

Space Weather Highlights
16 September - 22 September 2013

SWPC PRF 1986
23 September 2013

Solar activity was at low levels throughout the period. In all, nine C-class flares were observed this period, one from Region 1846 (S17, L=56, class/area Cso/210 on 21 September) and eight from 1850 (N08, L=29, class/area Dso/90 on 21 September), the largest of which was a C3 at 18/0315 UTC from Region 1846. Region 1843 (N01 L=127, class/area Dso/60 on 18 September) joined Regions 1846 and 1850 in being the most complex regions of this period, although it remained relatively unproductive, unlike Regions 1846 and 1850. An 8-degree filament eruption centered near S12E36 between 19/0231 - 19/0301 UTC resulted in a coronal mass ejection (CME) which is expected to make a glancing blow at Earth midday on 23 September, and was the only Earth-directed CME to be observed this period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels for 16 September through 19 September and increased to moderate to high levels for 20 September through 22 September.

Geomagnetic field activity was at quiet to unsettled levels throughout this period. Quiet conditions were observed on 16 September and most of 17 September, although an isolated period of unsettled conditions was observed at 17/1800 - 2100 UTC with onset of weak coronal hole high speed stream (CH HSS) effects. Quiet conditions prevailed on 18 September which gave way to quiet to unsettled conditions on 19 September due to peak CH HSS influence. A return to quiet conditions was observed on 20 September as CH HSS influence began to subside. An isolated period of unsettled conditions was observed on a predominately quiet 21 September due to CH HSS effects waning. The period ended with quiet conditions on 22 September.

Space Weather Outlook
23 September - 19 October 2013

Solar activity is expected to be at very low to low levels.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels on 23 September, 29 September - 01 October, 04 - 10 October due to coronal hole high speed stream (CH HSS) effects. Normal to moderate levels are expected for the remainder of the period.

Geomagnetic field activity is expected to be at quiet to unsettled levels for 23 - 24 September, 28 September - 02 October, 10 - 11 October, and 14 - 16 October with CH HSS effects. Predominately quiet conditions are expected for the remainder of the period, barring any transient activity.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
16 September	95	23	40	B1.1	0	0	0	0	0	0	0	0
17 September	99	80	140	B1.5	0	0	0	1	0	0	0	0
18 September	104	59	240	B2.4	1	0	0	2	0	0	0	0
19 September	108	85	290	B3.0	2	0	0	2	0	0	0	0
20 September	109	85	320	B2.8	4	0	0	2	0	0	0	0
21 September	110	79	390	B2.7	2	0	0	4	1	0	0	0
22 September	111	98	350	B2.4	0	0	0	1	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	>0.6 MeV	>2MeV	>4 MeV
16 September	1.3e+05	1.0e+04	2.4e+03		4.8e+06	
17 September	2.2e+05	1.0e+04	2.5e+03		4.6e+06	
18 September	1.7e+05	1.0e+04	2.4e+03		2.1e+06	
19 September	4.0e+05	1.0e+04	2.4e+03		1.6e+07	
20 September	3.2e+05	1.0e+04	2.5e+03		9.9e+07	
21 September	3.7e+05	1.0e+04	2.4e+03		1.1e+08	
22 September	2.2e+05	1.0e+04	2.7e+03		1.2e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
16 September	6	2-1-2-2-2-1-2-2	3	1-1-1-2-0-1-0-1	5	2-1-2-2-1-1-1-2
17 September	8	1-2-2-1-3-2-3-1	9	1-2-4-2-3-1-2-1	8	1-2-2-1-2-2-3-2
18 September	6	2-2-0-2-2-2-2-2	8	1-1-0-3-4-2-1-2	7	2-2-1-1-2-2-2-2
19 September	14	2-3-4-4-2-2-3-2	21	3-4-5-5-3-2-2-1	11	2-3-3-3-2-2-3-2
20 September	5	1-2-2-1-2-1-1-2	11	1-2-4-4-3-1-1-1	6	1-2-2-1-2-1-1-2
21 September	8	1-2-2-3-2-2-2-2	11	1-1-3-4-4-2-1-1	7	1-2-2-3-2-2-2-2
22 September	6	2-2-2-2-2-2-1-0	5	2-2-3-1-2-1-0-0	5	2-2-2-1-1-1-1-1

