

Space Weather Highlights
13 November - 19 November 2017

SWPC PRF 2203
20 November 2017

Solar activity was at very low levels throughout the period. Several B-class flares were observed from Region 2687 (S08, L=180, class/area Cao/090 on 16 Nov). The largest was a B7 flare at 13/0648 UTC. No Earth-directed coronal mass ejections were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached moderate levels on 16 Nov and high levels on 13-15 and 17-19 Nov. The largest flux of the period was 20,582 pfu observed at 13/1455 UTC.

Geomagnetic field activity ranged from quiet to active levels. The period began with solar wind speed between 370-430 km/s and total field between 2-9 nT. A prolonged period of -Bz reaching -7 nT was observed between 14/1322-2256 UTC. The geomagnetic field responded with quiet levels on 13 Nov and quiet to unsettled levels on 14 Nov. By 15 Nov, total field increased to a maximum of 15 nT at 15/1858 UTC while the Bz component deflected southward to a maximum of -9 nT at 16/0100 UTC. Solar wind speed increased to around 520 km/s late on 15 Nov through 16 Nov as a positive polarity coronal hole high speed stream (CH HSS) became geoeffective. By 16/0900 UTC, total field decreased to 5 nT while solar wind speed began decreasing early on 17 Nov. The period ended at nominal levels with solar wind speed near 380 km/s. The geomagnetic field responded with quiet to active levels on 15-16 Nov, quiet to unsettled levels on 17 and 19 Nov, and quiet levels on 18 Nov.

Space Weather Outlook
20 November - 16 December 2017

Solar activity is expected to be at very low levels throughout the 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 22-25 Nov, 05-10 Dec and 12-16 Dec due to recurrent CH HSS influences.

Geomagnetic field activity is expected to be at unsettled to active levels on 20-23 Nov, 29-30 Nov, 04-08 Dec and 11-14 Dec with G1 (Minor) geomagnetic storm levels likely on 04-07 Dec and G2 (Moderate) levels likely on 04-05 Dec due to recurrent CH HSS effects.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
13 November	72	0	0	A6.9	0	0	0	0	0	0	0	0
14 November	74	14	50	A6.7	0	0	0	3	0	0	0	0
15 November	74	14	90	A6.5	0	0	0	0	0	0	0	0
16 November	73	15	90	A5.9	0	0	0	0	0	0	0	0
17 November	76	26	70	A6.3	0	0	0	0	0	0	0	0
18 November	76	14	30	A6.0	0	0	0	0	0	0	0	0
19 November	74	0	0	A5.7	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
	13 November		1.1e+07	1.5e+04	3.4e+03	
14 November		1.1e+07	1.5e+04	3.7e+03		2.3e+08
15 November		4.9e+07	1.6e+04	3.6e+03		1.1e+08
16 November		3.4e+07	1.6e+04	3.5e+03		3.5e+07
17 November		3.6e+07	1.6e+04	3.6e+03		8.7e+07
18 November		2.8e+06	1.5e+04	3.8e+03		8.3e+07
19 November		2.7e+06	1.6e+04	3.9e+03		4.9e+07

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	13 November	6	2-2-2-2-1-2-1-1	9	0-1-2-4-3-3-1-0	6
14 November	8	3-3-2-2-1-2-1-2	18	1-1-4-5-3-4-3-2	11	3-3-3-2-1-3-2-3
15 November	11	1-3-3-3-2-3-2-2	27	1-2-5-6-3-5-2-2	14	2-3-3-4-2-4-3-2
16 November	11	4-3-3-2-2-1-1-2	15	2-3-4-5-2-1-1-2	14	4-4-3-2-1-1-2-3
17 November	5	2-2-2-2-1-1-0-1	19	1-2-4-6-4-1-0-1	6	1-2-2-3-2-0-0-1
18 November	5	2-1-2-2-1-1-1-1	13	0-1-5-4-3-2-1-0	6	2-2-2-2-2-1-1-2
19 November	5	1-2-3-1-1-0-1-1	2	0-1-2-1-0-0-0-0	5	1-2-3-1-0-0-1-1

