

Space Weather Highlights
12 June – 18 June 2006

SEC PRF 1607
20 June 2006

Solar activity was at very low levels to low levels. Three low-level C-class flares were observed from Region 892 (S06, L=283, class/area, Eki/260 on 08 June) as it approached the west limb. The largest of these was an impulsive C2.8 x-ray event at 16/1423 UTC. On 18 June, two CME's were first observed in LASCO imagery; one off the southwest limb at 0030 UTC and the other off the northeast limb at 0830 UTC. Both CME's were determined to be backside events. No other activity of significance was observed.

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 12 – 18 June.

The geomagnetic field ranged from quiet to minor storm levels. Solar wind speed ranged from a low of about 330 km/s early on 14 June to a high of near 615 km/s late on 15 June. The period began with wind speeds near 420 km/s. The Bz component of the IMF was weak, not varying much beyond +/- 5 nT through early on 14 June. As a result, the geomagnetic field was quiet through late on the 14th. At about 14/2030 UTC, density sharply decreased while temperature and wind speed increased, and phi went from positive to negative, all indicative of a solar sector boundary crossing. Shortly thereafter, the IMF Bz began fluctuating between +/- 5 nT through the remainder of the 14th, and further increased its fluctuations to +/- 10 nT through 15 June. During this period, wind speed gradually increased to the period's high of about 615 km/s as a coronal hole high speed wind stream became geoeffective. The geomagnetic field responded with unsettled to active levels at middle latitudes, while active to severe storm periods were observed at high latitudes on the 15th. By 16 June, the IMF Bz showed signs of weakening, not varying much beyond +/- 5 nT through the remainder of the summary period. Wind speed remained elevated with speeds varying between 500 to 600 km/s through late on the 16th. Geomagnetic conditions were quiet to unsettled at middle latitudes through the end of the period while high latitudes were quiet to active until early on 18 June when a sustained period of southward Bz caused minor to major storm levels. The period ended with a wind speed of 500 km/s.

Space Weather Outlook
21 June - 17 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 – 17 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. Unsettled to active periods are expected on 28 June while active to minor storm conditions are expected on 03 - 05 July and again on 12 July.



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	
12 June	74	32	120	A2.1	0	0	0	0	0	0	0	0	0
13 June	77	23	120	A2.7	0	0	0	0	0	0	0	0	0
14 June	75	35	120	A3.6	0	0	0	0	0	0	0	0	0
15 June	76	11	80	A9.3	2	0	0	1	0	0	0	0	0
16 June	75	0	0	A5.2	1	0	0	0	0	0	0	0	0
17 June	73	42	70	A1.6	0	0	0	0	0	0	0	0	0
18 June	73	23	20	A1.4	0	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
	12 June	4.0E+5	1.6E+4	3.6E+3		6.1E+8
13 June	6.2E+5	1.6E+4	3.5E+3		7.0E+8	
14 June	1.1E+6	1.6E+4	3.6E+3		5.6E+8	
15 June	1.1E+6	1.5E+4	3.4E+3		5.4E+7	
16 June	4.7E+5	1.6E+4	3.6E+3		8.9E+7	
17 June	4.0E+5	1.6E+4	3.4E+3		1.3E+8	
18 June	6.1E+5	1.6E+4	3.4E+3		5.9E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	12 June	2	1-0-1-0-1-1-1-1	3	1-9-1-0-3-0-0-0	4
13 June	2	1-1-0-0-1-0-1-1	1	1-1-0-0-0-0-0-0	3	1-1-0-0-0-1-2-1
14 June	6	1-1-0-2-1-1-3-3	3	2-0-0-0-1-1-1-2	7	2-1-1-1-1-2-2-3
15 June	17	2-3-4-4-3-3-3-3	45	3-4-6-7-5-4-2-3	28	2-4-5-5-3-3-3-4
16 June	7	3-2-2-1-1-2-2-2	10	3-3-3-2-2-2-2-2	10	3-3-2-1-2-2-3-3
17 June	7	2-2-3-1-2-1-2-1	16	3-3-4-4-4-2-1-1	10	2-3-4-2-2-2-3-1
18 June	6	0-2-3-2-1-1-1-2	21	1-3-6-5-2-1-1-2	8	1-2-3-3-1-1-1-2

