

Space Weather Highlights
07 October - 13 October 2019

SWPC PRF 2302
14 October 2019

Solar activity was very low. The solar disk was spotless. No Earth-directed coronal mass ejections (CMEs) were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels on 08-13 Oct and at high levels on 07 Oct. The maximum flux of the period was 1,930 pfu observed at 07/1745 UTC.

Geomagnetic field activity ranged from quiet to active levels. The period started off at nominal levels with solar wind speeds in the 350-405 km/s range. by 09 Oct, total field increased to 11 nT at 09/2135 UTC followed by an increase in solar wind speed to approximately 490 km/s as a weak negative polarity coronal hole high speed stream (CH HSS) moved into geoeffective position. Solar wind speed remained enhanced through late on 11 Oct. The geomagnetic field responded with quiet to active conditions on 09-10 Oct and quiet to unsettled levels on 11 Oct.

Space Weather Outlook
14 October - 09 November 2019

Solar activity is expected to continue at very low levels.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach moderate levels on 16 and 24 Oct and again on 04-09 Nov. High levels are expected on 14-15 Oct and on 25 Oct-03 Nov due to recurrent CH HSS influence.

Geomagnetic field activity is expected to reach unsettled levels on 14-15 Oct due to possible weak CH HSS effects. Unsettled to active levels are expected on 21 Oct and 24-28 with G1 (Minor) geomagnetic storm levels likely on 24-25 Oct due to recurrent CH HSS effects.



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
07 October	68	0	0	A2.1	0	0	0	0	0	0	0	0	0	0
08 October	67	0	0	A2.1	0	0	0	0	0	0	0	0	0	0
09 October	68	0	0	A2.3	0	0	0	0	0	0	0	0	0	0
10 October	68	0	0	A2.5	0	0	0	0	0	0	0	0	0	0
11 October	69	0	0	A2.7	0	0	0	0	0	0	0	0	0	0
12 October	68	0	0	A3.0	0	0	0	0	0	0	0	0	0	0
13 October	67	0	0	A3.4	0	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
07 October		4.8e+05	2.1e+04	3.7e+03		7.1e+07
08 October		2.5e+05	2.2e+04	4.0e+03		2.0e+07
09 October		5.2e+05	2.2e+04	4.3e+03		2.0e+07
10 October		4.6e+05	2.2e+04	4.3e+03		1.3e+07
11 October		8.7e+05	2.1e+04	4.0e+03		2.0e+07
12 October		5.4e+05	2.2e+04	3.8e+03		3.3e+07
13 October		6.3e+05	2.1e+04	3.8e+03		4.4e+07

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
07 October	4	0-1-1-1-2-2-1-2	7	0-0-0-3-4-2-1-1	6	1-1-1-1-2-2-2-2
08 October	4	1-1-2-1-1-1-1-1	6	1-0-3-3-2-1-0-1	5	2-2-2-1-1-1-2-1
09 October	7	1-2-2-3-1-1-2-2	17	0-2-3-6-4-1-1-1	9	2-3-2-4-2-1-1-2
10 October	10	1-4-3-2-2-2-1-2	17	1-3-5-4-2-4-2-1	13	2-4-4-2-2-3-2-2
11 October	6	0-1-3-2-2-2-2-1	15	0-0-3-5-4-4-1-0	8	1-1-2-2-2-3-2-2
12 October	4	2-2-1-2-1-1-1-0	6	1-1-2-3-3-1-1-0	5	2-2-1-2-2-0-1-1
13 October	1	1-0-0-0-1-0-1-0	0	0-0-0-0-0-0-0-0	4	1-0-0-0-0-0-1-0

