

**Space Weather Highlights**  
**17 June - 23 June 2019**

**SWPC PRF 2286**  
**24 June 2019**

Solar activity was at very low levels. No sunspots were observed on the visible disk. No Earth-directed CMEs were observed in available imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels on 17 Jun with a peak flux of 109 pfu observed at 17/2025 UTC. Normal levels were observed on 18-23 Jun.

Geomagnetic field activity was at quiet levels with an isolated unsettled period observed for 0600-0900 UTC period on 20 June. Solar wind parameters were at mostly nominal levels through the period. A peak wind speed of near 425 km/s was observed early on 22 Jun. Bt and Bz parameters were at mostly nominal levels.

**Space Weather Outlook**  
**24 June - 20 July 2019**

Solar activity is expected to be at very low levels 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 moderate to high levels on 25 Jun - 03 Jul in response to elevated wind speeds associated with recurrent CH HSS activity. Normal levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach unsettled to isolated active levels on 24-26 Jun, 06 Jul and 10-11 Jul due to negative polarity CH HSS influence. Quiet conditions are expected for the remainder of the outlook period.



### *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
17 June	66	0	0	A6.3	0	0	0	0	0	0	0	0	0
18 June	67	0	0	A6.3	0	0	0	0	0	0	0	0	0
19 June	68	0	0	A6.3	0	0	0	0	0	0	0	0	0
20 June	68	0	0	A6.3	0	0	0	0	0	0	0	0	0
21 June	67	0	0	A6.2	0	0	0	0	0	0	0	0	0
22 June	66	0	0	A6.3	0	0	0	0	0	0	0	0	0
23 June	67	0	0	A6.5	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
17 June	2.9e+05	1.9e+04	3.9e+03		3.4e+06	
18 June	3.6e+05	1.9e+04	3.8e+03		3.6e+06	
19 June	4.3e+05	1.9e+04	3.9e+03		1.1e+06	
20 June	4.1e+05	2.0e+04	3.8e+03		3.6e+05	
21 June	3.2e+05	2.0e+04	4.0e+03		4.6e+05	
22 June	2.7e+05	2.0e+04	4.0e+03		5.7e+05	
23 June	3.0e+05	2.0e+04	4.1e+03		5.3e+05	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
17 June	5	1-1-1-2-2-2-1-1	2	0-0-0-3-1-0-0-0	3	0-1-1-1-1-1-0-1
18 June	3	0-0-0-1-2-2-2-1	1	0-0-0-0-0-1-1-1	4	1-1-0-1-1-1-1-1
19 June	4	1-1-1-1-2-2-1-1	2	1-0-1-1-0-1-0-1	4	1-1-1-1-1-1-1-1
20 June	8	1-2-3-2-3-1-2-2	12	0-2-4-5-1-1-2-1	7	1-2-3-2-1-1-2-2
21 June	8	1-2-2-2-2-2-2-3	6	1-2-2-3-3-0-0-1	6	1-2-2-2-2-1-2-2
22 June	5	1-2-2-1-1-2-1-1	2	1-1-2-1-0-0-0-0	4	1-2-2-1-0-1-1-0
23 June	4	0-0-1-1-2-2-2-1	2	0-0-0-2-2-0-1-0	2	0-1-1-1-1-1-1-1

