

**Space Weather Highlights**  
**11 June - 17 June 2018**

**SWPC PRF 2233**  
**18 June 2018**

Solar activity was very low with only low level B-class flare activity observed from Region 2713 (N06, L=285, class/area Bxo/060 on 13 Jun). No Earth-directed CMEs were observed in satellite imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 11-13 Jun and decreased to moderate levels on 14-17 Jun. The largest flux of the period was 1,840 pfu observed at 11/1945 UTC.

Geomagnetic field activity was at quiet levels under a nominal solar wind regime. Solar wind speed ranged from approximately 280 km/s to 340 km/s through the majority of the period with total field at or below 6 nT. At approximately 17/1250 UTC, a solar sector boundary crossing was observed from a negative to a positive orientation. A corresponding increase in total field to around 14 nT was observed at 17/2355 UTC along with an increase in solar wind speed to near 415 km/s. This indicated the arrival of a CIR preceding a positive polarity coronal hole high speed stream (CH HSS).

**Space Weather Outlook**  
**18 June - 14 July 2018**

Solar activity is expected to be at very low levels with a slight chance for C-class flares from 18 Jun-01 Jul with the return of old Region 2712 (N15, L=176). Very low levels are expected for the rest of the forecast period.

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 on 28 Jun-10 Jul due to CH HSS influence.

Geomagnetic field activity is expected to be at unsettled to active levels on 18-19, 24-25, and 27-30 Jun with G1 (Minor) storm levels expected on 18 Jun and 28-29 Jun due to recurrent CH HSS activity.



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

Date	Radio	Sun	Sunspot	X-ray		Flares							
	Flux	spot	Area	Background		X-ray			Optical				
	10.7cm	No.	(10 <sup>-6</sup> hemi.)	Flux		C	M	X	S	1	2	3	4
11 June	70	0	0	A2.3	0	0	0	0	0	0	0	0	0
12 June	70	12	10	A2.6	0	0	0	0	0	0	0	0	0
13 June	71	16	60	A3.0	0	0	0	0	0	0	0	0	0
14 June	72	16	30	A2.7	0	0	0	0	0	0	0	0	0
15 June	71	13	10	A2.5	0	0	0	1	0	0	0	0	0
16 June	71	13	10	A2.1	0	0	0	0	0	0	0	0	0
17 June	71	15	20	A2.5	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
11 June	9.7e+05	2.0e+04	3.9e+03		7.3e+07	
12 June	7.6e+05	1.9e+04	3.7e+03		5.0e+07	
13 June	1.2e+06	1.9e+04	3.9e+03		5.2e+07	
14 June	9.8e+05	1.8e+04	3.8e+03		2.0e+07	
15 June	7.9e+05	1.9e+04	3.6e+03		1.6e+07	
16 June	7.7e+05	1.9e+04	3.7e+03		2.1e+07	
17 June	1.1e+06	1.9e+04	3.7e+03		2.2e+07	

