

**Space Weather Highlights**  
**19 June – 15 June 2006**

**SEC PRF 1608**  
**27 June 2006**

Solar activity was at very low levels. Newly numbered Region 897 (N06, L=358, class/area, Bxo/060 on 25 June) rotated onto the east limb on 25 June and produced five B-flares. Two CMEs were observed in LASCO imagery off the east limb on 23 June; both appeared to be backsided events.

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 on 19 – 22 June.

The geomagnetic field ranged from quiet to unsettled levels. Solar wind speed ranged from a high of about 500 km/s early on 19 June to a low of approximately 280 km/s late on 24 June. The period began with wind speeds elevated near 500 km/s, but decaying, as a coronal hole wind stream rotated out of a geoeffective position. By 21 June, wind speed had decreased to a low of approximately 280 km/s and fluctuated between 280 km/s and 340 km/s through the rest of the period. The Bz component of the IMF was weak, not varying much beyond +/- 5 nT. The geomagnetic field was mostly quiet with isolated unsettled levels.

**Space Weather Outlook**  
**28 June - 24 July 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 04 – 19 July.

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 28 June, 03 – 06 July, and again on 12 July. Active to minor storm conditions are expected on 28 June, 03 - 05 July, and again on 12 July.



**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	
19 June	73	21	40	<A1.0	0	0	0	0	0	0	0	0	0
20 June	73	20	50	<A1.0	0	0	0	0	0	0	0	0	0
21 June	73	19	110	<A1.0	0	0	0	0	0	0	0	0	0
22 June	72	0	0	<A1.0	0	0	0	0	0	0	0	0	0
23 June	72	0	0	<A1.0	0	0	0	0	0	0	0	0	0
24 June	74	0	0	A2.7	0	0	0	0	0	0	0	0	0
25 June	74	13	60	A3.3	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
	19 June	6.7E+5	1.6E+4	3.4E+3		6.3E+7
20 June	1.4E+6	1.6E+4	3.7E+3		1.1E+8	
21 June	2.2E+6	1.7E+4	3.6E+3		1.2E+8	
22 June	1.9E+6	1.7E+4	3.8E+3		4.0E+7	
23 June	2.0E+6	1.6E+4	3.7E+3		3.4E+7	
24 June	2.5E+6	1.7E+4	3.7E+3		3.8E+7	
25 June	1.4E+6	1.6E+4	3.6E+3		6.6E+6	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	19 June	4	2-1-1-0-3-1-1-0	2	2-1-1-0-0-0-0-1	5
20 June	2	1-0-0-0-1-1-1-1	2	2-0-0-0-1-1-0-1	4	2-1-0-0-1-1-2-2
21 June	2	0-0-0-0-1-2-1-1	1	0-0-0-0-0-1-0-1	4	1-0-0-0-1-2-1-2
22 June	6	0-2-2-1-2-2-2-1	5	1-2-2-2-2-2-1-1	6	1-2-2-1-1-2-1-1
23 June	1	0-0-0-0-1-0-1-0	3	0-0-0-0-3-0-2-1	2	1-0-0-0-1-1-1-1
24 June	2	0-0-0-0-1-1-1-1	1	0-0-0-0-0-0-1-1	4	1-0-0-1-1-2-2-2
25 June	3	1-1-1-1-1-1-1-1	4	2-1-1-3-0-1-0-0	5	2-1-0-1-1-1-1-1



