

Space Weather Highlights
10 December - 16 December 2018

SWPC PRF 2259
17 December 2018

Solar activity was very low throughout the period. Region 2731 (N13, L=023, class/area=Bxo/10 on 14 Dec) maintained sunspots for two days before decaying to plage and produced an isolated B1 flare at 15/1353 UTC. No Earth-directed CMEs were observed this period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels each day this period.

Geomagnetic field activity was quiet to unsettled on 10-11 Dec with quiet conditions observed throughout the remainder of the period.

Space Weather Outlook
17 December - 12 January 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 08-12 Jan with moderate flux levels expected on 17-21 Dec and 03-05 Jan. Normal levels are expected throughout the remainder of the outlook period.

Geomagnetic field activity is expected to reach active levels on 29 Dec and 04 Jan due to CH HSS effects. Quiet to unsettled or generally quiet conditions are expected throughout the remainder of the outlook period.



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	
10 December	71	0	0	A2.4	0	0	0	0	0	0	0	0	
11 December	71	11	10	A1.3	0	0	0	0	0	0	0	0	
12 December	71	0	0	A1.2	0	0	0	0	0	0	0	0	
13 December	70	0	0	A1.0	0	0	0	0	0	0	0	0	
14 December	71	12	10	A1.1	0	0	0	0	0	0	0	0	
15 December	71	12	10	A1.2	0	0	0	0	0	0	0	0	
16 December	70	0	0	A1.1	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
10 December		3.1e+06	1.6e+04	3.7e+03		3.1e+07
11 December		2.1e+06	1.6e+04	3.8e+03		9.4e+07
12 December		2.2e+06	1.7e+04	3.8e+03		1.3e+08
13 December		2.4e+06	1.6e+04	4.0e+03		1.0e+08
14 December		2.9e+06	1.7e+04	4.0e+03		1.0e+08
15 December		2.4e+06	1.7e+04	3.7e+03		7.6e+07
16 December		3.0e+06	1.7e+04	3.9e+03		7.0e+07

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
10 December	8	2-2-3-3-2-1-1-1	20	4-2-5-4-4-3-1-1	11	3-3-3-3-2-2-2-2
11 December	7	1-1-3-3-1-2-2-1	12	0-1-4-5-1-2-2-1	7	1-2-3-2-0-2-2-2
12 December	3	1-1-1-1-1-2-1-0	2	0-0-0-1-2-1-1-0	4	2-1-1-1-1-1-2-1
13 December	2	0-1-0-0-1-2-1-0	1	0-0-0-1-0-1-0-0	3	0-1-0-0-0-1-0-0
14 December	3	1-1-0-1-1-1-1-1	0	0-0-0-1-0-0-0-0	3	1-1-0-1-0-1-1-1
15 December	1	0-0-0-0-1-1-1-0	0	0-0-0-0-0-0-0-0	2	1-0-0-0-0-0-1-0
16 December	1	0-0-1-0-1-1-0-0	1	0-0-1-1-0-0-0-0	3	1-0-1-0-0-1-0-1

