

Space Weather Highlights
20 March – 26 March 2006

SEC PRF 1595
28 March 2006

Solar activity was at very low to low levels. Several low level C-class flares were produced by Region 862 (S07, L=302, class/area, Dac/130 on 20 March), all on 21 March. Since this flurry of activity, the region decayed significantly, and quietly rotated around the west limb on 24 March.

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 20 – 26 March.

Geomagnetic activity ranged from quiet to active levels at middle latitudes, while quiet to major storm levels were observed at high latitudes. Solar wind speed ranged from a high of about 725 km/s early on 20 March to a low of near 375 km/s early on 26 March. The period began with the solar wind speed around 700 km/s as a coronal hole high speed stream was moving out of a geoeffective position. The IMF Bz fluctuated between +/- 8 nT through late on 20 March, while the geomagnetic field responded with active to major storm levels at high levels through late on 21 March. During this period, middle latitudes experienced unsettled to active conditions. Thereafter, and through the balance of the summary period, wind speed slowly decayed and ended the period near 375 km/s, while the IMF Bz did not vary much beyond +/- 5 nT. As a result, the geomagnetic field was at mostly quiet to unsettled levels at all latitudes.

Space Weather Outlook
29 March – 24 April 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 16 – 22 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 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 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
20 March	77	33	130	A3.0	0	0	0	2	0	0	0	0
21 March	77	39	120	A3.2	6	0	0	4	0	0	0	0
22 March	76	49	130	A4.6	0	0	0	0	0	0	0	0
23 March	77	36	80	A4.3	0	0	0	1	0	0	0	0
24 March	76	44	110	A4.1	0	0	0	0	0	0	0	0
25 March	76	0	0	A3.2	0	0	0	0	0	0	0	0
26 March	74	0	0	A1.8	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
	20 March	2.7E+6	1.5E+4	3.4E+3		4.1E+8
21 March	1.4E+6	1.5E+4	3.5E+3		1.1E+9	
22 March	6.0E+5	1.6E+4	3.5E+3		5.5E+8	
23 March	5.0E+5	1.6E+4	3.8E+3		8.5E+8	
24 March	8.5E+5	1.5E+4	3.4E+3		1.1E+9	
25 March	6.9E+5	1.6E+4	3.9E+3		1.0E+8	
26 March	8.0E+5	1.6E+4	4.0E+3		1.8E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 March	14	4-3-3-3-1-2-3-3	40	6-5-5-6-3-4-3-2	22
21 March	8	2-3-1-1-2-3-2-2	28	2-2-2-5-5-6-3-3	13	3-4-1-1-3-3-3-3
22 March	9	2-3-3-1-1-1-2-2	10	2-3-3-4-1-1-1-1	10	3-4-3-1-1-1-2-3
23 March	2	2-1-0-1-0-0-0-1	3	2-2-1-0-0-1-0-1	5	2-2-2-0-0-1-1-1
24 March	2	1-0-0-0-1-1-1-2	2	1-0-0-1-0-1-1-1	4	1-0-0-0-1-1-2-2
25 March	4	1-3-2-0-1-0-2-0	7	2-1-2-3-3-1-1-0	7	2-3-1-1-2-1-2-1
26 March	5	1-2-0-1-2-1-2-2	6	0-0-0-3-3-2-2-1	7	1-1-0-1-2-2-3-3