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

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

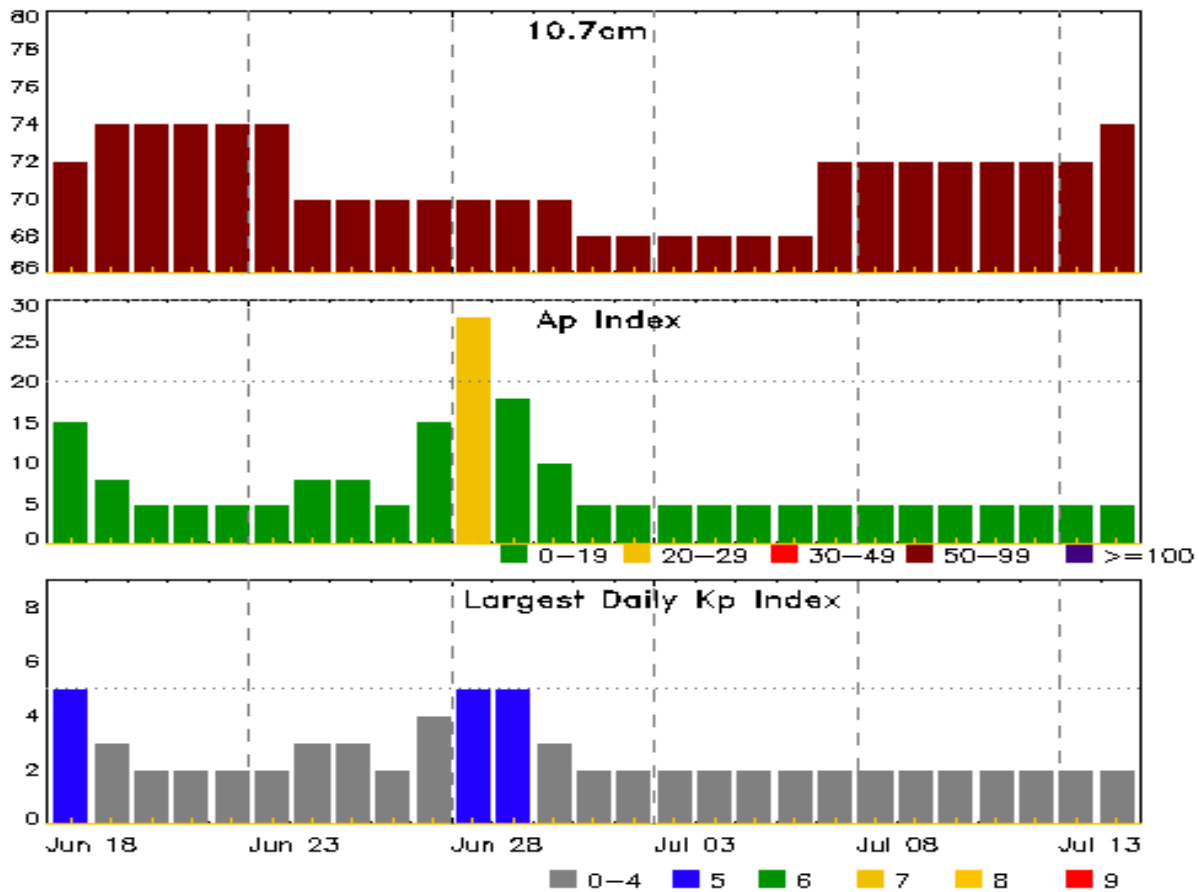


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
11 Jun 1502	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1610
12 Jun 1722	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1610
13 Jun 1845	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1610



## 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
18 Jun	72	15	5	02 Jul	68	5	2
19	74	8	3	03	68	5	2
20	74	5	2	04	68	5	2
21	74	5	2	05	68	5	2
22	74	5	2	06	68	5	2
23	74	5	2	07	72	5	2
24	70	8	3	08	72	5	2
25	70	8	3	09	72	5	2
26	70	5	2	10	72	5	2
27	70	15	4	11	72	5	2
28	70	28	5	12	72	5	2
29	70	18	5	13	72	5	2
30	70	10	3	14	74	5	2
01 Jul	68	5	2				

### ***Energetic Events***

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

**No Events Observed**

### ***Flare List***

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
11 Jun	1905	1912	1918	B1.8			2713
12 Jun	2051	2054	2059	B1.1			2713
15 Jun	0646	0649	0652	B1.1			2713
15 Jun	0945	0948	0950	B1.0	SF	N04E40	2713
16 Jun	0516	0520	0523	B1.6			2713
17 Jun	0653	0657	0706	B1.0			2713
17 Jun	1312	1429	1502	B1.2			2713



