

**Space Weather Highlights**  
**05 June – 11 June 2006**

**SEC PRF 1606**  
**13 June 2006**

Solar activity was at very low levels. Region 892 (S06, L=283, class/area, Eki/260 on 08 June) and Region 893 (S02, L=261, class/area, Dao/130 on 08 Jun) were the only two regions of interest during the reporting period. Both exhibited growth in area in the early part of the period, however by 09 June, both regions were in a decay phase. Only B-class flare activity was observed from both regions.

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 07 – 11 June.

The geomagnetic field ranged from quiet to active levels at middle latitudes while high latitudes reached minor to major storm conditions. The period began with the solar wind at about 380 km/s and the IMF Bz fluctuating around +/- 3 nT. Quiet conditions prevailed on 05 June. Early on 06 June, solar wind speed reached a low of approximately 330 km/s. Thereafter, wind speed began to increase while the IMF Bz began to fluctuate between +/- 10 nT as a recurrent coronal hole high speed stream moved into geoeffective position. The geomagnetic field responded with unsettled to active periods with periods of minor to major storm conditions at high latitudes. Solar wind speed at this time reached a high of around 660 km/s and continued to remain elevated, while the IMF Bz calmed to around +/- 5 nT. By 09 June, wind speed started to decline. Conditions at middle and high latitudes were mostly quiet to unsettled at this time with an isolated minor storm period observed at high latitudes. From 09 June until the end of the period, middle latitudes remained quiet while high latitudes were quiet to unsettled. The period ended with the solar wind speed around 420 km/s.

**Space Weather Outlook**  
**14 June - 10 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 – 10 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 position on 14 June, 28 June, and again on 03 – 05 July. Unsettled to active periods are expected on 14 and 28 June while active to minor storm conditions are expected on 03 - 05 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	
05 June	78	23	230	A3.2	0	0	0	0	0	0	0	0	0
06 June	78	36	280	A3.1	0	0	0	0	0	0	0	0	0
07 June	83	48	310	A6.0	0	0	0	1	0	0	0	0	0
08 June	80	67	390	A5.2	0	0	0	0	0	0	0	0	0
09 June	78	42	360	A3.5	0	0	0	0	0	0	0	0	0
10 June	76	46	300	A3.2	0	0	0	0	0	0	0	0	0
11 June	74	46	170	A2.1	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
	05 June	2.7E+5	1.6E+4	3.6E+3		2.1E+6
06 June	6.0E+5	1.6E+4	3.5E+3		9.2E+5	
07 June	5.5E+5	1.5E+4	3.4E+3		2.8E+7	
08 June	1.7E+6	1.6E+4	3.4E+3		2.2E+8	
09 June	6.8E+5	1.6E+4	3.4E+3		4.9E+8	
10 June	6.8E+5	1.5E+4	3.4E+3		7.6E+8	
11 June	4.0E+5	1.5E+4	3.4E+3		5.2E+8	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	05 June	2	1-1-0-0-1-1-1-1	2	1-2-1-0-0-1-1-0	4
06 June	15	1-2-3-3-3-2-4-4	35	2-2-5-6-4-5-5-3	23	2-2-4-4-3-4-5-4
07 June	18	3-4-3-2-3-2-4-4	35	4-4-5-6-5-4-2-3	24	4-4-4-3-3-3-4-4
08 June	18	4-4-4-2-3-2-3-3	26	3-4-5-4-5-4-2-2	20	4-5-4-2-3-3-3-3
09 June	9	3-2-3-2-2-1-2-2	15	3-3-3-5-3-2-1-1	10	3-2-3-2-2-2-2-2
10 June	7	2-2-2-2-2-2-2-2	8	2-3-2-2-3-2-1-1	8	3-3-2-2-2-2-2-2
11 June	4	2-2-1-0-1-1-2-1	8	3-2-2-1-3-3-0-1	5	2-1-2-1-2-1-1-2

