

Space Weather Highlights **13 September - 19 September 2010**

SWPC PRF 1829
21 September 2010

Solar activity was as at very low to low levels during the period. Activity was very low during 13 – 16 September with occasional B-class flares from Regions 1106 (S20, L=208, class/area Fao/110 on 14 September) and 1108 (S29, L=204, class/area Fho/420 on 19 September). Activity increased to low levels on 17 September by virtue of a C1/Sf flare at 17/0122 UTC from Region 1108. Activity decreased to very low levels for the rest of the period with isolated B-class flares from Regions 1106 and 1108.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to (briefly) moderate levels on 13 September. Normal flux levels were observed during the rest of the period.

Geomagnetic field activity ranged from quiet to active levels during the period. The field was quiet at all latitudes on 13 September. Activity increased to quiet to unsettled levels on 14 September. Activity increased to active levels early on 15 September, then decreased to quiet levels at all latitudes after 15/0300 UTC. Activity was at quiet to unsettled levels during 16 – 17 September with active periods detected at high latitudes. Activity decreased to quiet levels during 18 – 19 September. ACE solar wind data indicated the unsettled to active levels during 14 – 15 September were associated with a solar sector boundary crossing (toward (-) to away (+)). The unsettled to active levels during 16 – 17 September were associated with a coronal hole high-speed wind stream (CH HSS). Solar wind changes observed during the CH HSS included increased velocities (peak 518 km/s at 17/0820 UTC), increased IMF Bt (peak 11 nT at 16/1428 UTC), and intermittent periods of southward IMF Bz (peak deflection -10 nT at 16/1653 UTC).

Space Weather Outlook **15 September – 11 October 2010**

Solar activity is expected to be at very low to low levels during the period. Low activity is expected during 22 September – 04 October with C-class flares likely from Region 1109 (N19, L = 072, class/area Hrx/030 on 21 September). Activity is expected to decrease to very low levels during 05 – 18 October.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels during 23 - 30 September. Normal to moderate flux levels are expected during the remainder of the period.

Geomagnetic field activity is expected to be at unsettled to active levels during 22 – 24 September due to a recurrent coronal hole high-speed stream (CH HSS). Field activity is expected to decrease to quiet levels during 25 – 26 September. Activity is expected to increase to unsettled levels during 27 – 28 September due to CH HSS effects. Quiet levels are expected during 29 September – 02 October. Unsettled levels are expected during 03 – 05 October due to another round of CH HSS effects. Quiet levels are expected during 06 – 10 October. Activity is expected to increase to unsettled levels during 11 – 14 October due to recurrent solar sector boundary and CH HSS effects. Activity is expected to decrease to quiet levels during 15 – 17 October. Activity is expected to increase to quiet to unsettled levels on 18 October as another recurrent CH HSS begins to disturb the field.



Daily Solar Data

Date	Radio	Sun	Sunspot	X-ray	Flares							
	Flux	spot	Area	Background	X-ray Flux			Optical				
	10.7 cm	No.	(10 ⁻⁶ hemi.)		C	M	X	S	1	2	3	4
13 September	80	17	100	B1.1	0	0	0	0	0	0	0	0
14 September	81	24	110	B1.3	0	0	0	0	0	0	0	0
15 September	81	20	90	B1.8	0	0	0	1	0	0	0	0
16 September	83	46	400	B1.9	0	0	0	0	0	0	0	0
17 September	82	41	360	B1.5	1	0	0	1	0	0	0	0
18 September	82	42	470	B1.4	0	0	0	0	0	0	0	0
19 September	81	50	510	B1.2	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 September	8.8e+05	1.4e+04	3.3e+03		6.6e+06	
14 September	2.5e+05	1.4e+04	3.4e+03		1.6e+06	
15 September	1.3e+05	1.4e+04	3.2e+03		1.2e+06	
16 September	2.4e+05	1.4e+04	3.1e+03		1.4e+06	
17 September	1.9e+05	1.4e+04	3.4e+03		1.9e+06	
18 September	1.5e+05	1.4e+04	3.6e+03		3.9e+06	
19 September	2.7e+05	1.4e+04	3.5e+03		5.2e+06	

