

Space Weather Highlights
23 August - 29 August 2010

SWPC PRF 1826
31 August 2010

Solar activity was at very low levels during the period. The week's activity consisted of a few, low level B-class flares from Region 1100 (S19, L=207, class/area Axx/010 on 25 August) and Region 1101 (N12, L=084, class/area Hrx/140 on 29 August). Region 1101 rotated on the solar disk on 24 August, while Region 1102 (N27, L=104, class/area Cro/030 on 29 August) formed on the disk on 29 August.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels on 23-24 August. High levels occurred on 25 August for the rest of the period.

Geomagnetic field activity ranged from quiet to minor storm levels, with periods of major to severe conditions at high latitudes, due to a recurrent coronal hole high speed stream (CH HSS). Mostly quiet levels prevailed on 23 August except for the last period when active conditions occurred. Solar wind observations from the ACE spacecraft showed an enhanced interplanetary field (IMF) intensity (peak 22 nT at 23/2241Z) combined with intermittent periods of southward IMF Bz (maximum deflection -14 nT at 24/0109Z) with an increase in velocities from 358 km/s to 709 km/s. Quiet to active levels, with minor to severe storming at high latitudes occurred on 24 August. Quiet to minor storm conditions, with isolated major storm levels at high latitudes was observed on 25 August. Quiet to active levels, with minor to major storm conditions at high latitudes, were present on 26-27 August. Mostly quiet levels returned on 28-29 August as the CH HSS declined.

Space Weather Outlook
01 September – 27 September 2010

Solar activity is expected to be at very low levels. Very low to low levels are possible through 15 September as Region 1098 and 1099 return to the front of the solar disk.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels from 01-12 September. Normal to moderate levels are expected for 13-24 September. High levels are expected to return for 25 September to the remainder of the period due to a recurrent CH HSS.

Geomagnetic field activity is expected to be predominantly quiet for 01-18 September. Quiet to unsettled, with isolated active conditions are expected for 19-22 September due to a recurrent CH HSS. Quiet levels should prevail for 22 September through the remainder of the forecast period.



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
23 August	75	0	0	A4.9	0	0	0	0	0	0	0 0
24 August	74	11	30	A4.7	0	0	0	0	0	0	0 0
25 August	74	23	100	A5.2	0	0	0	0	0	0	0 0
26 August	73	23	100	A7.5	0	0	0	1	0	0	0 0
27 August	73	11	100	A7.9	0	0	0	0	0	0	0 0
28 August	72	11	130	A5.9	0	0	0	0	0	0	0 0
29 August	74	25	170	A5.7	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
23 August	8.5e+05	1.4e+04	3.4e+03		4.0e+06	
24 August	1.2e+06	1.4e+04	3.2e+03		1.1e+06	
25 August	2.9e+06	1.6e+04	3.3e+03		7.1e+07	
26 August	2.4e+06	1.6e+04	3.3e+03		7.1e+08	
27 August	6.9e+05	1.5e+04	3.3e+03		2.2e+08	
28 August	8.9e+05	1.5e+04	3.5e+03		3.8e+08	
29 August	6.3e+05	1.5e+04	3.5e+03		4.1e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
23 August	5	0-0-0-1-1-1-1-4	2	0-0-0-0-1-1-1-1	7	1-0-0-0-1-2-2-4
24 August	13	3-3-2-2-3-2-2-4	47	3-5-5-6-7-4-2-2	18	4-4-3-3-4-3-2-4
25 August	15	4-5-2-2-2-2-2-2	31	4-4-3-6-5-4-2-3	20	5-5-2-3-3-2-2-3
26 August	11	3-2-3-1-2-1-4-2	18	4-3-4-5-3-2-1-0	11	3-4-3-2-2-2-2-2
27 August	10	2-2-3-3-2-2-1-3	20	2-3-3-6-3-3-1-2	14	2-3-3-4-3-3-2-4
28 August	5	3-1-2-1-1-1-1-1	15	3-2-3-5-4-1-1-1	7	3-2-3-1-2-1-1-2
29 August	2	1-0-1-0-0-0-1-1	1	1-0-1-0-0-0-0-1	2	2-0-1-0-0-0-0-1

