Space Weather Highlights **SWPC PRF 2307**
11 November - 17 November 2019 **18 November 2019**

Solar activity was very low. Region 2752 (S23, L=286) was numbered on 13 Nov as a unipolar group, but quickly decayed to plage. The region remained an area of plage throughout the balance of the summary period. No Earth-directed 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 11 and 13-17 Nov with normal levels observed on 12 Nov.

Geomagnetic field activity was predominately at quiet levels throughout the period under a mostly nominal wind regime. An isolated unsettled period was observed midday on 11 Nov and again late on 17 Nov. The unsettled period late on 17 Nov was due to weak, negative polarity CH HSS influence.

Space Weather Outlook
18 November - 14 December 2019

Solar activity is expected to be a 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 reach high levels on 22 Nov through 03 Dec in response to CH HSS influence. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach G1 (Minor) storm levels on 21-23 Nov, with active levels on 20 Nov, due to a recurrent, positive polarity CH HSS. Quiet to isolated unsettled conditions are anticipated throughout the remainder of the outlook period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background		Flares						
						X-ray			Optical			
						C	M	X	S	1	2	3	4
11 November	70	0	0	A7.3	0	0	0	0	0	0	0	0	0
12 November	71	0	0	A7.8	0	0	0	0	0	0	0	0	0
13 November	71	0	0	A7.7	0	0	0	0	0	0	0	0	0
14 November	70	0	0	A7.5	0	0	0	0	0	0	0	0	0
15 November	70	0	0	A7.4	0	0	0	0	0	0	0	0	0
16 November	70	0	0	A7.5	0	0	0	0	0	0	0	0	0
17 November	70	0	0	A7.5	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
11 November		6.3e+05	2.2e+04	3.9e+03	2.0e+07	
12 November		9.2e+04	2.1e+04	3.6e+03	1.8e+06	
13 November		1.1e+05	2.2e+04	3.9e+03	2.9e+06	
14 November		1.4e+05	2.1e+04	3.7e+03	3.9e+06	
15 November		2.8e+05	2.2e+04	4.0e+03	5.3e+06	
16 November		3.9e+05	2.0e+04	3.8e+03	6.4e+06	
17 November		1.9e+05	2.2e+04	3.9e+03	3.4e+06	

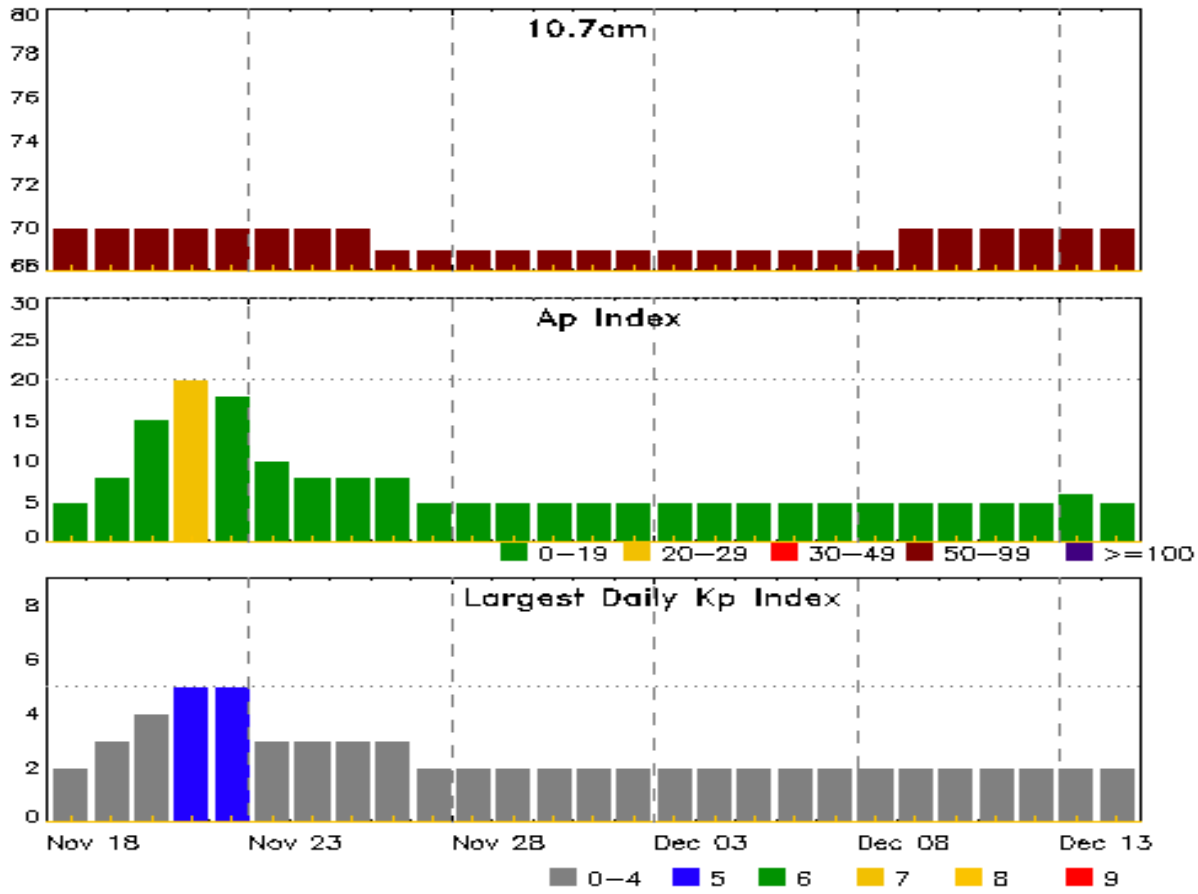
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
11 November	7	0-2-2-3-2-1-2-2	0	0-0-0-0-0-3-0-0	7	0-1-2-3-2-2-2-2
12 November	3	2-0-0-0-2-1-1-0	0	0-0-0-0-0-1-0-0	4	2-1-1-1-1-1-1-0
13 November	1	0-0-0-0-1-0-1-1	0	0-0-0-0-0-0-0-0	2	0-0-0-0-0-0-1-1
14 November	3	2-1-1-1-1-1-1-0	1	1-0-0-0-1-0-0-0	4	2-1-1-1-1-0-1-0
15 November	2	0-1-0-1-0-1-1-1	0	0-0-0-0-0-0-1-0	4	0-1-0-1-0-1-2-1
16 November	5	2-1-0-1-2-2-2-2	3	0-0-1-2-1-1-2-0	6	2-2-1-1-1-2-2-2
17 November	3	1-1-0-0-1-1-1-2	2	1-1-2-0-0-0-0-1	6	2-1-1-0-0-1-1-3