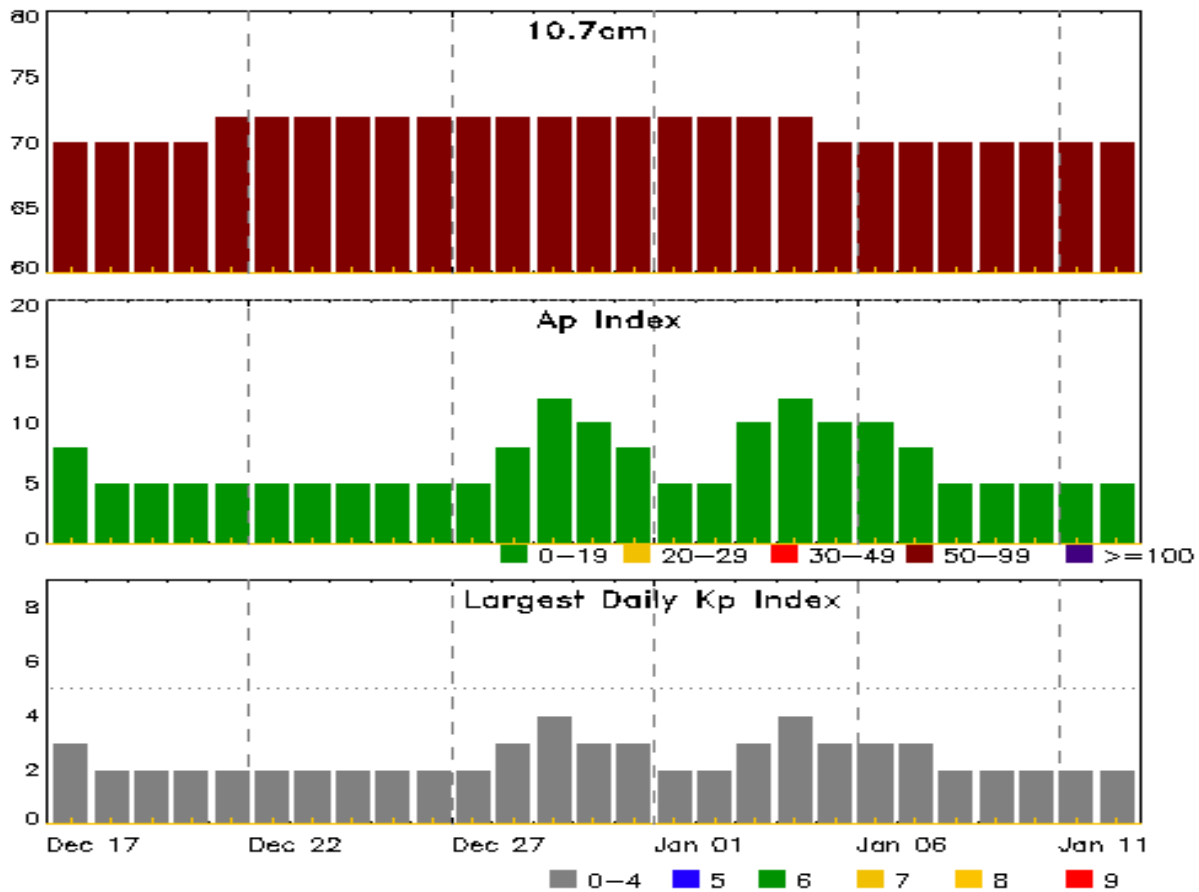


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
10 Dec 2026	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010
11 Dec 1300	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010
12 Dec 0931	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010
13 Dec 1208	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010
14 Dec 1305	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010
15 Dec 1352	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010
16 Dec 1416	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	10/2010



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
17 Dec	70	8	3	31 Dec	72	8	3
18	70	5	2	01 Jan	72	5	2
19	70	5	2	02	72	5	2
20	70	5	2	03	72	10	3
21	72	5	2	04	72	12	4
22	72	5	2	05	70	10	3
23	72	5	2	06	70	10	3
24	72	5	2	07	70	8	3
25	72	5	2	08	70	5	2
26	72	5	2	09	70	5	2
27	72	5	2	10	70	5	2
28	72	8	3	11	70	5	2
29	72	12	4	12	70	5	2
30	72	10	3				

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 #
11 Dec	0854	0900	0904	A3.1			
15 Dec	1349	1353	1358	B1.0			2731



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

Region 2729

05 Dec	S05W38	228	30	4	Cro	6	B								
06 Dec	S05W51	229	50	6	Cro	7	B								
07 Dec	S05W67	232	50	7	Bxo	6	B								
08 Dec	S05W80	231	10	6	Bxo	2	B								
09 Dec	S05W93	231	10	6	Bxo	2	B								
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 228

