

Space Weather Highlights
16 September - 22 September 2019

SWPC PRF 2299
23 September 2019

Solar activity was at very low levels. No sunspots were observed on the visible disk. An approximately 20 degree filament erupted near S35W02 around 19/2200 UTC which produced a narrow, slow-moving CME signature near the Sun-Earth line. Modeling of the event suggested most of the ejecta was oriented south and eastward of Earth's orbit; however, Earth may still observe weak influence from the periphery of the CME.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels from 16-21 Sep and dropped to just normal levels through 22 Sep.

Geomagnetic field activity was quiet to active conditions. Elevated wind speeds from a waning positive polarity CH HSS produced isolated active conditions on 16 Sep. Variable phi angle on 17 Sep suggested influence from a SSBC, cause a period of isolated active conditions. Quiet to unsettled levels on 18 Sep decreased to just quiet levels on 19-20 Sep. A brief period of southward Bz produced a single period of unsettled on 21 Sep. The remainder of the summary period was quiet.

Space Weather Outlook
23 September - 19 October 2019

Solar activity is expected to be at very low levels over 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 28 Sep - 12 Oct and 14 Oct; moderate levels are expected on 24-27 Sep, 13 Oct, and 15-18 Oct. The remainder of the outlook period is expected to be at normal levels. All enhancements in electron flux are in anticipation of multiple, recurrent CH HSSs.

Geomagnetic field activity is expected to be at quiet to G2 (Moderate) geomagnetic storm levels. G2 levels are expected on 28 Sep followed by G1 (Minor) geomagnetic levels on 29 Sep. Active conditions are expected on 23-25 Sep, 30 Sep and 06 Oct. Unsettled conditions are expected on 26-27 Sep, 01-03 Oct, 10 Oct and 12-15 Oct. The remainder of the outlook period is expected to be at quiet levels. All enhancements in geomagnetic activity are in anticipation of multiple, recurrent CH HSSs.



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
16 September	69	0	0	A3.7	0	0	0	0	0	0	0	0
17 September	68	0	0	A3.5	0	0	0	0	0	0	0	0
18 September	66	0	0	A3.7	0	0	0	0	0	0	0	0
19 September	67	0	0	A3.6	0	0	0	0	0	0	0	0
20 September	67	0	0	A3.4	0	0	0	0	0	0	0	0
21 September	68	0	0	A3.7	0	0	0	0	0	0	0	0
22 September	68	0	0	A3.5	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
16 September		4.8e+05	2.1e+04	3.8e+03		2.1e+07
17 September		5.3e+05	2.1e+04	3.7e+03		3.0e+07
18 September		3.8e+05	2.2e+04	4.1e+03		2.1e+07
19 September		4.0e+05	2.2e+04	4.0e+03		3.2e+07
20 September		4.2e+05	2.2e+04	3.9e+03		4.9e+07
21 September		3.1e+05	2.2e+04	3.8e+03		1.6e+07
22 September		2.1e+05	2.2e+04	4.3e+03		2.9e+06

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
16 September	10	3-4-2-2-2-1-2-1	7	3-3-0-1-3-1-1-1	11	4-4-1-1-1-2-2-2
17 September	8	3-1-1-2-2-2-2-3	4	2-1-0-1-0-1-2-2	9	4-1-1-1-1-1-2-4
18 September	8	3-1-2-2-3-1-1-2	13	2-1-4-3-5-1-0-1	9	3-2-2-2-3-1-1-2
19 September	4	1-1-0-1-2-1-2-1	1	1-0-1-0-1-0-0-0	4	1-1-1-1-1-1-1-1
20 September	3	2-1-0-0-2-2-1-0	1	1-1-1-0-0-0-0-0	3	2-1-1-1-1-1-1-1
21 September	7	2-2-3-2-2-1-1-1	11	2-2-3-4-4-1-0-0	7	2-2-3-2-2-1-1-1
22 September	2	2-1-0-0-1-1-1-0	1	0-1-0-0-0-0-1-0	7	2-2-0-0-0-1-1-1

