

Space Weather Highlights
23 September - 29 September 2019

SWPC PRF 2300
30 September 2019

Solar activity was very low throughout the summary period and no active regions with sunspots were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached very high levels on 29 Sep with high levels observed on 28 Sep. Normal and normal to moderate flux values were observed throughout the remainder of the week.

Geomagnetic field activity reached G1 (Minor) geomagnetic storm levels on 27-28 Sep due to the influence of a recurrent, positive polarity coronal hole high speed stream (CH HSS). Active conditions were observed on 24 and 29 Sep and quiet or quiet to unsettled conditions were observed throughout the remainder of the period.

Space Weather Outlook
30 September - 26 October 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 reach high levels on 30 Sep-12, 14, and 25-26 Oct. Normal and normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach G1 (Minor) geomagnetic storm levels on 24-25 Oct and active levels on 06, 21, and 26 Oct due to coronal hole high speed stream influences.



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
23 September	66	0	0	A3.8	0	0	0	0	0	0	0	0	0
24 September	67	0	0	A3.5	0	0	0	0	0	0	0	0	0
25 September	68	0	0	A3.8	0	0	0	0	0	0	0	0	0
26 September	67	0	0	A3.6	0	0	0	0	0	0	0	0	0
27 September	66	0	0	A3.6	0	0	0	0	0	0	0	0	0
28 September	67	0	0	A4.7	0	0	0	0	0	0	0	0	0
29 September	67	0	0	A4.7	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
23 September		2.5e+05	2.0e+04	3.6e+03		4.1e+06
24 September		4.8e+05	2.2e+04	4.1e+03		3.1e+06
25 September		2.6e+05	2.1e+04	3.7e+03		3.0e+06
26 September		2.2e+05	2.2e+04	3.9e+03		3.4e+06
27 September		1.0e+06	2.1e+04	3.8e+03		4.9e+06
28 September		2.4e+06	2.1e+04	3.6e+03		4.0e+08
29 September		9.7e+05	2.1e+04	4.0e+03		1.6e+09

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
23 September	2	0-0-0-1-2-1-1-1	1	0-0-0-2-0-0-0-0	3	0-0-0-1-1-1-1-1
24 September	11	3-3-2-1-3-3-3-1	14	1-4-4-3-3-3-1-1	13	3-3-2-1-3-4-3-1
25 September	3	0-1-1-1-1-2-1-1	9	2-1-3-5-0-0-0-0	4	1-1-2-2-1-1-1-1
26 September	2	2-0-0-0-2-0-1-0	0	1-0-0-0-0-0-0-0	4	3-1-1-0-1-0-0-1
27 September	15	0-1-2-1-3-3-4-5	24	0-0-1-3-6-5-3-4	21	1-2-2-1-3-4-5-5
28 September	21	3-4-4-4-3-3-3-4	51	2-3-7-7-6-3-2-2	27	3-5-5-5-4-3-4-4
29 September	10	2-3-2-2-1-2-3-3	24	2-3-5-5-2-4-4-3	9	2-3-2-2-1-3-3-4