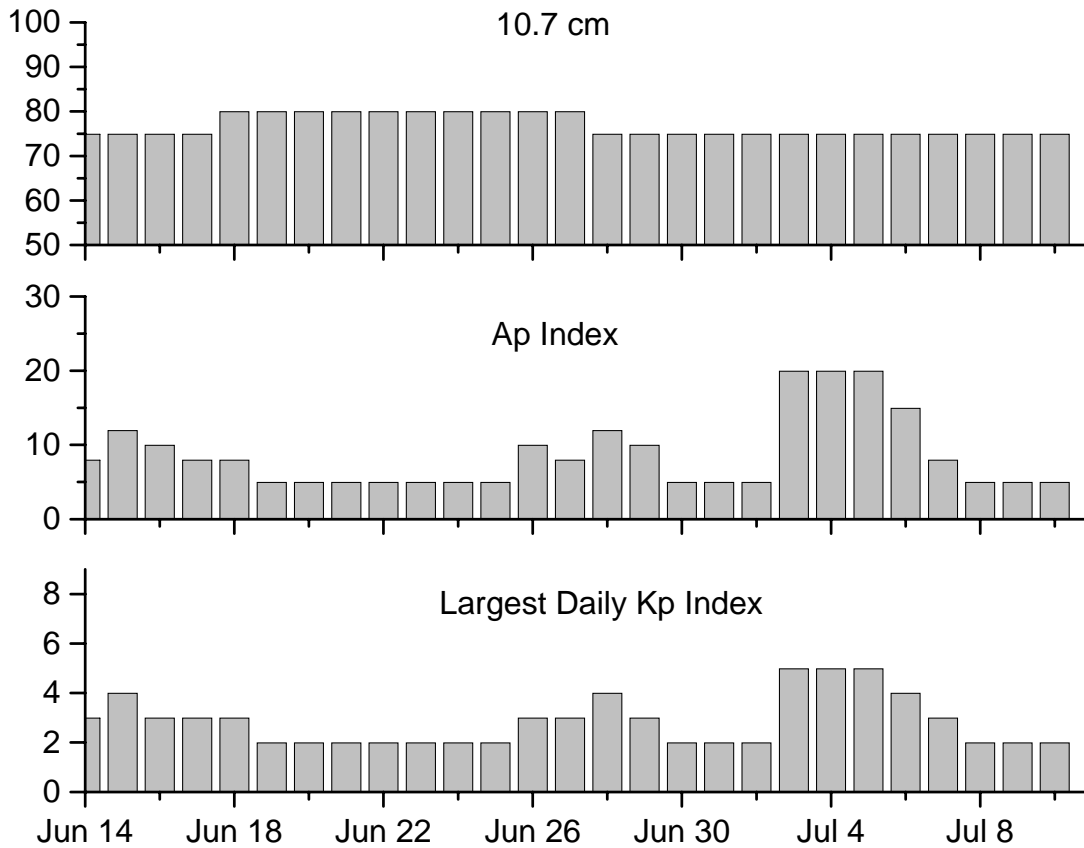


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
06 Jun 0713	ALERT: Geomagnetic K=4	06 Jun 0712
06 Jun 1202	WARNING: Geomagnetic K=4	06 Jun 1202 – 1600
06 Jun 1516	EXTENDED WARNING: Geomagnetic K=4	06 Jun 1202 – 2359
06 Jun 1724	ALERT: Geomagnetic K=4	06 Jun 1723
06 Jun 2356	EXTENDED WARNING: Geomagnetic K=4	06 Jun 1202 – 07 Jun 1600
07 Jun 1707	ALERT: Electron 2MeV Integral Flux >1000pfu	07 Jun 1645
07 Jun 2002	WATCH: Geomagnetic A <sub>≥</sub> 20	08 Jun
07 Jun 2222	ALERT: Geomagnetic K=4	07 Jun 2219
07 Jun 2224	WARNING: Geomagnetic K=4	07 Jun 2225 – 08 Jun 1600
08 Jun 0555	WARNING: Geomagnetic K=5	08 Jun 0555 - 1600
08 Jun 0557	ALERT: Geomagnetic K=5	08 Jun 0557
08 Jun 0852	ALERT: Electron 2MeV Integral Flux ≥1000pfu	08 Jun 0830
09 Jun 0024	WARNING: Geomagnetic K=4	09 Jun 0025 - 1600
09 Jun 0631	ALERT: Electron 2MeV Integral Flux ≥ 1000pfu	09 Jun 0530
10 Jun 0526	ALERT: Electron 2MeV Integral Flux ≥ 1000pfu	10 Jun 0524
11 Jun 0 825	ALERT: Electron 2MeV Integral Flux ≥ 1000pfu	11 Jun 0805



### 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
14 June	75	8	3	29 June	75	10	3
15	75	12	4	30	75	5	2
16	75	10	3	01 July	75	5	2
17	75	8	3	02	75	5	2
18	89	8	3	03	75	20	5
19	80	5	2	04	75	20	5
20	80	5	2	05	75	20	5
21	80	5	2	06	75	15	4
22	80	5	2	07	75	8	3
23	80	5	2	08	75	5	2
24	80	5	2	09	75	5	2
25	80	5	2	10	75	5	2
26	80	10	3				
27	80	8	3				
28	75	12	4				