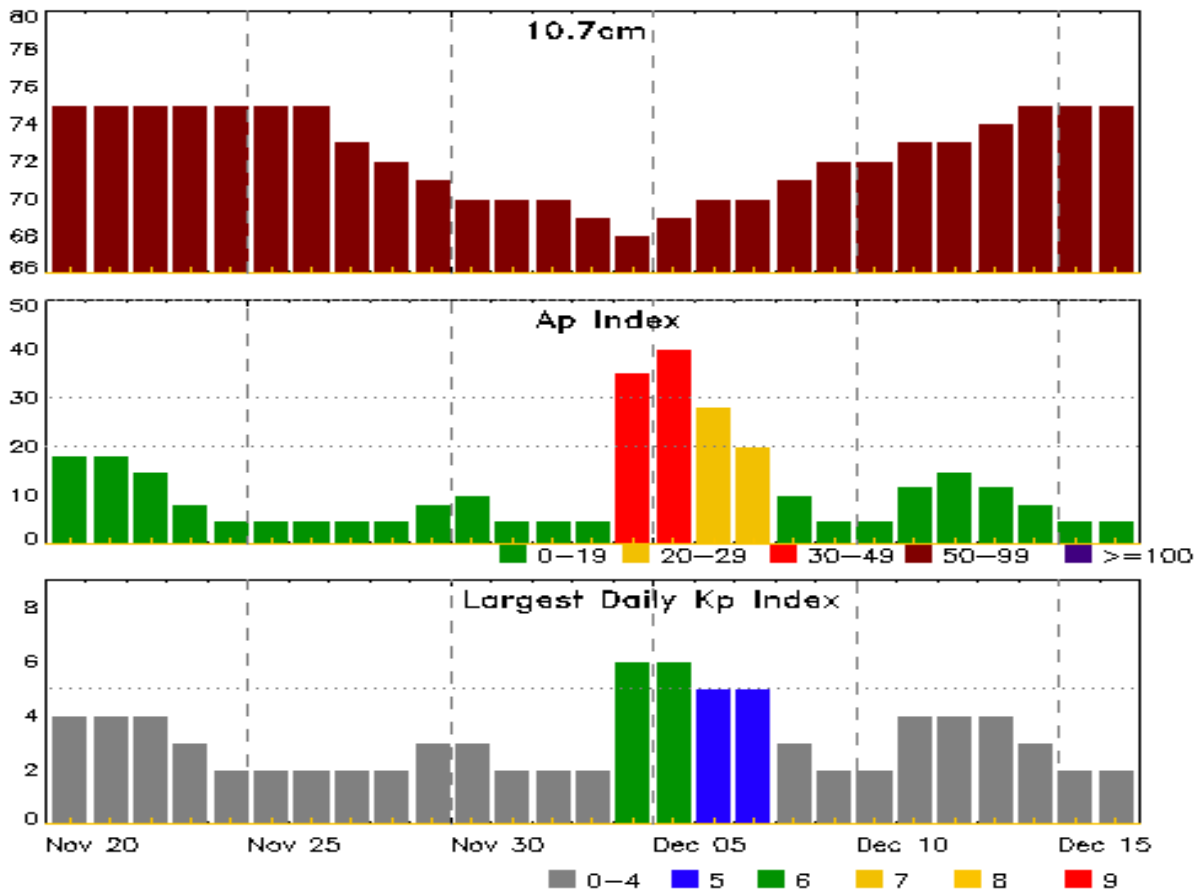


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
13 Nov 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	08/1100
14 Nov 0606	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	08/1100
14 Nov 1602	WARNING: Geomagnetic K = 4	14/1603 - 2100
15 Nov 0905	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	08/1100
15 Nov 1111	WARNING: Geomagnetic K = 4	15/1110 - 1500
15 Nov 1201	ALERT: Geomagnetic K = 4	15/1159
15 Nov 1610	WARNING: Geomagnetic K = 4	15/1610 - 2100
15 Nov 1800	ALERT: Geomagnetic K = 4	15/1759
15 Nov 2050	EXTENDED WARNING: Geomagnetic K = 4	15/1610 - 16/0300
16 Nov 0255	EXTENDED WARNING: Geomagnetic K = 4	15/1610 - 16/1200
16 Nov 0501	WARNING: Geomagnetic K = 5	16/0500 - 1200
17 Nov 1207	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	17/1150
18 Nov 1136	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	17/1150
19 Nov 1316	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	17/1150



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
20 Nov	75	18	4	04 Dec	68	35	6
21	75	18	4	05	69	40	6
22	75	15	4	06	70	28	5
23	75	8	3	07	70	20	5
24	75	5	2	08	71	10	3
25	75	5	2	09	72	5	2
26	75	5	2	10	72	5	2
27	73	5	2	11	73	12	4
28	72	5	2	12	73	15	4
29	71	8	3	13	74	12	4
30	70	10	3	14	75	8	3
01 Dec	70	5	2	15	75	5	2
02	70	5	2	16	75	5	2
03	69	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class	Optical			Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD		
13 Nov	0639	0648	0652	B7.5				
13 Nov	0758	0804	0809	B2.4				
13 Nov	1034	1042	1047	B1.3				
14 Nov	0556	0558	0601		SF	S09E75		
14 Nov	0640	0645	0647		SF	S09E75		
14 Nov	0730	0730	0736		SF	S09E73		
14 Nov	1009	1012	1015	B1.4				2687
16 Nov	1302	1306	1310	B3.7				2687
16 Nov	1854	1857	1859	B1.0				2687
17 Nov	0021	0028	0030	B6.2				2687
18 Nov	1748	1753	1758	B1.1				2687



