

**Space Weather Highlights**  
**06 May - 12 May 2019**

**SWPC PRF 2280**  
**13 May 2019**

Solar activity was at low levels on 06, 07, and 09 May due to C-class flare activity from Region 2740 (N08, L=307 class/area Dho/280 on 05 May. The largest of the flares was a C9.9/1N at 06/0510 UTC. Multiple eruptions were observed in coronagraph imagery, but only the halo CME from 06 May was geoeffective. The asymmetric halo CME was first observed in SOHO LASCO C2 imagery at 06/2348 UTC. Additionally, a partial halo CME was first observed in LASCO C2 imagery at 12/2036 UTC and is determined to be Earth-directed and arrive at Earth on 17 May. Solar activity was at very low levels for the remainder of the summary period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 07, 11, and 12 May. Normal to moderate levels were observed throughout the remainder of the period.

Geomagnetic field activity reached active to G1 (Minor) storm levels on 11 May due to the arrival of a CME from 06 May. Impact was first observed by the DSCOVR spacecraft at 10/1655 UTC. Total reached a peak of 12 nT and Bz reached a maximum southward deflection of -11 nT. Solar wind averaged near 350 km/s throughout transient passage. G1 (Minor) storm levels were observed during the 11/00-03 UTC synoptic period, with several active periods during the remainder of the UT day. Quiet to unsettled levels were observed for the remainder of the period.

**Space Weather Outlook**  
**13 May - 08 June 2019**

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

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 on 13-23 May, and 29 May - 08 June. Normal to moderate levels are expected on 24-28 May.

Geomagnetic field activity is expected to reach G1 (Minor) storm levels on 15 and 17 May due to CME arrival. Active conditions are expected on 29 May due to the influence of a recurrent coronal hole high speed stream. Quiet to unsettled conditions are expected for the remainder of the period.



### *Daily Solar Data*

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux			Flares						
							X-ray			Optical			
				C	M	X	S	1	2	3	4		
06 May	76	25	300	B1.4	7	0	0	10	1	0	0	0	
07 May	79	27	410	B1.2	2	0	0	6	1	0	0	0	
08 May	75	24	320	B1.0	0	0	0	0	0	0	0	0	
09 May	76	25	280	A9.4	1	0	0	2	0	0	0	0	
10 May	76	24	270	A9.3	0	0	0	0	0	0	0	0	
11 May	78	26	260	B1.0	0	0	0	0	0	0	0	0	
12 May	76	24	280	A9.9	0	0	0	0	0	0	0	0	

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
	06 May	8.6e+05	1.9e+04	3.6e+03	3.2e+07	
07 May	8.3e+05	1.8e+04	3.8e+03	3.0e+07		
08 May	8.3e+05	1.8e+04	3.7e+03	3.1e+07		
09 May	7.6e+05	1.9e+04	3.5e+03	6.5e+06		
10 May	9.0e+05	1.8e+04	3.4e+03	7.6e+06		
11 May	7.7e+05	1.7e+04	3.2e+03	8.9e+07		
12 May	9.4e+05	1.8e+04	3.6e+03	5.0e+08		

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 May	5	1-0-0-2-3-2-2-1	5	1-1-0-3-2-2-1-1	5
07 May	5	1-2-1-1-2-2-2-1	4	2-2-1-0-2-1-1-1	5	2-2-1-1-1-1-2-1
08 May	2	0-1-0-0-2-1-1-1	1	1-1-0-0-0-0-0-1	3	0-1-0-0-1-0-0-1
09 May	8	1-2-3-2-2-2-2-2	7	2-2-3-3-1-0-1-1	7	1-2-3-2-1-1-2-2
10 May	7	1-2-1-1-1-2-3-3	5	2-1-2-2-0-2-2-1	7	2-2-1-1-1-2-3-3
11 May	19	4-4-4-4-3-2-2-3	63	5-4-6-7-7-5-3-2	25	5-4-4-4-4-2-3-4
12 May	5	2-1-2-1-1-1-1-2	4	2-1-2-2-0-0-1-1	7	2-1-1-0-0-0-1-2

