

## **Space Weather Highlights 03 - 09 October 2005**

**SWO PRF 1571  
11 October 2005**

Solar activity was very low to low. Region 813 (S08, L=285, class/area, Dac/150 on 05 October) was responsible for an impulsive C1.4/Sf flare at 05/0822 UTC. This region formed on the disk on 04 October, and quickly developed into a relatively complex beta-gamma spot group. However, no significant activity was observed in this region which decayed to 30 millionths with a simple beta magnetic class by the end of the period. Old Region 808 (S10, L=232), which was very active during its previous passage on the visible disk, rotated back into view on 05 October as a large plage region with no sunspots.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. Solar wind speed ranged from a low near 300 km/s early on 05 October to a high of approximately 750 km/s on 08 October. Midday on 07 October, wind speed, density, and temperature all increased, indicating the passage of a co-rotating interaction region in advance of a coronal hole high speed wind stream. Wind speed increased from about 450 km/s to near 750 km/s in a short span of time early on the 8th. By the end of the summary period, wind speed had decayed to about 610 km/s. The IMF Bz began rotating through +/- 10 nT through late on the 7th and further increased its variability to +20 and -18 nT through about 08/0600 UTC. Thereafter, and through the remainder of the summary period, the Bz did not vary much beyond +/- 5 nT.

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 03 - 06 October.

The geomagnetic field ranged from quiet to active levels with minor to major storm conditions observed at high latitudes. Geomagnetic activity was mostly quiet to unsettled until midday on 07 October when a coronal hole high speed stream moved into a geoeffective position. Isolated active periods were observed late on 07 October and early on 08 October at middle latitudes. Isolated active periods were observed at high latitudes midday on 07 October while active to major storm periods were observed through most of the day on 08 October, again at high latitudes. Conditions decreased to mostly quiet to unsettled late on 08 October and continued that way through the rest of the period.

## **Space Weather Outlook 12 October - 07 November 2005**

Solar activity is expected to be very low to low.

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 12 - 22 October, 29 October - 02 November, and 06 - 07 November.

The geomagnetic field is expected to range from quiet to minor storm levels. Active to minor storm levels are possible on 15 October and 04 November due to a recurrent coronal hole high speed wind stream. Otherwise, expect quiet to unsettled conditions.

Note: SEC will be making a minor change in the Space Weather Highlights section of the Preliminary Report and Forecast of Solar Geophysical Data (PRF). At present, there are five paragraphs describing the solar geophysical environment in the Space Weather Highlights section of the PRF; solar activity, solar wind, proton events, electron flux, and geomagnetic activity. SEC's change will combine solar wind and geomagnetic activity into one paragraph describing the period's geomagnetic activity with respect to solar wind data. The Space Weather Outlook section will remain the same. We will make this change effective on 25 October 2005 with PRF #1573.



**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	
03 October	74	0	0	A5.5	0	0	0	0	0	0	0	0	0
04 October	83	15	60	B1.6	0	0	0	0	0	0	0	0	0
05 October	81	31	150	B1.3	1	0	0	3	0	0	0	0	0
06 October	80	28	130	A8.0	0	0	0	0	0	0	0	0	0
07 October	79	31	120	A5.9	0	0	0	0	0	0	0	0	0
08 October	78	24	80	A4.4	0	0	0	0	0	0	0	0	0
09 October	79	16	30	A4.4	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
	03 October	4.3E+5	1.5E+4	5.4E+3		1.3E+8
04 October	3.6E+5	1.5E+4	5.9E+3		1.6E+8	
05 October	4.3E+5	1.6E+4	6.1E+3		1.3E+8	
06 October	4.2E+5	1.4E+4	3.4E+3		6.8E+7	
07 October	1.2E+6	1.4E+4	3.5E+3		1.6E+7	
08 October	1.4E+6	1.4E+4	3.5E+3		2.5E+6	
09 October	1.4E+6	1.4E+4	3.3E+3		3.8E+7	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	03 October	5	2-3-2-1-1-1-1-0	8	2-2-3-4-2-0-0-0	7
04 October	2	1-1-0-0-1-1-0-0	4	0-0-1-1-3-0-0-0	4	1-1-0-0-1-1-1-1
05 October	2	0-1-1-0-1-1-1-0	3	0-0-2-1-2-1-1-0	4	0-1-1-0-1-1-2-1
06 October	2	0-1-1-0-1-1-2-0	3	0-1-1-1-3-0-1-0	4	1-1-1-1-1-1-1-1
07 October	11	2-2-1-2-2-4-3-3	12	0-0-3-4-3-2-3-3	11	1-2-2-2-2-2-3-4
08 October	16	4-3-3-3-3-2-3-3	36	4-5-5-6-4-4-3-3	22	4-4-4-4-3-2-4-3
09 October	7	3-1-1-1-2-1-2-3	11	2-2-2-4-3-2-2-2	9	3-2-1-2-2-1-3-3