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
11 Nov 0959	WARNING: Geomagnetic K = 4	11/1000 - 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
18 Nov	70	5	2	02 Dec	69	5	2
19	70	8	3	03	69	5	2
20	70	15	4	04	69	5	2
21	70	20	5	05	69	5	2
22	70	18	5	06	69	5	2
23	70	10	3	07	69	5	2
24	70	8	3	08	69	5	2
25	70	8	3	09	70	5	2
26	69	8	3	10	70	5	2
27	69	5	2	11	70	5	2
28	69	5	2	12	70	5	2
29	69	5	2	13	70	6	2
30	69	5	2	14	70	5	2
01 Dec	69	5	2				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
11 Nov	0710	0711	0712	A1.1			

Region Summary

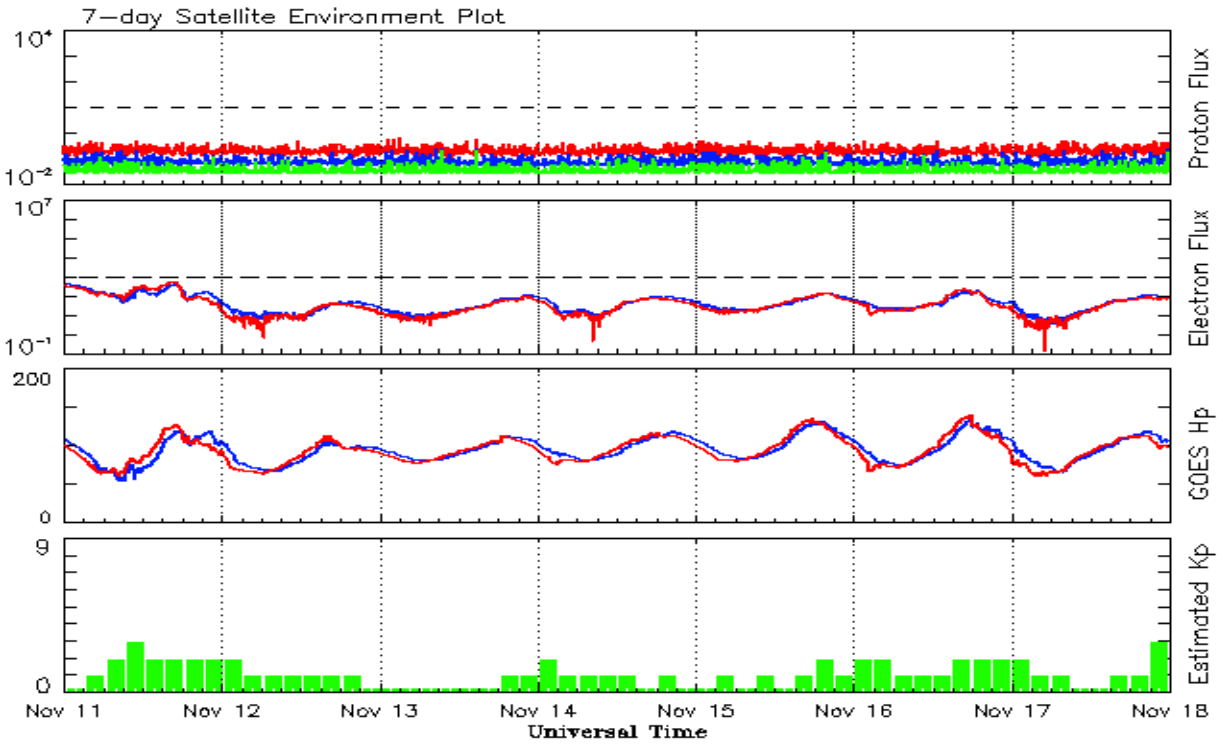
	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		Region 2752													
13 Nov	S23E56	286	plage												
14 Nov	S23E42	288	plage												
15 Nov	S23E28	289	plage												
16 Nov	S23E14	290	plage												
17 Nov	S23W00	291	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 291