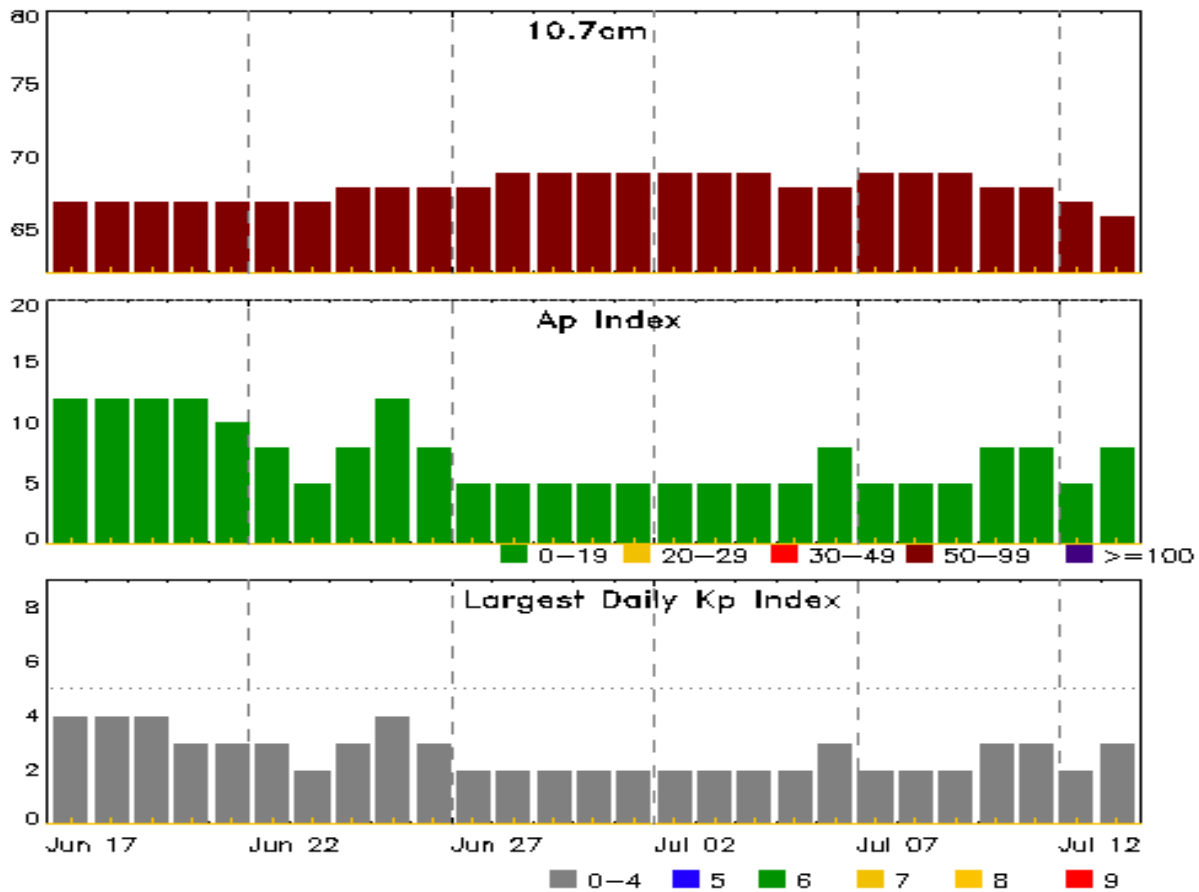


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
No Alerts or Warnings Issued		



## 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
24 Jun	67	8	3	08 Jul	69	5	2
25	67	12	4	09	69	5	2
26	67	10	3	10	68	8	3
27	67	5	2	11	68	8	3
28	67	5	2	12	67	5	2
29	67	5	2	13	67	5	2
30	67	5	2	14	67	5	2
01 Jul	68	5	2	15	67	5	2
02	69	5	2	16	67	5	2
03	69	5	2	17	67	5	2
04	69	5	2	18	67	5	2
05	68	5	2	19	67	5	2
06	68	8	3	20	67	5	2
07	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 #
23 Jun	0010	0011	0012	A1.1			