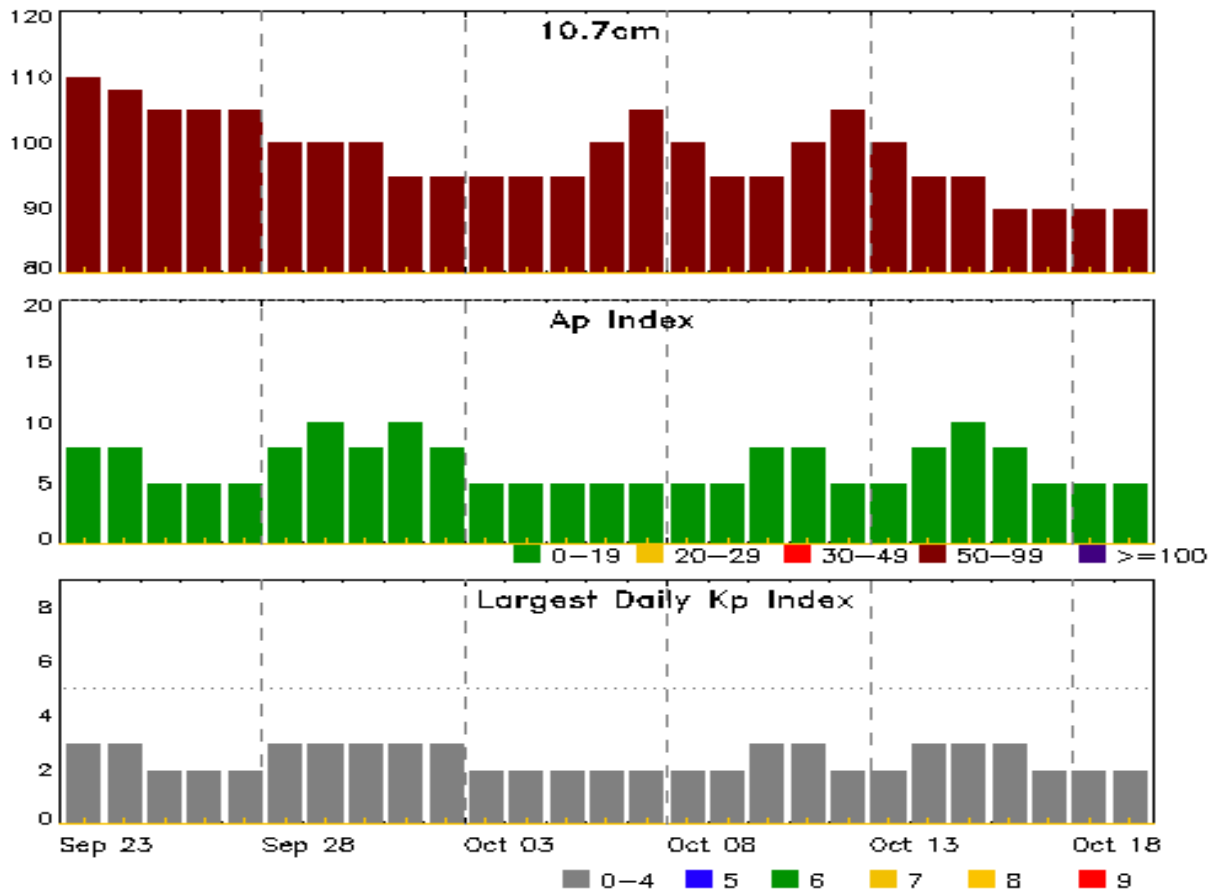


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
19 Sep 0526	WARNING: Geomagnetic K = 4	19/0530 - 1300
19 Sep 2049	ALERT: Type II Radio Emission	19/1947
20 Sep 1236	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	20/1220
21 Sep 1044	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	20/1220
22 Sep 0856	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	20/1220



Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
23 Sep	110	8	3	07 Oct	105	5	2
24	108	8	3	08	100	5	2
25	105	5	2	09	95	5	2
26	105	5	2	10	95	8	3
27	105	5	2	11	100	8	3
28	100	8	3	12	105	5	2
29	100	10	3	13	100	5	2
30	100	8	3	14	95	8	3
01 Oct	95	10	3	15	95	10	3
02	95	8	3	16	90	8	3
03	95	5	2	17	90	5	2
04	95	5	2	18	90	5	2
05	95	5	2	19	90	5	2
06	100	5	2				

Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Half	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
			Max						245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
16 Sep	2145	2222	2243	B6.0			1846
17 Sep	1249	U1250	1254		SF	N02E14	
17 Sep	2113	2118	2125	B6.8			
17 Sep	2251	2255	2300	B4.2			1846
18 Sep	0253	0315	0326	C3.9			1846
18 Sep	0951	0956	1009	B4.1	SF	N12E66	1847
18 Sep	1432	1443	1448	B5.1	SF	S13E57	1846
18 Sep	2235	2237	2239	B3.7			1846
19 Sep	0018	0021	0028	B5.0	SF	S17E51	1845
19 Sep	0758	0817	0852	C1.8			1850
19 Sep	1154	1200	1212	B8.6			1850
19 Sep	1450	1456	1501	B7.2			1850
19 Sep	1627	1631	1642	B8.1	SF	N12E82	1850
19 Sep	1838	1841	1844	B5.4			
19 Sep	2259	2300	2302	C1.2			1850
20 Sep	0411	0419	0438	B9.6			1850
20 Sep	0956	1002	1008	C2.1			1850
20 Sep	1139	1153	1203	C3.8	SF	N11E76	1850
20 Sep	1246	1251	1300	C2.3			1850
20 Sep	1651	1657	1708	C1.3	SF	N11E76	1850
20 Sep	1946	1951	1957	B6.8			1850
21 Sep	0139	0145	0152	C1.0			1850
21 Sep	0201	0204	0206	B8.3	SF	N04E69	1850
21 Sep	0622	U0627	0645		SF	N20E13	1849
21 Sep	0728	0735	0741	B8.9	SF	N21E48	
21 Sep	0838	0924	0932	C3.0	1F	N13E67	1850
21 Sep	1043	1045	1052		SF	N20E11	1849
22 Sep	0242	0247	0251	B6.0			1850
22 Sep	0637	0637	0643		SF	N20E01	1849



Region Summary

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio Lon	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
								C	M	X	S	1	2	3	4
Region 1838															
05 Sep	S03E68	223	30	2	Hsx	1	A								
06 Sep	S05E55	223	20	1	Hsx	1	A								
07 Sep	S05E41	225	30	1	Hax	1	A								
08 Sep	S03E27	226	30	2	Hax	3	A				1				
09 Sep	S04E15	223	10	2	Axx	3	A								
10 Sep	S04E02	223	0		Axx	1	A				1				
11 Sep	S04W13	226	10	2	Axx	3	A								
12 Sep	S05W25	224	10	1	Axx	2	A								
13 Sep	S05W40	227	plage												
14 Sep	S05W55	228	plage												
15 Sep	S05W70	230	plage												
16 Sep	S05W84	231	plage												
								0	0	0	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 223

Region 1840															
11 Sep	S12W03	215	20	5	Cro	5	B								
12 Sep	S11W19	218	1	2	Axx	2	A								
13 Sep	S11W33	220	plage												
14 Sep	S11W47	220	plage												
15 Sep	S11W61	221	plage												
16 Sep	S11W75	222	10	2	Bxo	2	B								
17 Sep	S11W89	223	10	1	Axx	1	A								
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 215



Region Summary - continued

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 1841</i>															
11 Sep	S05E69	143	30	2	Hsx	1	A								
12 Sep	S06E54	144	40	2	Cao	1	B								
13 Sep	S06E41	146	50	3	Cso	3	B								
14 Sep	S06E28	145	40	2	Cso	3	B								
15 Sep	S05E14	146	30	2	Hax	2	A								
16 Sep	S04E02	144	30	1	Hsx	1	A								
17 Sep	S04W12	146	30	1	Hsx	1	A								
18 Sep	S04W25	144	20	1	Hsx	1	A								
19 Sep	S04W38	144	10	1	Hrx	1	A								
20 Sep	S04W52	146	10	1	Hrx	1	A								
21 Sep	S04W65	146	10	1	Hrx	1	A								
22 Sep	S04W78	146	10	1	Hrx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 144

