

Space Weather Highlights
20 May - 26 May 2019

SWPC PRF 2282
27 May 2019

Solar activity was very low. No sunspots were observed on the solar disk and 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 was at normal levels on 20-21 May and normal to moderate levels on 22-26 May.

Geomagnetic field activity was at quiet to unsettled on 20 May and 26 May. The remainder of the reporting period was quiet.

Space Weather Outlook
27 May - 22 June 2019

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 range from normal to high levels. High levels are expected on 29 May - 02 Jun and moderate levels are expected on 03-12 Jun. Enhancements in electron flux are due to the anticipated influence of multiple CH HSSs. The remainder of the outlook period is expected to be at normal background levels.

Geomagnetic field activity is expected to range from quiet to active levels. Early on 27 May, unsettled to active levels are possible due to weak enhancements in the solar wind. Negative polarity CH HSS influence is expected to produce unsettled to active conditions from 28-30 May and quiet to unsettled conditions from 31 May-02 Jun. The remainder of the outlook period is expected to be mostly quiet under nominal solar wind conditions.



Daily Solar Data

Date	Radio	Sun	Sunspot	X-ray		Flares							
	Flux	spot	Area	Background		X-ray			Optical				
	10.7cm	No.	(10 ⁻⁶ hemi.)	Flux		C	M	X	S	1	2	3	4
20 May	69	0	0	A6.7	0	0	0	0	0	0	0	0	0
21 May	68	0	0	A6.3	0	0	0	0	0	0	0	0	0
22 May	67	0	0	A6.3	0	0	0	0	0	0	0	0	0
23 May	67	0	0	A6.2	0	0	0	0	0	0	0	0	0
24 May	66	0	0	A6.3	0	0	0	0	0	0	0	0	0
25 May	67	0	0	A6.3	0	0	0	0	0	0	0	0	0
26 May	68	0	0	A6.3	0	0	0	0	0	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
20 May	3.4e+05	1.9e+04	3.7e+03		3.4e+06	
21 May	3.1e+05	1.9e+04	4.0e+03		3.7e+06	
22 May	4.4e+05	1.9e+04	3.7e+03		5.8e+06	
23 May	3.6e+05	2.0e+04	3.9e+03		6.0e+06	
24 May	5.5e+05	1.9e+04	3.6e+03		3.7e+06	
25 May	5.5e+05	1.9e+04	4.1e+03		4.5e+06	
26 May	6.1e+05	1.9e+04	4.1e+03		5.0e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
20 May	7	3-2-2-1-2-1-2-2	3	2-2-2-1-0-1-0-0	6	3-2-1-1-1-1-1-1
21 May	4	1-2-1-1-2-1-1-1	2	1-0-0-0-2-0-0-1	4	1-2-1-1-2-0-0-1
22 May	5	0-1-2-2-2-2-1-1	2	0-1-1-2-1-0-0-1	4	0-1-2-1-1-1-1-1
23 May	5	1-1-1-2-2-2-1-2	4	2-1-0-3-1-1-0-1	5	1-1-1-2-1-1-1-2
24 May	6	1-2-1-2-2-2-2-2	3	1-2-1-0-1-1-1-1	5	1-2-1-1-1-1-2-2
25 May	3	1-0-1-1-1-1-2-1	1	0-0-0-0-1-0-1-1	4	1-1-0-1-1-1-2-2
26 May	6	1-1-1-1-2-2-2-3	1	1-0-0-0-0-0-0-1	4	1-1-1-0-1-1-1-3