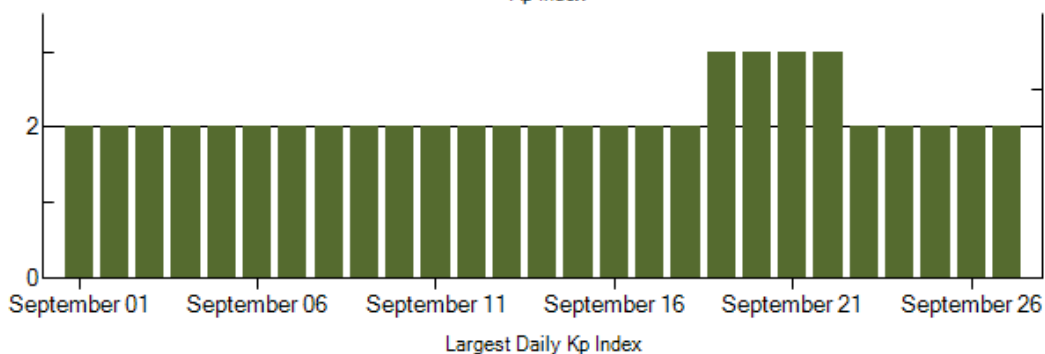
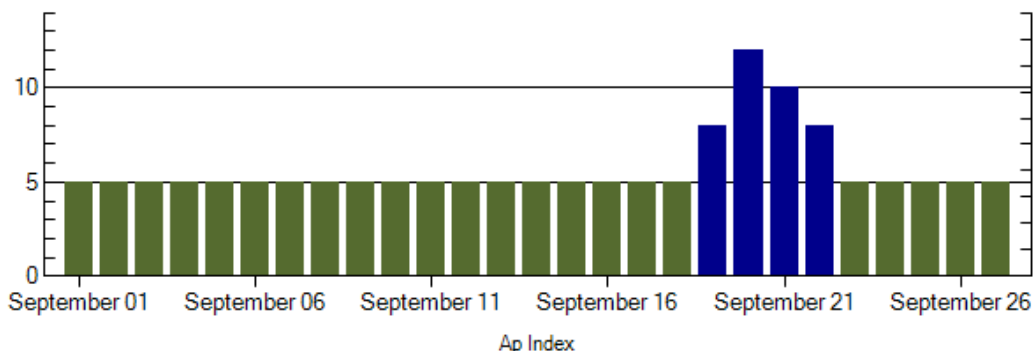
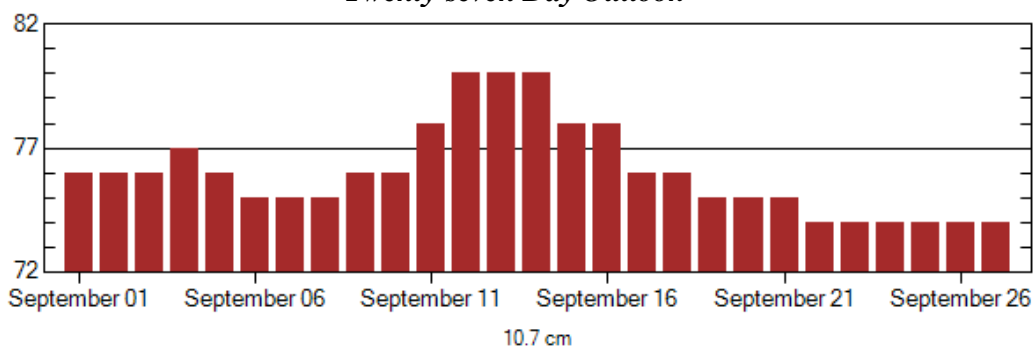


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
24 Aug 0002	ALERT: Geomagnetic K = 4	23 Aug 2359
24 Aug 0055	WARNING: Geomagnetic K = 4	24 Aug 0055 - 1600
24 Aug 0601	ALERT: Geomagnetic K = 4	24 Aug 0559
24 Aug 1032	WARNING: Geomagnetic K = 5	24 Aug 1032 - 2359
24 Aug 2219	WARNING: Geomagnetic K = 4	24 Aug 2230 - 25/1600
25 Aug 0241	ALERT: Geomagnetic K = 5	25 Aug 0240
25 Aug 0329	WARNING: Geomagnetic K = 5	25 Aug 0330 - 0600
25 Aug 0335	ALERT: Geomagnetic K = 5	25 Aug 0335
25 Aug 1622	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Aug 1555
25 Aug 2255	WARNING: Geomagnetic K = 4	25 Aug 2310 - 26/1600
26 Aug 0525	ALERT: Geomagnetic K = 4	26 Aug 0525
26 Aug 0533	CONTINUED ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Aug 1555
27 Aug 0445	WARNING: Geomagnetic K = 4	27 Aug 0455 - 1600
27 Aug 0643	ALERT: Geomagnetic K = 4	27 Aug 0640
27 Aug 0918	CONTINUED ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Aug 1555
27 Aug 2225	WARNING: Geomagnetic K = 4	27 Aug 2245 - 28/1600
27 Aug 2249	ALERT: Geomagnetic K = 4	27 Aug 2247
28 Aug 0551	CONTINUED ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Aug 1555
29 Aug 0507	CONTINUED ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Aug 1555