## ***Region Summary***

Location		Sunspot Characteristics						Flares							
Date	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
		Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		<i>Region 2713</i>													
12 Jun	N03E69	286	10	5	Bxo	2	B								
13 Jun	N06E56	285	60	6	Bxo	6	B								
14 Jun	N05E43	285	30	7	Bxi	6	B								
15 Jun	N05E30	286	10	4	Bxo	3	B				1				
16 Jun	N05E15	288	10	1	Axx	3	A								
17 Jun	N05E02	287	20	6	Bxo	5	B								
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 287

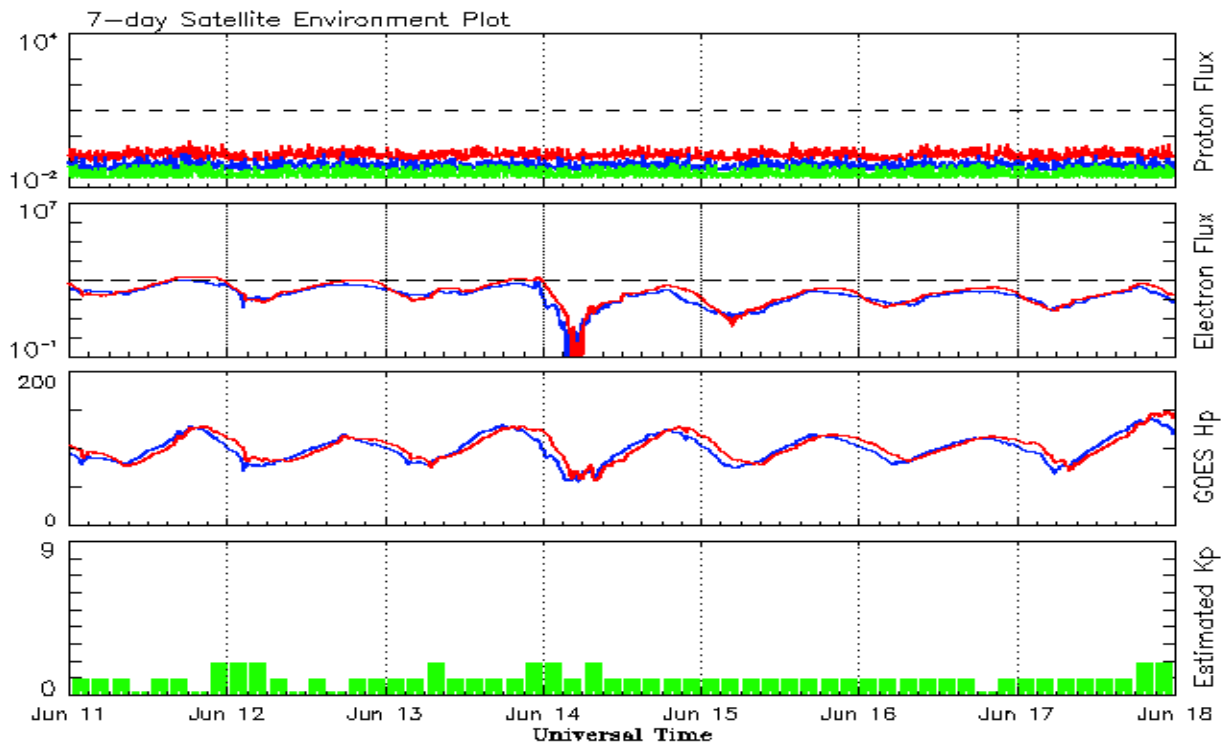


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>									
June	19.3	12.3	0.65	39.0	24.9	81.9	90.4	9	11.4
July	36.8	19.4	0.53	36.5	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
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	11.7	77.9	76.3	12	10.7
September	42.2	26.2	0.62	18.6	10.9	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			71.5		8	
<b>2018</b>									
January	7.8	4.0	0.51			70.0		6	
February	16.0	6.4	0.40			72.0		7	
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	