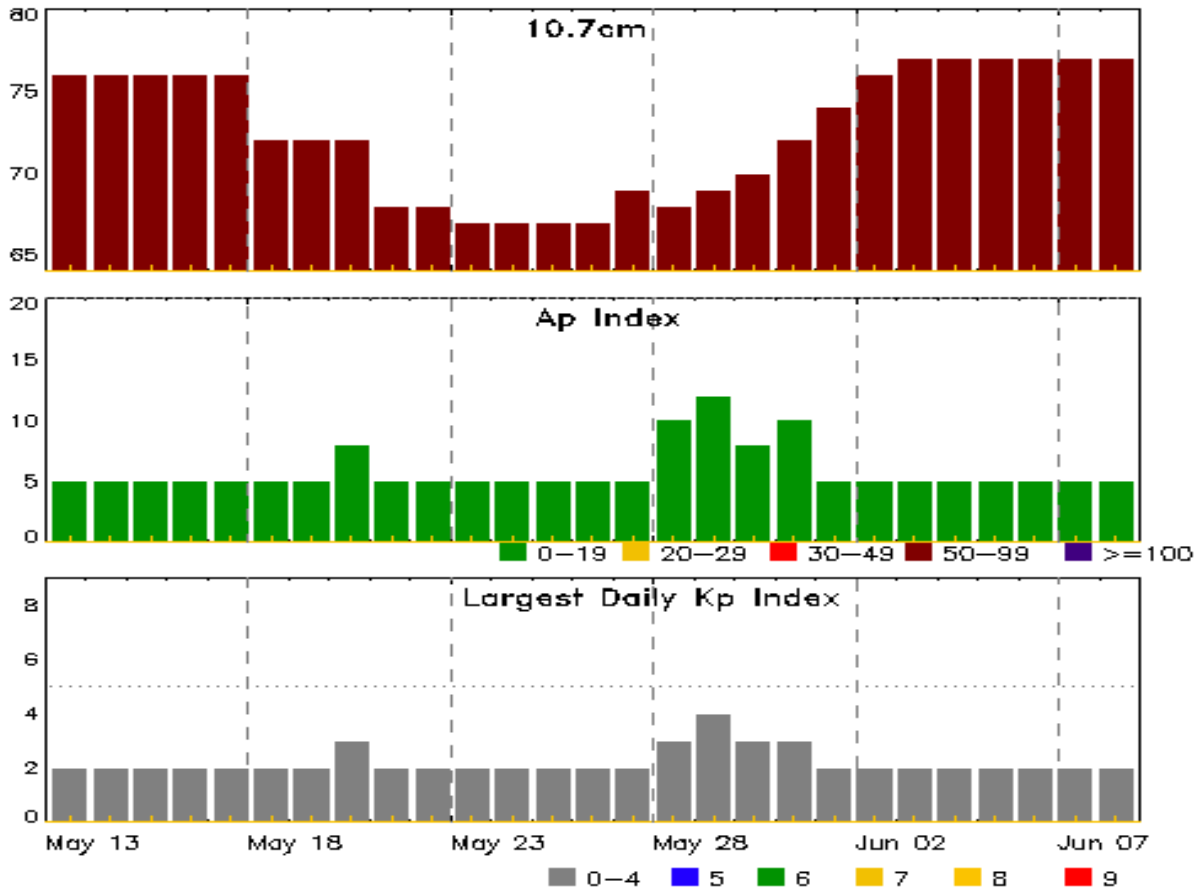


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
06 May 0543	ALERT: Type II Radio Emission	06/0511
07 May 1854	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	07/1835
11 May 0152	WARNING: Geomagnetic K = 4	11/0152 - 0600
11 May 0201	ALERT: Geomagnetic K = 4	11/0200
11 May 0218	WARNING: Geomagnetic K = 5	11/0218 - 0600
11 May 0223	ALERT: Geomagnetic K = 5	11/0220
11 May 0544	EXTENDED WARNING: Geomagnetic K = 4	11/0152 - 1500
11 May 1244	EXTENDED WARNING: Geomagnetic K = 4	11/0152 - 2100
11 May 1248	WARNING: Geomagnetic K = 5	11/1250 - 1800
11 May 1642	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625
11 May 2055	EXTENDED WARNING: Geomagnetic K = 4	11/0152 - 12/0600
12 May 0900	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625
12 May 1412	WATCH: Geomagnetic Storm Category G1 predicted	