Region Summary

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

Region 2687

14 Nov	S08E64	181	50	7	Cao	4	B										
15 Nov	S07E55	177	90	8	Cao	4	B										
16 Nov	S08E39	180	90	12	Cao	5	B										
17 Nov	S08E31	175	60	4	Hax	4	A										
18 Nov	S09E18	175	30	2	Hrx	4	A										
19 Nov	S09E04	175	plage														
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 175

Region 2688

17 Nov	N11W32	238	10	4	Bxo	2	B										
18 Nov	N11W45	238	plage														
19 Nov	N11W59	238	plage														
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 238

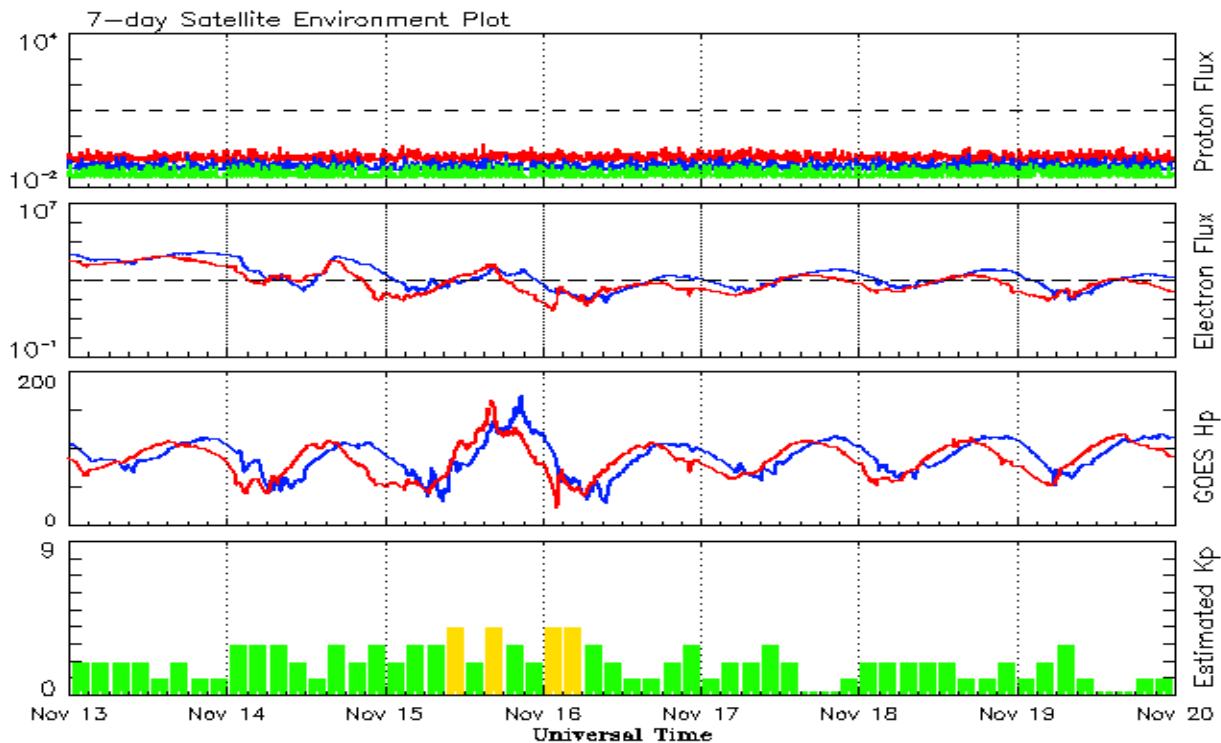


**Recent Solar Indices (preliminary)
Observed monthly mean values**

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
2015									
November	61.8	37.3	0.61	59.0	36.7	109.6	105.3	13	12.5
December	54.1	34.8	0.64	55.1	34.7	112.8	102.5	15	12.5
2016									
January	50.4	34.2	0.67	51.4	32.6	103.5	99.9	10	12.3
February	56.0	33.8	0.61	49.6	31.5	103.5	98.1	10	12.0
March	40.9	32.5	0.80	47.7	30.2	91.6	96.6	11	11.8
April	39.2	22.7	0.58	45.0	28.7	93.4	95.3	10	11.8
May	48.9	30.9	0.64	42.1	26.9	93.1	93.2	12	11.7
June	19.3	12.3	0.65	39.0	24.9	81.9	90.4	9	11.4
July	36.8	19.4	0.53	36.5	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
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	15.5	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			73.5		9	
June	18.0	11.5	0.64			74.8		7	
July	18.8	11.0	0.59			77.7		9	
August	25.0	19.9	0.80			77.9		12	
September	42.2	26.2	0.62			92.0		19	
October	16.0	7.9	0.49			76.4		11	

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 13 November 2017*

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.