Daily Geomagnetic Data

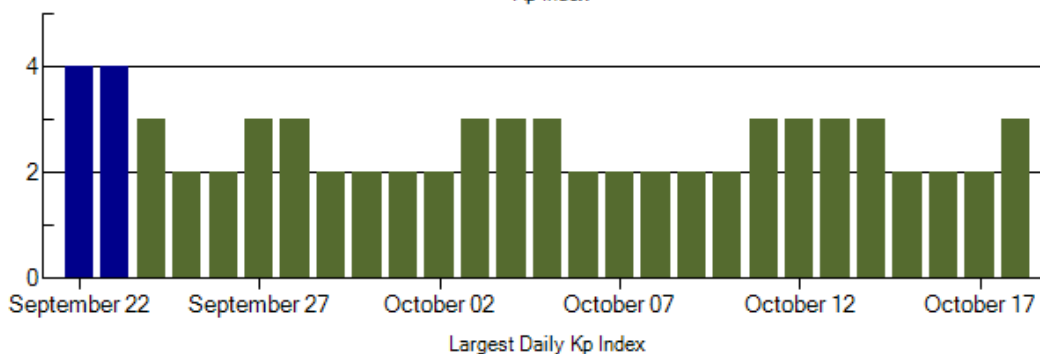
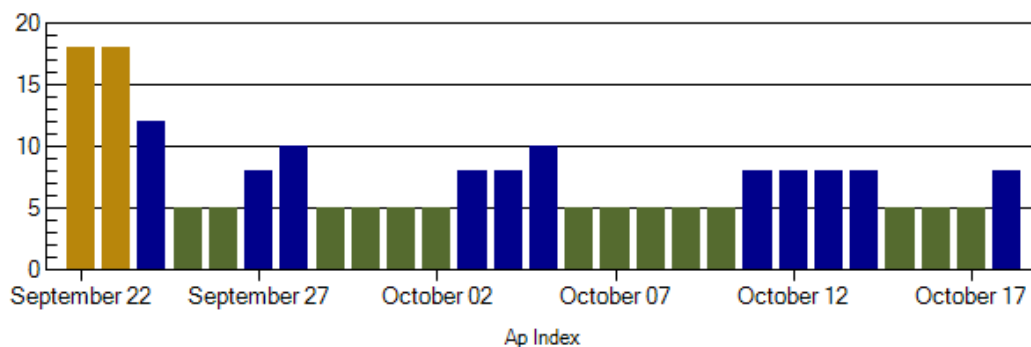
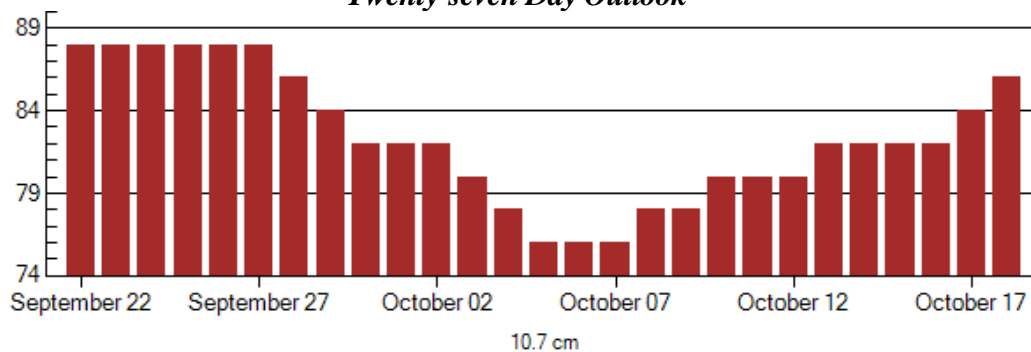
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
13 September	1	0-0-0-0-1-2-0-0	1	0-0-0-1-0-1-0-0	2	0-0-0-0-1-2-0-1
14 September	7	1-1-3-2-1-1-3-2	8	1-2-3-2-2-2-2-2	9	1-2-3-2-1-2-3-3
15 September	4	3-1-2-2-1-0-0-0		Not Available	7	4-1-2-2-1-1-1-1
16 September	5	0-1-0-0-2-2-3-2		Not Available	6	1-0-1-0-1-3-3-2
17 September	7	2-3-3-1-2-1-1-1	12	2-2-4-4-3-1-1-1	8	2-3-3-2-2-2-2-1
18 September	2	2-1-1-1-1-0-0-0	3	2-1-2-2-0-0-0-0	4	3-1-1-1-1-1-0-1
19 September	2	1-1-0-1-0-1-1-1	3	1-1-1-2-2-0-0-0	4	1-1-0-1-1-1-1-1

