

**Space Weather Highlights**  
**10 September - 16 September 2018**

**SWPC PRF 2246**  
**17 September 2018**

Solar activity was very low throughout the period. Region 2722 (S07, Lo=215, class/area Bxo/10 on 11 Sep) produced the strongest flare of the period, a B1 flare at 11/0759 UTC. The region decayed to plage in the following days. No Earth-directed CMEs were observed in available coronagraph imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit ranged from normal background to high levels. High levels were reached on 12-16 Sep and moderate levels were reached on 10-11 Sep. All enhancements in electron flux are associated with the influence of a positive polarity CH HSS.

Geomagnetic field activity ranged from quiet to G2 (Moderate) geomagnetic storm levels. The onset of a CIR ahead of a positive polarity CH HSS on 10 Sep increased geomagnetic activity to G1 levels. As wind speeds increased to around 550 km/s on 11 Sep, geomagnetic activity further increased to G2 (Moderate) geomagnetic storm levels. Total magnetic field strength (Bt) peaked at 15 nT late on 10 Sep. Bt then decreased to near 5-6 nT by mid-day on 11 Sep, which decreased the geomagnetic response to mostly quiet to active levels. One additional period of isolated G1 (Minor) geomagnetic storming was observed early on 14 Sep. Wind speeds persisted at elevated levels through 16 Sep, with a notable increase to a peak around 650 km/s observed early on 15 Sep. As wind speeds decreased, quiet to unsettled levels on 15 Sep gave way to quiet levels on 16 Sep.

**Space Weather Outlook**  
**17 September - 13 October 2018**

Solar activity is expected to be very low throughout the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate levels on 06-08 Oct and at high levels for the remainder of the outlook period. All enhancements in electron flux are expected due to multiple, recurrent CH HSSs.

Geomagnetic field activity is expected to range from quiet to G2 (Moderate) geomagnetic storm levels. G2 (Moderate) geomagnetic storm levels are expected on 08 Oct; G1 (Minor) geomagnetic storm levels are expected on 07 Oct and 10 Oct; active conditions are expected on 17 Sep, 23 Sep, 02 Oct and 11 Oct; unsettled conditions are expected on 18 Sep, 24 Sep, 01 Oct, 09 Oct and 12 Oct. All levels of elevated geomagnetic activity are due to the anticipated influence of multiple, recurrent CH HSSs.



### ***Daily Solar Data***

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
10 September	69	0	0	A0.0	0	0	0	0	0	0	0	0
11 September	69	14	10	A0.0	0	0	0	0	0	0	0	0
12 September	70	11	0	A0.0	0	0	0	0	0	0	0	0
13 September	70	0	0	A0.0	0	0	0	0	0	0	0	0
14 September	69	0	0	A0.0	0	0	0	0	0	0	0	0
15 September	69	0	0	A0.0	0	0	0	0	0	0	0	0
16 September	69	0	0	A0.0	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	>0.6 MeV	>2MeV	>4 MeV
10 September		1.4e+06	1.7e+04	3.5e+03	2.2e+07	
11 September		5.8e+05	1.6e+04	3.3e+03	9.4e+06	
12 September		1.1e+06	1.6e+04	3.3e+03	4.7e+07	
13 September		1.4e+06	1.7e+04	3.5e+03	1.5e+08	
14 September		1.4e+06	1.7e+04	3.6e+03	9.8e+08	
15 September		8.4e+05	1.7e+04	3.6e+03	1.2e+09	
16 September		1.1e+06	1.7e+04	3.6e+03	1.5e+09	

### ***Daily Geomagnetic Data***

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
10 September	15	1-1-1-3-3-3-3-5	23	0-0-2-3-5-5-5-3	21	1-1-1-2-3-5-5-5
11 September	24	4-4-5-5-3-2-3-2	62	2-4-8-7-5-3-3-2	35	4-5-6-6-4-3-3-2
12 September	10	2-2-1-2-2-3-3-3	9	2-1-1-4-3-2-2-1	9	2-2-1-2-2-2-2-3
13 September	17	4-4-4-3-2-3-2-2	31	3-3-4-6-5-5-2-2	17	4-4-3-3-3-3-2-3
14 September	11	4-3-2-2-2-2-2-2	24	5-4-3-5-4-2-3-2	16	5-4-3-2-2-2-3-3
15 September	7	3-2-2-2-2-1-1-2	8	2-2-3-3-2-1-1-1	8	3-3-2-2-2-1-1-2
16 September	5	2-1-2-2-1-1-1-1	4	2-1-2-2-2-0-1-0	7	2-2-2-2-1-0-1-2



### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
10 Sep 1611	WARNING: Geomagnetic K = 4	10/1610 - 2300
10 Sep 1729	WARNING: Geomagnetic K = 5	10/1730 - 2100
10 Sep 1733	ALERT: Geomagnetic K = 4	10/1733
10 Sep 1745	ALERT: Geomagnetic K = 5	10/1745
10 Sep 2036	EXTENDED WARNING: Geomagnetic K = 4	10/1610 - 11/0600
10 Sep 2036	EXTENDED WARNING: Geomagnetic K = 5	10/1730 - 11/0300
10 Sep 2101	ALERT: Geomagnetic K = 5	10/2059
10 Sep 2344	ALERT: Geomagnetic K = 5	10/2344
11 Sep 0424	WARNING: Geomagnetic K = 5	11/0423 - 1200
11 Sep 0425	EXTENDED WARNING: Geomagnetic K = 4	10/1610 - 11/1800
11 Sep 0437	ALERT: Geomagnetic K = 5	11/0436
11 Sep 0739	ALERT: Geomagnetic K = 5	11/0739
11 Sep 0804	WARNING: Geomagnetic K = 6	11/0805 - 1200
11 Sep 0817	ALERT: Geomagnetic K = 6	11/0817
11 Sep 1008	ALERT: Geomagnetic K = 5	11/1008
11 Sep 1050	ALERT: Geomagnetic K = 6	11/1050
11 Sep 1110	EXTENDED WARNING: Geomagnetic K = 4	10/1610 - 11/2359
11 Sep 1110	EXTENDED WARNING: Geomagnetic K = 6	11/0805 - 1500
11 Sep 1110	EXTENDED WARNING: Geomagnetic K = 5	11/0423 - 2100
11 Sep 2344	EXTENDED WARNING: Geomagnetic K = 4	10/1610 - 12/0900
12 Sep 1750	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	12/1730
12 Sep 2357	WARNING: Geomagnetic K = 4	13/0000 - 0600
13 Sep 0152	ALERT: Geomagnetic K = 4	13/0152
13 Sep 0529	EXTENDED WARNING: Geomagnetic K = 4	13/0000 - 1200
13 Sep 1132	EXTENDED WARNING: Geomagnetic K = 4	13/0000 - 1800
13 Sep 1456	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	12/1730
14 Sep 0106	WARNING: Geomagnetic K = 4	14/0105 - 0900
14 Sep 0222	ALERT: Geomagnetic K = 4	14/0222

