

Space Weather Highlights
12 September - 18 September 2016

SWPC PRF 2142
19 September 2016

Solar activity was at very low levels throughout the period. Region 2585 (N08, L=222, class/area=Ekc/590 on 03 Sep) was the largest and most magnetically complex region on the disk this week, however, the region only produced low-level B-class flare activity before rotating out of view early in the period. Region 2592 (N14, L=027, class/area=Bxo/10 on 18 Sep) produced several low-level B-class flares in the latter half of the week, but was relatively simple throughout the period. No Earth-directed coronal mass ejections (CMEs) were observed this period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 12-14 Sep, moderate levels on 18 Sep, and were at normal levels on 15-17 Sep.

Geomagnetic field activity was quiet on 13, 16-27 Sep and quiet to unsettled on 12, 14-15, and 18 Sep under a mostly nominal solar wind regime.

Space Weather Outlook
19 September - 15 October 2016

Solar activity is expected to be at very low levels with a change for C-class flares throughout the period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach very high levels on 02-05 Oct with high levels expected on 21-25, 29 Sep-01 Oct, and 06-11 Oct following solar wind enhancements associated with the influence of multiple coronal hole high speed streams. Electron flux is expected to be at normal or normal to moderate levels throughout the remainder of the period.

Geomagnetic field activity is likely to reach G2 (Moderate) geomagnetic storm levels on 28-30 Sep and G1 (Minor) storm levels on 19-20 Sep and 01 Oct due to the anticipated influence of multiple, recurrent coronal hole high speed streams. Active conditions are expected on 21 Sep and 02-05 Oct with generally quiet or quiet to unsettled conditions likely throughout the remainder of the period.



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
12 September	87	57	290	A8.3	0	0	0	0	0	0	0	0
13 September	86	27	60	B1.1	0	0	0	0	0	0	0	0
14 September	85	24	30	B1.3	0	0	0	0	0	0	0	0
15 September	84	12	10	B1.0	0	0	0	0	0	0	0	0
16 September	84	13	10	A7.4	0	0	0	0	0	0	0	0
17 September	80	14	10	A9.0	0	0	0	1	0	0	0	0
18 September	83	47	40	A9.2	0	0	0	3	2	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
	12 September		3.3e+05	1.3e+04	3.5e+03	
13 September		3.7e+05	1.3e+04	3.0e+03		4.2e+07
14 September		4.1e+05	1.4e+04	3.5e+03		2.3e+07
15 September		1.7e+05	1.3e+04	3.3e+03		1.1e+05
16 September		3.4e+05	1.3e+04	3.2e+03		1.0e+05
17 September		3.7e+05	1.4e+04	3.5e+03		5.6e+04
18 September		3.3e+05	1.4e+04	3.2e+03		1.7e+06

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	12 September	6	2-2-2-2-2-1-1	3	2-2-1-0-1-0-0-0	6
13 September	4	2-1-2-1-2-1-0-1	6	1-1-2-4-2-0-0-0	5	2-2-2-2-1-1-0-1
14 September	8	1-2-2-2-3-2-2-2	12	1-1-3-0-5-3-2-2	8	2-2-2-2-3-2-3-2
15 September	6	2-2-2-2-1-2-1-2	9	2-3-4-3-2-1-0-0	7	3-3-2-2-1-1-0-1
16 September	3	0-0-1-1-2-1-2-1	1	0-0-0-0-0-1-1-0	3	0-0-1-1-1-1-2-1
17 September	4	2-0-1-2-2-1-1-1	1	2-0-0-0-0-0-0-0	4	2-1-1-2-1-0-0-1
18 September	8	1-1-2-3-3-2-2-1	17	1-1-1-4-5-5-1-1	7	2-1-2-3-3-2-2-1