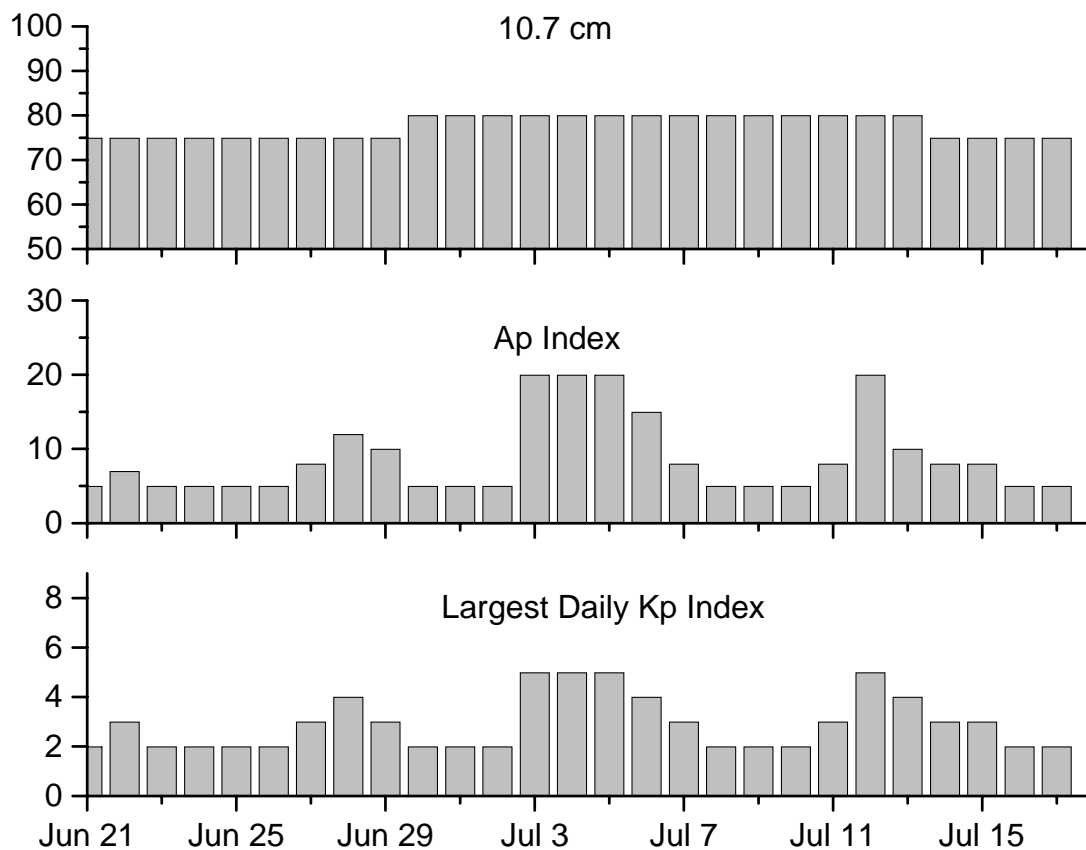


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
12 Jun 0503	ALERT: Electron 2MeV Integral Flux >1000pfu	12 Jun 0500
13 Jun 0515	ALERT: Electron 2MeV Integral Flux >1000pfu	13 Jun 0500
14 Jun 0510	ALERT: Electron 2MeV Integral Flux >1000pfu	14 Jun 0500
15 Jun 0542	ALERT: Geomagnetic K=4	15 Jun 0541
15 Jun 0550	WARNING: Geomagnetic K=5	15 Jun 0550 – 0900
15 Jun 0602	ALERT: Electron 2MeV Integral Flux >1000pfu	15 Jun 0545
15 Jun 0624	WARNING: Geomagnetic K=4	15 Jun 0626 -1600
15 Jun 0851	ALERT: Geomagnetic K=5	15 Jun 0845
15 Jun 0852	EXTENDED WARNING: Geomagnetic K=5	15 Jun 0550 - 1600
15 Jun 0901	ALERT: Geomagnetic K=6	15 Jun 0858
15 Jun 0936	WARNING: Geomagnetic K=6	15 Jun 0940 - 1200
15 Jun 0949	ALERT: Geomagnetic K=6	15 Jun 0945
15 Jun 1552	EXTENDED WARNING: Geomagnetic K=4	15 Jun 0625 - 2359
16 Jun 1226	ALERT: Electron 2MeV Integral Flux >1000pfu	16 Jun 1205
17 Jun 0636	WARNING: Geomagnetic K=4	17 Jun 0635 - 1600
17 Jun 0646	ALERT: Geomagnetic K=4	17 Jun 0645
17 Jun 1106	ALERT: Electron 2MeV Integral Flux >1000pfu	17 Jun 1045
18 Jun 0825	WARNING: Geomagnetic K=4	18 Jun 0824 - 1600
18 Jun 0912	ALERT: Geomagnetic K=4	18 Jun 0910
18 Jun 1420	ALERT: Electron 2MeV Integral Flux >1000pfu	18 Jun 1410



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
21 June	75	5	2	06 July	80	15	4
22	75	5	3	07	80	8	3
23	75	5	2	08	80	5	2
24	75	5	2	09	80	5	2
25	75	5	2	10	80	5	2
26	75	5	2	11	80	8	3
27	75	8	3	12	80	20	5
28	75	12	4	13	80	10	4
29	75	10	3	14	75	8	3
30	80	5	2	15	75	8	3
01 July	80	5	2	16	75	5	2
02	80	5	2	17	75	5	2
03	80	20	5				
04	80	20	5				
05	80	20	5				



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 Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
12 June	No Flares Observed						
13 June	No Flares Observed						
14 June	0434	0437	0440	B1.1			892
	0622	0626	0631	B1.2			892
	1737	1747	1800	B1.7			892