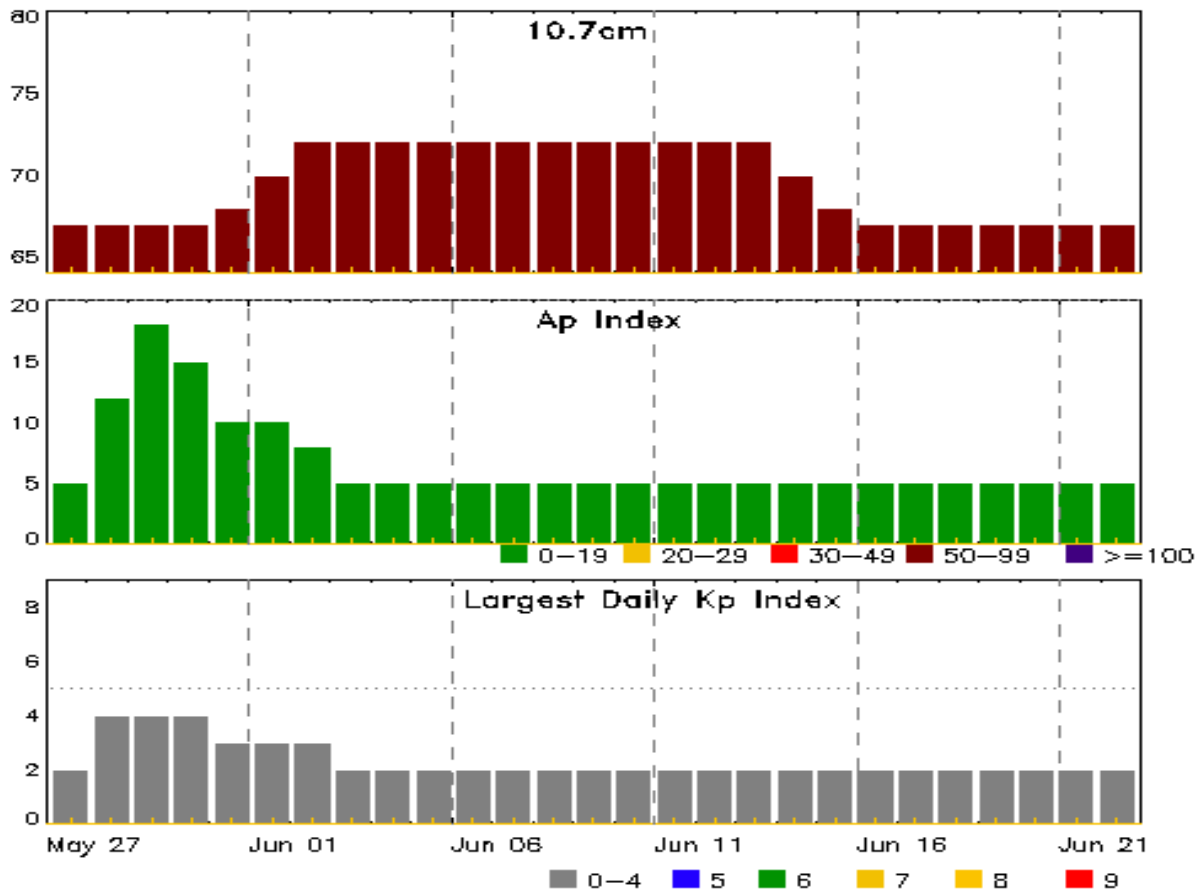


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
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
27 May	67	5	2	10 Jun	72	5	2
28	67	12	4	11	72	5	2
29	67	18	4	12	72	5	2
30	67	15	4	13	72	5	2
31	68	10	3	14	70	5	2
01 Jun	70	10	3	15	68	5	2
02	72	8	3	16	67	5	2
03	72	5	2	17	67	5	2
04	72	5	2	18	67	5	2
05	72	5	2	19	67	5	2
06	72	5	2	20	67	5	2
07	72	5	2	21	67	5	2
08	72	5	2	22	67	5	2
09	72	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 #
23 May	0910	0913	0916	A7.0			