## 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
13 May	76	5	2	27 May	69	5	2
14	76	5	2	28	68	10	3
15	76	5	2	29	69	12	4
16	76	5	2	30	70	8	3
17	76	5	2	31	72	10	3
18	72	5	2	01 Jun	74	5	2
19	72	5	2	02	76	5	2
20	72	8	3	03	77	5	2
21	68	5	2	04	77	5	2
22	68	5	2	05	77	5	2
23	67	5	2	06	77	5	2
24	67	5	2	07	77	5	2
25	67	5	2	08	77	5	2
26	67	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 245	Radio Flux 2695	Intensity II

**No Events Observed**

## *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
06 May	0045	0049	0053	B2.6			2740
06 May	0504	0510	0512	C9.9	1N	N08E49	2740
06 May	0723	0741	0754	C1.7	SF	N10E51	2740
06 May	0835	0846	0858	C2.0	SF	N09E47	2740
06 May	0900	0905	0913		SF	N09E47	2740
06 May	0928	0932	A0946		SF	N09E46	2740
06 May	0955	1002	1005	C1.5			2740
06 May	1144	1151	1157	B2.5			2740
06 May	1335	1354	1357	C7.3	SN	N08E45	2740
06 May	1745	1749	1752	C1.0	SF	N08E44	2740
06 May	1833	1837	1841	B2.9	SF	N08E43	2740
06 May	1914	1917	1919	B2.8	SF	N08E43	2740
06 May	1927	1930	1932	B3.0	SF	N08E43	2740
06 May	1941	1950	1952	C1.0	SF	N08E43	2740
06 May	2012	2015	2017	B2.5			2740
06 May	2039	2043	2045	B3.4			2740
06 May	2216	2231	2239	B4.8			2740
06 May	2310	2313	2316	B7.6			2740
06 May	2350	2353	2355	B3.4			2740
07 May	0138	0145	0148	B6.5	SF	N09E46	2740
07 May	0343	0347	0352	B2.4	SF	N09E46	2740
07 May	0452	0457	0500	B3.4			2740
07 May	0718	0725	0727	B3.1	SF	N09E46	2740
07 May	0837	0841	0844	B2.0	SF	N09E46	2740
07 May	0918	0923	0925	B5.0			2740
07 May	0929	0935	0939	B8.0			2740
07 May	0951	1048	1058	C1.2	SF	N08E53	2740
07 May	B1118	U1156	A1213	C1.4	1F	N08E53	2740
07 May	1330	1333	1338	B3.2	SF	N08E53	2740
08 May	2121	2129	2137	B1.9			2740
09 May	0540	0551	0556	C6.7	SF	N09E13	2740



### *Flare List*

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
09 May	B0610	0616	0626		SF	N07E26	2740
10 May	0839	0847	0856	B2.0			2741
10 May	1729	1734	1740	B2.2			2741
10 May	1826	1842	1848	B2.2			2740



## Region Summary

Date	Location		Sunspot Characteristics					Flares															
	Lat CMD	Lon	Helio 10 <sup>-6</sup> hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
<b>Region 2740</b>																							
03 May	N12E80	307	260	4	Hhx	1	A	1															
04 May	N09E67	307	270	4	Hhx	2	A	1				1											
05 May	N08E54	307	280	4	Dho	4	BD					5											
06 May	N07E40	308	200	3	Cso	4	BD	7				10	1										
07 May	N08E28	306	240	5	Cso	6	B	2				6	1										
08 May	N08E14	307	160	4	Cao	3	B																
09 May	N08W00	307	120	3	Cao	4	B	1				2											
10 May	N08W13	308	110	3	Hax	3	A																
11 May	N08W27	308	100	3	Hax	3	A																
12 May	N08W40	308	70	3	Hax	2	A																
								12	0	0	24	2	0	0	0	0							

Still on Disk.

