

Solar activity was at low levels on 17-19 Jul and very low levels on 20-23 Jul. Region 2665 (S06, L=111, class/area Ekc/710 on 09 Jul) produced the strongest flare of the period, a C2 flare observed at 19/0007 UTC from around the west limb. Region 2666 (N13, L=103, class/area Cro/030 on 13 Jul) was mostly quiet as it decayed to plage before rotating around the west limb. No Earth-directed CMEs were observed in available coronagraph imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels throughout the summery period. A maximum flux of 13,630 pfu was observed at 19/1755 UTC.

Geomagnetic field activity ranged from quiet to G2 (Moderate) geomagnetic storm levels throughout the reporting period. On 17 Jul, the continuing influence of a CME caused quiet to active conditions with an isolated period of G2 (Moderate) storm levels reported during the 1500-1800 UTC synoptic period. Waning CME effects led to quiet to unsettled conditions on 18 Jul. Conditions were quiet on 19 Jul through early on 20 Jul. Late on 20 Jul conditions reached unsettled as a solar sector boundary crossing (SSBC) became geoeffective. An isolated period of active was observed during the 0000-0300 UTC synoptic period on 21 July as total magnetic field strength (Bt) increased to near 10 nT. Following the SSBC was a co-rotating interaction region (CIR), causing solar wind speeds to increase from around 450 km/s to a peak of 800 km/s observed at 21/1804 UTC. With the exception of G1 (Minor) geomagnetic storm conditions observed during the 22/0900-1200 UTC synoptic period, quiet to active conditions were observed through the remainder of the period under the influence of positive polarity CH HSS.

### **Space Weather Outlook** **24 July - 19 August 2017**

Solar activity is expected to be low with a chance for M-class flare activity (R1-R2/Minor-Moderate) on 30 Jul - 12 Aug due to the return of old Region 2665 (S06, L=115) as it rotates through the visible disk. Very low activity is expected for the remainder of the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to range from normal to high levels. The influence of recurrent, positive polarity CH HSSs are expected to cause high levels from 24-29 Jul and again on 18-19 Aug. Moderate levels are expected on 30-31 Jul and the remainder of the outlook period is likely to be at normal levels.

Geomagnetic field activity is expected to range from quiet to G1 (Minor) geomagnetic storm levels. Quiet to G1 (Minor) storm levels are likely on 05 Aug; quiet to active levels are likely on



24 Jul and 17-18 Aug; quiet to unsettled levels are likely on 06-07 Aug and 19 Aug. All enhancements in geomagnetic activity are due to the influence of multiple, recurrent, positive polarity CH HSSs. The remainder of the outlook period is expected to be quiet under a nominal solar wind regime.



### *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		
17 July	86	13	450	B2.0	2	0	0	0	0	0	0	0	0
18 July	78	0	0	B2.4	6	0	0	0	0	0	0	0	0
19 July	73	0	0	B1.5	1	0	0	0	0	0	0	0	0
20 July	70	0	0	A8.8	0	0	0	0	0	0	0	0	0
21 July	69	0	0	A4.8	0	0	0	0	0	0	0	0	0
22 July	70	0	0	A4.2	0	0	0	0	0	0	0	0	0
23 July	71	0	0	A5.0	0	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
	17 July	5.2e+07	1.6e+04	3.7e+03	2.8e+08	
18 July	2.2e+07	1.8e+04	4.9e+03	2.8e+08		
19 July	1.4e+07	1.6e+04	4.1e+03	6.6e+08		
20 July	2.0e+07	1.7e+04	4.1e+03	6.4e+08		
21 July	4.7e+07	1.6e+04	3.9e+03	2.6e+07		
22 July	4.3e+07	1.5e+04	3.5e+03	9.7e+07		
23 July	2.6e+07	1.5e+04	3.1e+03	1.4e+08		

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	17 July	23	3-4-4-4-4-5-2-2	54	3-4-6-6-6-7-1-2	27
18 July	7	3-3-1-1-2-1-1-1	13	3-4-3-1-2-1-4-1	7	3-3-2-1-2-1-0-1
19 July	5	1-1-1-2-2-2-1-1	2	1-1-0-2-0-0-0-1	4	1-1-0-1-1-1-1-1
20 July	6	0-2-1-1-2-2-2-3	6	1-2-1-1-1-1-3-2	7	1-2-1-1-1-2-3-3
21 July	13	3-4-2-1-3-3-1-3	19	3-4-3-2-4-5-2-2	14	4-3-3-1-2-3-1-3
22 July	18	3-2-4-5-2-2-3-3	31	3-3-6-6-3-3-3-3	16	3-2-4-5-2-2-2-3
23 July	16	3-3-4-3-3-2-2-4	35	2-3-6-6-6-2-2-2	15	3-3-3-3-3-2-2-4