Recent Solar Indices (preliminary)
Observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2017					
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	7.9	2.6	72.4	69.6	6	6.7
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	
October	1.8	0.2	0.11			67.4		8	

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 11 November 2019

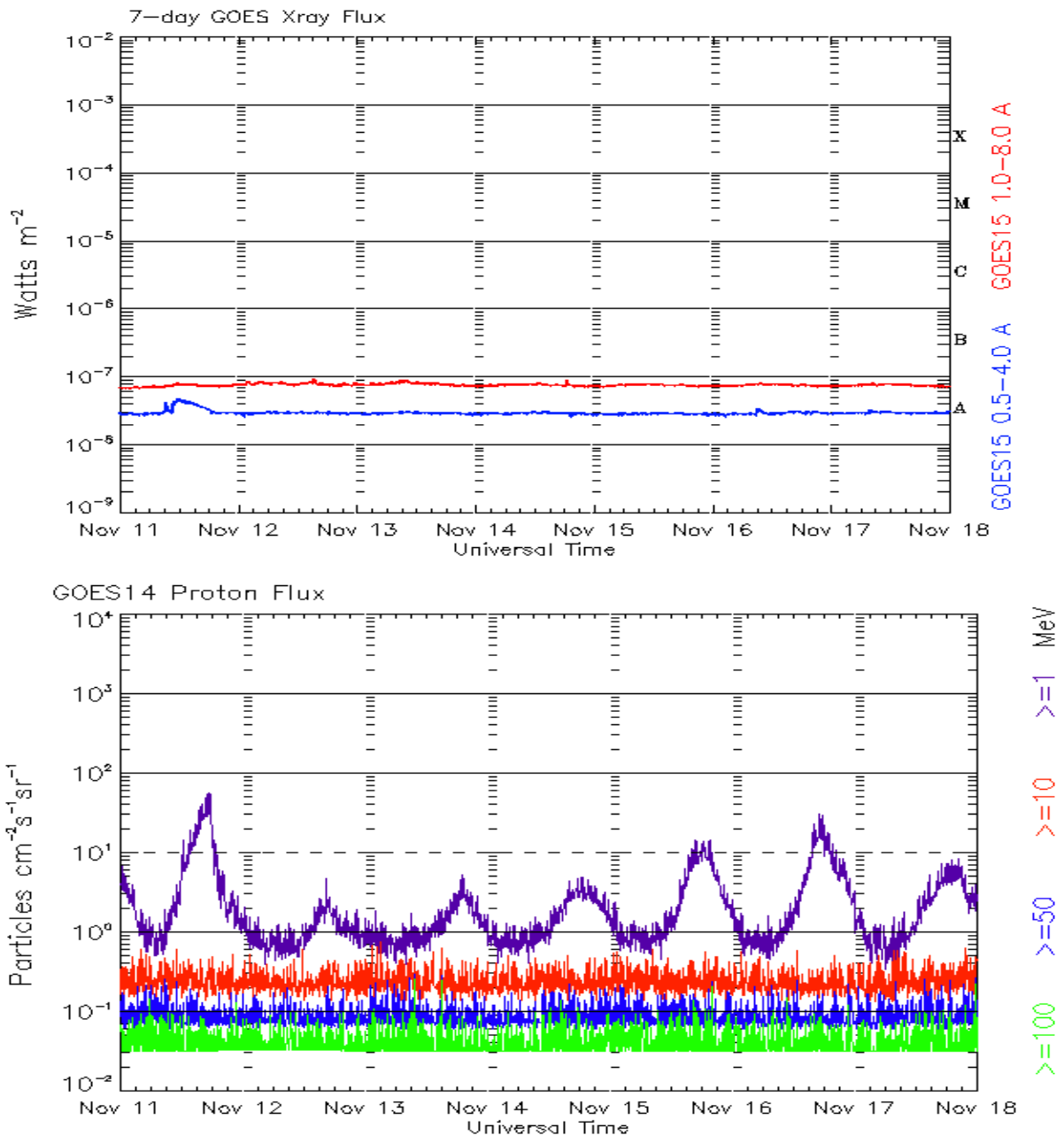
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm^2-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm^2-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 11 November 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 intergral 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)

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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

The Weekly has been published continuously since 1951 and is available online since 1997.

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