***Energetic Events***

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

***No Events Observed***

***Flare List***

Date	Time			Optical X-ray Class.	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
05 June	0421	0427	0433	B1.0			
	0952	0956	0959	B1.3			
	1030	1034	1037	B1.2			892
06 June	No Flares Observed						
07 June	0223	0226	0228	B1.0			
	0601	0606	0616	B2.4			892
	0850	0858	0915	B5.3			892
	1339	1346	1349	B3.0			892
	1508	1511	1513	B1.2			
	1524	1524	1526	B1.6	Sf	S03E57	893
	1712	1718	1721	B1.5			893
	1907	1910	1912	B1.3			892
	1923	1927	1929	B1.6			892
	2259	2303	2306	B1.3			892
08 June	0314	0317	0319	B1.6			892
	0728	0732	0736	B1.1			
	0905	0910	0921	B1.4			
	0956	1001	1003	B1.3			892
	1106	1109	1111	B1.1			892
	1111	1114	1116	B1.6			
	1544	1549	1551	B3.3			892
09 June	No Flares Observed						
10 June	1634	1639	1647	B5.9			892
11 June	0914	0918	0921	B1.4			892
	2028	2031	2036	B1.0			892



### *Region Summary*

Location		Sunspot Characteristics												
Date	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

#### *Region 887*

26 May	S12E64	046	0030	06	Bxo	002	B								
27 May	S13E52	045	0050	06	Cro	004	B								
28 May	S12E38	046	0030	05	Cao	005	B								
29 May	S12E24	046	0030	05	Cao	006	B								
30 May	S12E10	047	0030	01	Hrx	002	A								
31 May	S13W05	049	0010	01	Axx	001	A								
01 Jun	S13W18	049	0000	00		000									
02 Jun	S13W31	049													
03 Jun	S13W44	049													
04 Jun	S13W57	049	0000	00		000									
05 Jun	S13W70	049	0000	00		000									
06 Jun	S13W83	049	0000	00		000									

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 049

#### *Region 891*

30 May	S13E19	038	0030	02	Cso	004	B								
31 May	S14E06	038	0010	01	Axx	001	A								
01 Jun	S14W07	038	0000	00		000									
02 Jun	S14W20	038													
03 Jun	S14W33	038													
04 Jun	S14W46	038	0000	00		000									
05 Jun	S14W59	038	0000	00		000									
06 Jun	S14W72	038	0000	00		000									
07 Jun	S14W85	038	0000	00		000									

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 038



**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 892*

04 Jun	S08E67	284	0230	10	Dsi	007	B											
05 Jun	S08E53	285	0230	14	Eki	013	Bg											
06 Jun	S07E41	284	0250	14	Eki	013	B											
07 Jun	S07E29	282	0250	15	Eki	024	Bd											
08 Jun	S06E15	283	0260	14	Eki	035	Bg											
09 Jun	S06W02	286	0260	11	Ehi	016	Bg											
10 Jun	S07W14	285	0220	14	Eai	018	Bg											
11 Jun	S07W27	285	0120	09	Cao	011	Bg											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 286

*Region 893*

06 Jun	S03E64	261	0030	04	Cao	003	B													
07 Jun	S01E52	259	0060	04	Dao	004	B						1							
08 Jun	S02E37	261	0130	06	Dao	012	B													
09 Jun	S02E24	260	0100	06	Dao	006	B													
10 Jun	S02E10	261	0080	06	Cso	008	Bg													
11 Jun	S02W03	261	0040	05	Cso	004	B													
													0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 261

