

Space Weather Highlights
17 September - 23 September 2018

SWPC PRF 2247
24 September 2018

Solar activity was at very low levels this period. There were no numbered spot regions and no Earth-directed CMEs observed in available satellite imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reach high levels on 17 - 23 Sep, with a peak flux of 34,900 pfu observed at 17/0005 UTC.

Geomagnetic field activity was at quiet to unsettled levels from 17 - 19 Sep due to effects from a negative polarity coronal hole high speed stream (CH HSS). Wind speeds began the period on 17 Sep near 370 km/s, but increased to over 500 km/s following the onset of the CH HSS, seeing a peak speed near 587 km/s. Total field strength reached 12 nT while the Bz component saw isolated southward deflections to near -7 nT. Conditions returned to quiet levels on 20 Sep and most of 21 Sep, until the last synoptic period, when a SSBC ahead of a positive polarity CH HSS, increased activity to G1 Minor storm levels. The enhanced conditions continued into 22 Sep, with G1 storm levels reached the first period, and unsettled to active conditions continuing throughout the day. Wind speeds took a while to increase, but along with the SSBC from negative to positive, a CIR enhanced the mag field, increasing total field strength to approximately 11 nT and dropped the Bz component to near -11 nT. Wind speeds eventually increased to reach a peak of 574 km/s late on 22 Sep. By 23 Sep, conditions remained slightly enhanced, with active levels occurring the first synoptic period of the day, but were beginning to subside. Quiet to unsettled conditions returned for the remainder of the day as CH HSS influence continued to wane.

Space Weather Outlook
24 September - 20 October 2018

Solar activity is expected to be at very low levels throughout the outlook period, with a slight chance for C-class flare activity.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels through the period. Moderate levels are expected from 06 - 08 Oct. High levels are expected from 24 Sep - 05 Oct, and 09 - 20 Oct.

Geomagnetic field activity is expected to be at G1 (Minor) geomagnetic storm levels on 7, 8, 10, and 19 Oct due to recurrent positive polarity coronal hole high speed streams (CH HSSs). There is a chance for G2 storm levels on 8 Oct as well. Active levels are expected on 24 Sep, and 2, 10, and 20 Oct from the influence of the recurrent CH HSSs as well. Field activity is expected to be at quiet to unsettled levels 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
17 September	68	0	0	A0.0	0	0	0	0	0	0	0	0
18 September	68	0	0	A0.0	0	0	0	0	0	0	0	0
19 September	68	0	0	A0.0	0	0	0	0	0	0	0	0
20 September	67	0	0	A0.0	0	0	0	0	0	0	0	0
21 September	67	0	0	A0.0	0	0	0	0	0	0	0	0
22 September	68	0	0	A0.0	0	0	0	0	0	0	0	0
23 September	68	0	0	A0.0	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
17 September		1.2e+06	1.7e+04	3.5e+03	5.0e+08	
18 September		1.2e+06	1.7e+04	3.5e+03	2.7e+08	
19 September		1.1e+06	1.7e+04	3.5e+03	4.0e+08	
20 September		1.1e+06	1.7e+04	3.5e+03	4.4e+08	
21 September		2.0e+06	1.6e+04	3.6e+03	4.3e+08	
22 September		1.9e+06	1.6e+04	3.3e+03	7.9e+07	
23 September		5.4e+05	1.5e+04	3.4e+03	2.6e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
17 September	9	3-2-2-2-2-2-3	8	2-3-3-2-2-2-1-1	11	3-3-2-2-2-2-3-3
18 September	5	2-1-2-2-1-1-1-1	12	2-1-3-5-3-1-1-1	6	3-2-2-2-1-1-1-1
19 September	4	1-2-2-1-1-1-1-0	4	1-1-3-2-0-0-0-0	4	1-3-2-1-0-1-0-0
20 September	2	1-0-0-1-1-0-1-0	1	1-0-0-1-0-0-0-0	2	1-0-0-1-1-0-0-0
21 September	6	0-1-0-1-1-1-2-4	3	0-1-0-0-2-1-1-2	9	1-1-1-1-1-1-2-5
22 September	20	4-3-3-4-4-2-3-4	30	5-2-0-0-6-3-3-3	27	5-4-3-4-4-3-4-4
23 September	9	3-2-2-3-2-1-2-2	24	3-4-4-5-5-3-2-1	22	4-3-2-3-3-2-2-2