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
14 Sep 0739	WARNING: Geomagnetic K = 4	14 Sep 0740 - 0900
14 Sep 0744	ALERT: Geomagnetic K = 4	14 Sep 0740
16 Sep 1627	WARNING: Geomagnetic K = 4	16 Sep 1627 - 2100
17 Sep 0544	ALERT: Geomagnetic K = 4	17 Sep 0540



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
22 Sep	88	18	4	06 Oct	76	5	2
23	88	18	4	07	76	5	2
24	88	12	3	08	78	5	2
25	88	5	2	09	78	5	2
26	88	5	2	10	80	5	2
27	88	8	3	11	80	8	3
28	86	10	3	12	80	8	3
29	84	5	2	13	82	8	3
30	82	5	2	14	82	8	3
01 Oct	82	5	2	15	82	5	2
02	82	5	2	16	82	5	2
03	80	8	3	17	84	5	2
04	78	8	3	18	86	8	3
05	76	10	3				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray	Imp /	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
13 September	0429	0436	0439	B2.1				1106
14 September	No Flares Observed							
15 September	0723	0723	0728	B2.8	SF	N30E35		1107
	0832	0842	0852	B2.8				1106
	0443	0508	0525	B5.0				1106
	1708	1715	1721	B9.1				1108
	2156	2201	2208	B3.4				1106
	2220	2225	2231	B5.3				1106
16 September	0621	1109	1136	B4.5				
	0909	0912	0914	B3.1				
	1104	1109	1121	B4.6				1106
	1352	1400	1404	B3.6				1108
	1858	1903	1906	B3.7				1108
	2229	2234	2240	B4.6				1106
17 September	0014	0017	0019	B5.7				1108
	0120	0123	0127	C1.3	SF	S31E70		1108
	0418	0421	0423	B2.5				1106
	1732	1736	1739	B2.7				1106
18 September	0618	0852	0905	B4.2				1106
	1244	1248	1251	B2.3				1108
19 September	0247	0256	0305	B2.4				1106
	0638	0716	0804	B3.6				1108



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
<i>Region 1106</i>															
10 Sep	S18E72	220	50	1	HRX	1	A								
11 Sep	S18E64	215	50	1	HSX	1	A								
12 Sep	S19E57	209	80	14	CSO	5	B								
13 Sep	S19E44	209	100	15	CSO	7	B								
14 Sep	S19E30	209	110	17	FAO	14	B								
15 Sep	S20E18	208	90	16	FAO	10	B								
16 Sep	S20E05	208	110	18	FSO	21	B								
17 Sep	S20W08	208	80	17	FSI	16	B								
18 Sep	S20W21	207	100	18	FSO	14	B								
19 Sep	S20W34	207	90	18	FSO	17	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 208