Region Summary

	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
<i>Region 2741</i>																
06 May	N05E81	267	100	2	Hsx	1	A									
07 May	N05E66	268	170	2	Hsx	1	A									
08 May	N05E52	269	160	3	Hsx	1	A									
09 May	N06E38	270	160	3	Hsx	1	A									
10 May	N06E25	270	160	3	Hsx	1	A									
11 May	N06E11	270	160	3	Hsx	3	A									
12 May	N06W02	270	210	3	Hsx	2	A									
13 May	N05W16	271	150	2	Hsx	2	A					1				
14 May	N06W30	272	160	3	Hsx	3	A									
15 May	N05W44	272	150	2	Hsx	3	A	1				2				
16 May	N05W57	272	150	3	Hax	3	A									
17 May	N05W70	272	150	3	Hax	3	A									
18 May	N05W83	272	140	2	Hax	1	A									
								1	0	0	3	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 270

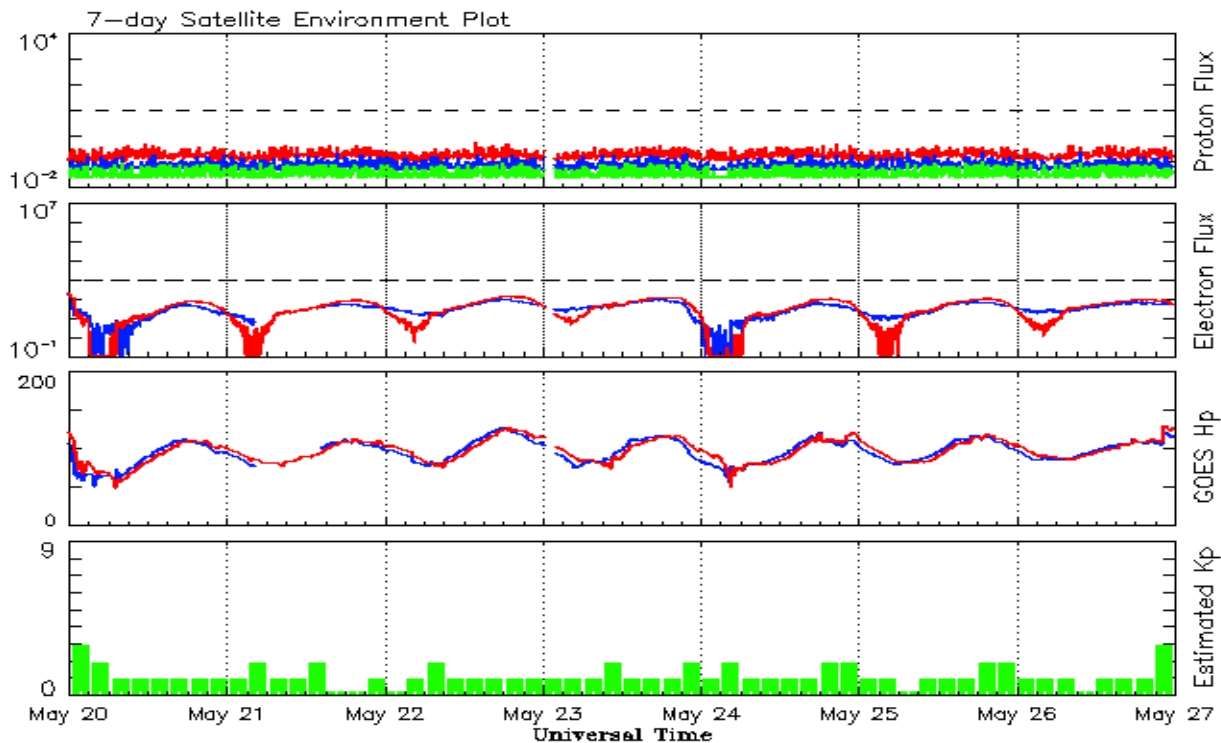


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2017									
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
2018									
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			68.9		6	
December	5.6	1.9	0.34			70.0		7	
2019									
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	