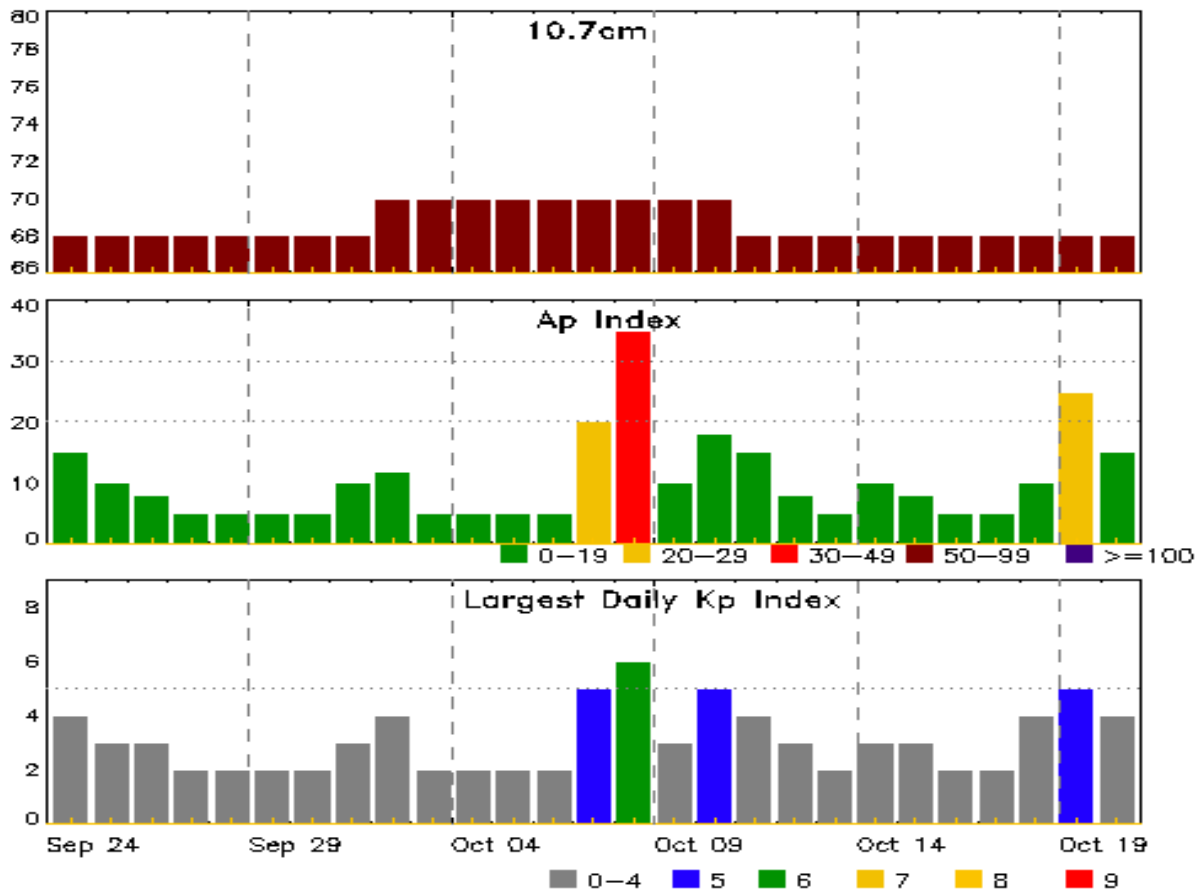


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
17 Sep 0321	WARNING: Geomagnetic K = 4	17/0320 - 1200
17 Sep 1424	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730
18 Sep 1036	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730
19 Sep 0901	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730
20 Sep 0900	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730
20 Sep 1543	WATCH: Geomagnetic Storm Category G1 predicted	
21 Sep 0900	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730
21 Sep 2333	WARNING: Geomagnetic K = 4	21/2335 - 22/1200
21 Sep 2344	ALERT: Geomagnetic K = 4	21/2345
21 Sep 2356	WARNING: Geomagnetic K = 5	21/2355 - 22/0900
22 Sep 0001	ALERT: Geomagnetic K = 5	21/2359
22 Sep 0245	ALERT: Geomagnetic K = 5	22/0245
22 Sep 1155	EXTENDED WARNING: Geomagnetic K = 4	21/2335 - 22/2359
22 Sep 1551	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730
22 Sep 2354	EXTENDED WARNING: Geomagnetic K = 4	21/2335 - 23/1200
23 Sep 0915	CANCELLATION: Geomagnetic Storm Category G1 predicted	
23 Sep 0942	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1730