**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 11 June 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.

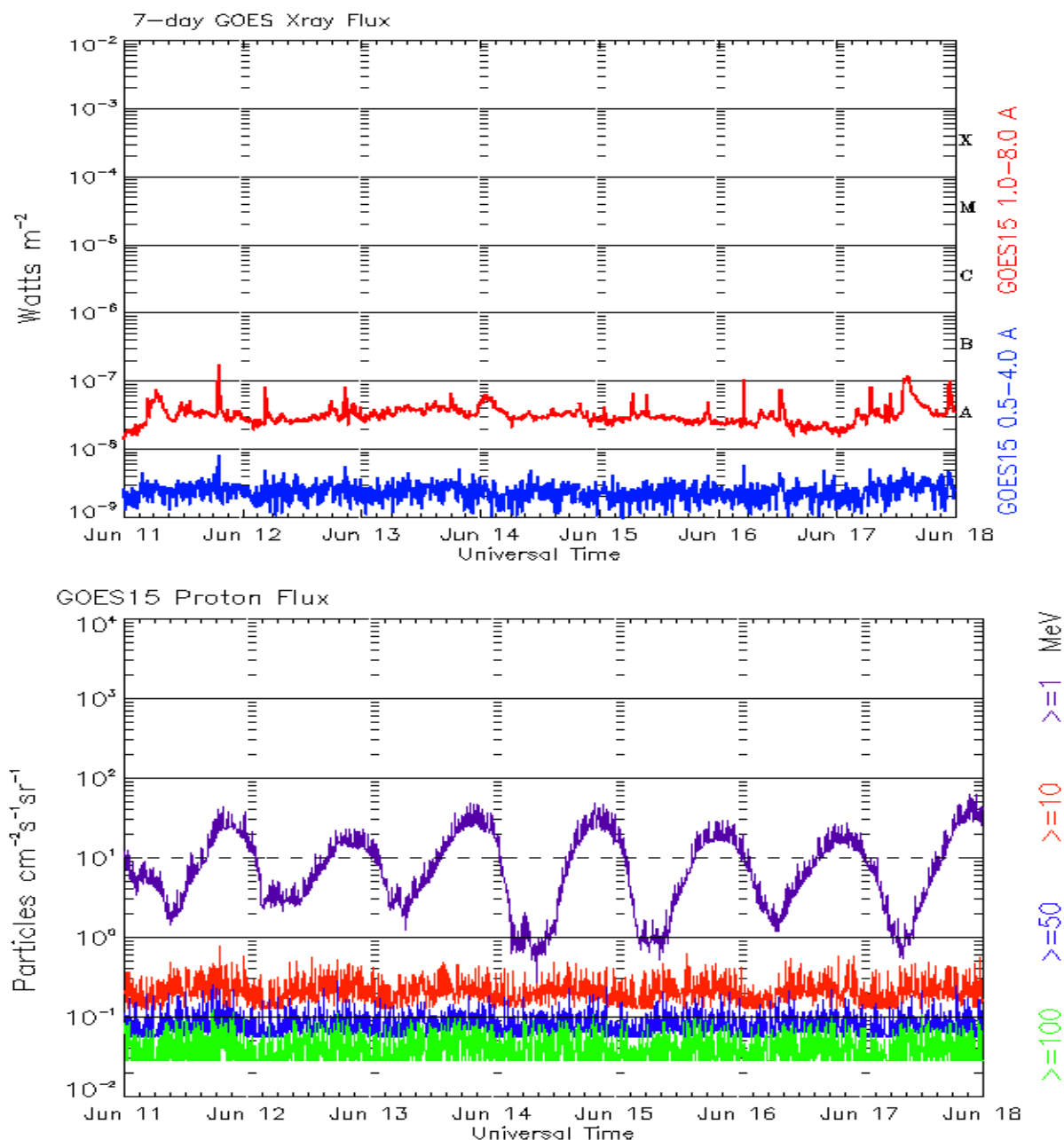
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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. Hp 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 11 June 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](mailto:SWPC.Webmaster@noaa.gov)

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

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