*Alerts and Warnings Issued*

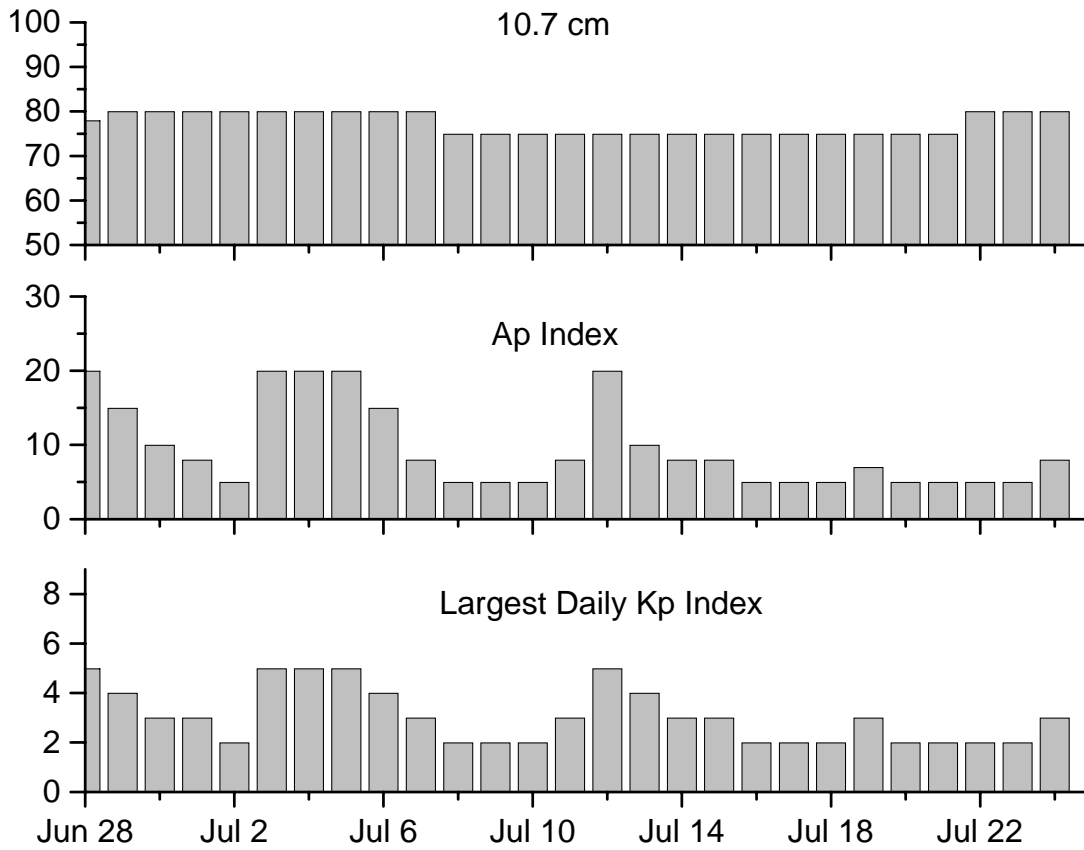
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Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
19 Jun 1403	ALERT: Electron 2MeV Integral Flux >1000pfu	19 June 1335
20 Jun 0807	ALERT: Electron 2MeV Integral Flux >1000pfu	20 Jun 0745
21 Jun 0504	ALERT: Electron 2MeV Integral Flux >1000pfu	21 Jun 0500
22 Jun 1533	ALERT: Electron 2MeV Integral Flux >1000pfu	22 Jun 1510

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### 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
28 June	78	20	5	13 July	75	10	4
29	80	15	4	14	75	8	3
30	80	10	3	15	75	8	3
01 July	80	8	3	16	75	5	2
02	80	5	2	17	75	5	2
03	80	20	5	18	75	5	2
04	80	20	5	19	75	7	3
05	80	20	5	20	75	5	2
06	80	15	4	21	75	5	2
07	80	8	3	22	80	5	2
08	75	5	2	23	80	5	2
09	75	5	2	24	80	8	3
10	75	5	2				
11	75	8	3				
12	75	20	5				



**Energetic Events**

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	½		Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
	Begin	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II

**No Events Observed**

**Flare List**

Date	Time			Optical	Imp/ Brtns	Location	Rgn
	Begin	Max	End	X-ray Class.		Lat CMD	
19 June	1258	1302	1307	B1.1			
20 June	No Flares Observed						
21 June	No Flares Observed						
22 June	No Flares Observed						
23 June	No Flares Observed						
24 June	1008	1012	1015	B3.1			
	1034	1039	1046	B1.8			
	1125	1129	1139	B1.7			
	1512	1554	1607	B1.4			
	1732	1736	1738	B1.9			
	2104	2109	2112	B1.5			
25 June	0327	0331	0334	B1.0			
	0500	0505	0508	B4.3			
	0635	0641	0652	B1.1			
	0739	0747	0802	B1.6			
	2020	2025	2033	B1.2			897