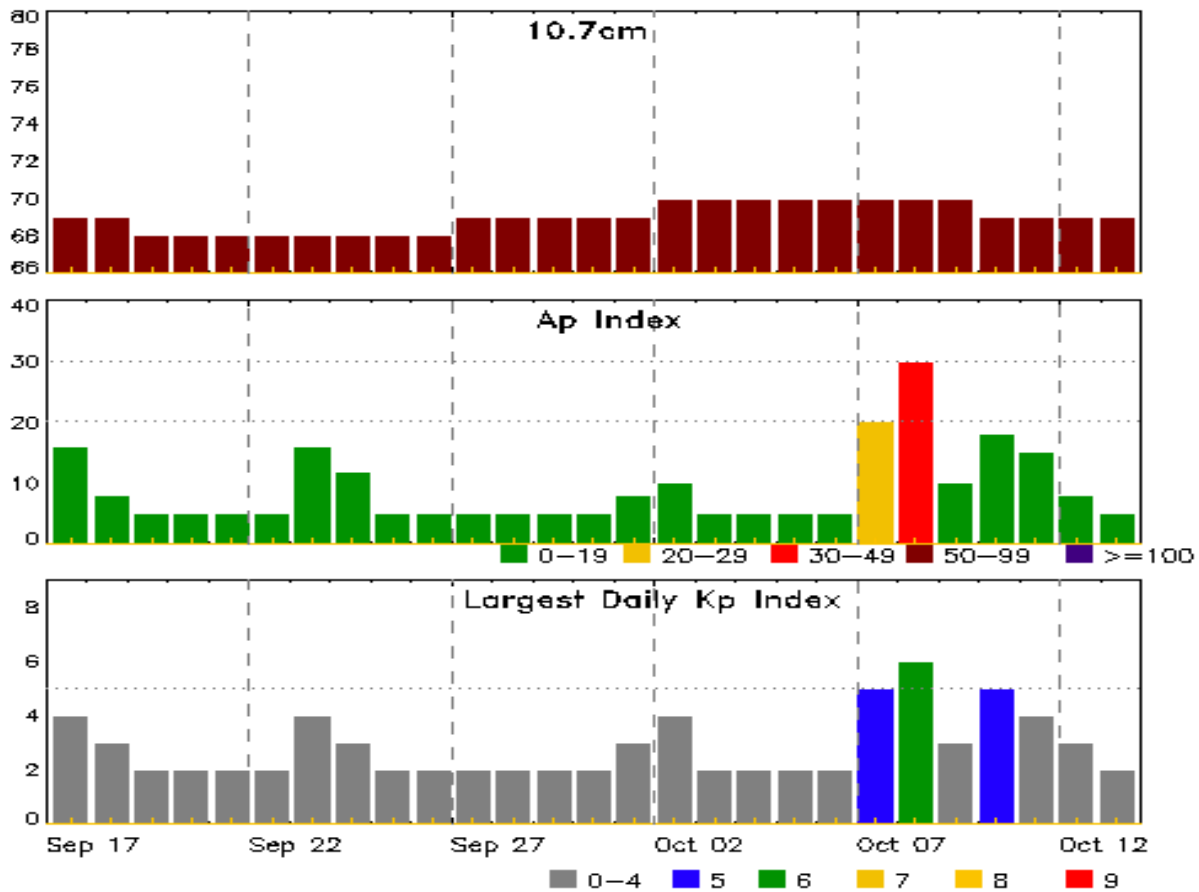


### *Alerts and Warnings Issued*

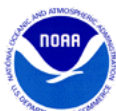
<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
14 Sep 0235	WARNING: Geomagnetic K = 5	14/0235 - 0900
14 Sep 0302	ALERT: Geomagnetic K = 5	14/0259
14 Sep 0859	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	12/1730
15 Sep 0859	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	12/1730
16 Sep 0859	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	12/1730



## 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
17 Sep	69	16	4	01 Oct	69	8	3
18	69	8	3	02	70	10	4
19	68	5	2	03	70	5	2
20	68	5	2	04	70	5	2
21	68	5	2	05	70	5	2
22	68	5	2	06	70	5	2
23	68	16	4	07	70	20	5
24	68	12	3	08	70	30	6
25	68	5	2	09	70	10	3
26	68	5	2	10	69	18	5
27	69	5	2	11	69	15	4
28	69	5	2	12	69	8	3
29	69	5	2	13	69	5	2
30	69	5	2				



### ***Energetic Events***

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

**No Events Observed**

### ***Flare List***

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
10 Sep	1250	1253	1255	A3.5			
11 Sep	0756	0759	0801	B1.0			
13 Sep	1756	1758	1802	A1.8			
16 Sep	0434	0435	0436	A1.0			



## ***Region Summary***

Date	Location		Sunspot Characteristics					Flares							
	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

### ***Region 2721***

08 Sep	N09W15	286	10	3	Bxo	6	B								
09 Sep	N10W28	286	10	3	Bxo	2	B								
10 Sep	N11W43	288	plage												
11 Sep	N11W57	289	plage												
12 Sep	N11W71	290	plage												
13 Sep	N11W85	291	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 286

### ***Region 2722***

11 Sep	S07E17	215	10	5	Bxo	4	B								
12 Sep	S07E01	218	0		Axx	1	A								
13 Sep	S07W14	220	plage												
14 Sep	S07W28	220	plage												
15 Sep	S07W41	220	plage												
16 Sep	S07W54	220	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 218



