

Space Weather Highlights
13 March – 19 March 2006

SEC PRF 1594
21 March 2006

Solar activity was at very low levels. Several low level B-class flares were produced by new Region 862 (S07, L=299, class/area, Dai/090 on 19 March). Since first appearing on the disk on 18 March, Region 862 showed steady growth both in spot count, areal coverage, and magnetic complexity.

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 March.

Geomagnetic activity ranged from quiet to major storm levels at middle latitudes, while quiet to severe storm levels were observed at high latitudes. Solar wind speed ranged from a low of about 350 km/s early on 14 March and a high of near 675 km/s early on 19 March. The period began with the solar wind speed around 400 km/s as a coronal hole high speed stream was moving out of geoeffective position. Solar wind speed slowly decreased to 350 km/s by early on 14 March, while the IMF Bz did not vary much beyond +/- 3 nT. The geomagnetic field responded with quiet conditions. On 15 March, the solar wind speed increased to approximately 560 km/s with the IMF Bz fluctuating between +10 to -7 nT. Mostly quiet to unsettled conditions were observed through early on 18 March. Early on 18 March, a recurrent coronal hole high speed stream moved into geoeffective position. Solar wind speed increased to around 600 km/s with the IMF Bz varying between +/- 11 nT. The geomagnetic field responded with active to major storm periods at middle latitudes, while high latitudes experienced minor to severe storm periods.

Space Weather Outlook
22 March – 17 April 2006

Solar activity is expected to be at very low to low levels with an isolated chance of moderate activity until 25 March when Region 862 is due to rotate around the west limb.

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 22 – 25 March and 16 – 17 April.

The geomagnetic field is expected to be at quiet to unsettled levels for the majority of the period. From 14 – 16 April, active to major 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 ⁻⁶ hemi.)	X-ray Background	Flares								
					X-ray Flux			Optical					
					C	M	X	S	1	2	3	4	
13 March	73	14	20	<A1.0	0	0	0	0	0	0	0	0	0
14 March	74	34	30	<A1.0	0	0	0	0	0	0	0	0	0
15 March	74	22	30	<A1.0	0	0	0	0	0	0	0	0	0
16 March	72	22	20	A1.2	0	0	0	0	0	0	0	0	0
17 March	72	24	30	<A1.0	0	0	0	0	0	0	0	0	0
18 March	72	27	30	<A1.0	0	0	0	0	0	0	0	0	0
19 March	75	40	100	A1.5	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
	13 March	2.4E+5	1.7E+4	3.8E+3		8.5E+6
14 March	3.3E+5	1.6E+4	3.6E+3		6.2E+6	
15 March	4.0E+5	1.6E+4	3.3E+3		1.8E+6	
16 March	3.6E+5	1.5E+4	3.1E+3		1.5E+6	
17 March	3.7E+5	1.5E+4	3.4E+3		2.1E+6	
18 March	8.9E+5	1.5E+4	3.2E+3		1.4E+6	
19 March	1.9E+6	1.5E+4	3.4E+3		6.1E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	13 March	2	0-1-0-1-1-1-1-0	1	1-0-0-2-0-0-0-0	3
14 March	2	0-0-0-1-1-1-0-1	1	0-0-0-0-2-0-0-1	4	0-0-0-1-2-2-2-2
15 March	6	2-3-1-2-2-1-2-0	7	2-1-1-3-1-1-3-1	7	1-2-1-2-2-2-3-1
16 March	4	0-1-2-2-2-1-1-1	12	1-2-3-5-2-3-1-0	6	1-2-2-2-1-2-1-2
17 March	2	0-1-0-0-1-0-1-1	2	0-0-0-2-1-0-1-1	3	0-0-0-0-1-1-1-1
18 March	15	0-1-3-3-3-3-4-4	39	0-1-4-6-5-6-5-4	26	1-1-4-4-3-5-5-5
19 March	24	6-5-3-2-3-2-3-2	51	4-4-7-6-6-4-3-3	37	6-5-5-4-4-2-4-3