Region 2730

11 Dec	N08E17	94	10	2	Axx	1	A								
12 Dec	N09E03	94	plage												
13 Dec	N09W15	101	plage												
14 Dec	N09W29	101	plage												
15 Dec	N09W43	102	plage												
16 Dec	N09W57	103	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 94

Region 2731

14 Dec	N13E49	23	10	5	Bxo	2	B								
15 Dec	N13E35	24	10	1	Axx	2	A								
16 Dec	N13E21	25	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 25

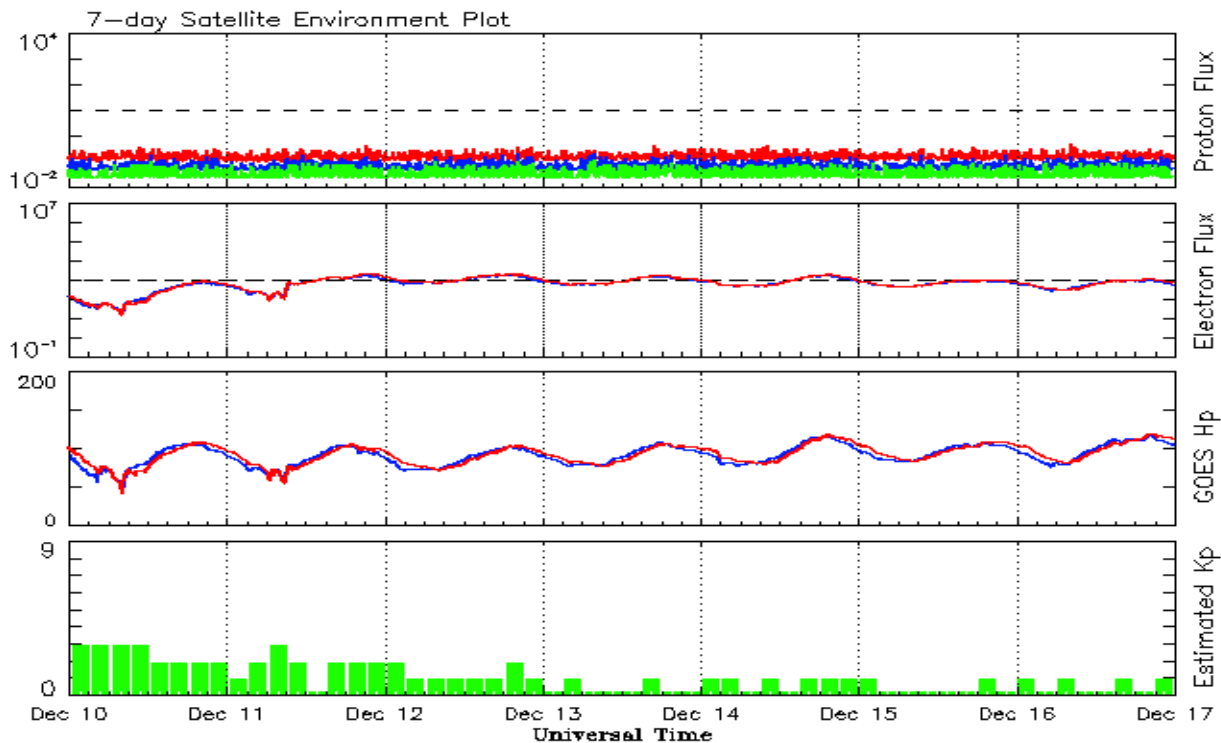


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2016									
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
2017									
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.4	74.6	78.6	15	11.5
April	30.4	19.4	0.64	24.3	14.9	80.9	78.4	13	11.5
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			72.5		7	
July	1.3	1.0	0.77			69.7		6	
August	10.0	5.3	0.53			69.1		10	
September	5.7	2.0	0.35			68.3		9	
October	6.9	2.9	0.42			69.5		7	
November	7.3	3.5	0.48			68.9		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 10 December 2018*