**Region Summary**

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

*Region 894*

11 Jun	S07E36	222	0010	01	Hsx	001	A								
12 Jun	S07E23	222													
13 Jun	S07E10	222													
14 Jun	S07W04	222	0010	01	Axx	002	A								
15 Jun	S06W18	223													
16 Jun	S06W31	223													
17 Jun	S07W44	223	0040	03	Bxo	004	B								
18 Jun	S07W57	223													
19 Jun	S07W70	223													

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 222



**Region Summary-Continued**

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

*Region 895*

17 Jun	N00E09	170	0010	01	Axx	001	A									
18 Jun	N00W04	170														
19 Jun	N00W17	170														
20 Jun	N00W30	170														
21 Jun	N00W43	170														
22 Jun	N00W56	170														
23 Jun	N00W69	170														
24 Jun	N00W82	170														

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 170

*Region 896*

17 Jun	S12E28	151	0020	01	Cso	007	B									
18 Jun	S11E16	150	0020	06	Cao	013	B									
19 Jun	S11E03	150	0040	06	Dro	011	B									
20 Jun	S10W11	150	0050	06	Dro	010	B									
21 Jun	S10W25	151	0110	06	Bxo	009	B									
22 Jun	S10W38	151														
23 Jun	S10W51	151														
24 Jun	S10W64	151														
25 Jun	S10W77	151														

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 150

*Region 897*

25 Jun	N06E75	358	0060	07	Bxo	003	B									
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0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 358