*Region 894*

11 Jun	S07E36	222	0010	01	Hsx	001	A													
													0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 222



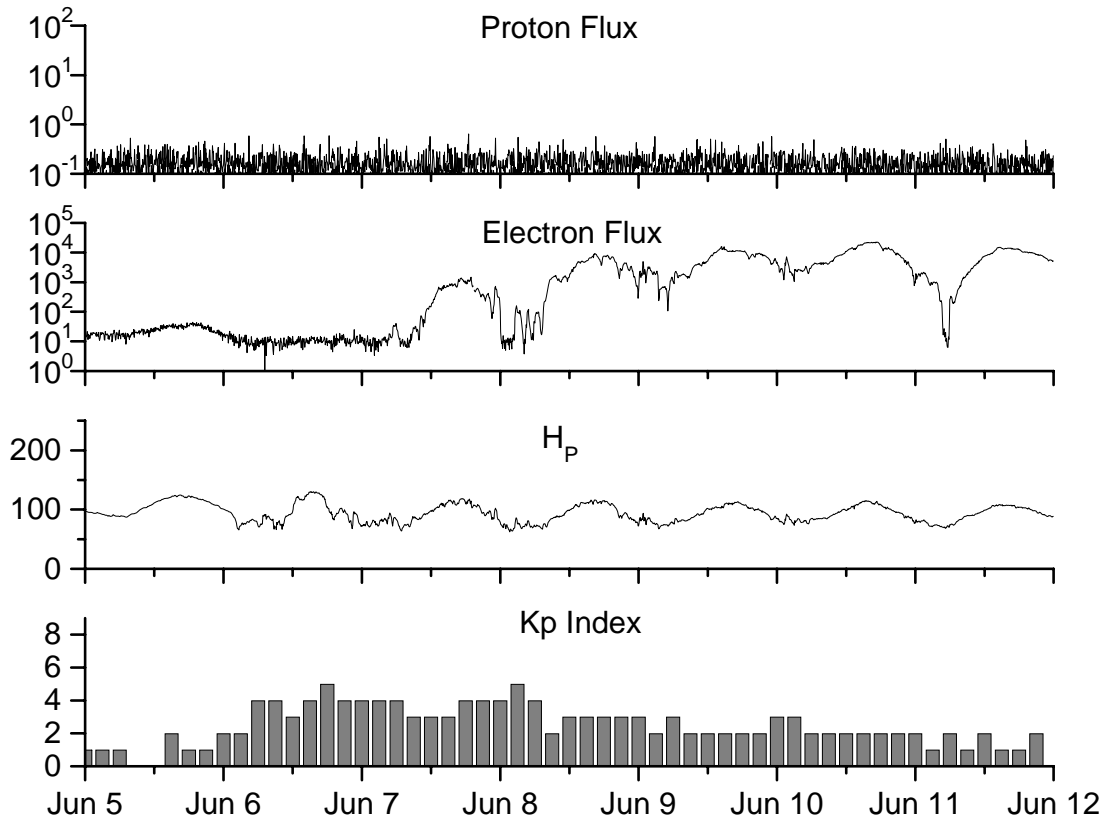
**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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
<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 05 June 2006*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W101) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