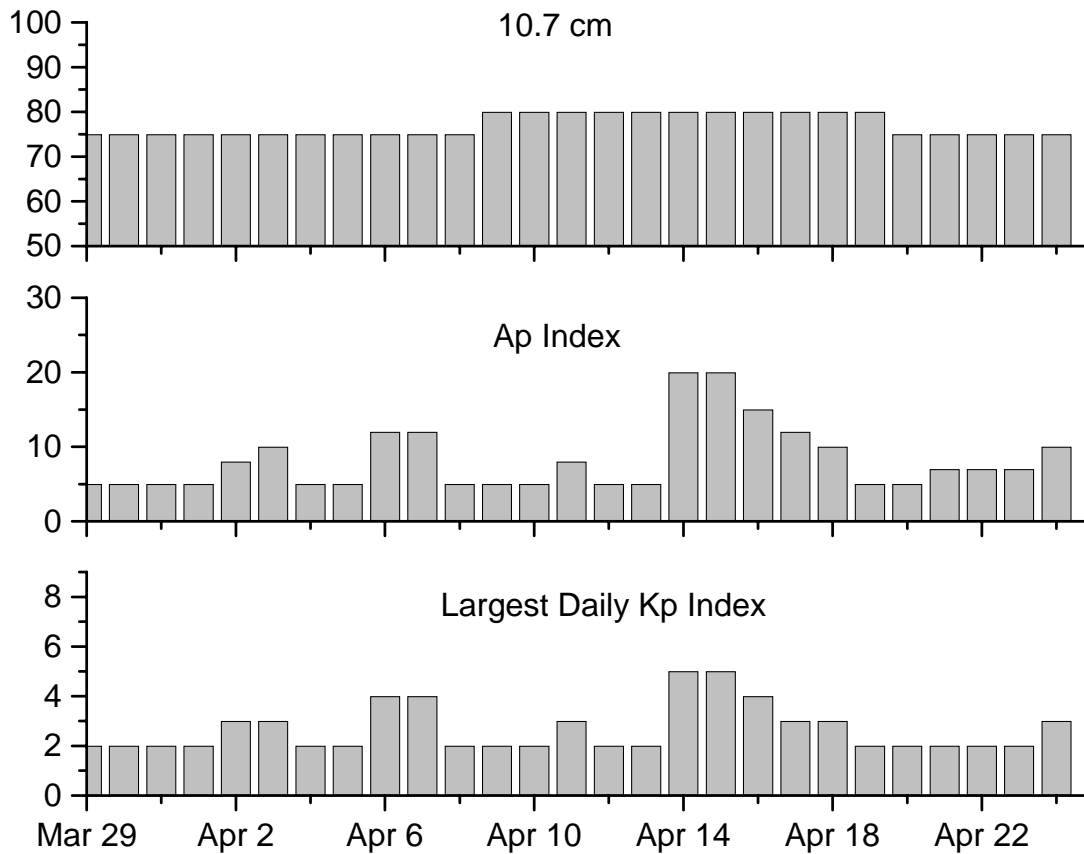


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
20 Mar 0147	ALERT: Geomagnetic K=5	20 Mar 0145
20 Mar 0456	WARNING: Geomagnetic K=5	20 Mar 0457
20 Mar 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	20 Mar 0500
20 Mar 1557	EXTENDED WARNING: Geomagnetic K=4	20 Mar 2359
20 Mar 2354	EXTENDED WARNING: Geomagnetic K=4	21 Mar 1600
21 Mar 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	21 Mar 0500
21 Mar 1556	EXTENDED WARNING: Geomagnetic K=4	21 Mar 2359
22 Mar 0356	ALERT: Geomagnetic K=4	22 Mar 0353
22 Mar 0400	WARNING: Geomagnetic K=4	22 Mar 0400 - 1600
22 Mar 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	22 Mar 0500
23 Mar 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	23 Mar 0500
24 Mar 0545	ALERT: Electron 2MeV Integral Flux > 1000pfu	24 Mar 0500
25 Mar 1226	ALERT: Electron 2MeV Integral Flux > 1000pfu	25 Mar 1205
26 Mar 1047	ALERT: Electron 2MeV Integral Flux > 1000pfu	26 Mar 1025



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
29 March	75	5	2	12 April	80	5	2
30	75	5	2	13	80	5	2
31	75	5	2	14	80	20	5
01 April	75	5	2	15	80	20	5
02	75	8	3	16	80	15	4
03	75	10	3	17	80	12	2
04	75	5	2	18	80	10	3
05	75	5	2	19	80	5	2
06	75	12	4	20	75	5	2
07	75	12	4	21	75	7	2
08	75	5	2	22	75	7	2
09	80	5	2	23	75	7	2
10	80	5	2	24	75	10	3
11	80	8	3				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Class	Imp/	Location		Radio Flux		Intensity	
				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	
20 March	0437	0437	0440	B7.1	Sf	S08W13		862
	0613	0616	0620	B1.0		862		
	0728	0732	0743	B1.3		862		
	0751	0757	0801	B2.0	862			
	0809	0813	0821	B2.3	862			
	0843	0844	0850	B4.9	Sf	S07W18		862
	1045	1048	1050	B1.1		862		
	1107	1110	1112	B1.1	862			
	1328	1336	1338	B1.1	862			
	21 March	0937	0942	A1001	C2.5	Sf	S08W32	
1153		1158	1201	B2.2	862			
1201		1204	1207	C1.3	862			
1631		1633	1642	C2.4	Sf	S06W36		862
1717		1726	1734	B1.1		862		
1753		1759	1818	B5.3	862			
1838		1841	1856	C1.2	Sf	S06W37		862
1913		1920	1925	C1.1		862		
1943		1946	1948	B1.4	862			
2054		2112	2119	B2.7	862			
2120		2124	2128	B3.7	862			
2205		2212	2215	B2.1	862			
2227		2230	2233	B1.7	862			
2258		2302	2306	B1.8	862			
2324	2326	2335	C2.1	Sf	S06W39		862	
22 March	0038	0045	0050		B2.6	862		
	0059	0107	0112	B4.6	862			
	0201	0210	0219	B3.6	862			
	0235	0239	0242	B2.6	862			
	0535	0541	0544	B1.2	862			
	0658	0720	0729	B1.8	862			
	0829	0835	0840	B2.3	862			
	0909	0916	0923	B1.8	862			
	1059	1104	1112	B2.8	862			
	1243	1250	1258	B2.3	862			
1538	1548	1553	B2.3	862				