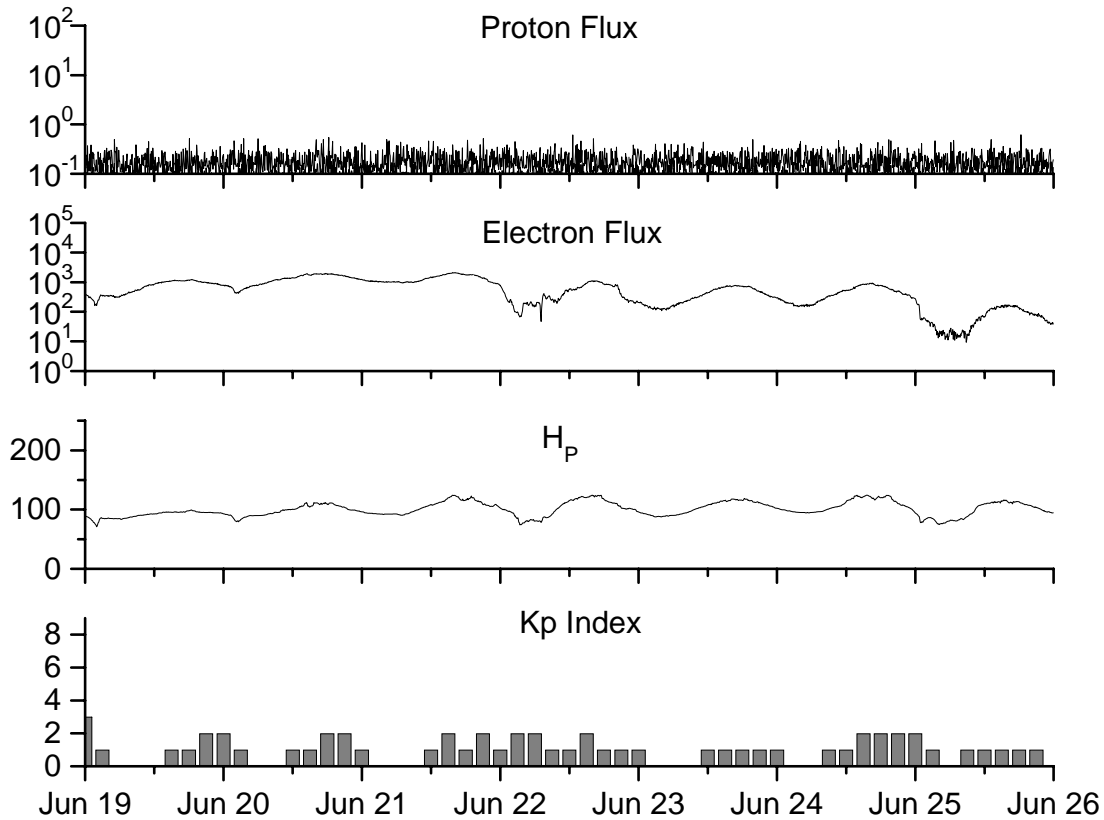


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>									
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	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	
<b>2006</b>									
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 19 June 2006*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W134) 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).

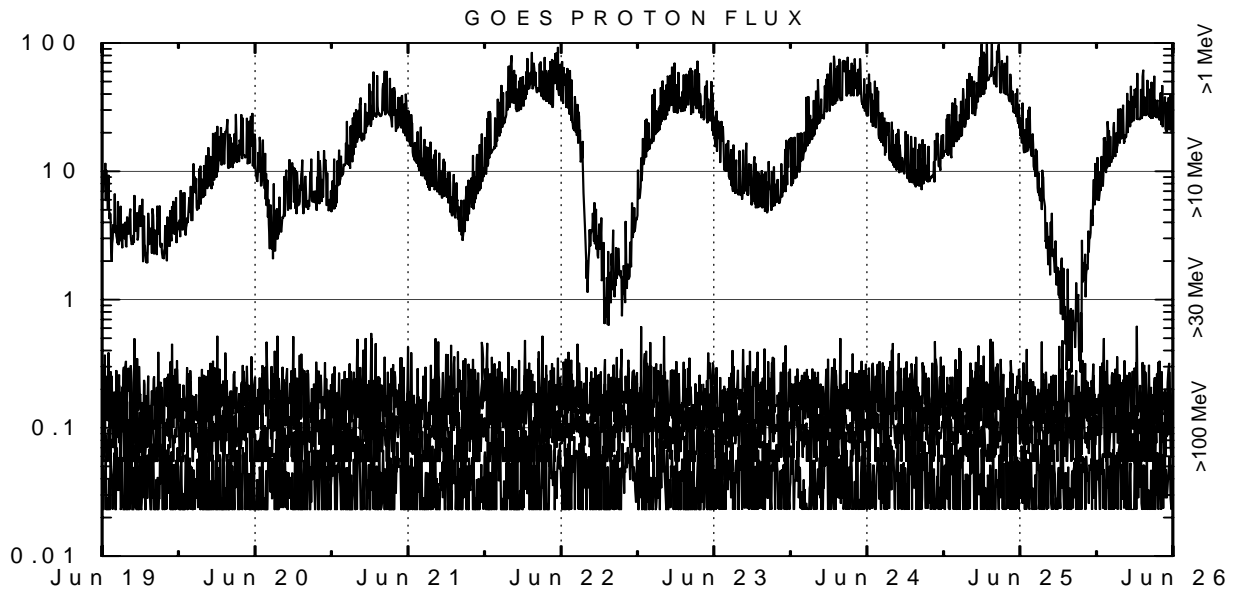
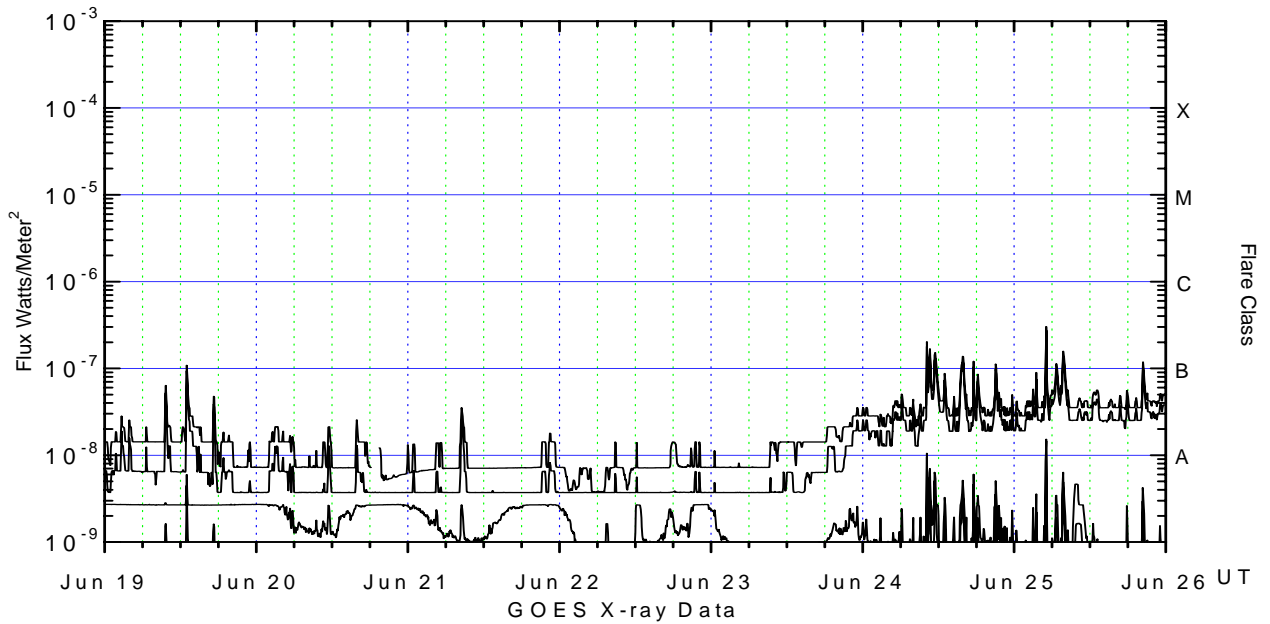
*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*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