Absolute heliographic longitude: 307

### Region 2741

06 May	N05E81	267	100	2	Hsx	1	A														
07 May	N05E66	268	170	2	Hsx	1	A														
08 May	N05E52	269	160	3	Hsx	1	A														
09 May	N06E38	270	160	3	Hsx	1	A														
10 May	N06E25	270	160	3	Hsx	1	A														
11 May	N06E11	270	160	3	Hsx	3	A														
12 May	N06W02	270	210	3	Hsx	2	A														
								0	0	0	0	0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 270



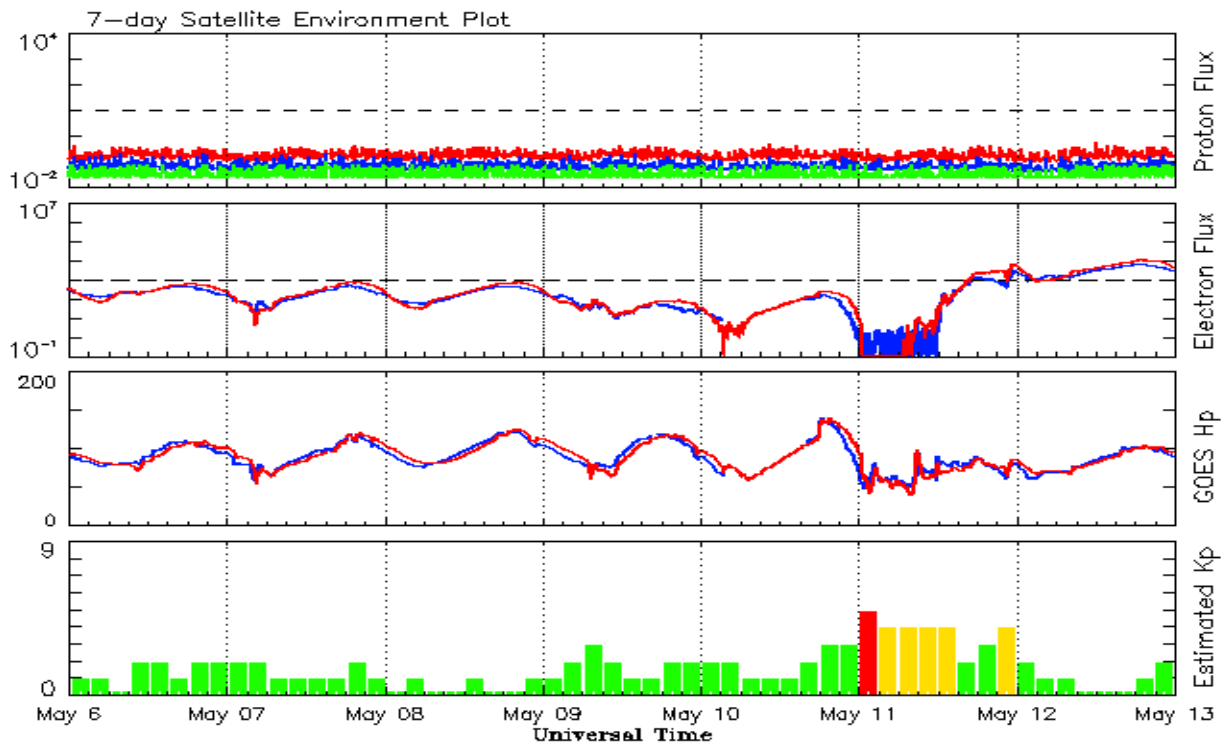
**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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	
<b>2017</b>										
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	
<b>2018</b>										
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	4.3	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	4.0	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			68.9		6		
December	5.6	1.9	0.34			70.0		7		
<b>2019</b>										
January	16.0	4.7	0.29			71.6		6		
February		0.5				70.6		7		
March	14.8	5.7	0.39			71.5		6		
April	11.5	5.5	0.48			72.4		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 06 May 2019*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-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.