### *Alerts and Warnings Issued*

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
17 Jul 0342	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/0325
17 Jul 0528	EXTENDED WARNING: Geomagnetic K = 5	16/0520 - 17/1500
17 Jul 0555	EXTENDED WARNING: Geomagnetic K = 4	16/0520 - 17/1800
17 Jul 1537	WARNING: Geomagnetic K = 5	17/1536 - 2100
17 Jul 1537	EXTENDED WARNING: Geomagnetic K = 4	16/0520 - 17/2300
17 Jul 1607	ALERT: Geomagnetic K = 5	17/1607
17 Jul 1627	WARNING: Geomagnetic K = 6	17/1626 - 2100
17 Jul 1642	ALERT: Geomagnetic K = 6	17/1642
17 Jul 2255	EXTENDED WARNING: Geomagnetic K = 4	16/0520 - 18/0600
18 Jul 0521	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/0325
18 Jul 0555	EXTENDED WARNING: Geomagnetic K = 4	16/0520 - 18/1200
19 Jul 0501	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/0325
20 Jul 0500	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/0325
21 Jul 0214	WARNING: Geomagnetic K = 4	21/0212 - 0600
21 Jul 0233	ALERT: Geomagnetic K = 4	21/0232
21 Jul 0555	EXTENDED WARNING: Geomagnetic K = 4	21/0212 - 1500
21 Jul 1356	EXTENDED WARNING: Geomagnetic K = 4	21/0212 - 2359
21 Jul 1442	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/0325
21 Jul 2354	EXTENDED WARNING: Geomagnetic K = 4	21/0212 - 22/0600
22 Jul 0529	EXTENDED WARNING: Geomagnetic K = 4	21/0212 - 22/1500
22 Jul 1005	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/0325
22 Jul 1029	WARNING: Geomagnetic K = 5	22/1028 - 1500
22 Jul 1142	ALERT: Geomagnetic K = 5	22/1142
22 Jul 1440	EXTENDED WARNING: Geomagnetic K = 4	21/0212 - 23/0600
23 Jul 0551	EXTENDED WARNING: Geomagnetic K = 4	21/0212 - 23/1200
23 Jul 1055	CONTINUED ALERT:	17/0325