### *Alerts and Warnings Issued*

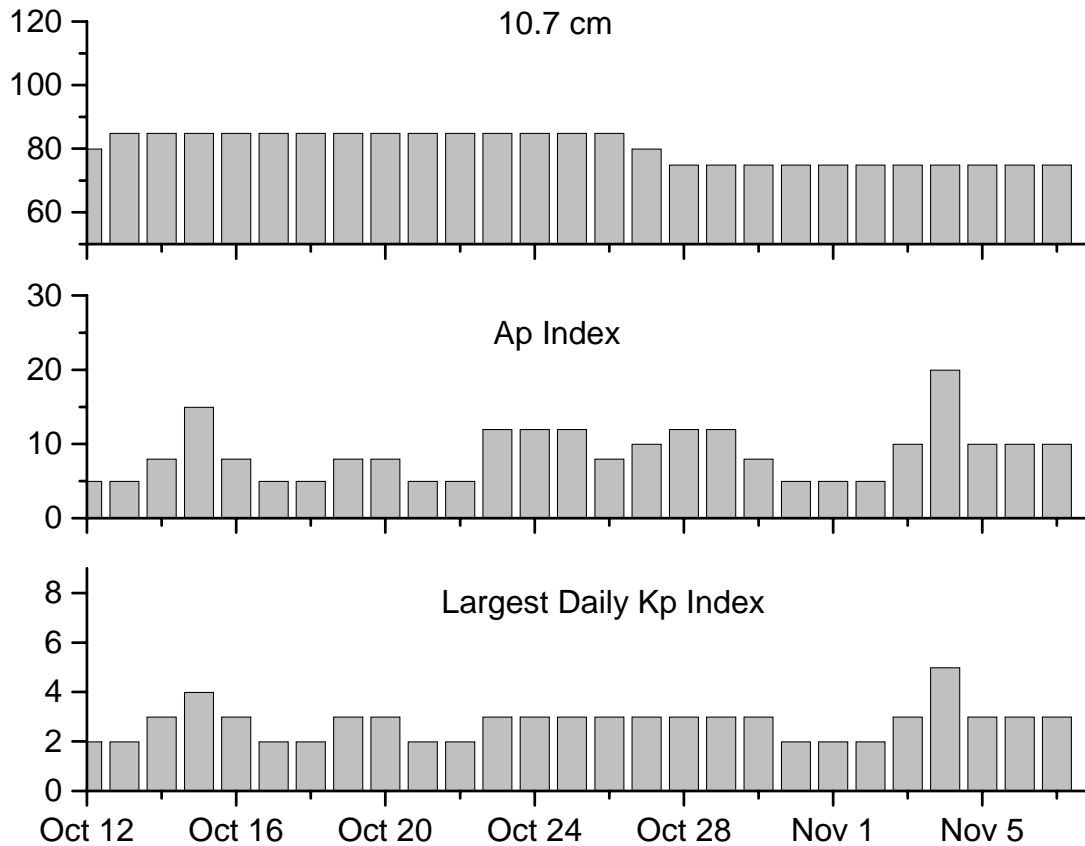
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<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UTC</u>
03 Oct 0956	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Oct 0935
04 Oct 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Oct 0500
05 Oct 0936	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Oct 0915
06 Oct 1231	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 Oct 1210
08 Oct 0207	WARNING: Geomagnetic K = 5	08 Oct 0210 -1500
08 Oct 0214	ALERT: Geomagnetic K = 4	08 Oct 0213
08 Oct 1458	WARNING: Geomagnetic K = 4	08 Oct 1459 - 2359
09 Oct 0000	EXTENDED WARNING: Geomagnetic K = 4	08 Oct 1459 -09 Oct 1600
09 Oct 2341	ALERT: Electron 2MeV Integral Flux > 1000pfu	09 Oct 2320