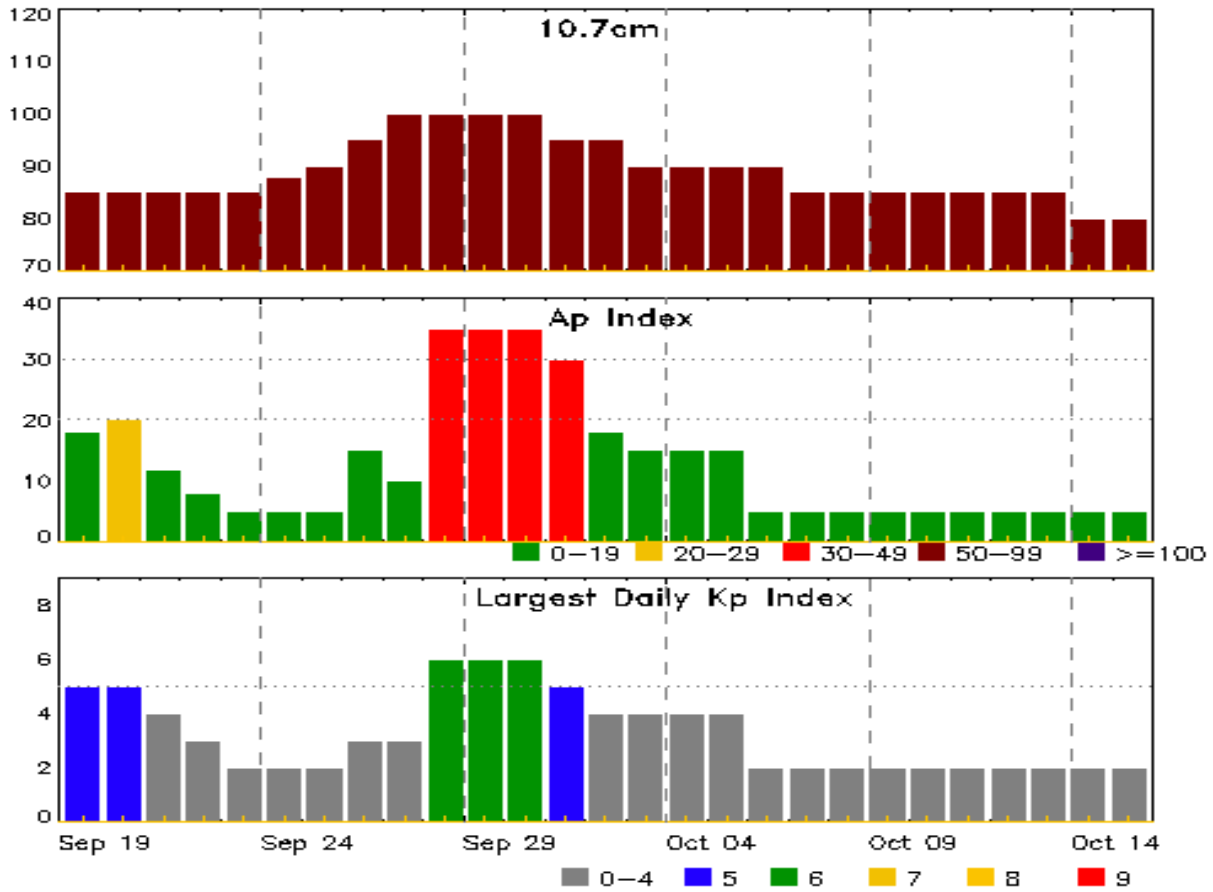


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
12 Sep 1416	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	02/1305
13 Sep 1320	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	02/1305
14 Sep 1322	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	02/1305
16 Sep 1859	WATCH: Geomagnetic Storm Category G1 predicted	
17 Sep 0143	WATCH: Geomagnetic Storm Category G1 predicted	



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
19 Sep	85	18	5	03 Oct	90	15	4
20	85	20	5	04	90	15	4
21	85	12	4	05	90	15	4
22	85	8	3	06	90	5	2
23	85	5	2	07	85	5	2
24	88	5	2	08	85	5	2
25	90	5	2	09	85	5	2
26	95	15	3	10	85	5	2
27	100	10	3	11	85	5	2
28	100	35	6	12	85	5	2
29	100	35	6	13	85	5	2
30	100	35	6	14	80	5	2
01 Oct	95	30	5	15	80	5	2
02	95	18	4				



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	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
13 Sep	0440	0444	0447	B2.7			2585
14 Sep	1540	1544	1550	B1.9			2589
14 Sep	1906	1911	1924	B2.4			2589
15 Sep	0315	0320	0326	B2.3			2591
15 Sep	0427	0438	0443	B4.1			
16 Sep	0743	0747	0757	B2.4			
16 Sep	1203	1221	1358	B2.9			
17 Sep	0555	0605	0618	B4.0			2592
17 Sep	0700	0703	0709	B2.1			2592
17 Sep	0808	0811	0817	B1.9	SF	N17E51	2592
18 Sep	0244	0251	0257	B4.1			2592
18 Sep	1041	1100	1147	B6.8	1F	N16E36	2592
18 Sep	1130	1131	1201		1F	N15E39	2592
18 Sep	1335	1335	1337		SF	N07E17	
18 Sep	1417	1418	1419		SF	N07E17	2593
18 Sep	1418	1418	1419		SF	N15E37	2592
18 Sep	1939	1948	1955	B2.0			2592