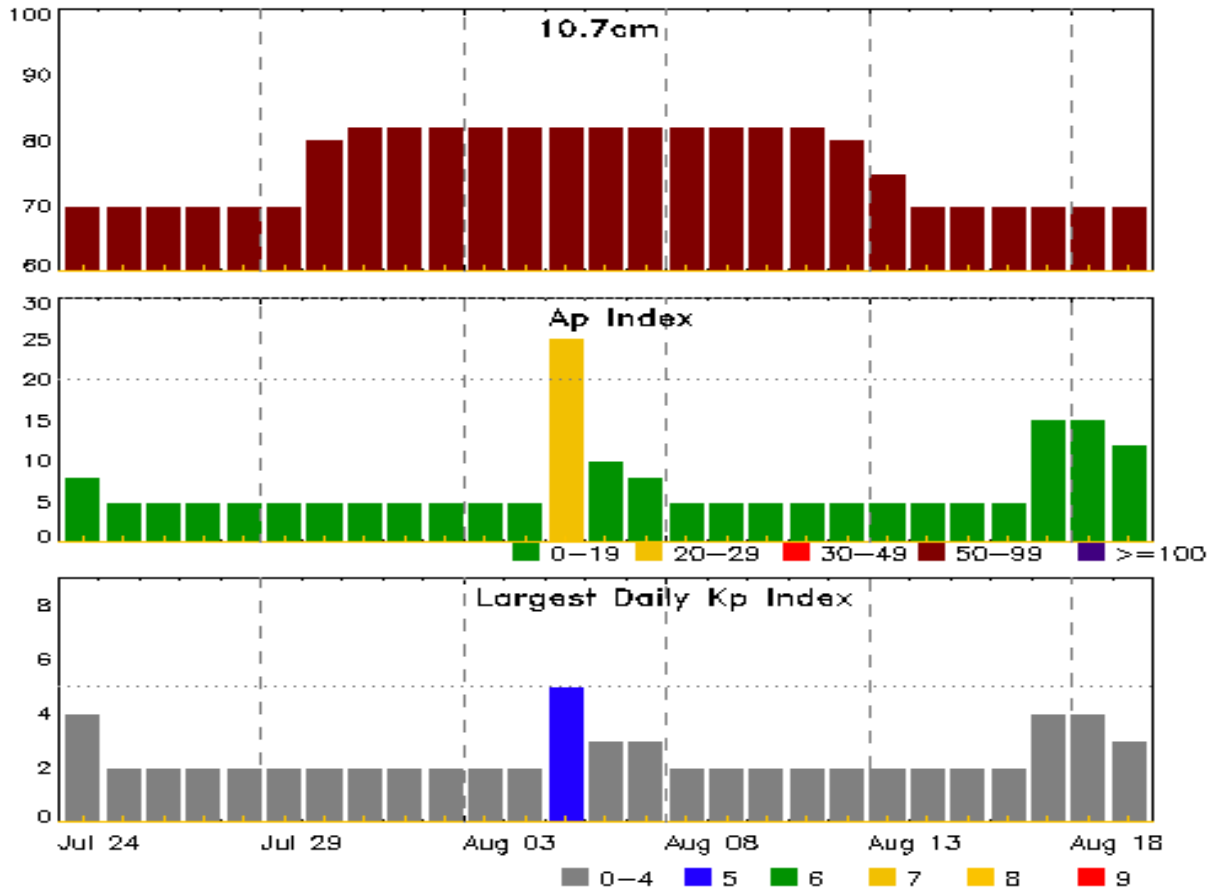


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
-	Electron 2MeV Integral Flux $\geq$ 1000pfu	-
23 Jul 2312	WARNING: Geomagnetic K = 4	23/2312 - 24/1200
23 Jul 2324	ALERT: Geomagnetic K = 4	23/2323



## 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 Jul	70	8	4	07 Aug	82	8	3
25	70	5	2	08	82	5	2
26	70	5	2	09	82	5	2
27	70	5	2	10	82	5	2
28	70	5	2	11	82	5	2
29	70	5	2	12	80	5	2
30	80	5	2	13	75	5	2
31	82	5	2	14	70	5	2
01 Aug	82	5	2	15	70	5	2
02	82	5	2	16	70	5	2
03	82	5	2	17	70	15	4
04	82	5	2	18	70	15	4
05	82	25	5	19	70	12	3
06	82	10	3				



### *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	Optical Location Lat CMD	Optical Rgn #
	Begin	Max	End				
17 Jul	0057	0104	0108	B6.3			2665
17 Jul	0223	0228	0232	B3.3			2665
17 Jul	0324	0328	0331	C2.3			2665
17 Jul	0403	0407	0409	B3.2			2665
17 Jul	0528	0532	0536	B4.9			2665
17 Jul	0900	0904	0909	B3.1			
17 Jul	0916	0920	0925	B4.0			
17 Jul	1013	1017	1020	B4.4			
17 Jul	1709	1842	2050	C1.2			2665
18 Jul	0006	0011	0014	B7.3			2665
18 Jul	0031	0040	0048	C2.1			2665
18 Jul	0431	0435	0441	B5.6			2665
18 Jul	0500	0504	0507	B5.0			2665
18 Jul	0511	0515	0517	B8.7			2665
18 Jul	0532	0544	0549	C1.3			2665
18 Jul	0621	0633	0650	C1.3			2665
18 Jul	0820	0829	0834	C1.7			2665
18 Jul	2211	2234	2246	C1.1			2665
18 Jul	2354	0007	0018	C2.8			2665
19 Jul	2236	0001	0046	C1.4			2665
23 Jul	0734	0737	0739	B1.5			
23 Jul	2231	2239	2245	B1.3			



## Region Summary

Date	Location		Sunspot Characteristics				Flares										
	Lat CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
								C	M	X	S	1	2	3	4		
<b>Region 2665</b>																	
05 Jul	S05E78	109	70	6	Hsx	1	A					2					
06 Jul	S06E64	111	140	9	Dai	6	B					3					
07 Jul	S06E52	110	310	11	Ekc	15	B	1				19	1				
08 Jul	S06E38	111	480	11	Ekc	14	B	1				23		2			
09 Jul	S06E24	111	710	11	Ekc	21	BG	4	1			16	1	1			
10 Jul	S06E11	110	690	12	Ekc	22	BG	1				2					
11 Jul	S06W03	111	620	13	Ekc	17	BG	1				5					
12 Jul	S06W17	112	570	12	Ehi	17	B										
13 Jul	S07W30	113	440	12	Ehi	26	B					2					
14 Jul	S06W43	113	460	11	Ekc	18	B	2	1			2	2				
15 Jul	S05W57	113	380	10	Dki	12	B	5				6					
16 Jul	S06W70	113	340	10	Dko	5	B	5				3					
17 Jul	S06W86	115	450	5	Cho	3	B	2									
								22	2	0	83	4	3	0	0		

Crossed West Limb.