Region 1843

17 Sep	N01E06	127	20	3	Cao	4	B								
18 Sep	N01W07	127	40	3	Dao	5	B								
19 Sep	N01W21	127	60	4	Dso	6	B								
20 Sep	N02W35	129	50	5	Cso	8	B								
21 Sep	N02W49	130	20	4	Cso	6	B								
22 Sep	N03W62	130	20	4	Cao	5	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 127

Region 1844

17 Sep	N24W56	189	10	1	Axx	1	A								
18 Sep	N24W70	191	plage												
19 Sep	N24W84	191	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 189



Region Summary - continued

	Location	Sunspot Characteristics						Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10 ⁻⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 1845															
17 Sep	S20E59	73	10	1	Axx	1	A								
18 Sep	S18E48	73	10	1	Axx	1	A								
19 Sep	S18E34	73	10	1	Axx	1	A				1				
20 Sep	S18E20	74	plage												
21 Sep	S18E06	75	plage												
22 Sep	S17W05	73	10	3	Bxo	3	B								
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 73

Region 1846															
17 Sep	S16E77	56	50	2	Hax	1	A								
18 Sep	S17E62	59	160	3	Hsx	1	A	1			1				
19 Sep	S16E49	57	180	6	Cso	2	B								
20 Sep	S17E36	58	160	8	Cso	4	B								
21 Sep	S17E25	56	210	9	Cso	5	B								
22 Sep	S18E10	58	140	5	Hsx	1	A								
								1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 58

Region 1847															
17 Sep	N11E67	66	10	1	Axx	1	A								
18 Sep	N11E55	66	10	1	Axx	1	A				1				
19 Sep	N11E41	66	plage												
20 Sep	N11E27	67	plage												
21 Sep	N11E13	68	plage												
22 Sep	N11W01	69	plage												
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 69

Region Summary - continued

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

Region 1848

19 Sep	S10E36	70	10	1	Axx	1	A								
20 Sep	S11E23	71	0	1	Axx	1	A								
21 Sep	S11E09	72	plage												
22 Sep	S11W05	73	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 73

Region 1849

19 Sep	N22E32	75	10	3	Bxo	3	B								
20 Sep	N22E18	76	10	3	Bxo	7	B								
21 Sep	N20E04	77	60	7	Dao	11	B				2				
22 Sep	N19W10	78	90	8	Dao	12	B				1				
								0	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 77

Region 1850

19 Sep	N09E75	31	10	1	Axx	1	A	2			1				
20 Sep	N08E64	28	90	8	Dao	4	B	4			2				
21 Sep	N08E52	29	90	8	Dso	6	B	2			1	1			
22 Sep	N07E38	30	50	7	Dao	5	B								
								8	0	0	4	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 30