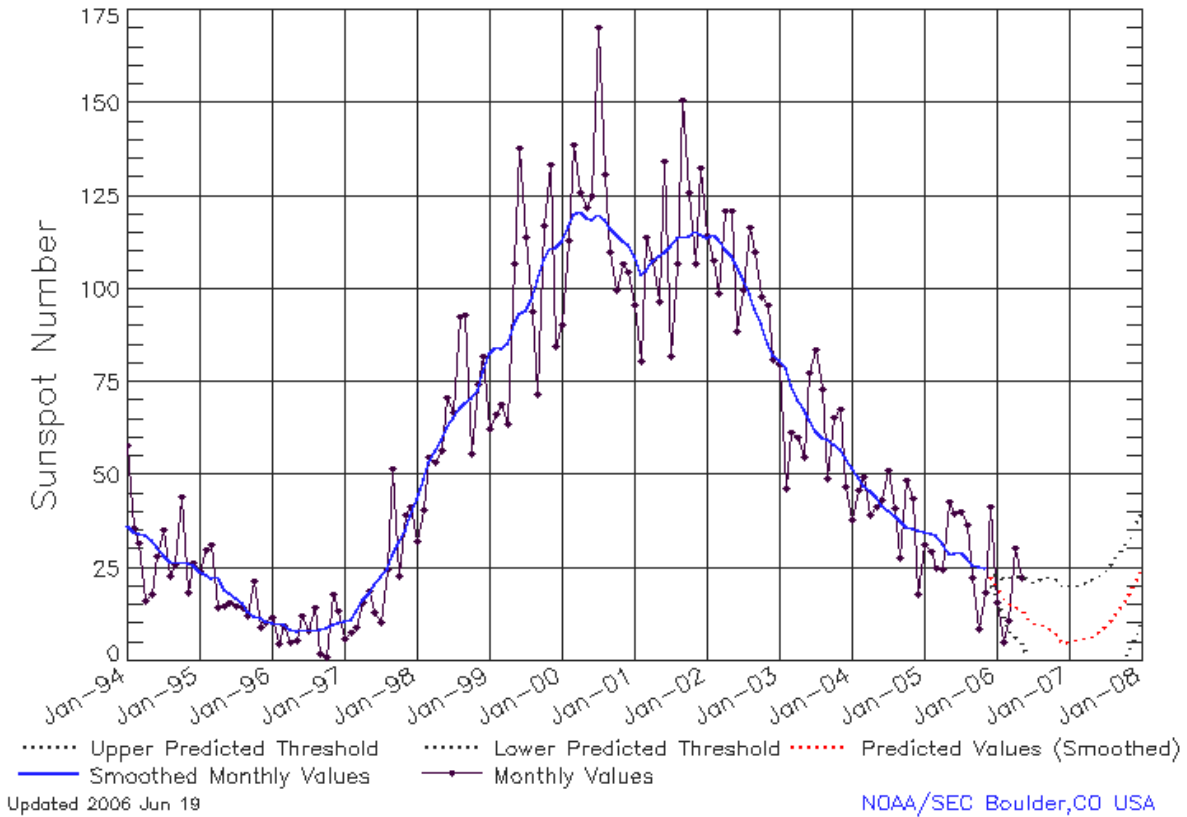
X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 12 (W75) and GOES 11 (W134) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W134) 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 31 May 06