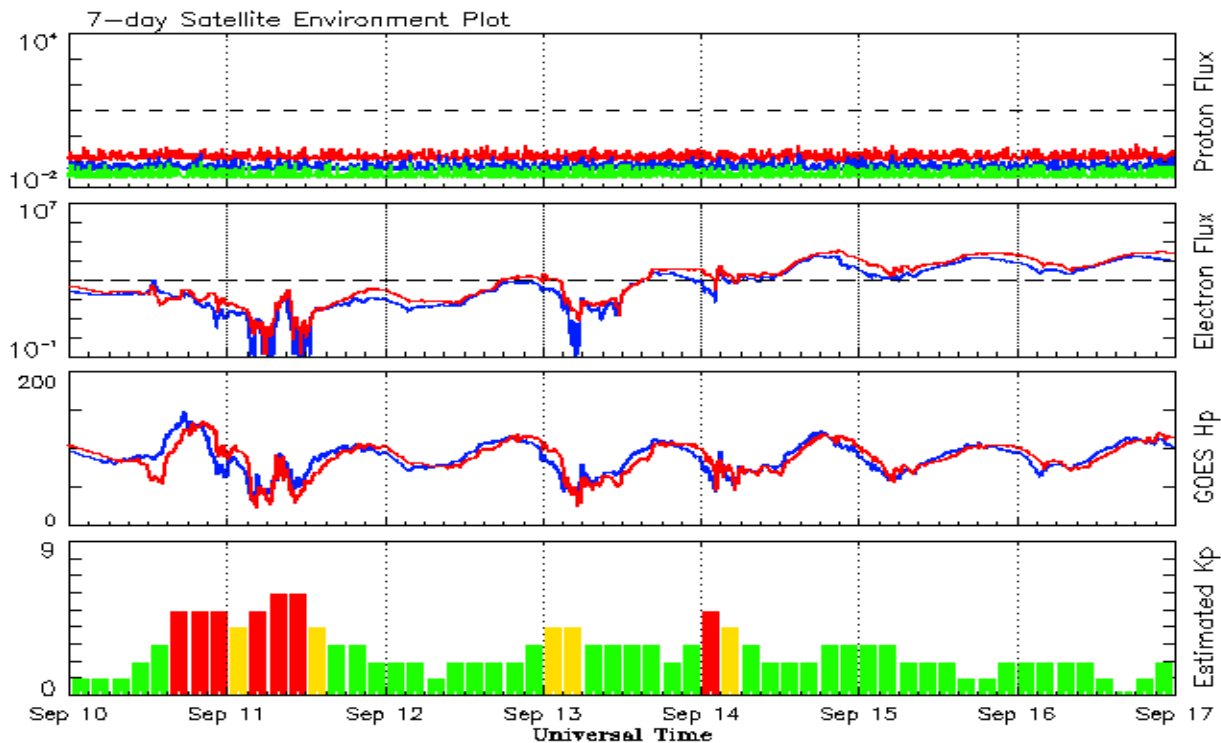
**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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
<b>2016</b>									
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
<b>2017</b>									
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.4	74.6	78.6	15	11.5
April	30.4	19.4	0.64	24.3	14.9	80.9	78.4	13	11.5
May	18.1	11.3	0.62	23.1	14.0	73.5	77.7	9	11.3
June	18.0	11.5	0.64	22.0	13.3	74.8	77.3	7	11.3
July	18.8	10.7	0.59	20.8	12.6	77.7	76.8	9	11.0
August	25.0	19.6	0.80	19.7	11.8	77.9	76.3	12	10.7
September	42.2	26.2	0.62	18.6	11.0	92.0	75.9	19	10.3
October	16.0	7.9	0.49	16.8	10.0	76.4	75.1	11	9.8
November	7.7	3.4	0.44	15.7	9.2	72.1	74.6	11	9.5
December	7.6	4.9	0.64	15.7	9.1	71.5	74.4	8	9.4
<b>2018</b>									
January	7.8	4.1	0.51	15.0	8.6	70.0	74.0	6	9.3
February	16.0	6.4	0.40	13.7	7.6	72.0	73.3	7	9.1
March	6.0	1.5	0.25			68.4		8	
April	7.0	5.3	0.76			70.0		7	
May	15.0	7.9	0.53			70.9		8	
June	19.7	9.5	0.48			72.5		7	
July	1.3	1.0	0.77			69.7		6	
August	10.0	5.3	0.53			69.1		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 10 September 2018*