15 June	B0058	0058	0104	B4.6	Sf	N00W44	893
	0415	0431	0454	C2.6			892
	0620	0625	0631	B3.1			892
	0634	0644	0657	B9.8			892
	0808	0823	0839	C1.4			892
	1021	1035	1050	B2.4			892
	1116	1136	1157	B3.3			892
	1510	1521	1540	B2.8			
	1658	1710	1743	B3.8			
	2158	2202	2205	B2.0			892
16 June	0401	0406	0417	B1.2			
	0930	0935	0940	B1.3			892
	0953	0958	1003	B1.2			892
	1114	1118	1121	B1.2			892
	1417	1423	1428	C2.8			892
	1530	1538	1550	B2.7			
	1634	1644	1652	B5.2			
17 June	0959	1006	1014	B1.4			
18 June	No Flares Observed						



Region Summary

Location		Sunspot Characteristics											
Date	(° Lat ° CMD)	Helio		Flares			X-ray			Optical			
		Lon	Area (10 ⁻⁶ 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												
12 Jun	S07W40	285	0100	09	Cao	008	B												
13 Jun	S07W56	288	0100	02	Hax	002	A												
14 Jun	S07W70	288	0100	02	Hsx	001	A												
15 Jun	S06W85	290	0080	03	Hsx	001	A				2								
											2	0	0	0	0	0	0	0	0

Crossed West Limb.

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												
12 Jun	S02W16	261	0020	05	Cso	004	B												
13 Jun	S01W29	261	0020	01	Hsx	001	A												
14 Jun	S01W43	261	0010	01	Axx	002	A												
15 Jun	S01W57	262																	1
16 Jun	S01W70	262																	
17 Jun	S01W83	262																	
											0	0	0	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 261



Region Summary-Continued

Location		Sunspot Characteristics											
Date	(° 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	2

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															
											0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 222

Region 895

17 Jun	N00E09	170	0010	01	Axx	001	A										
18 Jun	N00W04	170															
											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										
											0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 150