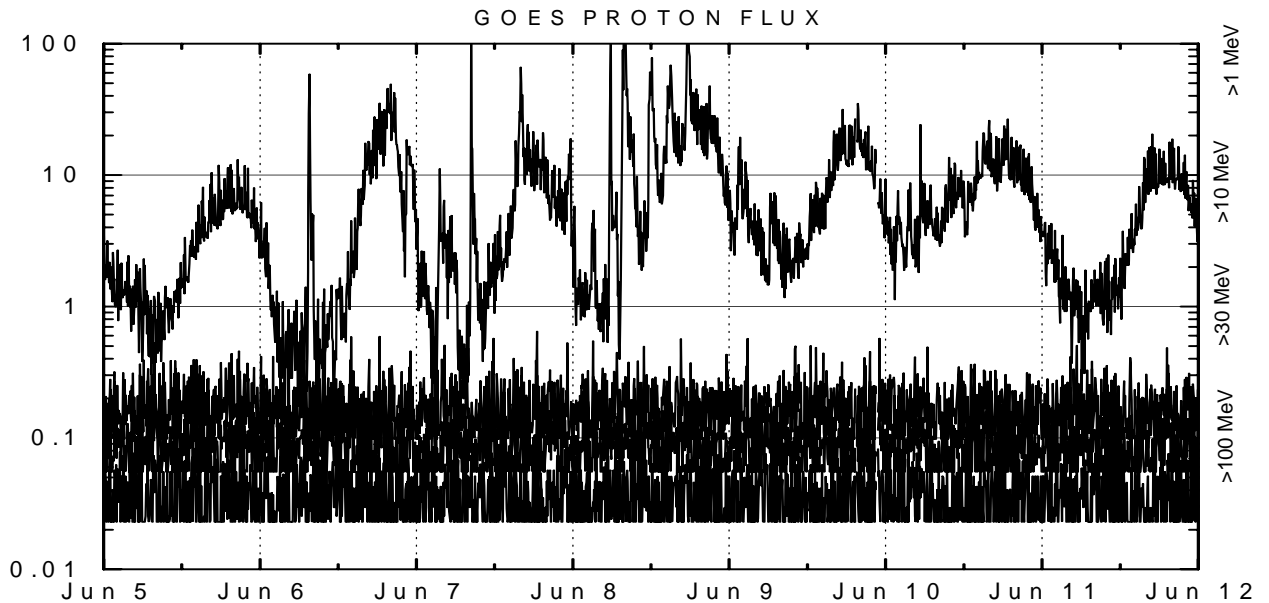
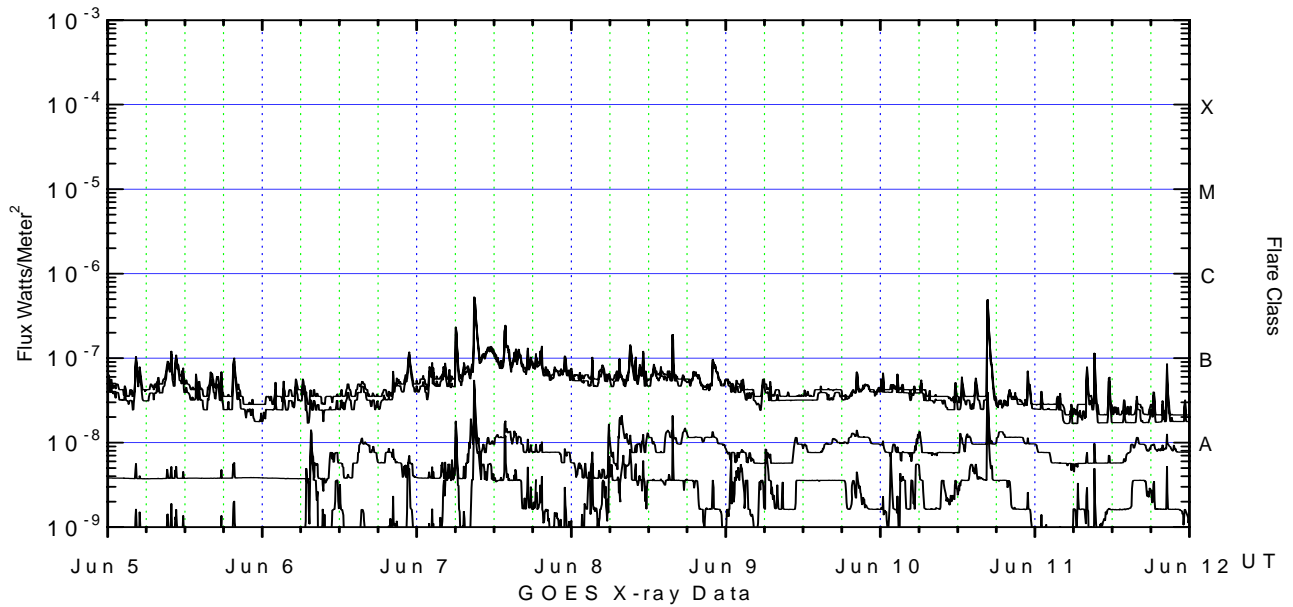
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*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 ( $\text{watts/m}^2$ ) 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 ( $\text{protons/cm}^2\text{-sec-sr}$ ) as measured by GOES-11 (W101) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ( $\text{protons/cm}^2\text{-sec-sr}$ ) at greater than 10 MeV.





Space  
Environment  
Center

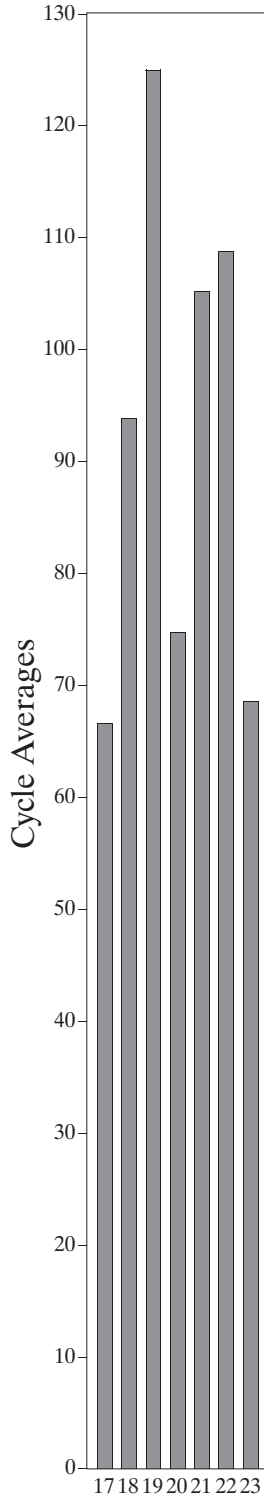
# Sunspot Number (RI)

March 2006  
(Month 114)

Preliminary data



Comparison of Cycles  
at current month in cycle



K. Tegnell

Cycle

