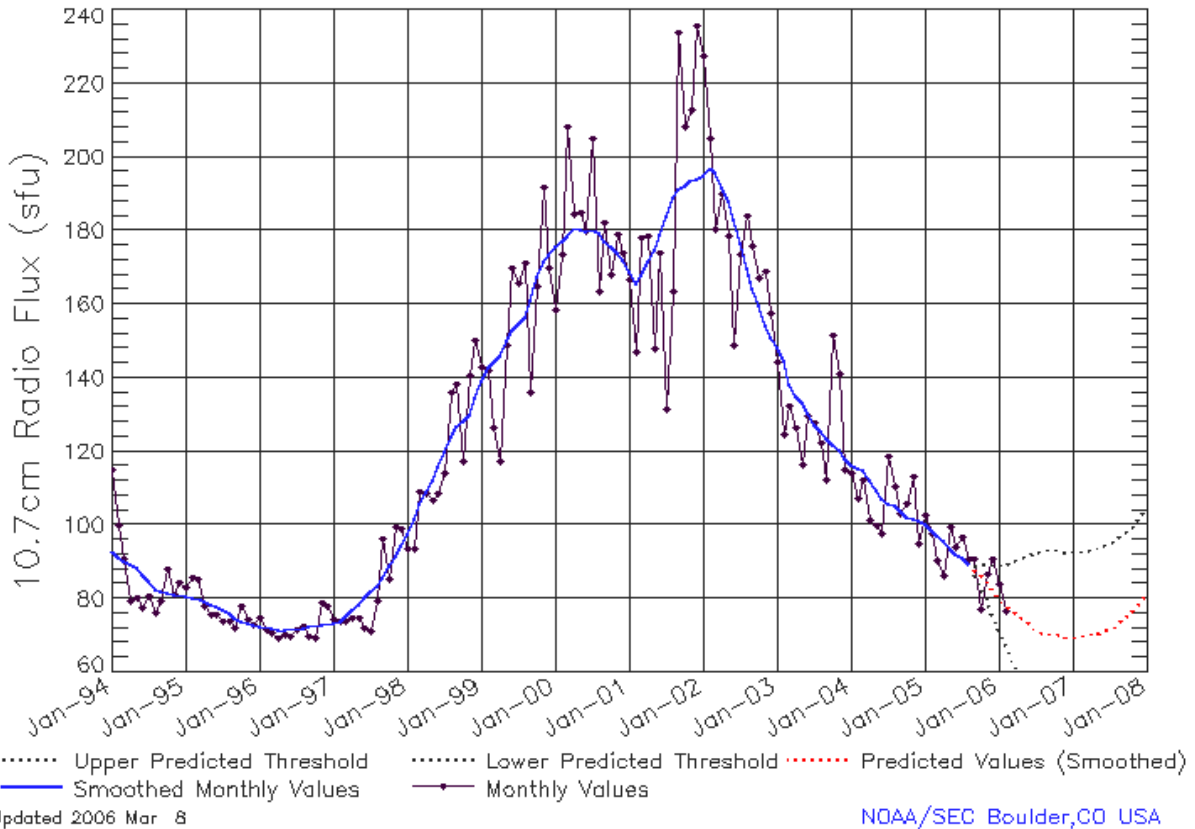
## SEC Prediction of Smoothed Sunspot Number

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



# ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 28 Feb 06



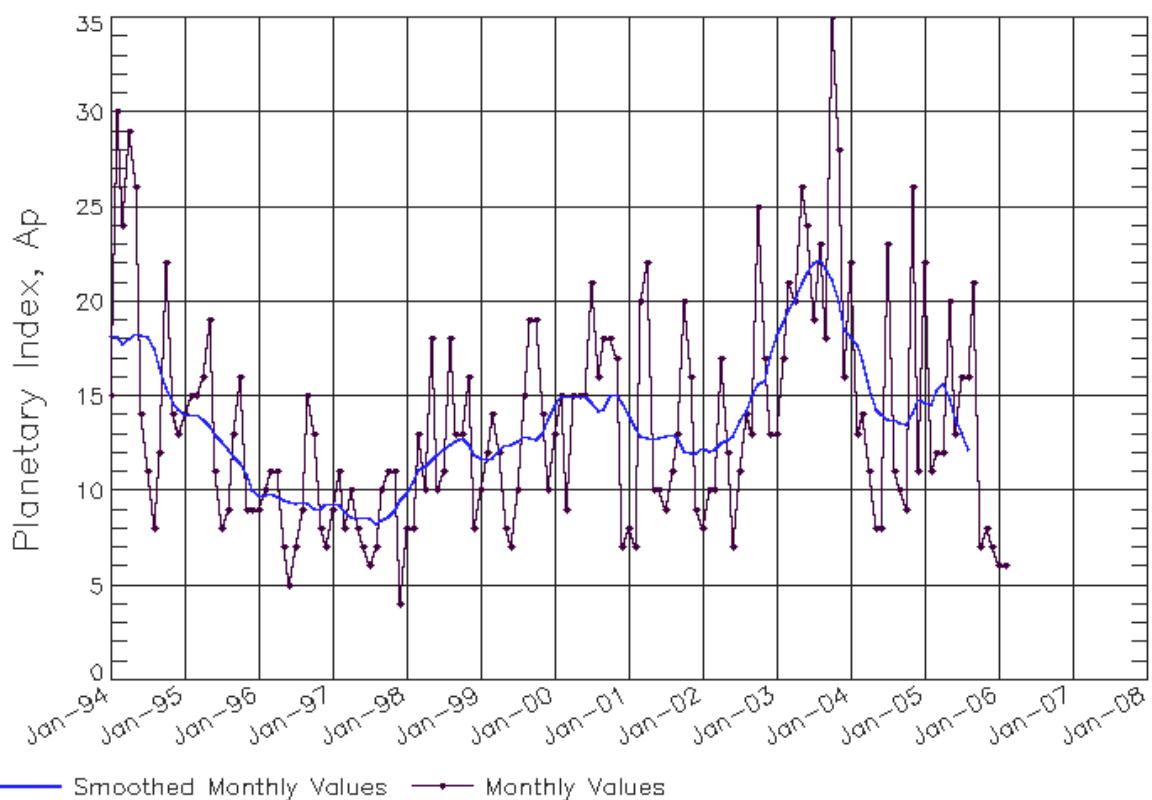
### SEC Prediction of Smoothed F10.7cm Radio Flux

	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 (***)	<b>87</b> (1)	<b>86</b> (3)	<b>84</b> (5)	<b>82</b> (7)
2006	<b>80</b> (9)	<b>78</b> (11)	<b>76</b> (13)	<b>75</b> (15)	<b>74</b> (15)	<b>73</b> (14)	<b>71</b> (13)	<b>71</b> (11)	<b>70</b> (11)	<b>70</b> (10)	<b>70</b> (10)	<b>70</b> (10)
2007	<b>70</b> (10)	<b>70</b> (10)	<b>70</b> (10)	<b>70</b> (10)	<b>71</b> (10)	<b>71</b> (11)	<b>72</b> (11)	<b>73</b> (12)	<b>74</b> (13)	<b>76</b> (14)	<b>77</b> (16)	<b>79</b> (17)



# ISES Solar Cycle Ap Progression

Data Through 28 Feb 06



Updated 2006 Mar 8

NOAA/SEC Boulder, CO USA