Region 1851

22 Sep	S16E69	358	30	1	Hrx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 358

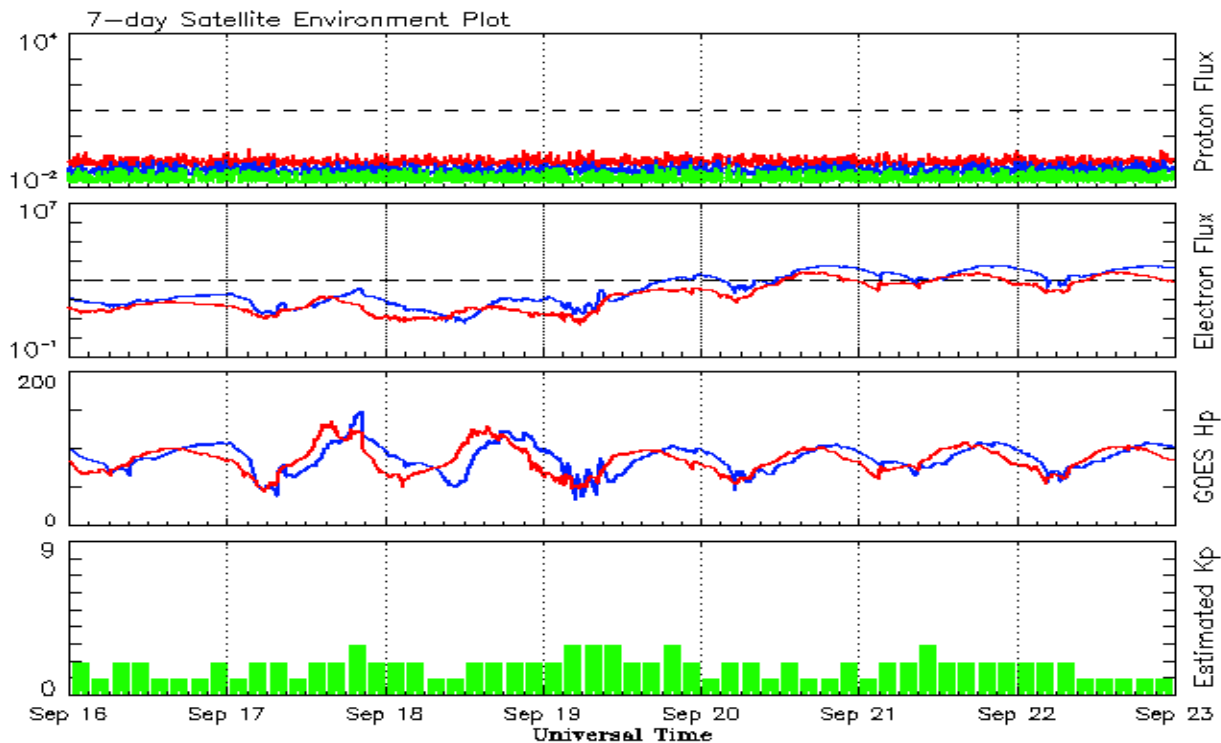


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2011									
September	106.4	78.0	0.73	84.6	59.5	134.5	118.4	13	7.7
October	116.8	88.0	0.75	84.6	59.9	137.2	118.4	7	8.0
November	133.1	96.7	0.73	86.3	61.1	153.1	119.5	3	8.0
December	106.3	73.0	0.69	89.2	63.4	141.2	121.6	3	8.0
2012									
January	91.3	58.3	0.64	92.0	65.5	133.1	124.4	6	8.3
February	50.1	32.9	0.66	94.2	66.9	106.7	126.7	7	8.4
March	77.9	64.3	0.82	94.1	66.8	115.1	126.8	14	8.1
April	84.4	55.2	0.65	91.3	64.6	113.1	125.8	9	8.0
May	99.5	69.0	0.69	87.7	61.7	121.5	123.8	8	8.2
June	88.6	64.5	0.73	83.9	58.9	120.5	121.1	10	8.3
July	99.6	66.5	0.67	82.4	57.8	135.6	119.5	13	8.3
August	85.8	63.0	0.74	83.1	58.2	115.7	119.2	7	8.1
September	84.0	61.4	0.73	83.7	58.1	123.2	118.9	8	7.8
October	73.5	53.3	0.73	85.0	58.6	123.3	119.2	9	7.4
November	89.2	61.8	0.69	87.3	59.7	120.9	120.1	6	7.3
December	60.4	40.8	0.68	88.0	59.6	108.4	120.1	3	7.5
2013									
January	99.8	62.9	0.63	87.1	58.7	127.1	118.9	4	7.5
February	60.0	38.1	0.63	86.7	58.4	104.4	118.0	5	7.4
March	81.0	57.9	0.71			111.2		9	
April	112.8	72.4	0.64			125.0		5	
May	125.5	78.7	0.63			131.3		10	
June	80.1	52.5	0.66			110.2		13	
July	86.1	57.0	0.66			115.6		9	
August	90.2	66.0	0.73			114.7		9	

Note: Values are final except for the most recent 6 months which are considered preliminary.
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 16 September 2013*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