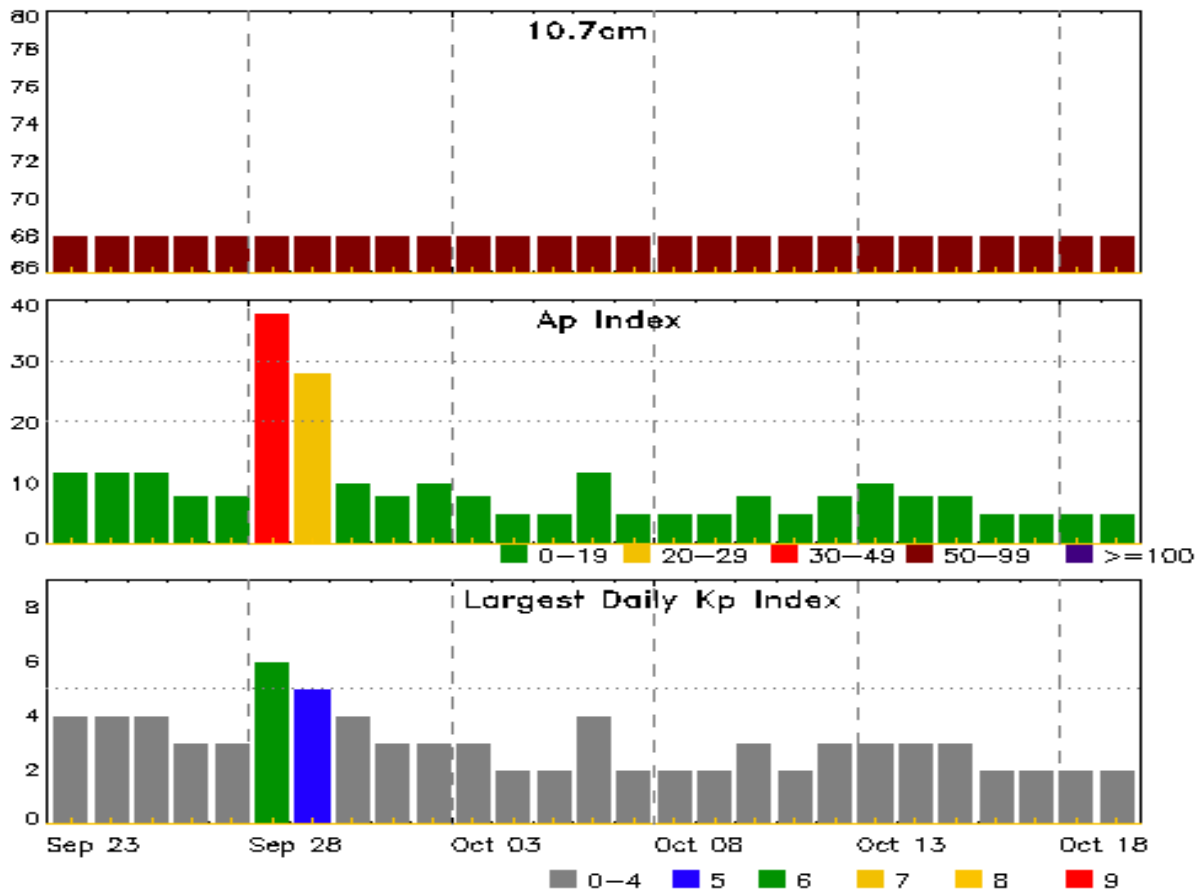


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
16 Sep 0304	WARNING: Geomagnetic K = 4	16/0259 - 1200
16 Sep 0305	ALERT: Geomagnetic K = 4	16/0259
17 Sep 0243	WARNING: Geomagnetic K = 4	17/0243 - 0900
17 Sep 0300	ALERT: Geomagnetic K = 4	17/0259
17 Sep 1739	WARNING: Geomagnetic K = 4	17/1740 - 2300
17 Sep 2226	ALERT: Geomagnetic K = 4	17/2226
17 Sep 2228	EXTENDED WARNING: Geomagnetic K = 4	17/1740 - 18/0300