### ***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

No Active Regions

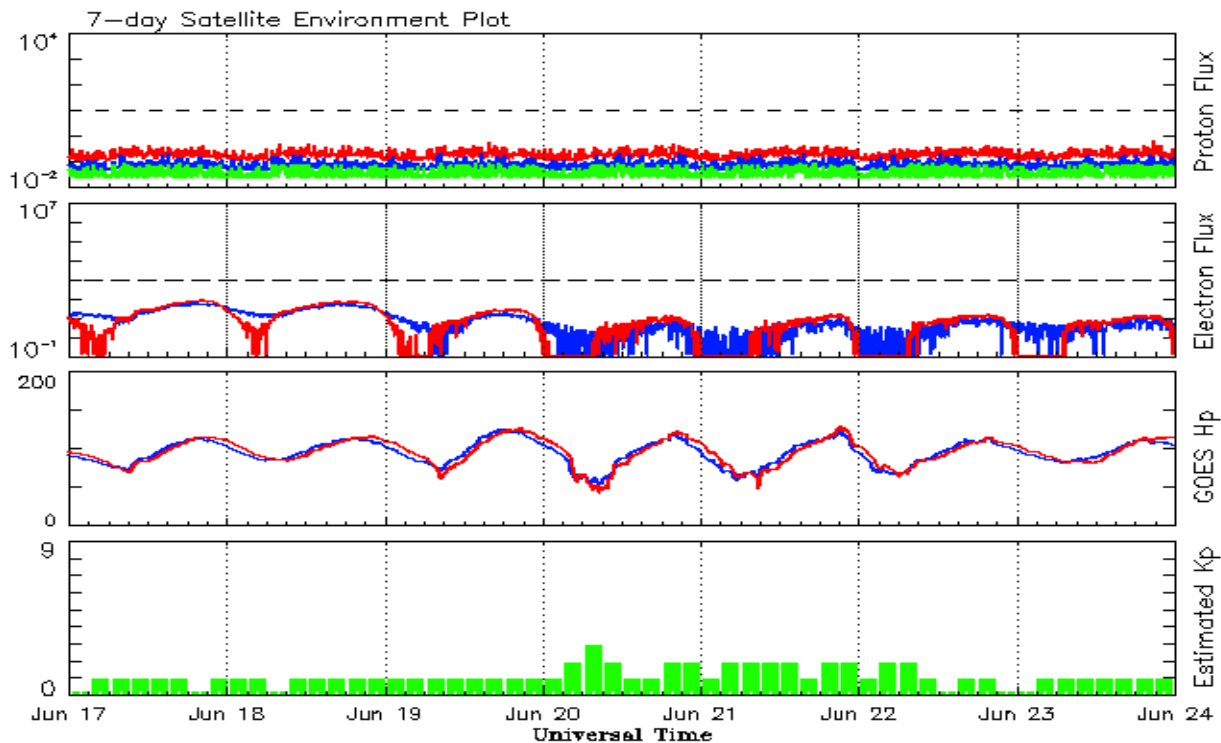


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2017</b>									
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	8.5	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	11.5	5.9	68.4	71.9	8	8.6
April	7.0	5.3	0.76	9.6	4.7	70.0	70.6	7	8.0
May	15.0	7.9	0.53	9.2	4.5	70.9	70.2	8	7.6
June	19.7	9.4	0.48	9.1	4.3	72.5	70.0	7	7.4
July	1.3	1.0	0.77	9.4	4.3	69.7	70.0	6	7.3
August	10.0	5.2	0.53	9.0	4.0	69.1	70.0	10	7.3
September	5.7	2.0	0.35	8.7	4.0	68.3	70.1	9	7.3
October	6.9	2.9	0.42	9.2	4.1	69.5	70.3	7	7.1
November	7.3	2.9	0.48	9.5	4.0	68.9	70.4	6	7.0
December	5.6	1.9	0.34			70.0		7	
<b>2019</b>									
January	16.0	4.7	0.29			71.6		6	
February		0.5				70.6		7	
March	14.8	5.7	0.39			71.5		6	
April	11.5	5.5	0.48			72.4		6	
May	18.1	6.1	0.34			71.3		7	

**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 17 June 2019*

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.