Flare List- Continued

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
23 March	0926	0926	0931	B2.2	Sf	S06W59	862
	1046	1057	1105	B2.6			
	1203	1210	1214	B1.4			
	1225	1232	1240	B1.9			
	1300	1304	1307	B1.3			
	1410	1423	1433	B3.6			
	2107	2115	2123	B5.1			
24 March	1252	1259	1304	B1.0			
25 March	1715	1719	1723	B1.1			860
26 March	No Flares Observed						

Region Summary

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

Region 862

18 Mar	S07E03	299	0020	04	Cso	005	B										
19 Mar	S07W10	299	0090	08	Dai	018	B										
20 Mar	S07W27	302	0130	09	Dac	023	Bg					2					
21 Mar	S07W39	301	0120	10	Dai	029	Bg	5				4					
22 Mar	S06W51	300	0110	11	Dac	025	Bg										
23 Mar	S07W66	302	0060	11	Dai	014	B					1					
24 Mar	S06W77	300	0060	08	Bxo	007	B										
								5	0	0	7	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 299

Region 863

22 Mar	N08W52	301	0020	03	Cso	004	B										
23 Mar	N08W65	301	0020	04	Cso	002	B										
24 Mar	N07W79	302	0030	03	Bxo	003	B										
								0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 301



Region Summary- Continued

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

Region 864

24 Mar	S05W61	284	0020	04	Bxo	004	B									
25 Mar	S05W74	284														
26 Mar	S05W87	284														

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 284

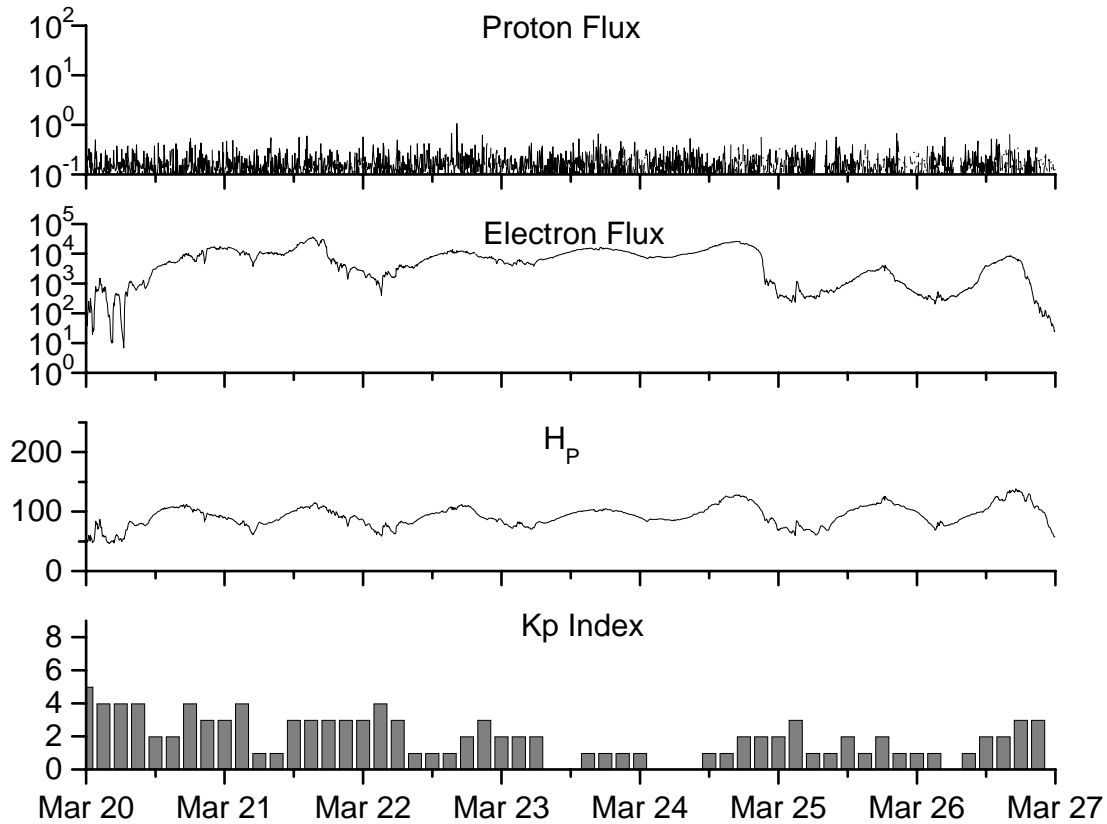


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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 20 March 2006*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W104) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