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
23 Sep	68	12	4	07 Oct	68	5	2
24	68	12	4	08	68	5	2
25	68	12	4	09	68	5	2
26	68	8	3	10	68	8	3
27	68	8	3	11	68	5	2
28	68	38	6	12	68	8	3
29	68	28	5	13	68	10	3
30	68	10	4	14	68	8	3
01 Oct	68	8	3	15	68	8	3
02	68	10	3	16	68	5	2
03	68	8	3	17	68	5	2
04	68	5	2	18	68	5	2
05	68	5	2	19	68	5	2
06	68	12	4				

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 #
18 Sep	1836	1839	1843	A1.7			



Region Summary

Location		Sunspot Characteristics					Flares								
Date	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
	Lon	10 ⁻⁶ hemi. (helio)	Class	Count	Class	C	M	X	S	1	2	3	4		

No Active Regions

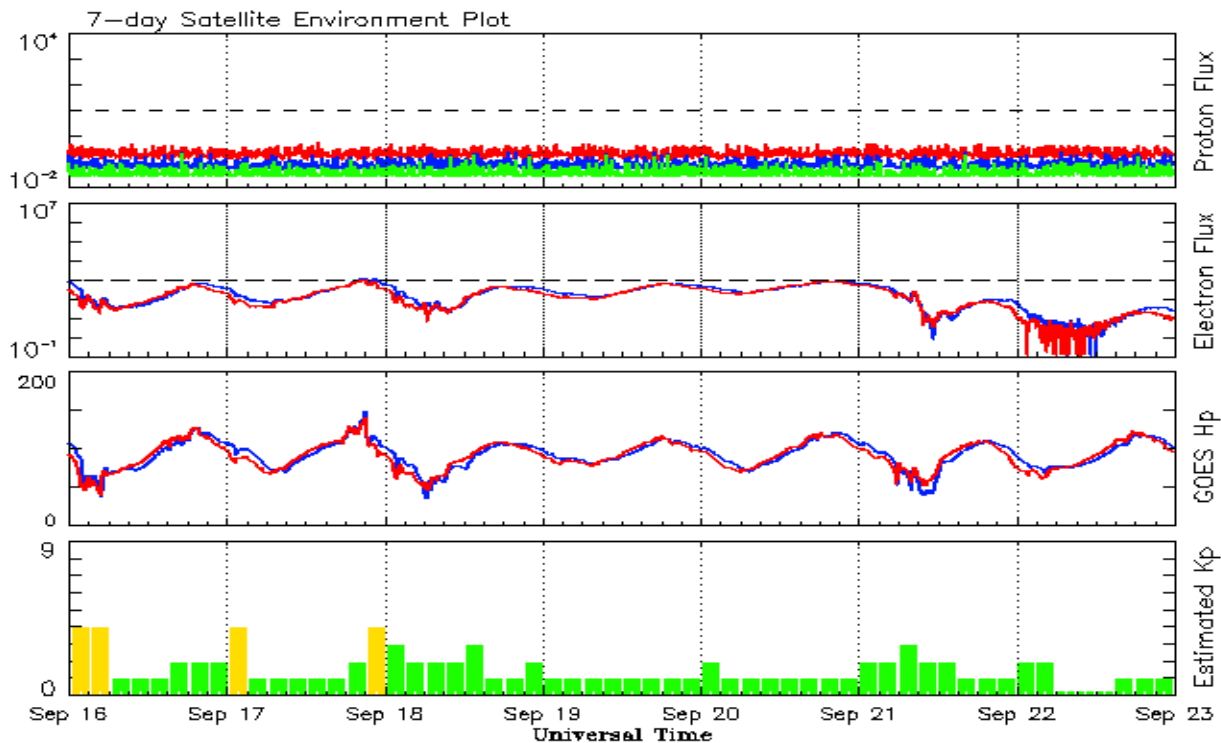


Recent Solar Indices (preliminary)
Observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	<u>Observed values</u>		<u>Ratio</u>	<u>Smooth values</u>		<u>Penticton</u>	<u>Smooth</u>	<u>Planetary</u>	<u>Smooth</u>
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2017									
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	4.2	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	3.9	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	9.3	3.6	70.0	70.3	7	6.9
2019									
January	16.0	4.6	0.29	9.0	3.2	71.6	70.0	6	6.8
February		0.5		8.7	3.0	70.6	69.8	7	6.7
March	14.8	5.6	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	
June	11.6	0.7	0.06			68.1		5	
July	1.6	0.5	0.31			67.1		6	
August	2.5	0.4	0.16			67.0		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 16 September 2019*