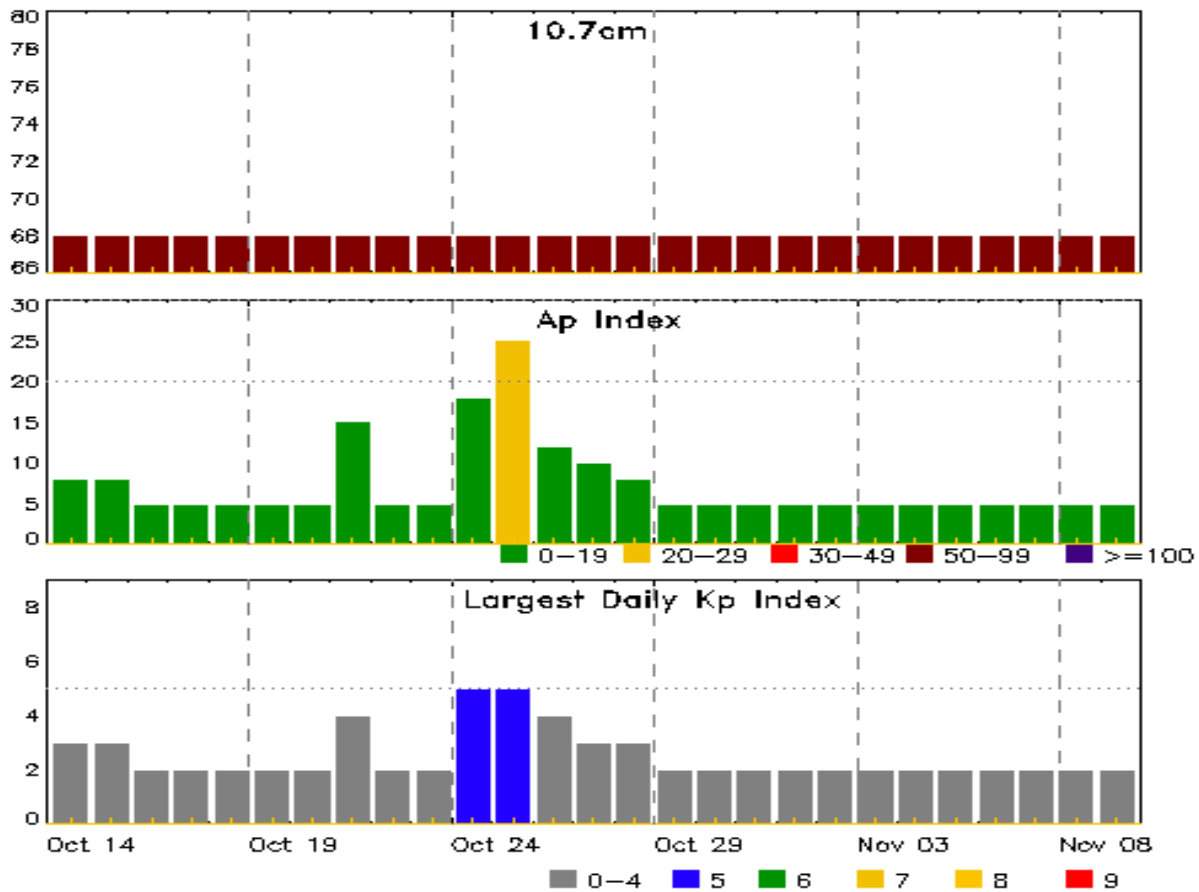


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
07 Oct 1231	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	28/1310
09 Oct 1013	WARNING: Geomagnetic K = 4	09/1013 - 1500
09 Oct 1202	ALERT: Geomagnetic K = 4	09/1200
10 Oct 0532	WARNING: Geomagnetic K = 4	10/0532 - 0900
10 Oct 0547	ALERT: Geomagnetic K = 4	10/0547
10 Oct 0839	EXTENDED WARNING: Geomagnetic K = 4	10/0532 - 1200



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
14 Oct	68	8	3	28 Oct	68	8	3
15	68	8	3	29	68	5	2
16	68	5	2	30	68	5	2
17	68	5	2	31	68	5	2
18	68	5	2	01 Nov	68	5	2
19	68	5	2	02	68	5	2
20	68	5	2	03	68	5	2
21	68	15	4	04	68	5	2
22	68	5	2	05	68	5	2
23	68	5	2	06	68	5	2
24	68	18	5	07	68	5	2
25	68	25	5	08	68	5	2
26	68	12	4	09	68	5	2
27	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		Imp/	Location	Rgn
				Class	Brtns	Lat CMD	#
07 Oct	1934	1937	2013	A7.1			
10 Oct	1653	1657	1659	A7.2			