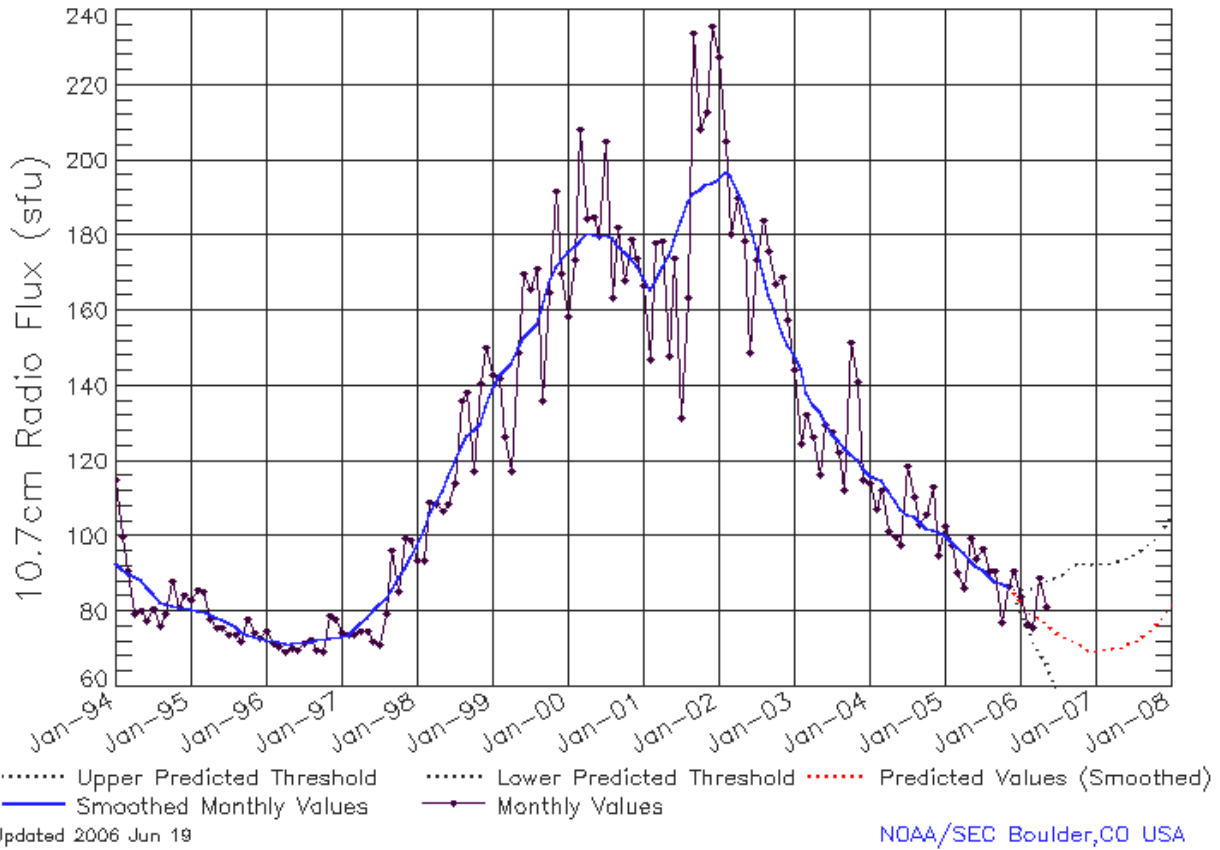
## SEC Prediction of Smoothed Sunspot Number