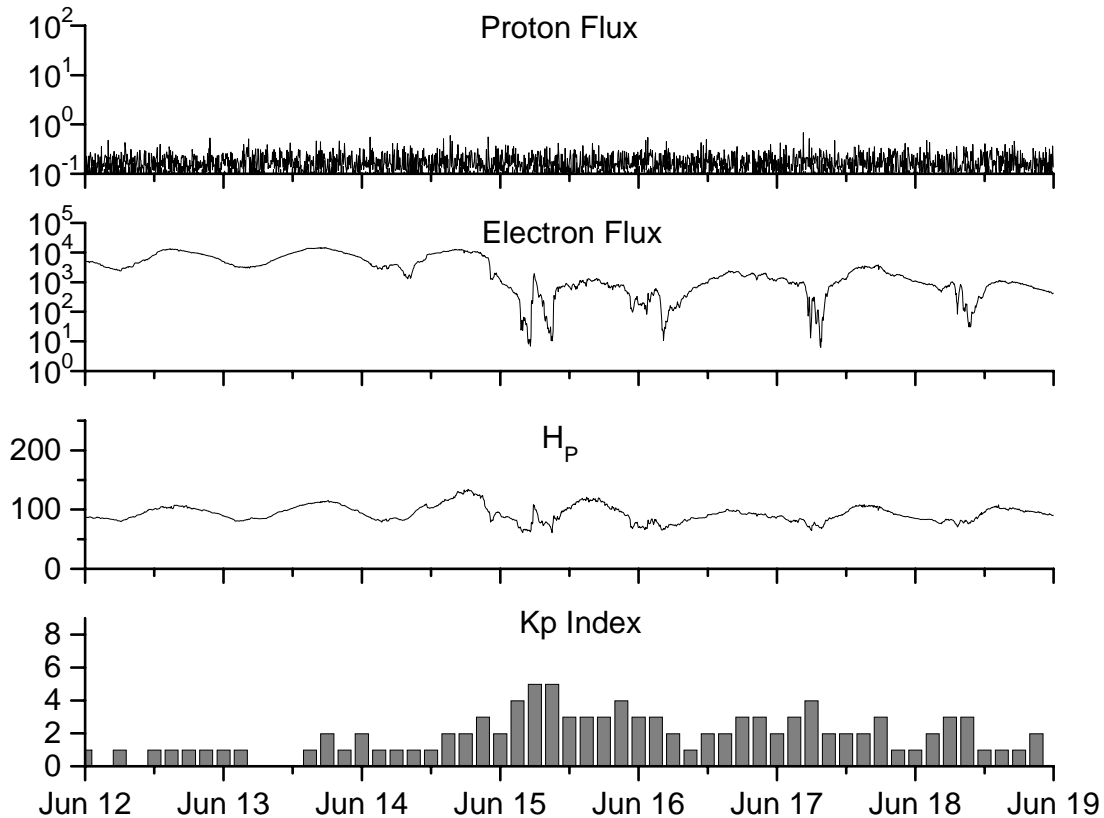


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth RI	*Penticton 10.7 cm Value	Smooth Planetary Ap Value		
2004									
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
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	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	
2006									
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 12 June 2006*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W101) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