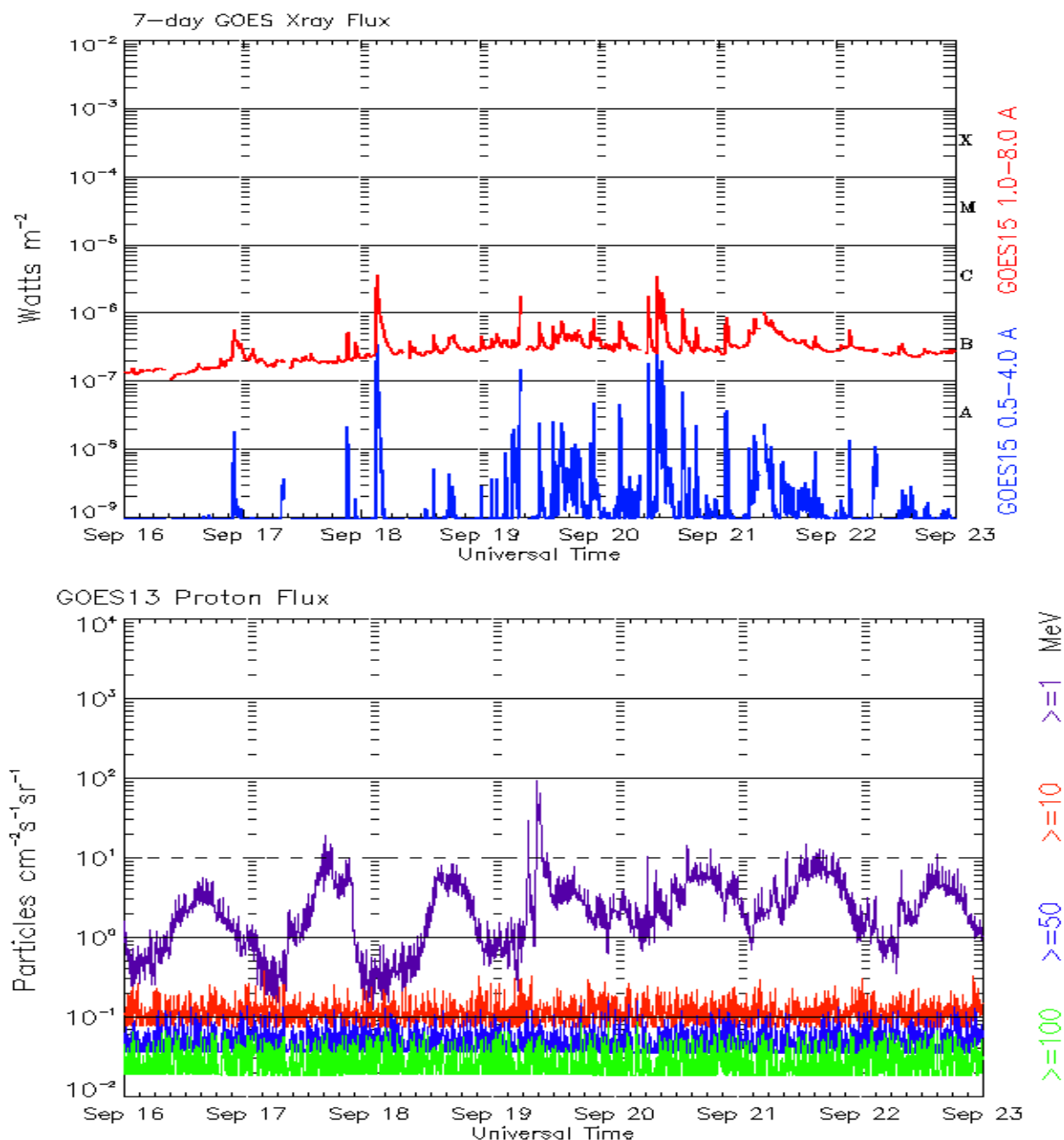
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

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
Week Beginning 16 September 2013*

The x-ray plots contains five-minute averages x-ray flux (Watt/m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, 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 flux units ($\text{pfu} = \text{protons/cm}^2\text{-sec -sr}$) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1 , >10 , >30 , and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned.
Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

The Weekly has been published continuously since 1951 and is available online since 1997.

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