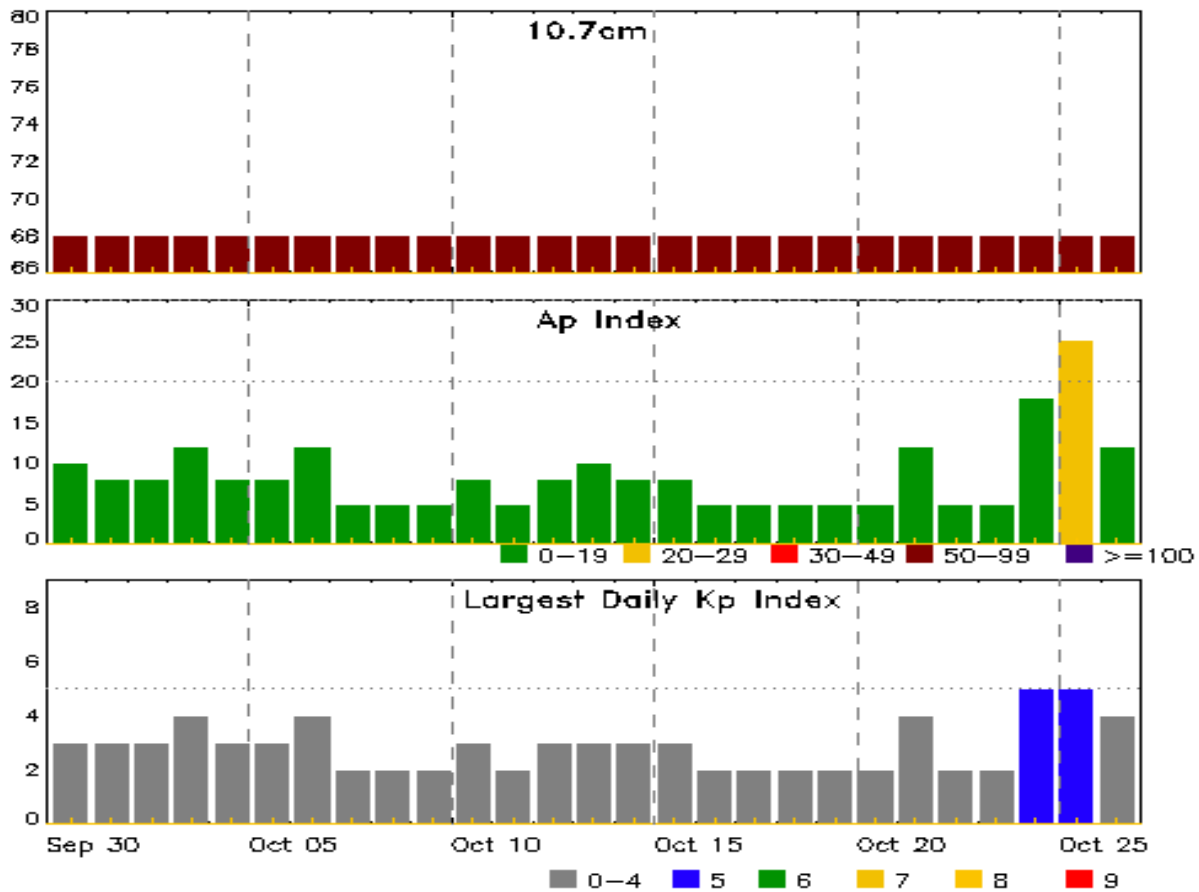


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
24 Sep 0317	WARNING: Geomagnetic K = 4	24/0317 - 1200
24 Sep 1328	WARNING: Geomagnetic K = 4	24/1326 - 2300
24 Sep 1805	ALERT: Geomagnetic K = 4	24/1759
24 Sep 2048	WATCH: Geomagnetic Storm Category G1 predicted	
24 Sep 2256	EXTENDED WARNING: Geomagnetic K = 4	24/1326 - 25/0300
25 Sep 1856	WATCH: Geomagnetic Storm Category G2 predicted	
26 Sep 1701	WATCH: Geomagnetic Storm Category G2 predicted	
26 Sep 1711	WATCH: Geomagnetic Storm Category G2 predicted	
27 Sep 0950	WARNING: Geomagnetic K = 4	27/1000 - 28/2359
27 Sep 1630	ALERT: Geomagnetic K = 4	27/1628
27 Sep 1630	WARNING: Geomagnetic K = 5	27/1630 - 28/0900
27 Sep 2022	ALERT: Geomagnetic K = 5	27/2021
27 Sep 2022	WARNING: Geomagnetic K = 6	27/2022 - 28/0900
27 Sep 2236	ALERT: Geomagnetic K = 5	27/2235
28 Sep 0445	ALERT: Geomagnetic K = 5	27/0439
28 Sep 0846	EXTENDED WARNING: Geomagnetic K = 5	27/1630 - 28/2100
28 Sep 0847	ALERT: Geomagnetic K = 5	28/0845
28 Sep 1201	ALERT: Geomagnetic K = 5	28/1159
28 Sep 1330	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	28/1310
28 Sep 1951	EXTENDED WARNING: Geomagnetic K = 5	27/1630 - 29/0600
28 Sep 1951	EXTENDED WARNING: Geomagnetic K = 4	27/1000 - 29/1500
29 Sep 1010	CONTINUED ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	28/1310
29 Sep 1952	WARNING: Geomagnetic K = 4	29/1951 - 2359