Region Summary

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
<i>Region 2749</i>															
01 Oct	S09E61	129	0		Axx	1	A								
02 Oct	S09E48	129	0		Axx	1	A								
03 Oct	S09E34	130	plage												
04 Oct	S09E20	131	plage												
05 Oct	S09E06	132	plage												
06 Oct	S09W08	133	plage												
07 Oct	S09W22	133	plage												
08 Oct	S09W36	134	plage												
09 Oct	S09W50	135	plage												
10 Oct	S09W64	136	plage												
11 Oct	S09W78	137	plage												
12 Oct	S09W92	137	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 132

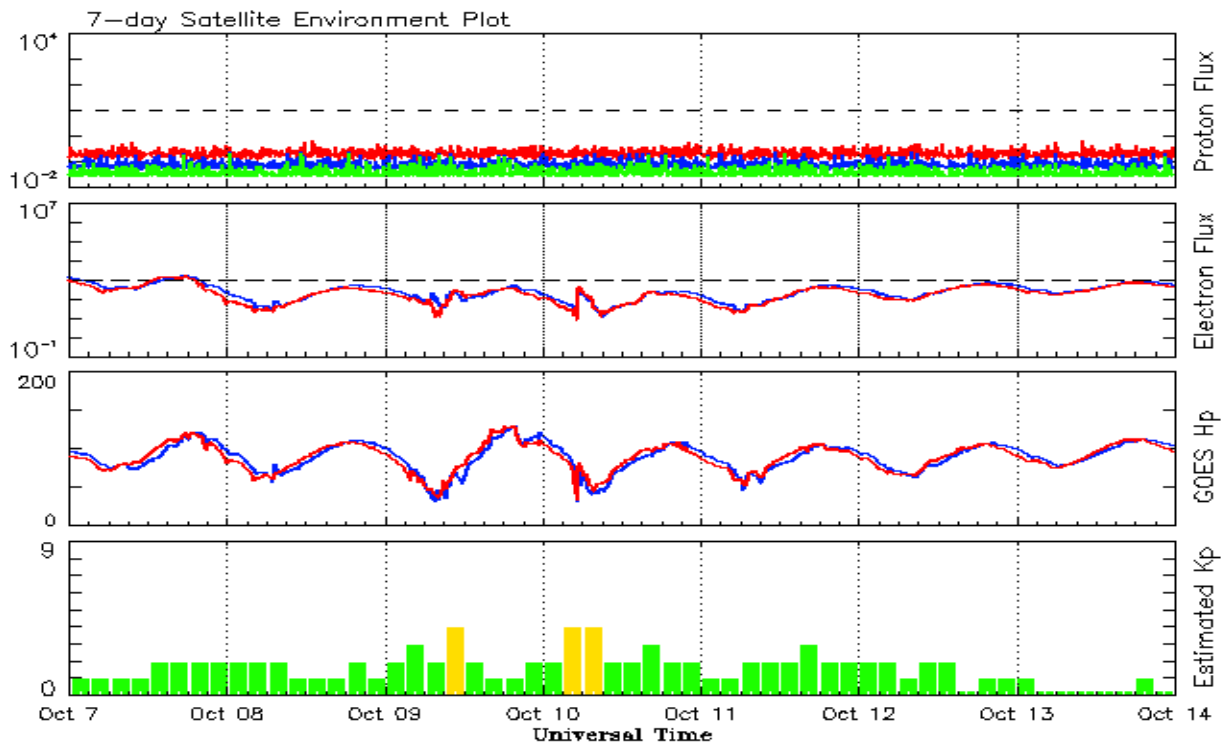


Recent Solar Indices (preliminary)
Observed monthly mean values

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									
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	8.3	2.8	71.5	69.7	6	6.6
April	11.5	5.5	0.48			72.4		6	
May	18.1	5.9	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	
September	2.6	0.7	0.27			68.1		10	