<i>Region 1107</i>															
12 Sep	N33E62	204	10	1	AXX	1	A								
13 Sep	N33E49	204													
14 Sep	N33E36	204													
15 Sep	N33E23	204									1				
16 Sep	N33E10	204													
17 Sep	N33W03	204													
18 Sep	N33W16	202													
19 Sep	N33W29	202													
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 204

<i>Region 1108</i>															
16 Sep	S28E69	144	290	9	CKO	5	B								
17 Sep	S28E59	141	280	13	EHO	5	B	1			1				
18 Sep	S28E49	138	370	14	ESO	8	B								
19 Sep	S30E36	137	420	18	FHO	13	B								
								1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 137

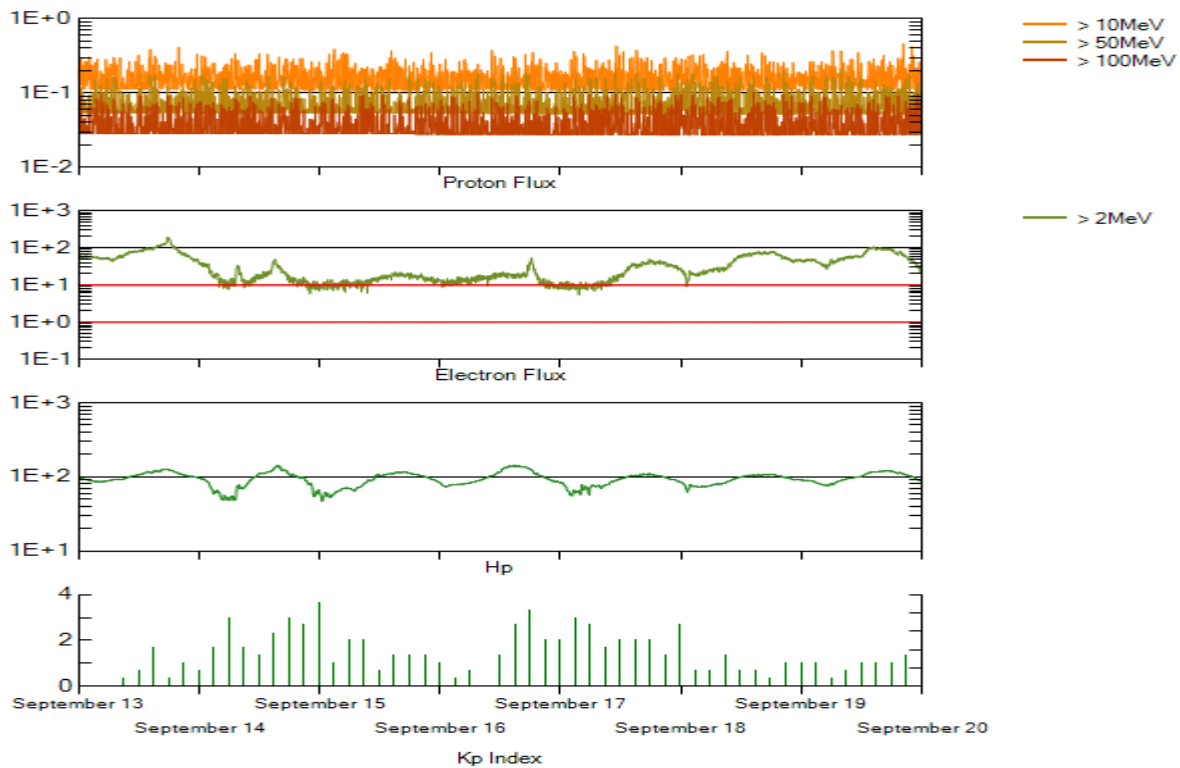


Recent Solar Indices (preliminary)									
Of the observed monthly mean values									
Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	Smooth SEC	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2008									
September	1.5	1.1	0.73	3.7	2.3	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	16.7	10.6	84.7	76.5	5	5.1
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		5	
August	28.2	19.6	0.70			79.7		8	