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 2585																							
30 Aug	N08E85	221	plage																				
31 Aug	N08E71	221	230	9	Csi	13	B																
01 Sep	N07E56	223	520	11	Eai	8	B																
02 Sep	N06E43	223	460	11	Ekc	17	BG																
03 Sep	N08E31	222	590	11	Ekc	14	BG																
04 Sep	N08E16	224	550	12	Ekc	25	BG																
05 Sep	N08E02	224	420	12	Eki	12	B																
06 Sep	N07W11	224	400	13	Eki	10	BG																
07 Sep	N08W25	225	430	13	Eki	12	BG																
08 Sep	N08W37	224	380	12	Eko	12	BD																
09 Sep	N09W50	224	380	11	Eko	13	BG																
10 Sep	N08W64	224	340	12	Eko	9	BD																
11 Sep	N08W78	225	240	11	Eso	7	B																
12 Sep	N08W92	226	220	11	Eao	7	B																
								3	0	0	18	0	0	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 224

Region 2587																								
04 Sep	N10E28	212	0	1	Axx	2	A																	
05 Sep	N10E14	212	plage																					
06 Sep	N10W00	213	plage																					
07 Sep	N10W14	214	plage																					
08 Sep	N10W28	215	plage																					
09 Sep	N10W42	216	plage																					
10 Sep	N10W56	216	plage																					
11 Sep	N10W70	217	plage																					
12 Sep	N10W84	218	plage																					
								0	0	0	0	0	0	0	0	0								

Crossed West Limb.

Absolute heliographic longitude: 213



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 2588																	
06 Sep	N12E08	205	10	3	Bxo	2	B										
07 Sep	N12W06	206	30	5	Dso	6	B										
08 Sep	N12W19	206	10	6	Bxo	4	B										
09 Sep	N13W33	207	10	6	Axx	1	A										
10 Sep	N11W51	210	10		Axx	1	A										
11 Sep	N11W65	212	5		Axx	1	A										
12 Sep	N11W79	213	plage														
13 Sep	N11W88	210	plage														
								0	0	0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 206

Region 2589																	
08 Sep	N14E14	173	10	3	Bxo	3	B										
09 Sep	N15W01	175	30	4	Cro	7	B				2						
10 Sep	N14W13	173	80	6	Dai	12	B										
11 Sep	N15W28	175	70	6	Dso	8	B										
12 Sep	N15W42	176	50	6	Cso	6	B										
13 Sep	N14W54	175	20	6	Cso	2	B										
14 Sep	N12W71	178	20	1	Hsx	1	A										
15 Sep	N13W86	180	plage														
								0	0	0	2	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 175

Region 2590																	
09 Sep	N08W20	193	10	3	Bxo	4	B										
10 Sep	N08W34	194	plage														
11 Sep	N08W48	195	plage														
12 Sep	N08W62	196	10	1	Axx	1	A										
13 Sep	N06W74	195	plage														
14 Sep	N06W89	197	plage														
								0	0	0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 193



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 2591																	
10 Sep	N05E18	142	20	5	Cro	4	B					2					
11 Sep	N05E03	144	25	6	Cro	7	B										
12 Sep	N05W11	145	10	3	Bxo	3	B										
13 Sep	N04W24	145	40	7	Cso	5	B										
14 Sep	N04W39	147	10	2	Axx	3	A										
15 Sep	N05W51	145	plage														
16 Sep	N05W66	147	plage														
17 Sep	N05W81	149	plage														
									0	0	0	2	0	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 144

Region 2592																	
15 Sep	N14E66	27	10	3	Bxo	2	B										
16 Sep	N14E53	27	10	2	Bxo	3	B										
17 Sep	N14E39	29	10	5	Bxo	4	B					1					
18 Sep	N14E27	27	10	6	Bxo	5	B					1	2				
									0	0	0	2	2	0	0	0	0

Still on Disk.
 Absolute heliographic longitude: 27

Region 2593																	
18 Sep	N07E11	43	20	4	Cri	9	B					1					
									0	0	0	1	0	0	0	0	0

Still on Disk.
 Absolute heliographic longitude: 43

Region 2594																	
18 Sep	N12E11	43	10	3	Cro	3	B										
									0	0	0	0	0	0	0	0	0