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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
12 Oct	80	5	2	26 Oct	85	8	3
13	85	5	2	27	80	10	3
14	85	8	3	28	75	12	3
15	85	15	4	29	75	12	3
16	85	8	3	30	75	8	3
17	85	5	2	31	75	5	2
18	85	5	2	01 Nov	75	5	2
19	85	8	3	02	75	5	2
20	85	8	3	03	75	10	3
21	85	5	2	04	75	20	5
22	85	5	2	05	75	10	3
23	85	12	3	06	75	10	3
24	85	12	3	07	75	10	3
25	85	12	3				



***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	II

*No Events Observed*

***Flare List***

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
03 October	No Flares Observed						
04 October	0532	0622	0655	B7.2			
	0646	0649	0652	B8.4			
	0902	0914	0918	B6.4			
	0943	0950	0952	B8.4			
	1923	1927	1932	B5.4			
	2137	2158	2211	B8.4			
05 October	0030	0034	0039	B5.3			
	0146	0149	0152	B5.6			
	0205	0208	0213	B5.0			
	0307	0307	0311		Sf	S07E29	813
	0345	0348	0352	B6.3			
	0656	0718	0730	B9.5			
	0818	0819	0824	C1.4	Sf	S07E26	813
06 October	0558	0603	0606	B2.1			
07 October	0649	0652	0721	B1.0			
08 October	0535	0540	0544	B1.2			
	0807	0810	0817	B1.1			
	0905	0909	0911	B1.0			
09 October	No Flares Observed						



### Region Summary

Location		Sunspot Characteristics					Flares							
Date	( ° Lat ° CMD)	Helio Lon	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
							C	M	X	S	1	2	3	4
<i>Region 812</i>														
23 Sep	S01E73	028	0030	03	Cso	004	B							
24 Sep	S03E62	026	0030	05	Cao	003	B							
25 Sep	S02E45	030	0020	05	Cso	003	B							
26 Sep	S01E32	030	0020	01	Hsx	002	A							
27 Sep	S02E20	028	0020	04	Hax	002	A							
28 Sep	S02E05	030	0020	01	Hax	001	A							
29 Sep	S03W08	030	0020	01	Hsx	001	A							
30 Sep	S03W20	029	0020	02	Cso	003	B							
01 Oct	S03W33	029												
03 Oct	S03W59	029												
04 Oct	S03W72	029												
05 Oct	S03W85	029												
06 Oct	S03W98	029												
									0	0	0	0	0	0
Crossed West Limb.														
Absolute heliographic longitude: 030														
<i>Region 813</i>														
04 Oct	S06E30	286	0060	04	Dso	005	B							
05 Oct	S08E18	285	0150	07	Dac	021	Bg	1			2			
06 Oct	S08E05	285	0130	06	Dai	018	Bg							
07 Oct	S08W08	285	0120	06	Dao	021	Bg							
08 Oct	S08W22	285	0080	07	Dao	014	B							
09 Oct	S08W35	285	0030	04	Dso	006	B							
									1	0	0	2	0	0
Still on Disk.														
Absolute heliographic longitude: 285														