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
01 Sep	76	5	2	15 Sep	78	5	2
02	76	5	2	16	78	5	2
03	76	5	2	17	76	5	2
04	77	5	2	18	76	5	2
05	76	5	2	19	75	8	3
06	75	5	2	20	75	12	3
07	75	5	2	21	75	10	3
08	75	5	2	22	74	8	3
09	76	5	2	23	74	5	2
10	76	5	2	24	74	5	2
11	78	5	2	25	74	5	2
12	80	5	2	26	74	5	2
13	80	5	2	27	74	5	2
14	80	5	2				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	$\frac{1}{2}$			Integ		Imp/		Rgn	Radio Flux		Intensity	
	Begin	Max	Max	Class	Flux	Brtns	Lat CMD		245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
23 August	No Flares Observed						
24 August	No Flares Observed						
25 August	No Flares Observed						
26 August	1047	1053	1102	B2.6			1101
	0534	0539	0547		SF	S21W68	1100
	1731	1734	1736	B1.5			1100
	2350	2354	2359	B1.7			
27 August	0026	0033	0039	B2.2			
	0056	0100	0107	B1.6			1100
	0318	0333	0343	B2.3			
	0436	0439	0446	B4.7			1100
	0510	0514	0518	B2.2			
	1636	1640	1644	B1.9			
	1955	1958	2004	B1.3			
	2217	2221	2226	B1.1			
	2255	2259	2301	B1.1			
28 August	0044	0050	0056	B1.0			1101
29 August	No Flares Observed						



Region Summary

Date	Location		Sunspot Characteristics					Flares							
	° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
Region 1100															
16 Aug	S24E59	202	10	1	AXX	1	A								
17 Aug	S23E49	199	10	1	AXX	1	A								
18 Aug	S22E36	199	10	1	AXX	1	A								
19 Aug	S23E22	200		1	AXX	1	A								
20 Aug	S27E05	204			AXX	1	A								
21 Aug	S27W08	204													
22 Aug	S27W21	204													
23 Aug	S27W34	204													
24 Aug	S27W47	204													
25 Aug	S19W64	207	10	2	AXX	2	A								
26 Aug	S20W78	205	10	2	AXX	2	A					1			
27 Aug	S20W91	205													
								0	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 204

<i>Region 1101</i>															
24 Aug	N12E79	0	30	3	HRX	1	A								
25 Aug	N12E61	82	90	2	HSX	1	A								
26 Aug	N13E48	83	90	5	HSX	1	A								
27 Aug	N12E34	84	100	3	HSX	1	A								
28 Aug	N12E21	81	130	3	HSX	1	A								
29 Aug	N12E07	84	140	2	HRX	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 84

<i>Region 1102</i>															
29 Aug	N27W13	104	30	3	CRO	4	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 104