Still on Disk.
 Absolute heliographic longitude: 43

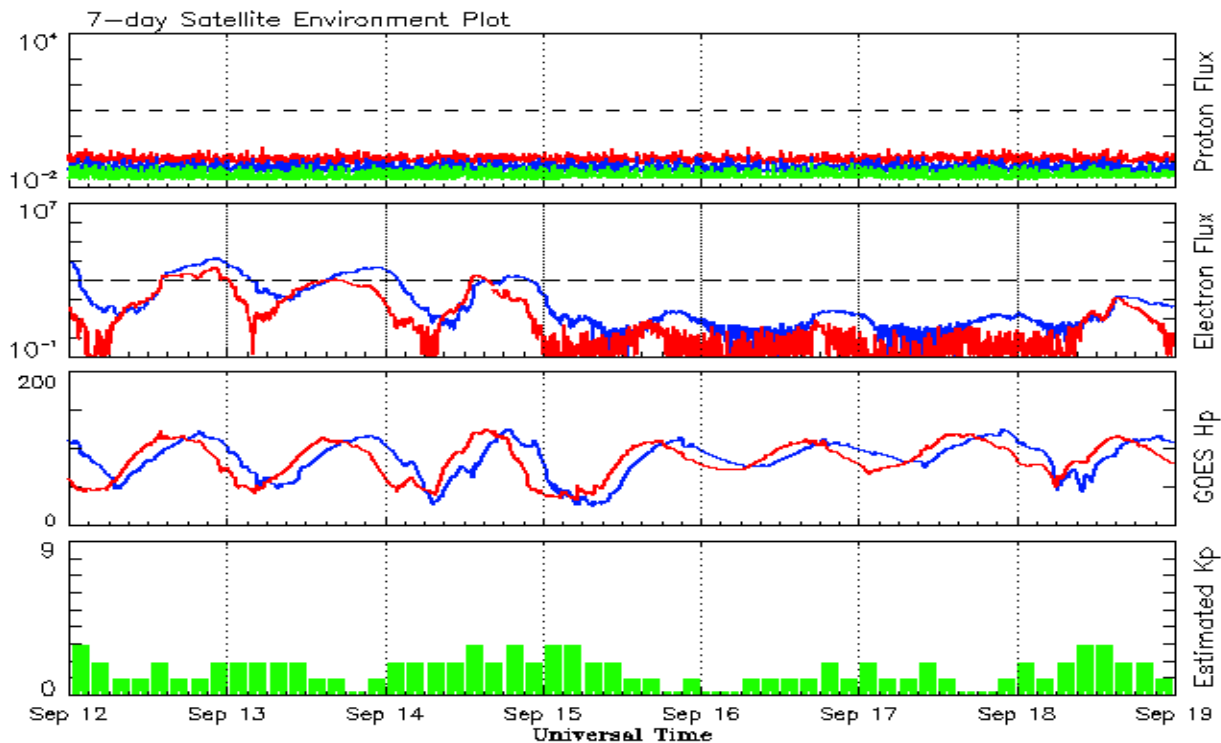


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2014									
September	127.4	78.0	0.69	107.4	61.1	146.1	140.1	11	9.3
October	92.0	54.0	0.66	101.7	58.4	153.7	138.4	10	9.9
November	101.8	62.2	0.69	97.9	56.8	155.3	137.4	10	10.1
December	120.0	67.7	0.65	95.2	55.3	158.7	137.0	12	10.5
2015									
January	101.2	55.8	0.66	92.1	53.6	141.7	135.8	10	11.0
February	70.6	40.0	0.63	88.3	51.7	128.8	133.8	10	11.5
March	61.7	32.7	0.62	84.2	49.3	126.0	131.2	17	12.0
April	72.5	45.2	0.75	80.5	47.3	129.2	127.3	12	12.4
May	83.0	53.3	0.71	77.5	45.7	120.1	123.3	9	12.7
June	77.3	39.9	0.53	73.1	43.3	123.2	119.5	14	13.0
July	68.4	39.5	0.58	68.2	41.0	107.0	116.0	10	13.1
August	61.6	38.6	0.63	65.5	39.8	106.2	113.3	16	13.1
September	72.5	47.2	0.65	64.0	39.5	102.1	110.8	16	12.8
October	59.5	38.2	0.62	61.8	38.6	104.1	107.9	15	12.5
November	61.8	37.3	0.61	59.0	36.8	109.6	105.3	13	12.5
December	54.1	34.8	0.64	55.1	34.7	112.8	102.5	15	12.5
2016									
January	50.4	34.2	0.67	51.4	32.7	103.5	99.9	10	12.3
February	56.0	33.8	0.61	49.6	31.6	103.5	98.1	10	12.0
March	40.9	32.5	0.80			91.6		11	
April	39.2	22.8	0.58			93.4		10	
May	48.9	31.3	0.64			93.1		12	
June	19.3	12.5	0.65			81.9		9	
July	36.8	19.5	0.53			85.9		10	
August	50.4	30.4	0.60			85.0		10	

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 12 September 2016*

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.