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 20 May 2019*

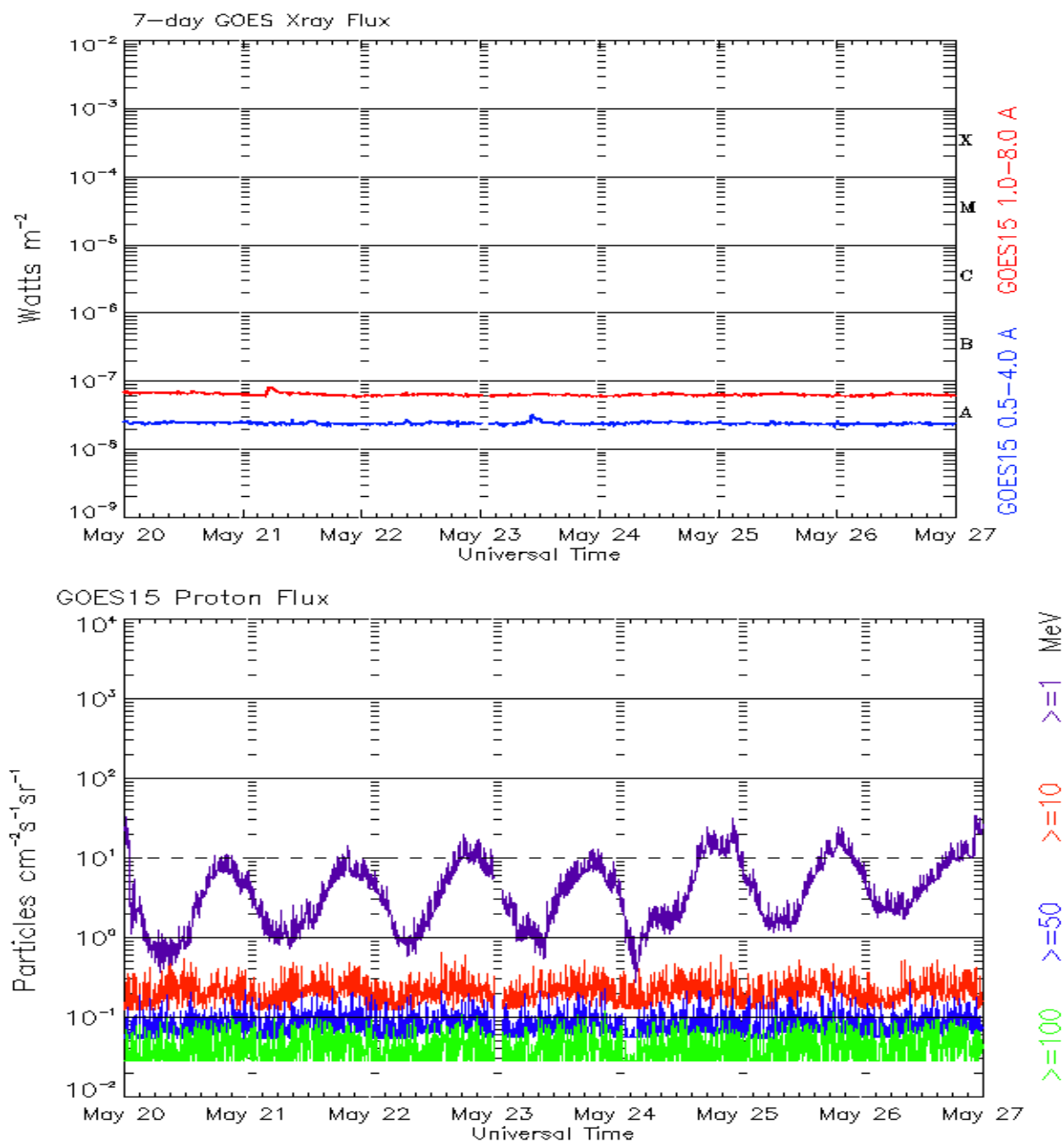
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 20 May 2019*

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 (pfu = protons/ 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

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 -- User Guide