	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 (***)	<b>23</b>
2006	<b>20</b> (3)	<b>17</b> (5)	<b>16</b> (7)	<b>15</b> (8)	<b>14</b> (9)	<b>12</b> (10)	<b>10</b> (11)	<b>10</b> (12)	<b>10</b> (13)	<b>9</b> (14)	<b>7</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 31 May 06



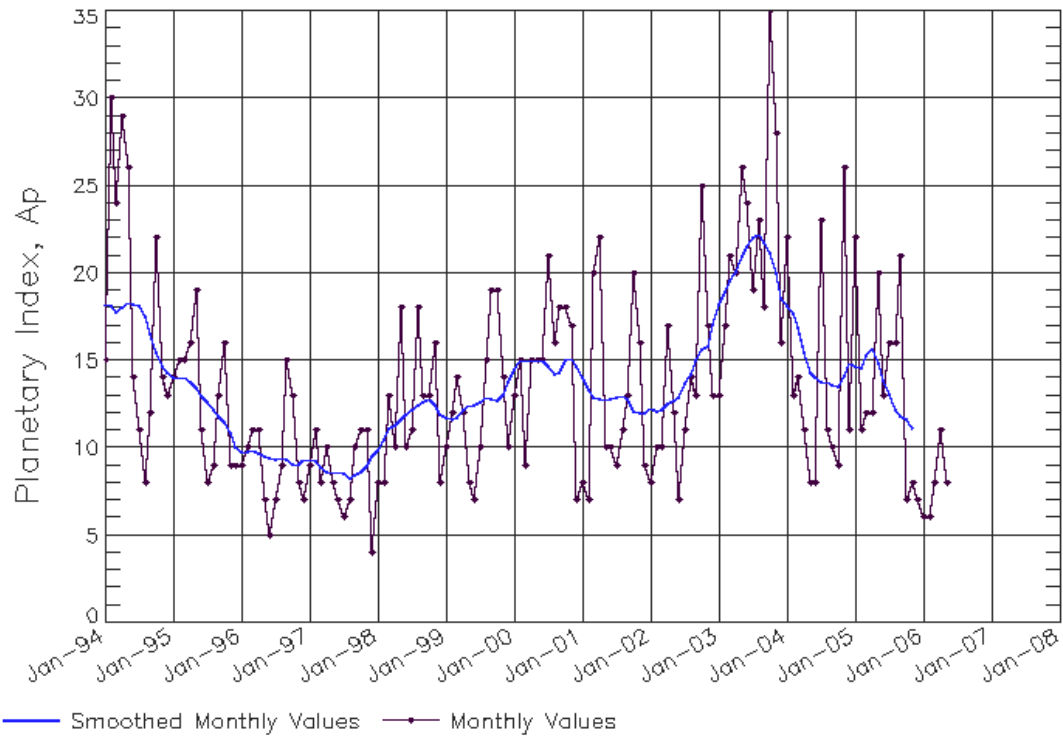
## SEC Prediction of Smoothed F10.7cm Radio Flux

	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 (***)	<b>85</b> (1)
2006	<b>83</b> (3)	<b>81</b> (5)	<b>79</b> (7)	<b>78</b> (9)	<b>77</b> (11)	<b>76</b> (13)	<b>74</b> (14)	<b>73</b> (13)	<b>73</b> (13)	<b>72</b> (12)	<b>71</b> (11)	<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> (10)	<b>72</b> (11)	<b>73</b> (11)	<b>74</b> (12)	<b>76</b> (13)	<b>77</b> (14)	<b>79</b> (16)



# ISES Solar Cycle Ap Progression

Data Through 31 May 06



Updated 2006 Jun 19

NOAA/SEC Boulder, CO USA