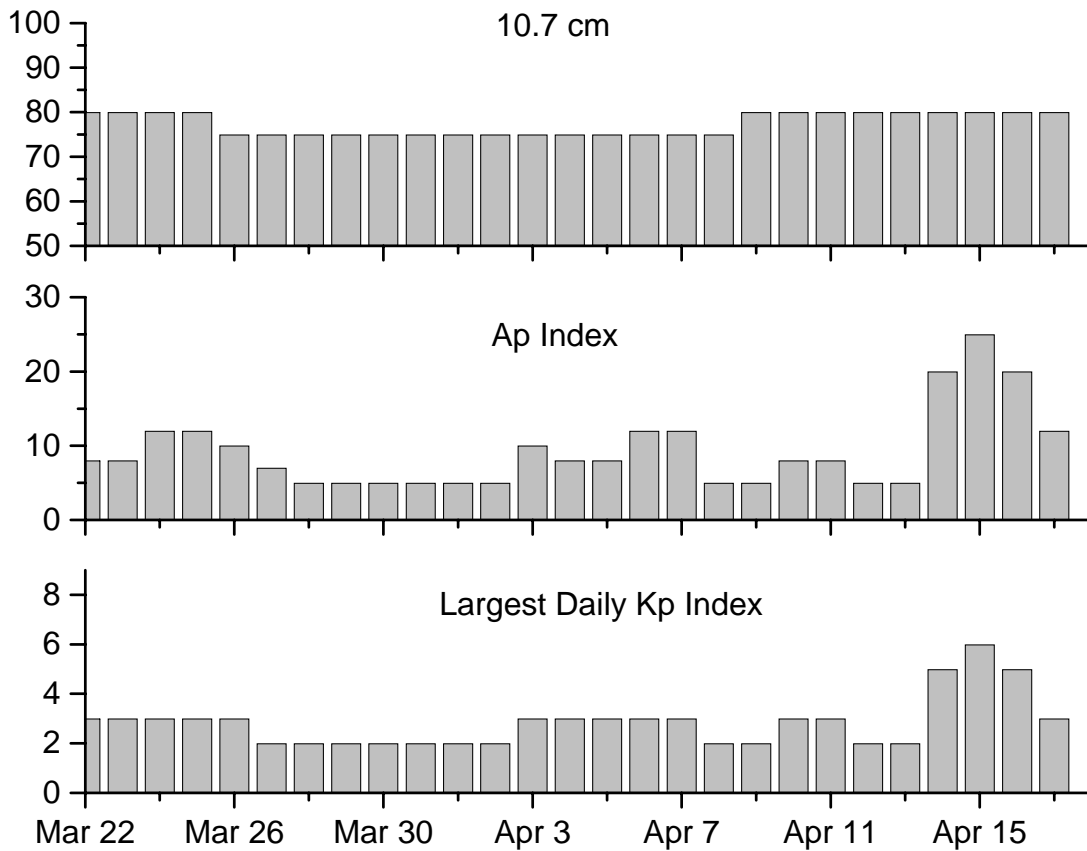


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
18 Mar 0742	ALERT: Geomagnetic K=4	18 Mar 0740
18 Mar 1016	ALERT: Geomagnetic K=4	18 Mar 1014
18 Mar 1017	WARNING: Geomagnetic K=4	18 Mar 1020- 1600
18 Mar 1024	WARNING: Geomagnetic K=5	18 Mar 1025- 1230
18 Mar 1032	ALERT: Geomagnetic K=5	18 Mar 1028
18 Mar 1551	EXTENDED WARNING: Geomagnetic K=4	18 Mar 1020 -2359
18 Mar 2344	EXTENDED WARNING: Geomagnetic K=4	18 Mar 1020 19 Mar 160
19 Mar 0036	WARNING: Geomagnetic K=5	19 Mar 0040- 1600
19 Mar 0039	ALERT: Geomagnetic K=5	19 Mar 0038
19 Mar 0040	WARNING: Geomagnetic K=6	19 Mar 0040- 1600
19 Mar 0042	ALERT: Geomagnetic K=6	19 Mar 0040
19 Mar 1435	ALERT: Electron 2MeV Integral Flux > 1000pfu	19 Mar 1415
19 Mar 1556	EXTENDED WARNING: Geomagnetic K=4	18 Mar 1020- 19 Mar 2359
19 Mar 2321	EXTENDED WARNING: Geomagnetic K=4	18 Mar 1020 20 Mar 1600



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	
	1/2		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	
13 March	No Flares Observed						
14 March	0700	0705	0710	B3.6			
	1359	1405	1413	B1.7			
	1553	1557	1607	B1.5			860
15 March	0340	0344	0346	B1.2			859
	1043	1047	1053	B1.5			859
	1115	1121	1135	B1.1			859
16 March	No Flares Observed						
17 March	No Flares Observed						
18 March	No Flares Observed						
19 March	2302	2338	2348	B2.2			862

Region Summary

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

Region 857

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													

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 074



Region Summary- Continued

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

Region 858

12 Mar	N18E15	005	0020	05	Cro	008	B									
13 Mar	N18W01	008	0020	06	Bxo	004	B									
14 Mar	N18W14	008	0010	06	Bxo	002	B									
15 Mar	N18W27	008														
16 Mar	N18W40	008														
17 Mar	N18W53	008														
18 Mar	N18W66	008														
19 Mar	N18W79	008														