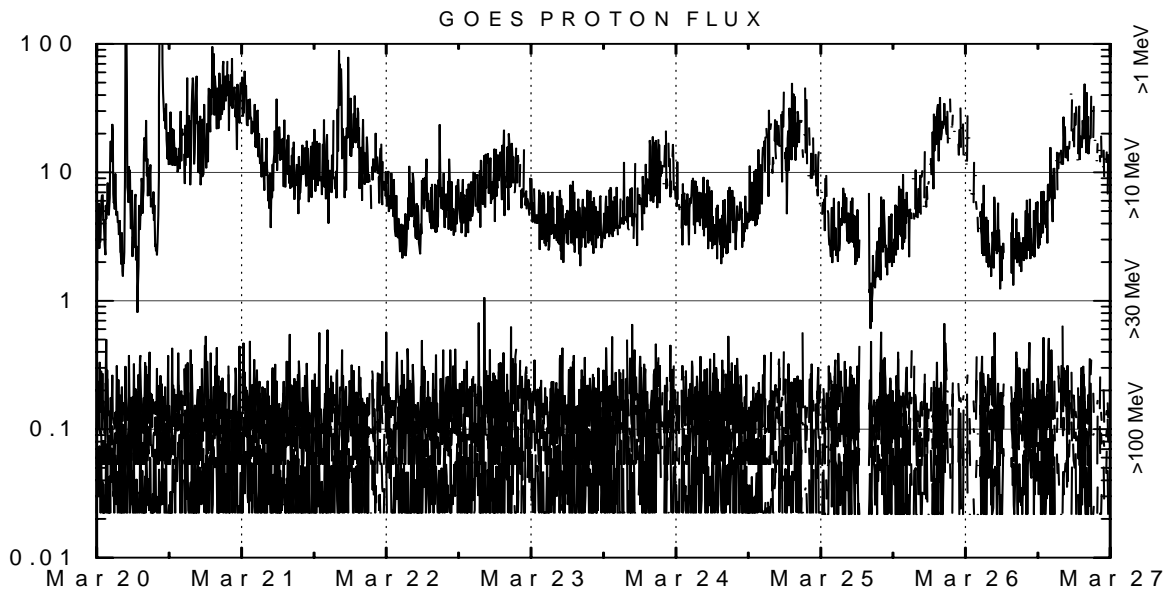
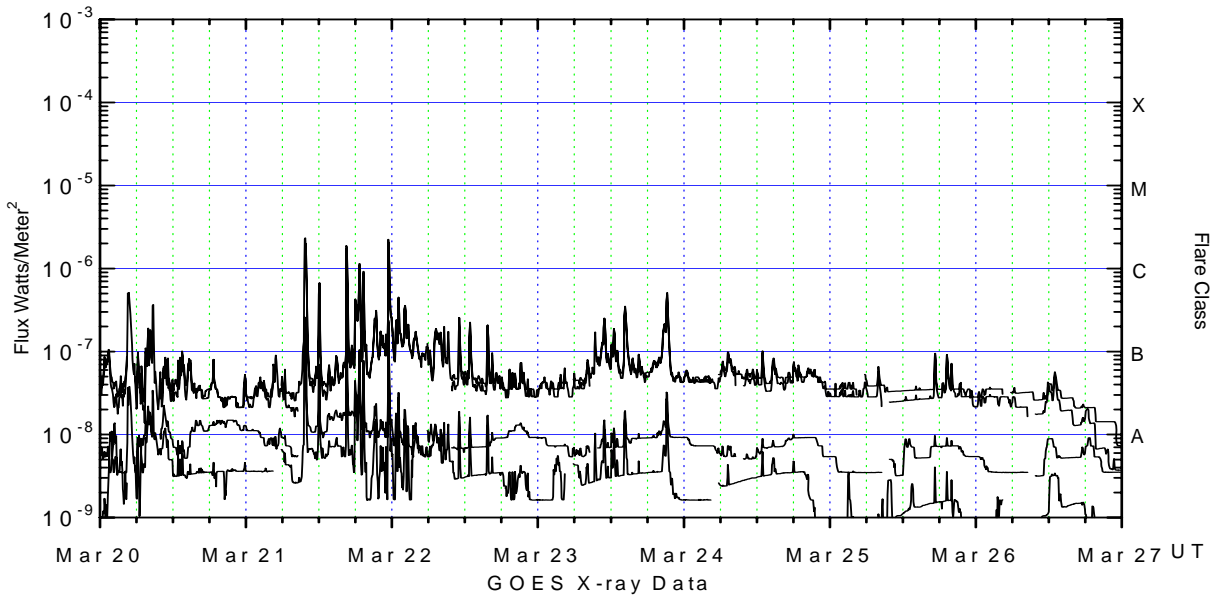
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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 (W104) 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.