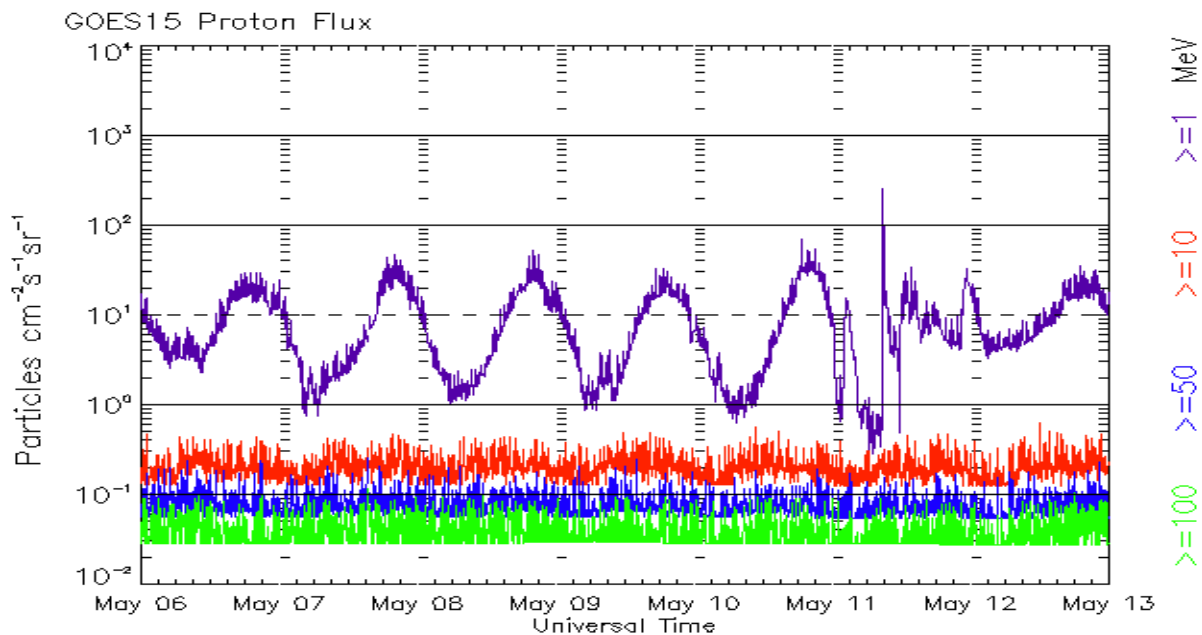
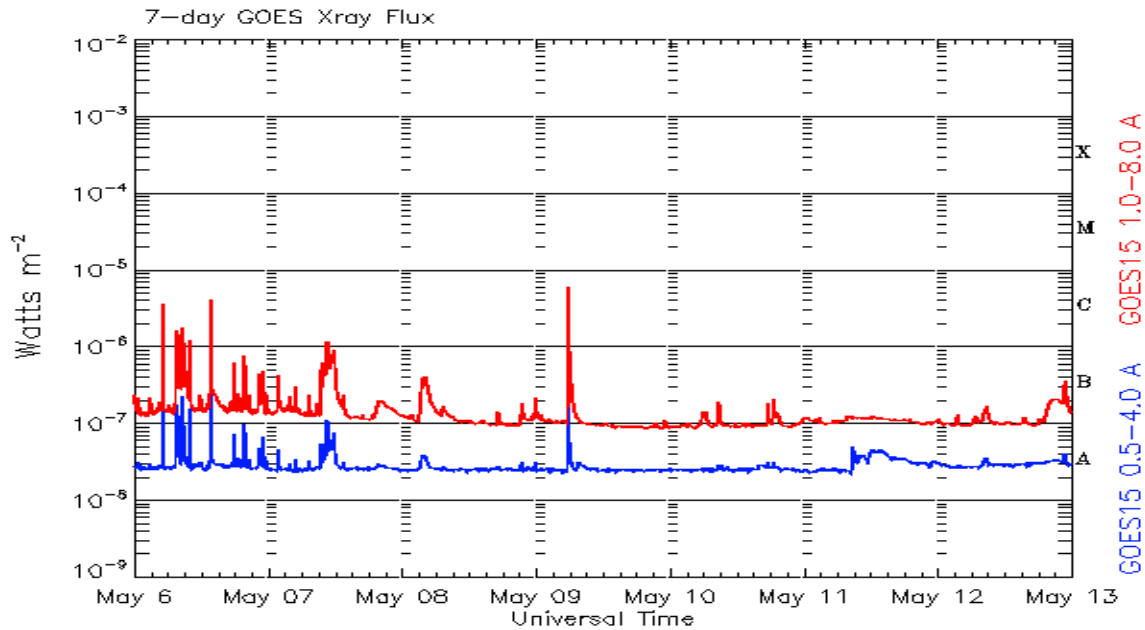
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 06 May 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

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