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
24 Sep	68	15	4	08 Oct	70	35	6
25	68	10	3	09	70	10	3
26	68	8	3	10	70	18	5
27	68	5	2	11	68	15	4
28	68	5	2	12	68	8	3
29	68	5	2	13	68	5	2
30	68	5	2	14	68	10	3
01 Oct	68	10	3	15	68	8	3
02	70	12	4	16	68	5	2
03	70	5	2	17	68	5	2
04	70	5	2	18	68	10	4
05	70	5	2	19	68	25	5
06	70	5	2	20	68	15	4
07	70	20	5				

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 Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #

No Flares Observed



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
		<i>Region 2722</i>													
11 Sep	S07E17	215	10	5	Bxo	4	B								
12 Sep	S07E01	218	0		Axx	1	A								
13 Sep	S07W14	220	plage												
14 Sep	S07W28	220	plage												
15 Sep	S07W41	220	plage												
16 Sep	S07W54	220	plage												
17 Sep	S07W69	222	plage												
18 Sep	S07W84	224	plage												
19 Sep	S07W99	225	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 218

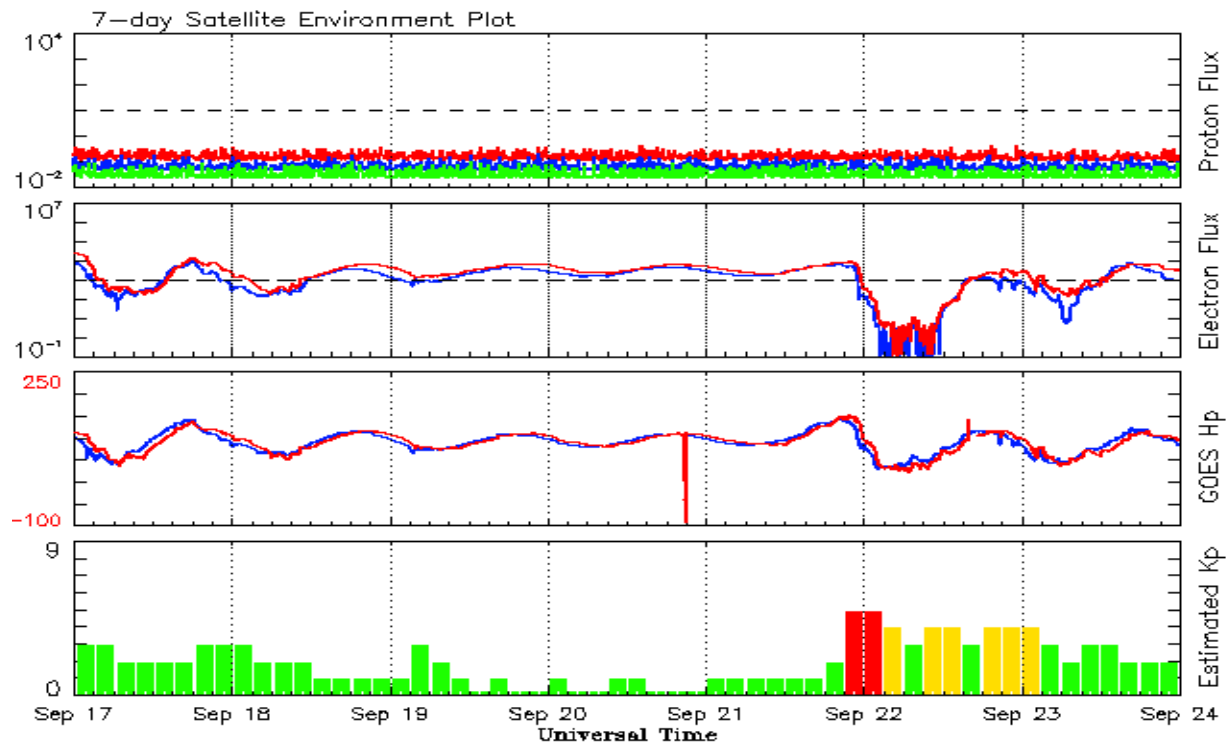


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2016									
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	15.4	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	8.6	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			68.4		8	
April	7.0	5.3	0.76			70.0		7	
May	15.0	7.9	0.53			70.9		8	
June	19.7	9.5	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	