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
30 Sep	68	10	3	14 Oct	68	8	3
01 Oct	68	8	3	15 Oct	68	8	3
02 Oct	68	8	3	16 Oct	68	5	2
03 Oct	68	12	4	17 Oct	68	5	2
04 Oct	68	8	3	18 Oct	68	5	2
05 Oct	68	8	3	19 Oct	68	5	2
06 Oct	68	12	4	20 Oct	68	5	2
07 Oct	68	5	2	21 Oct	68	12	4
08 Oct	68	5	2	22 Oct	68	5	2
09 Oct	68	5	2	23 Oct	68	5	2
10 Oct	68	8	3	24 Oct	68	18	5
11 Oct	68	5	2	25 Oct	68	25	5
12 Oct	68	8	3	26 Oct	68	12	4
13 Oct	68	10	3				

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			X-ray	Optical		
	Begin	Max	End		Class	Imp/ Brtns	Location Lat CMD
23 Sep	1608	1609	1610		A1.1		



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

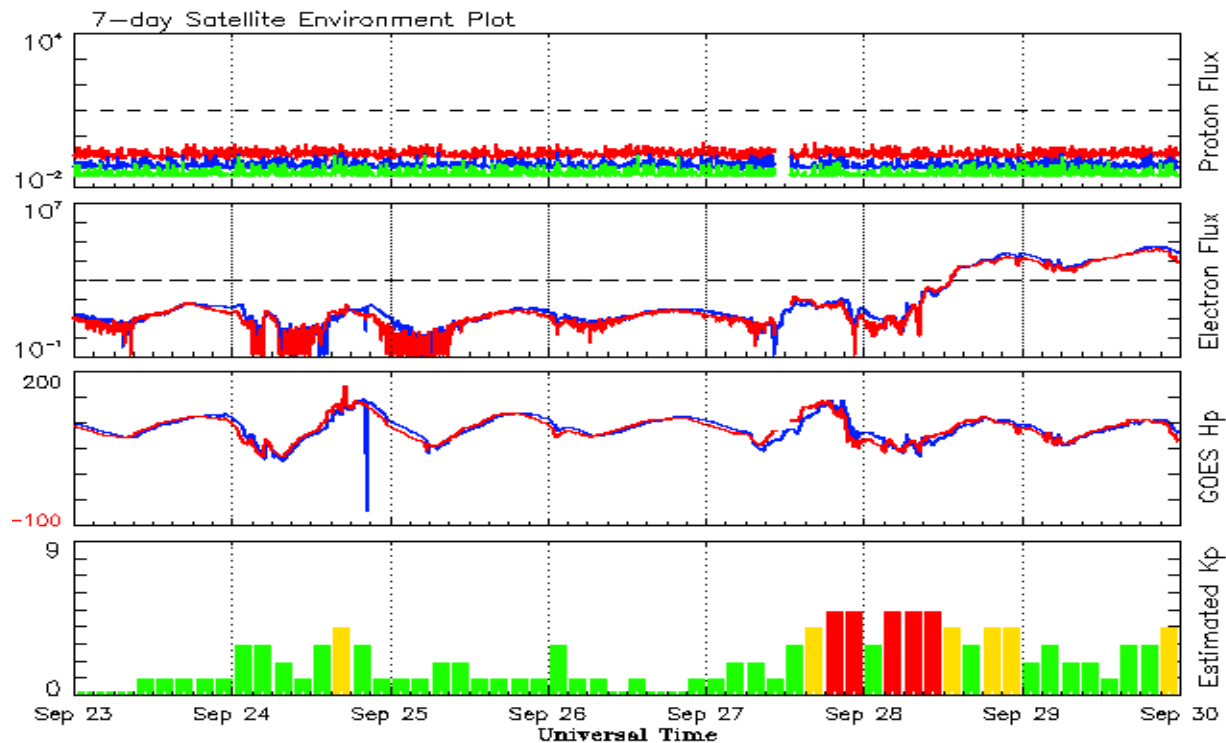


Recent Solar Indices (preliminary)
Observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
	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 23 September 2019*