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 008

Region 859

14 Mar	S07W79	073	0010	01	Axx	001	A									
15 Mar	S07W92	073														

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 073

Region 860

14 Mar	S03E50	304	0010	01	Hsx	001	A									
15 Mar	S04E36	305	0020	01	Axx	001	A									
16 Mar	S04E22	306	0010	01	Axx	001	A									
17 Mar	S04E10	305	0020	01	Axx	002	A									
18 Mar	S04W03	305	0010	02	Hrx	002	A									
19 Mar	S04W16	305	0010	02	Axx	002	A									

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 305



Region Summary- Continued

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

Region 861

15 Mar	S12E46	295	0010	01	Axx	001	A									
16 Mar	S11E33	295	0010	01	Axx	001	A									
17 Mar	S11E20	295	0010	01	Axx	002	A									
18 Mar	S11E07	295														
19 Mar	S11W06	295														

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 295

Region 862

18 Mar	S07E03	299	0020	04	Cso	005	B									
19 Mar	S07W10	299	0090	08	Dai	018	B									

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 299

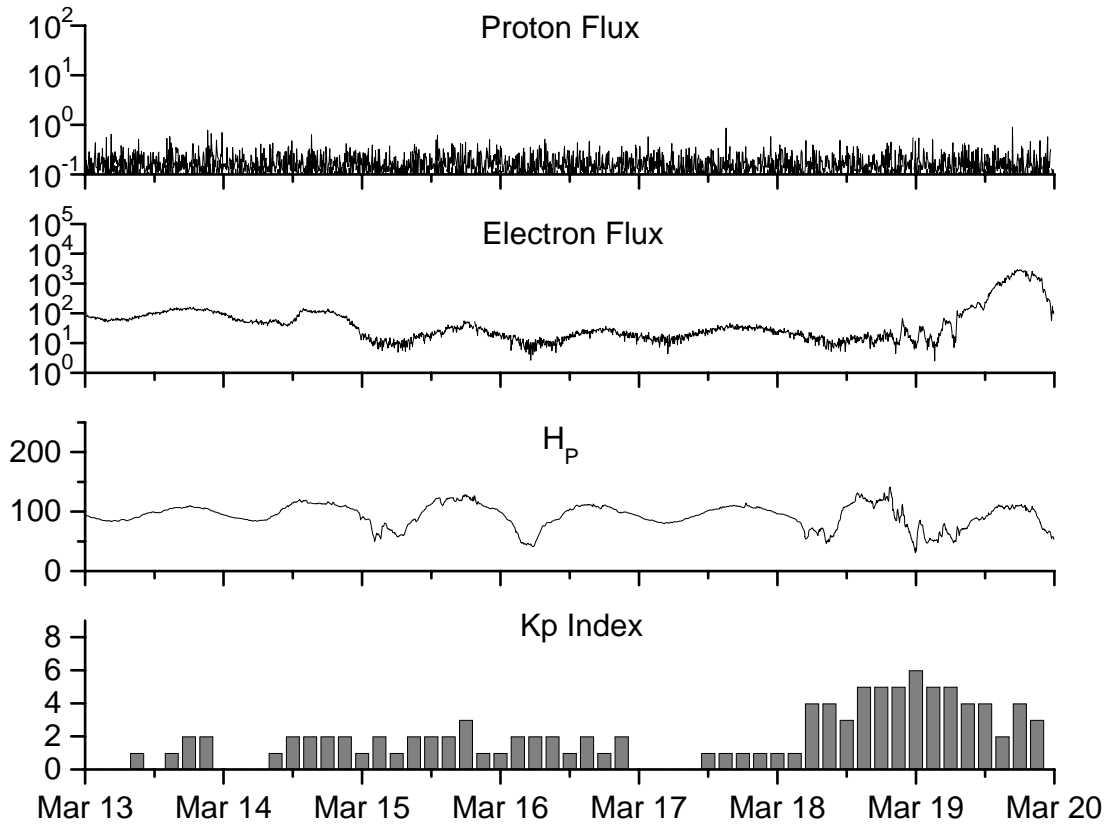


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2004									
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
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	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	
2006									
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 13 March 2006

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W105) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