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 17 September 2018*

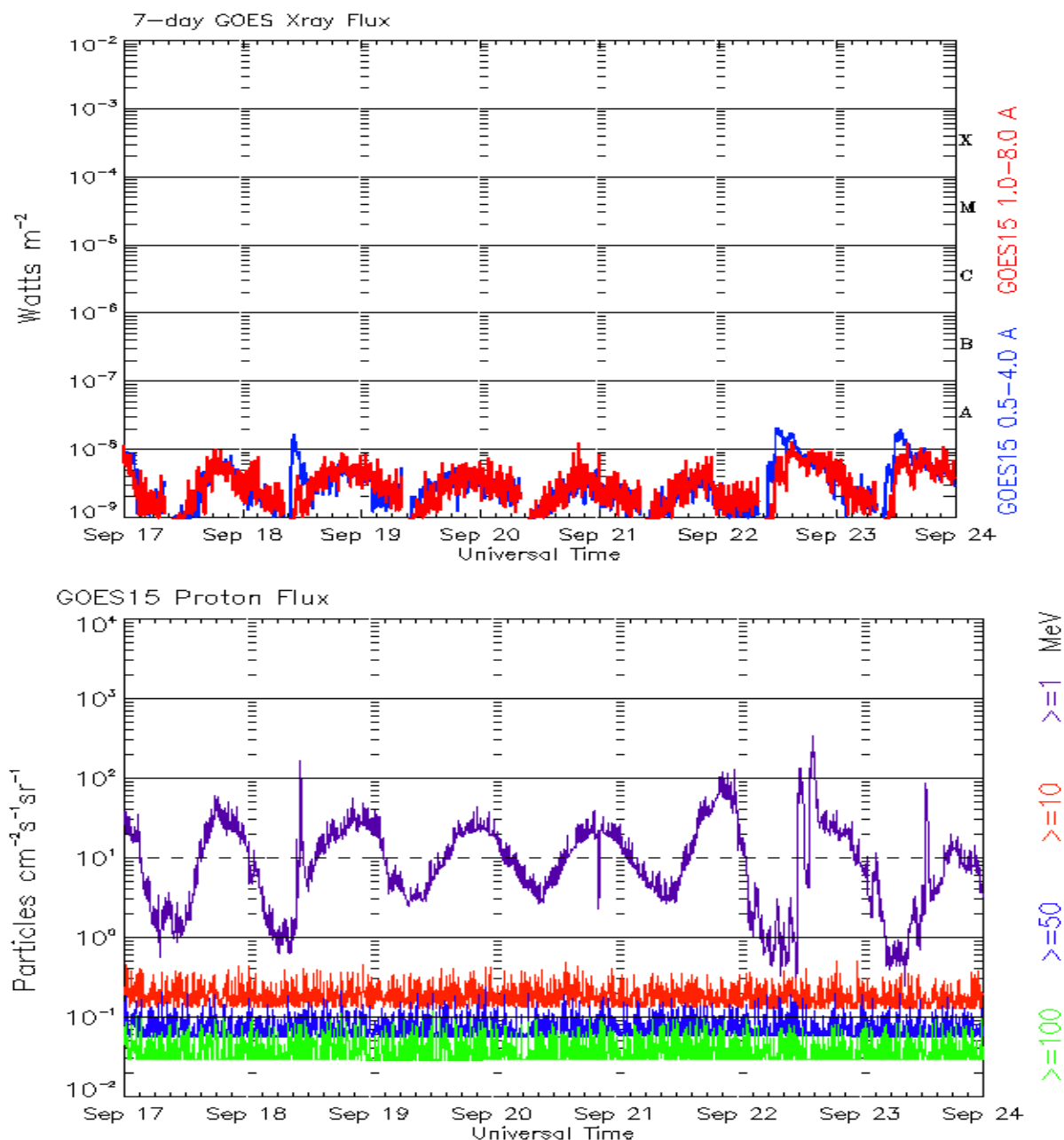
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 17 September 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

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

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