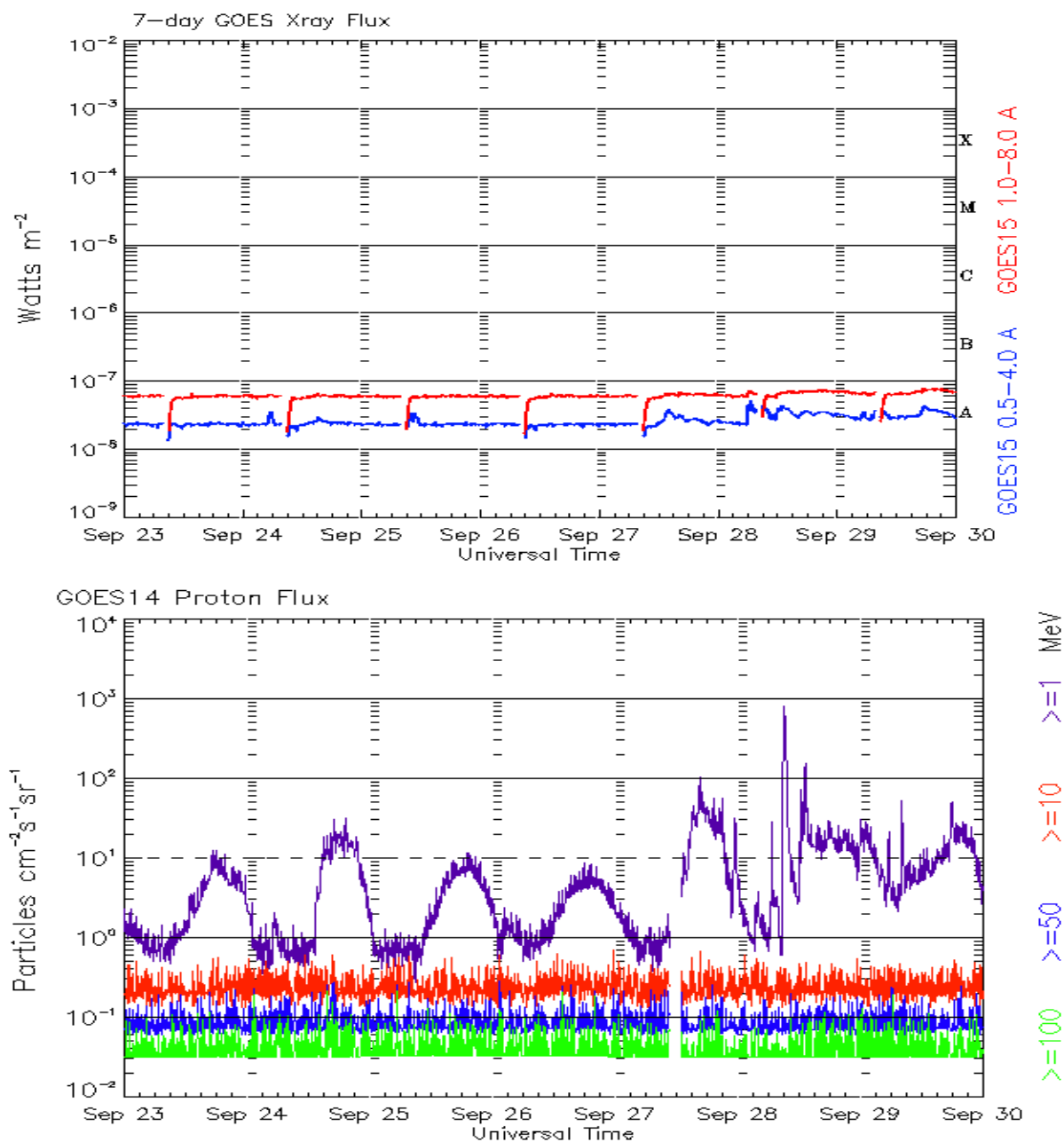
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 23 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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