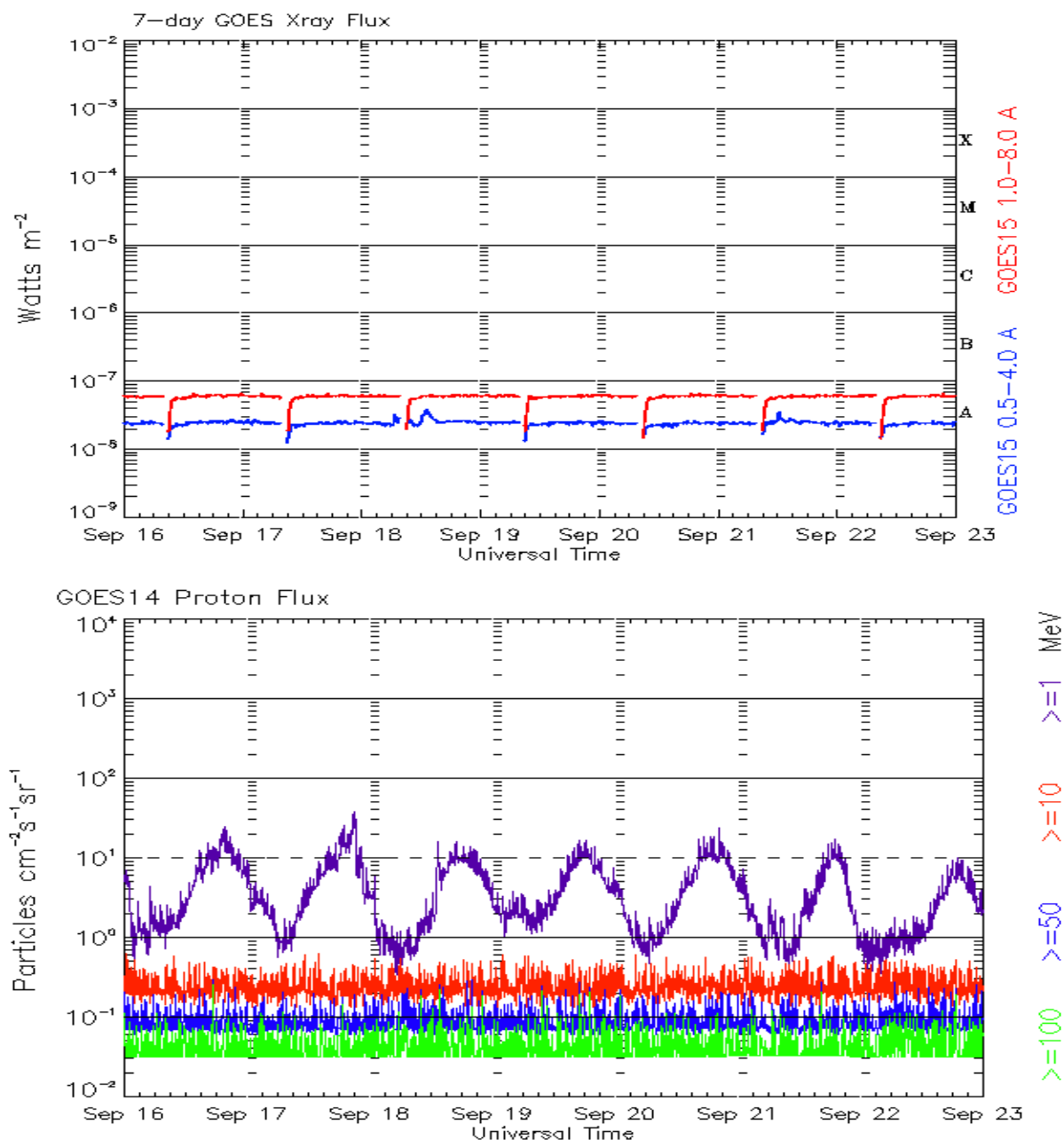
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 16 September 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.



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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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