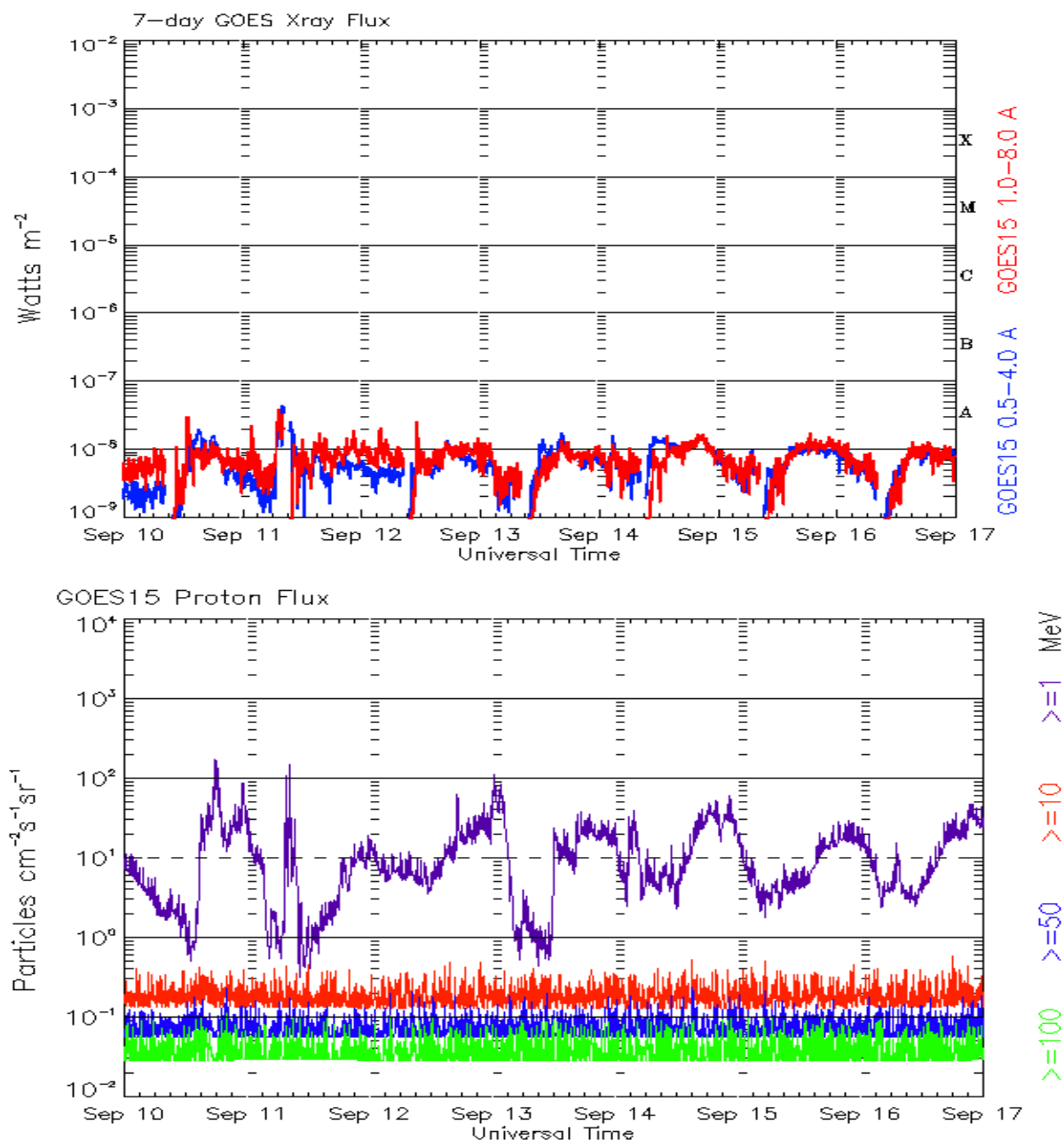
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-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 10 September 2018*

The x-ray plots contains five-minute averages x-ray flux ( $\text{Watt/m}^2$ ) 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 (pfu = protons/ $\text{cm}^2$  -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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