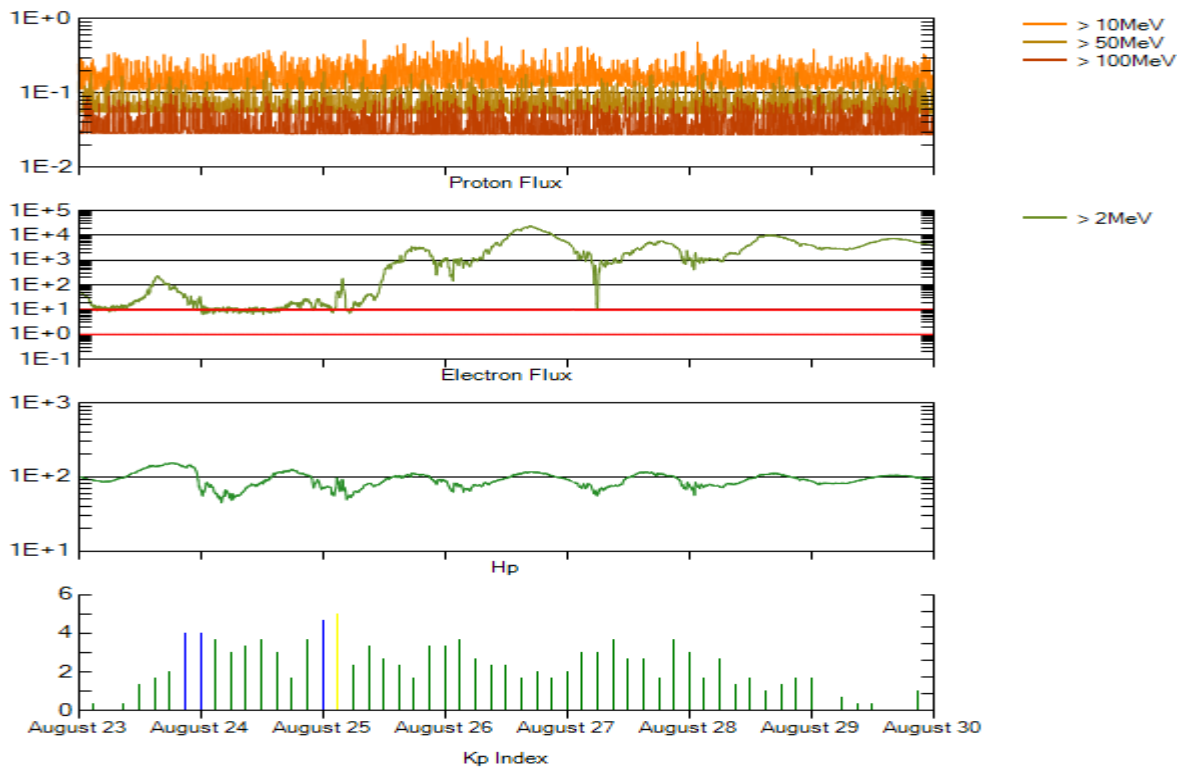
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values	Ratio	Smooth values			*Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2008									
August	0.0	0.5	**	4.4	2.7	66.3	68.6	5	6.3
September	1.5	1.1	0.73	3.7	2.3	67.1	68.4	6	5.8
October	5.2	2.9	0.56	2.9	1.8	68.3	68.2	7	5.4
November	6.8	4.1	0.60	2.7	1.7	68.6	68.3	4	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	4	4.9
2009									
January	2.8	1.3	0.46	3.0	1.8	69.8	68.7	4	4.7
February	2.5	1.4	0.56	3.1	1.9	70.0	68.8	5	4.7
March	0.7	0.7	1.00	3.4	2.0	69.2	69.0	5	4.6
April	1.2	0.8	1.00	3.7	2.2	69.7	69.3	4	4.3
May	3.9	2.9	0.74	3.8	2.3	70.5	69.7	4	4.1
June	6.6	2.9	0.39	4.4	2.7	68.6	70.2	4	4.0
July	5.0	3.2	0.70	5.8	3.6	68.2	71.0	4	3.9
August	0.3	0.0	0.00	7.7	4.8	67.4	72.1	5	3.8
September	6.6	4.3	0.64	9.9	6.2	70.5	73.3	4	3.8
October	7.0	4.8	0.66	11.3	7.1	72.3	74.1	3	4.1
November	7.7	4.1	0.55	12.4	7.6	73.6	74.5	3	4.5
December	15.7	10.8	0.68	13.6	8.3	76.8	74.9	2	4.8
2010									
January	21.3	13.2	0.62	14.8	9.3	81.1	75.5	3	5.0
February	31.0	18.8	0.60			84.7		5	
March	24.7	15.4	0.62			83.3		5	
April	11.2	7.9	0.71			75.9		10	
May	19.9	8.8	0.44			73.8		8	
June	17.9	13.5	0.75			72.6		7	
July	23.1	16.1	0.70			79.9		6	

NOTE: Values are final except for the most recent 6 months which are considered preliminary.
Cycle 23 started in May 1996 with an RI=8.0. Cycle 23 maximum was April 2000 with an RI=120.8.