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 13 September 2010

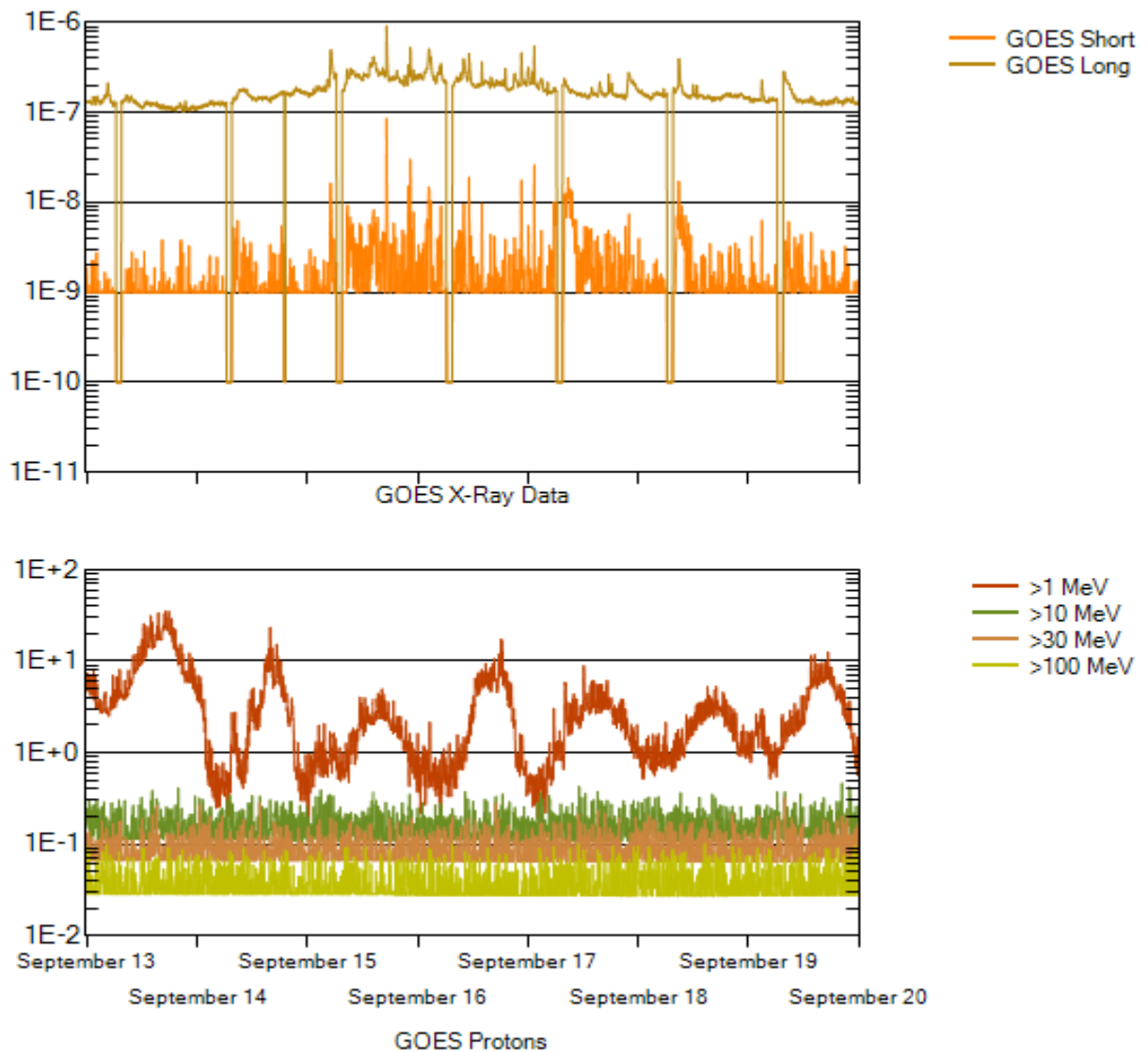
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²–sec–sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²–sec–sr) with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