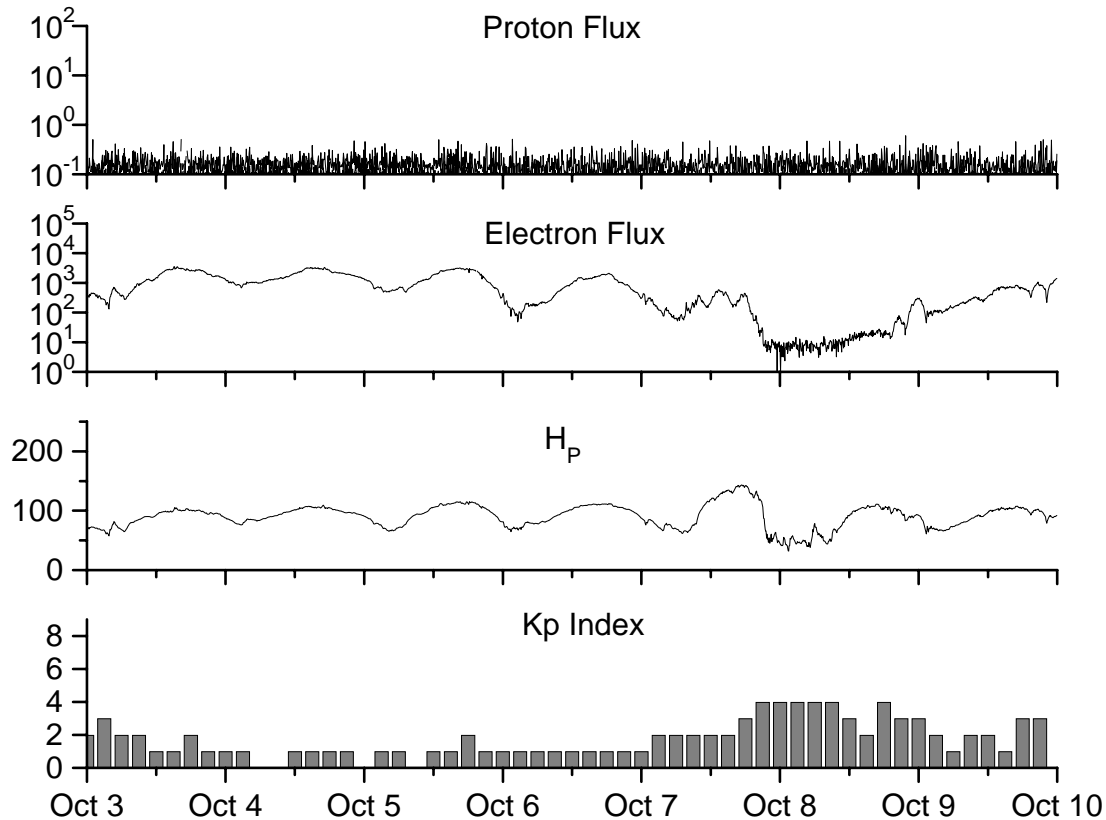


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2003</b>									
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
<b>2004</b>									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
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
<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			85.9		12	
May	65.4	42.6	0.65			99.5		20	
June	59.8	39.6	0.66			93.7		13	
July	71.0	39.9	0.56			96.6		16	
August	65.6	36.4	0.55			90.7		16	
September	39.2	22.1	0.56			90.8		21	

**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 03 October 2005*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W113) 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).