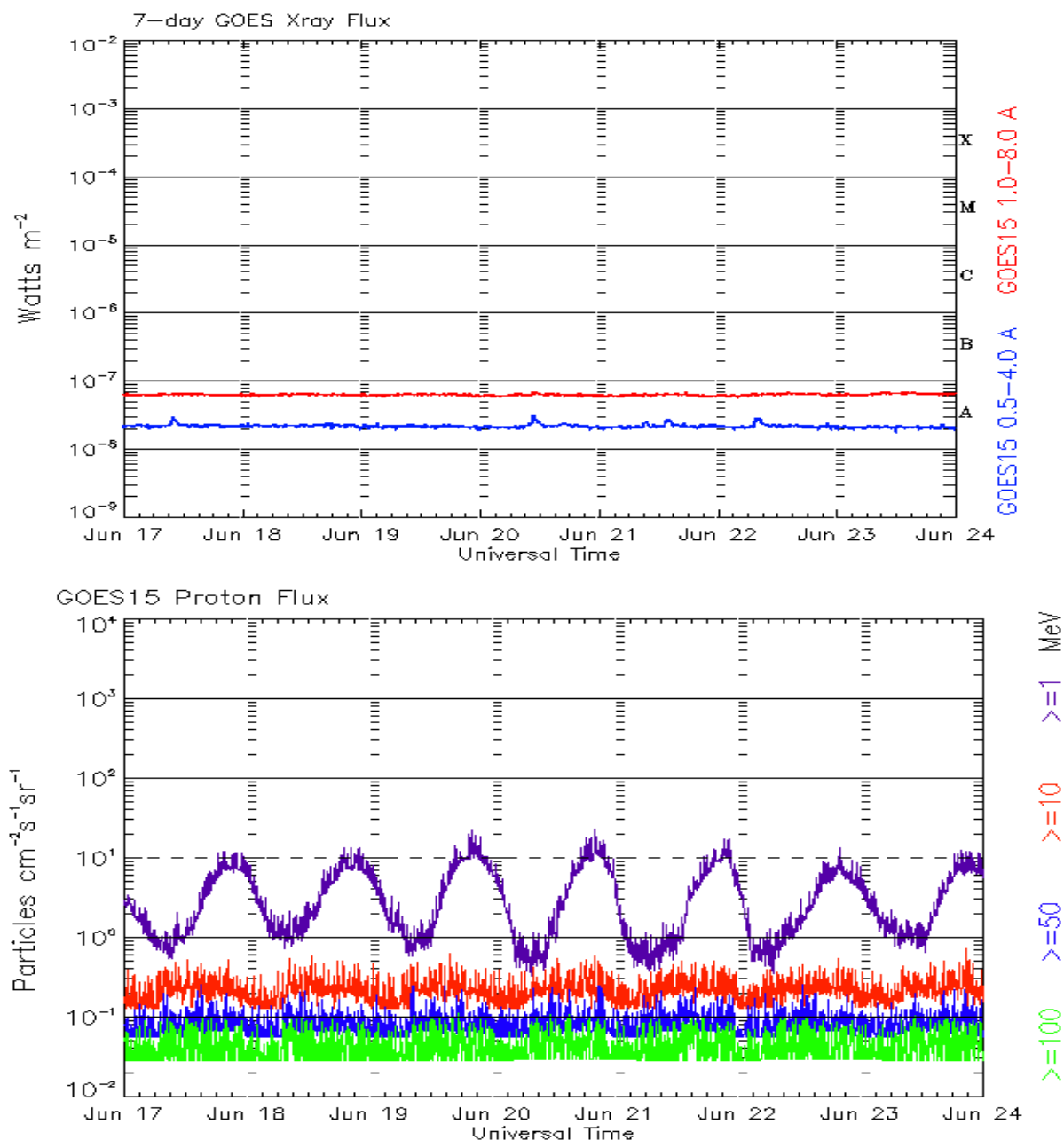
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 17 June 2019*

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)***

Published every Monday by the Space Weather Prediction Center.

U.S. Department of Commerce  
NOAA / National Weather Service  
Space Weather Prediction Center  
325 Broadway, Boulder CO 80305

**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.

<http://spaceweather.gov/weekly/> -- Current and previous year

<http://spaceweather.gov/ftpmenu/warehouse.html> -- Online archive from 1997

<http://spaceweather.gov/ftpmenu/> -- Some content as ascii text

<http://spaceweather.gov/SolarCycle/> -- Solar Cycle Progression web site

<http://spaceweather.gov/contacts.html> -- Contact and Copyright information

[http://spaceweather.gov/weekly/Usr\\_guide.pdf](http://spaceweather.gov/weekly/Usr_guide.pdf) -- User Guide