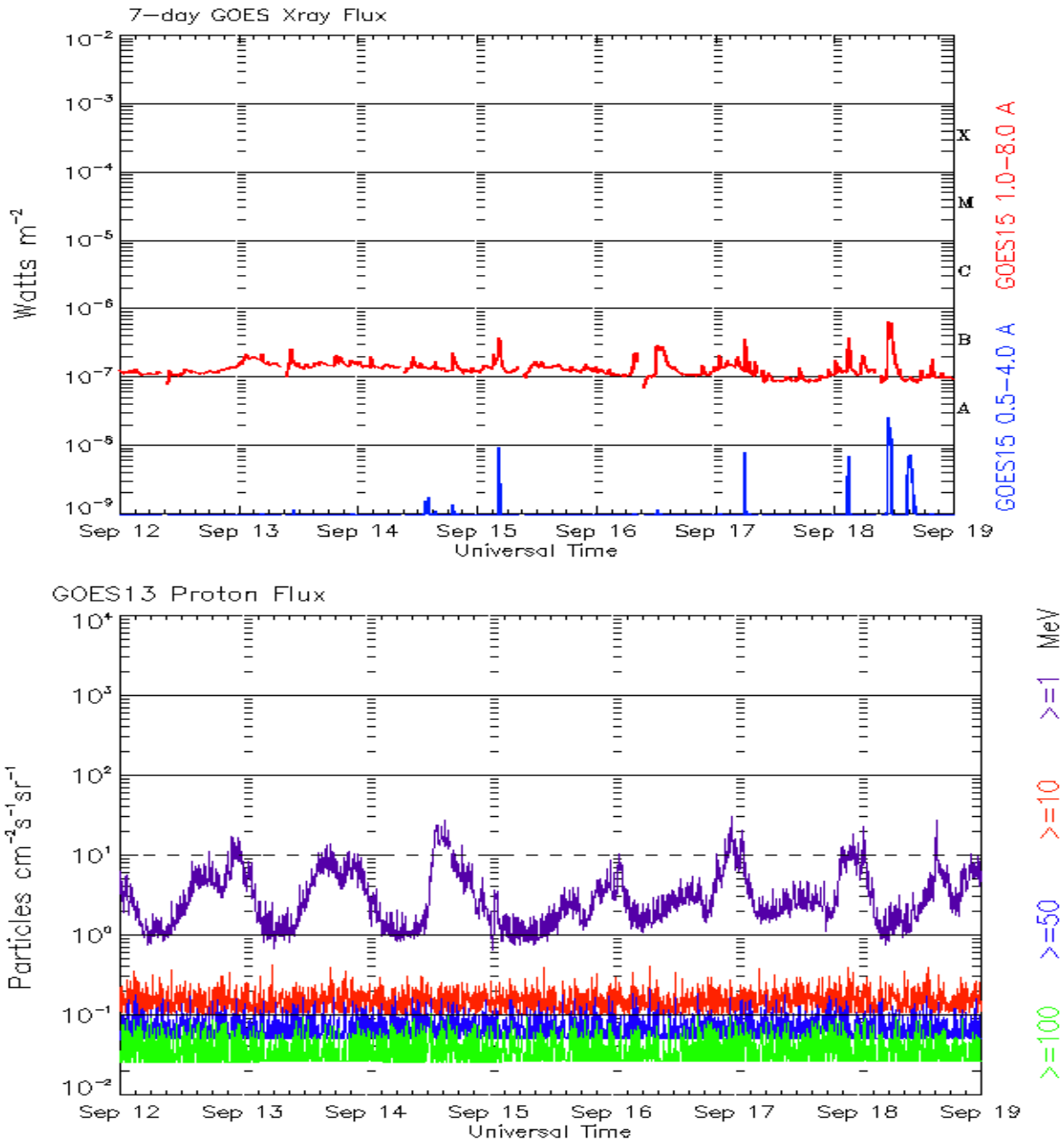
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 12 September 2016*

The x-ray plots contains five-minute averages x-ray flux (Watt/m²) 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 intergral flux units (pfu = protons/cm² -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

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