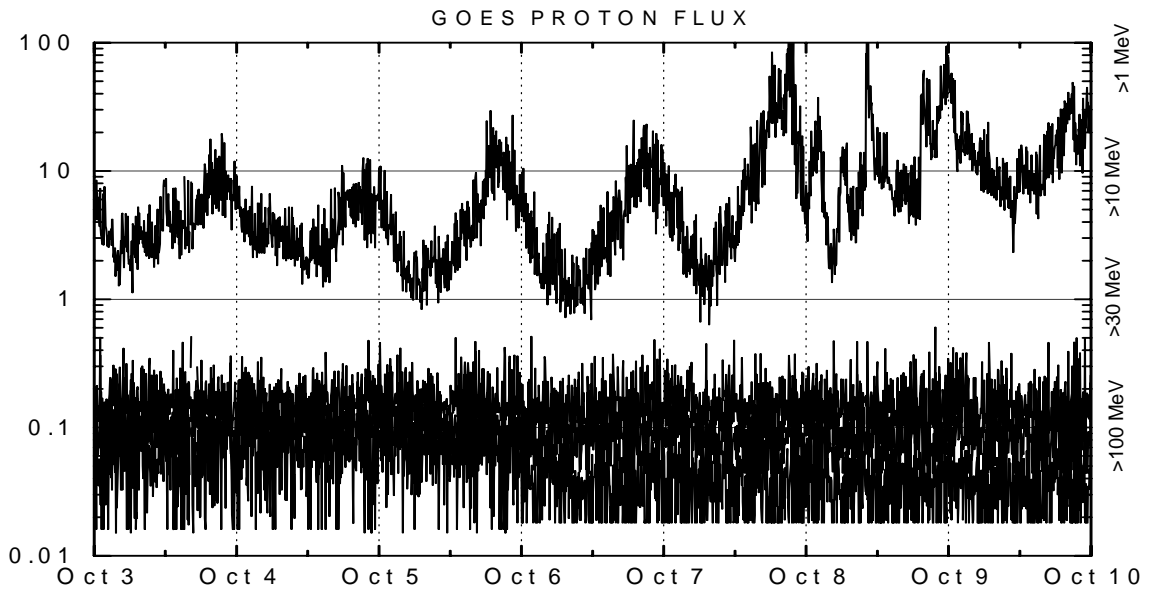
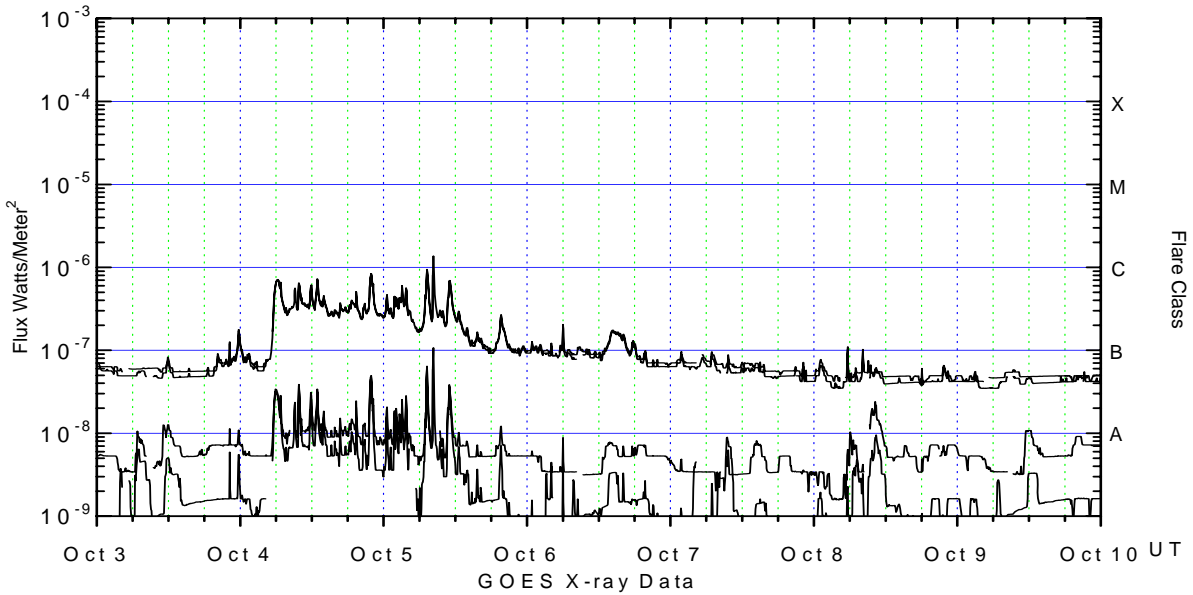
*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*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 SWO 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 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/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W113) 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.