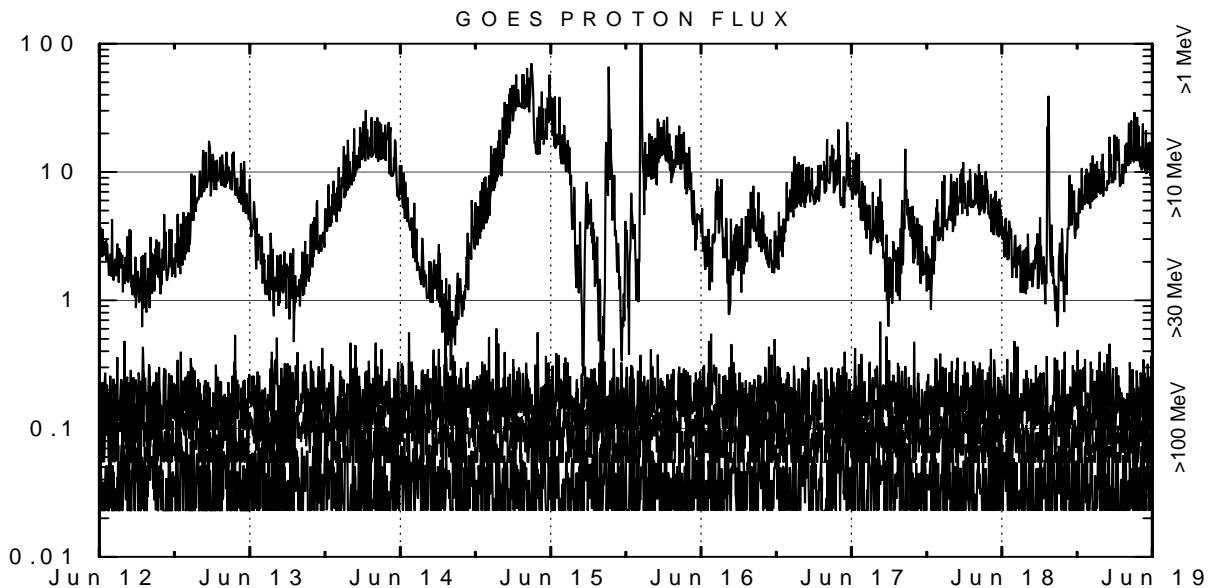
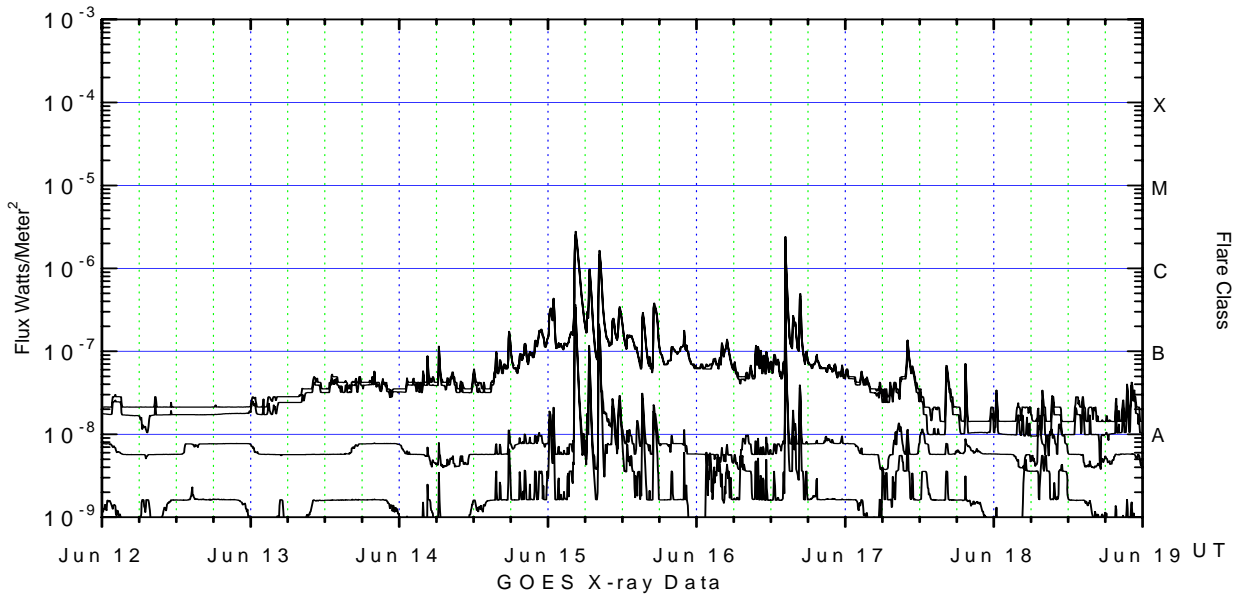
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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 (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 (protons/cm²-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 (protons/cm²-sec-sr) at greater than 10 MeV.