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 07 October 2019*

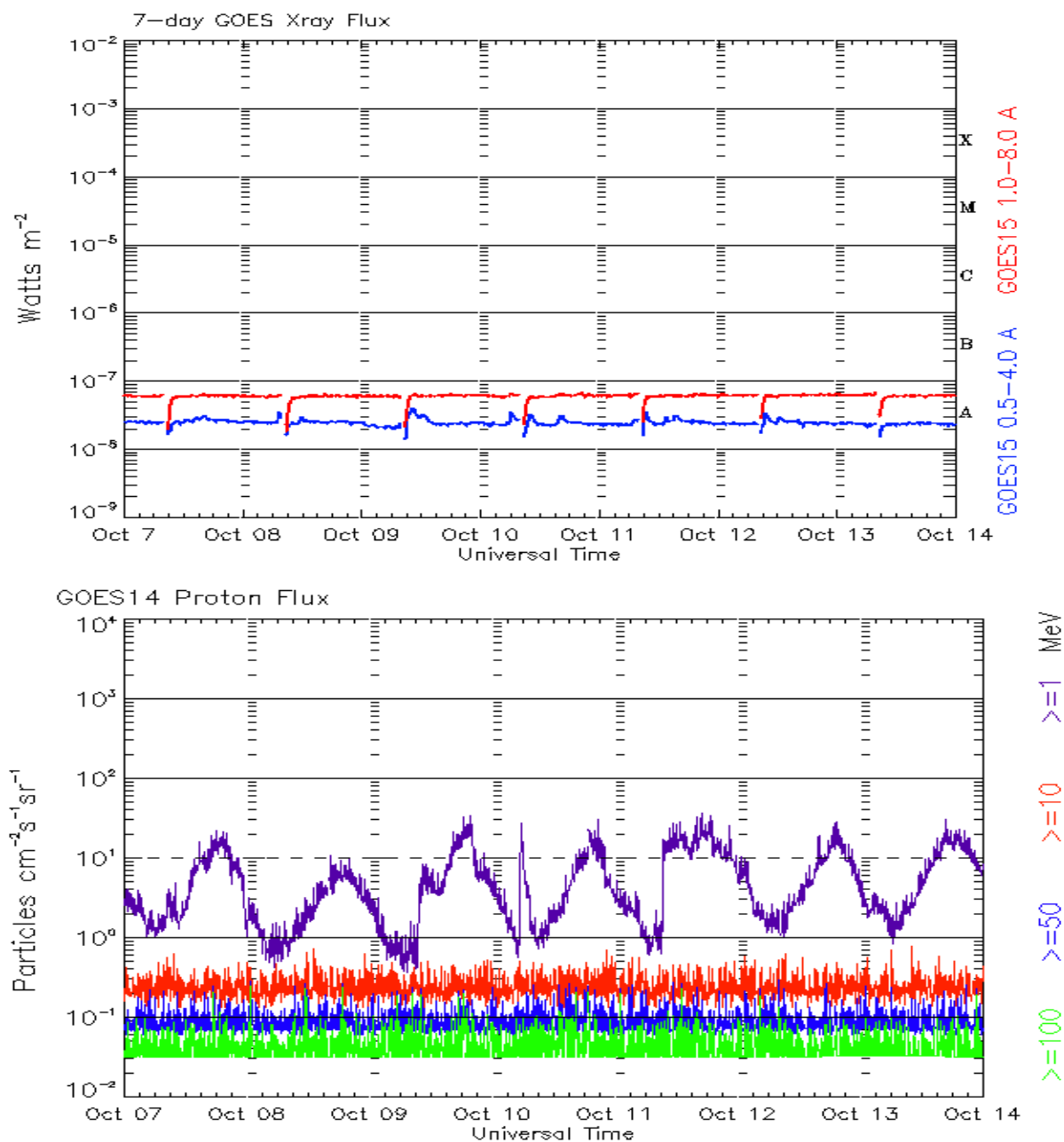
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 07 October 2019*

The x-ray plots contains five-minute averages x-ray flux (Watt/m²) 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/cm² -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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