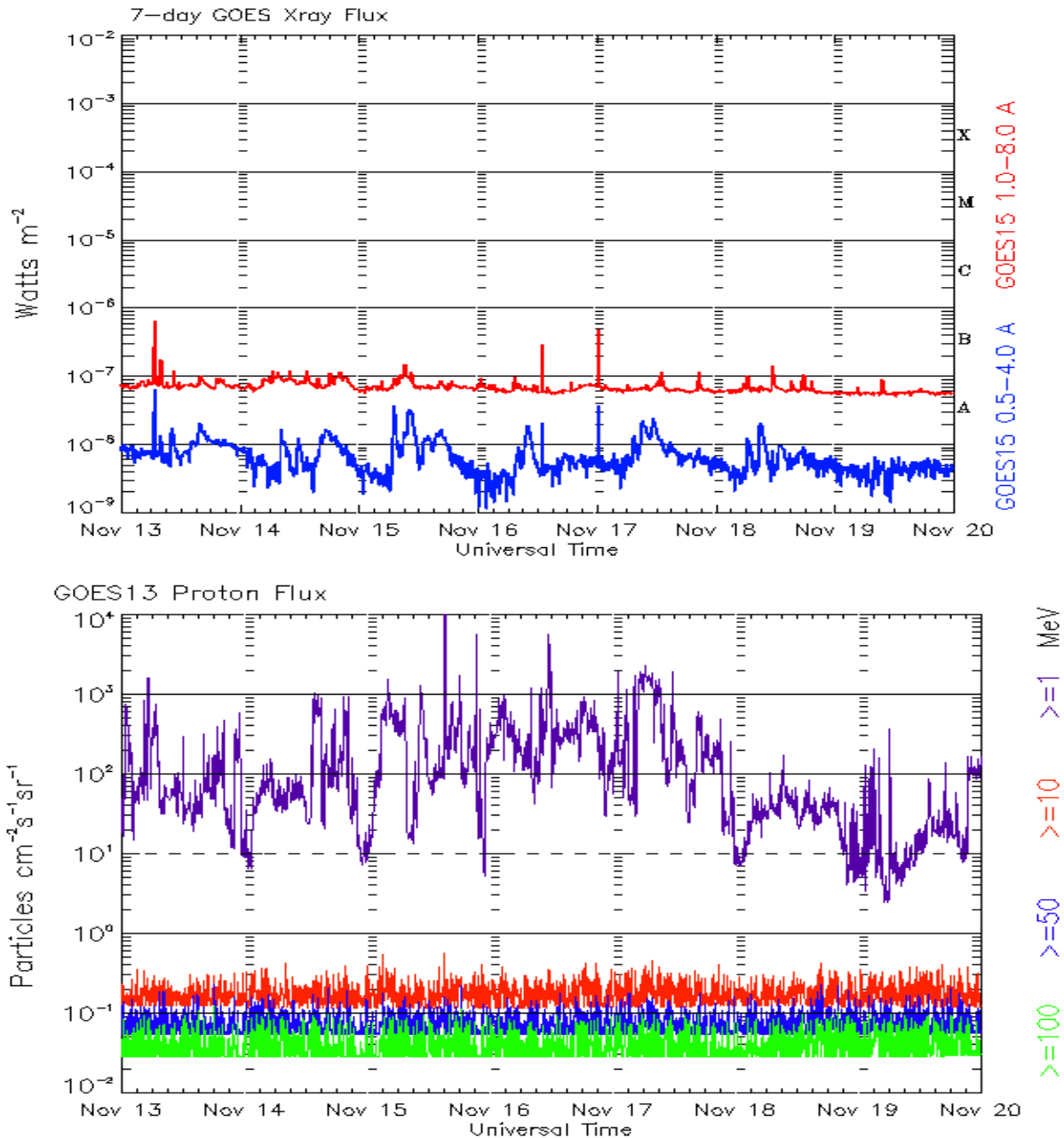
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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.

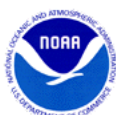




*Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 13 November 2017*

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 intergral 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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