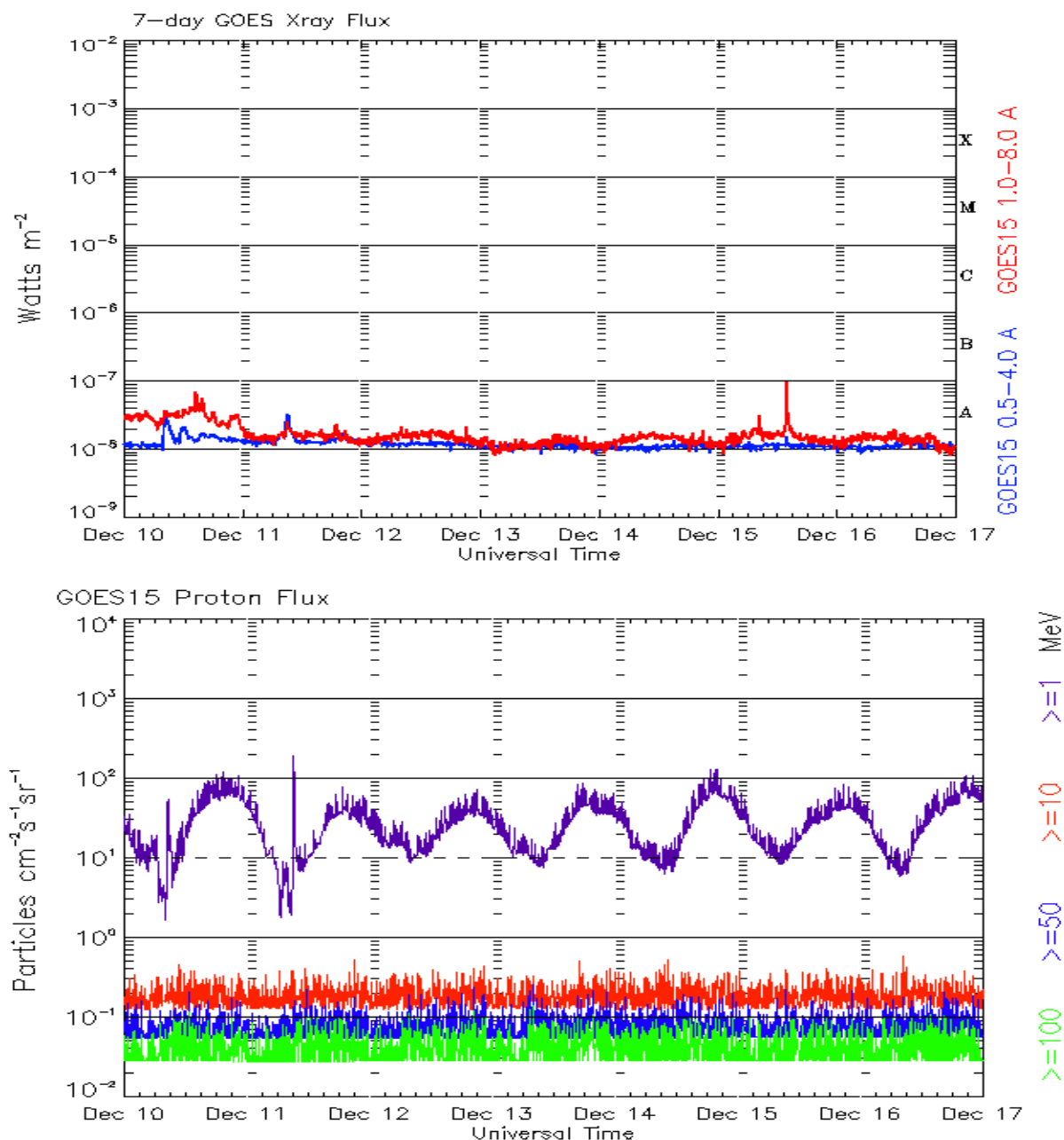
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 10 December 2018*

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.



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

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