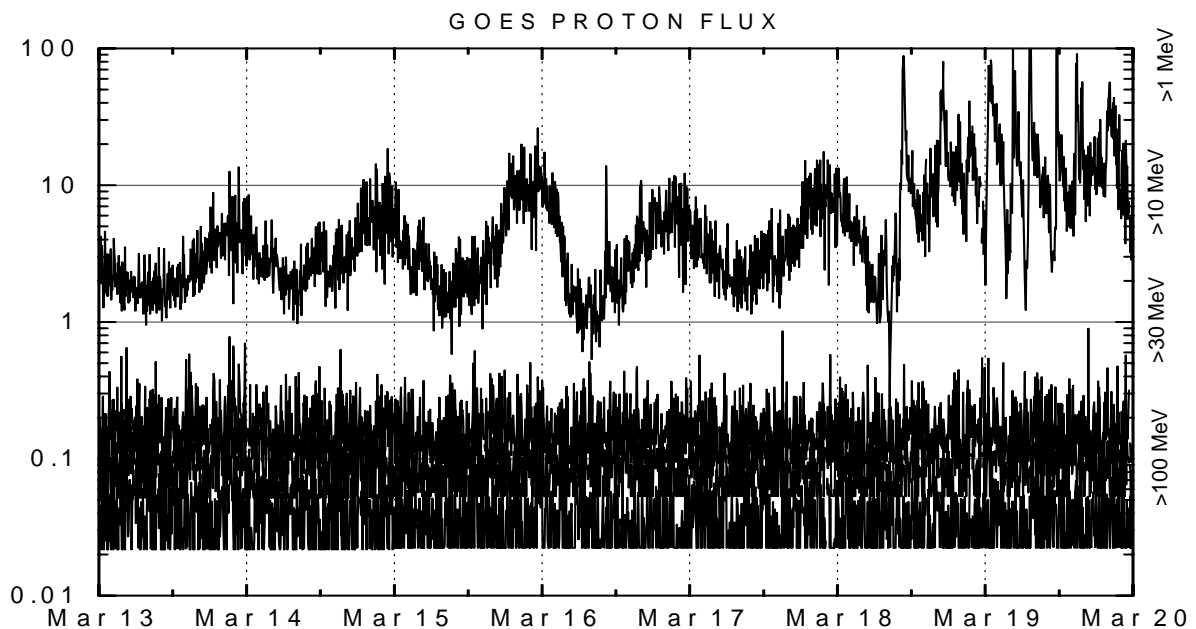
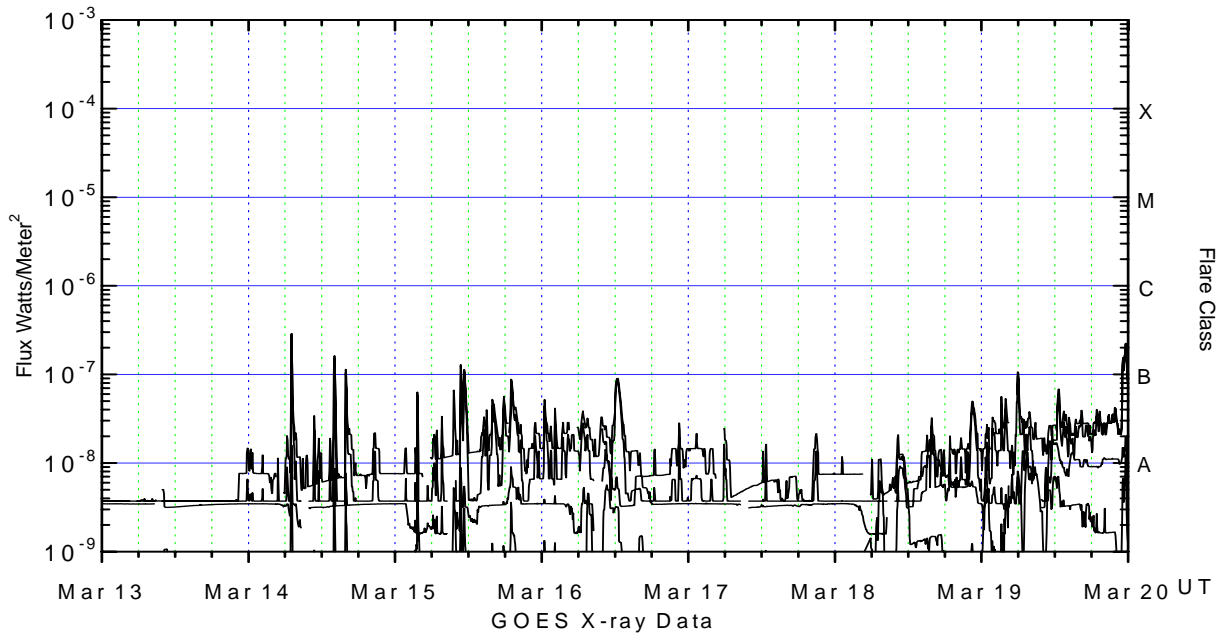
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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