** SWPC sunspot number was zero, so a ratio could not be computed.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 23 August 2010

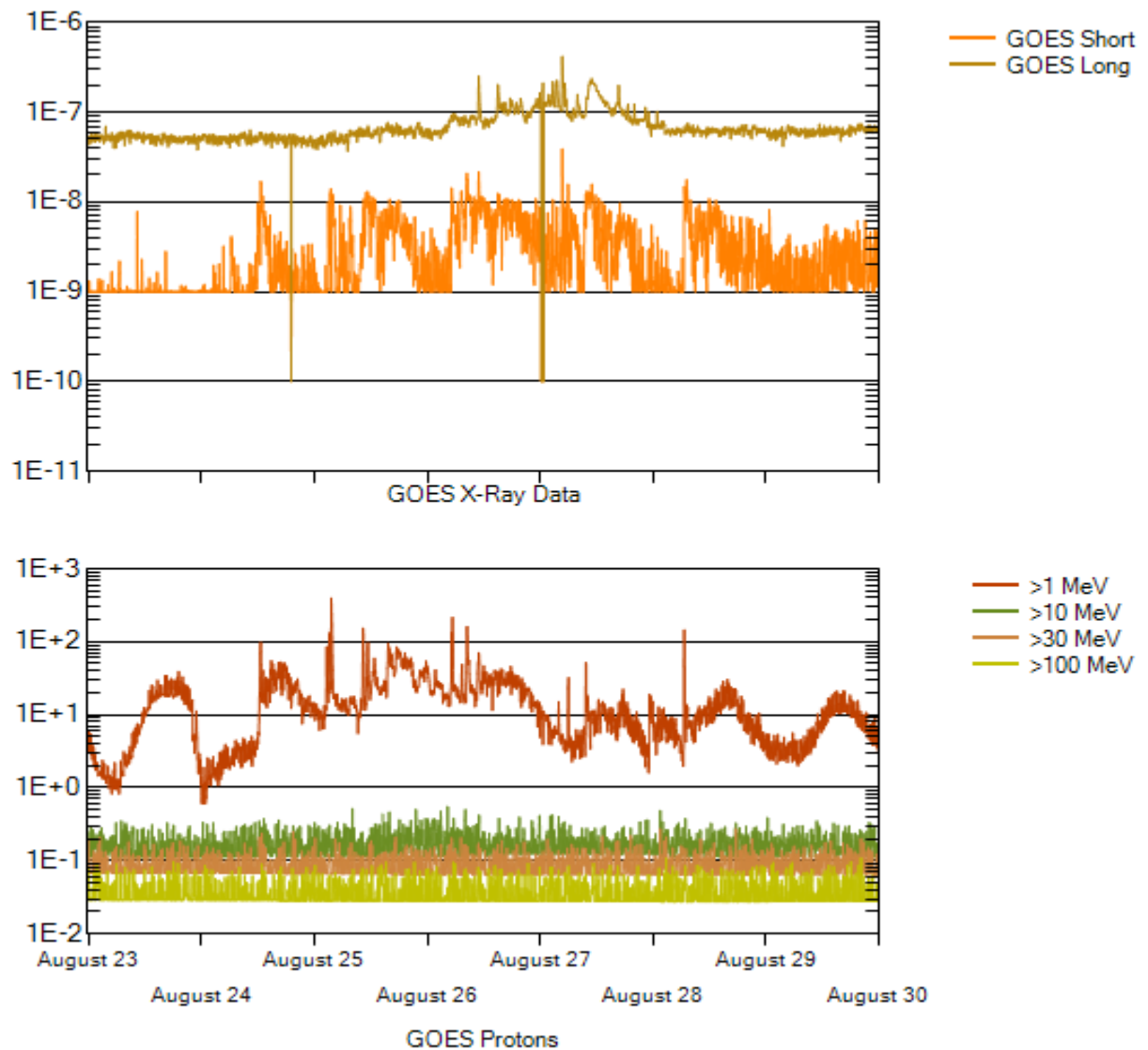
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²–sec–sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²–sec–sr) with energies greater than 2 MeV at GOES-13.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as measured by GOES-13. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp 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 Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWPC 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 Kp 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

The x-ray plot contains five-minute averaged x-ray flux (Watts/m^2) as measured by GOES 14 (W105) in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral proton flux ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-13 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.