Absolute heliographic longitude: 111

### Region 2666

12 Jul	N13W06	101	20	4	Cro	6	B										
13 Jul	N13W20	103	30	6	Cro	9	B										
14 Jul	N12W32	102	20	7	Bxo	9	B										
15 Jul	N13W47	103	10	2	Axx	2	A										
16 Jul	N15W56	99	10	1	Axx	1	A										
17 Jul	N15W70	100	plage														
18 Jul	N15W84	101	plage														
								0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 101



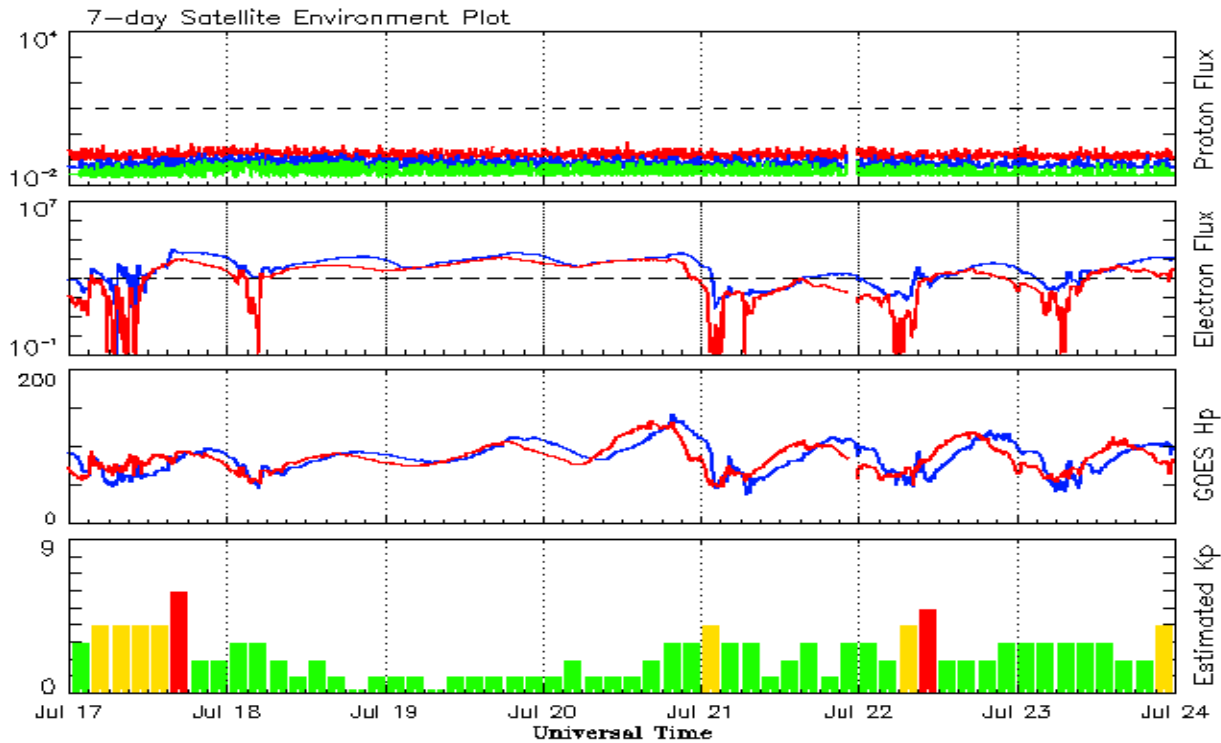


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2015</b>									
July	68.4	39.5	0.58	68.2	41.0	107.0	116.0	10	13.1
August	61.6	38.6	0.63	65.5	39.8	106.2	113.3	16	13.1
September	72.5	47.2	0.65	64.0	39.5	102.1	110.8	16	12.8
October	59.5	38.2	0.62	61.8	38.6	104.1	107.9	15	12.5
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
<b>2016</b>									
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
<b>2017</b>									
January	28.1	15.7	0.55			77.4		10	
February	22.0	15.8	0.71			76.9		10	
March	25.4	10.6	0.42			74.6		15	
April	30.4	19.6	0.64			80.9		13	
May	18.1	11.3	0.62			73.5		9	
June	18.0	11.6	0.64			74.8		7	

**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 July 2017*

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.

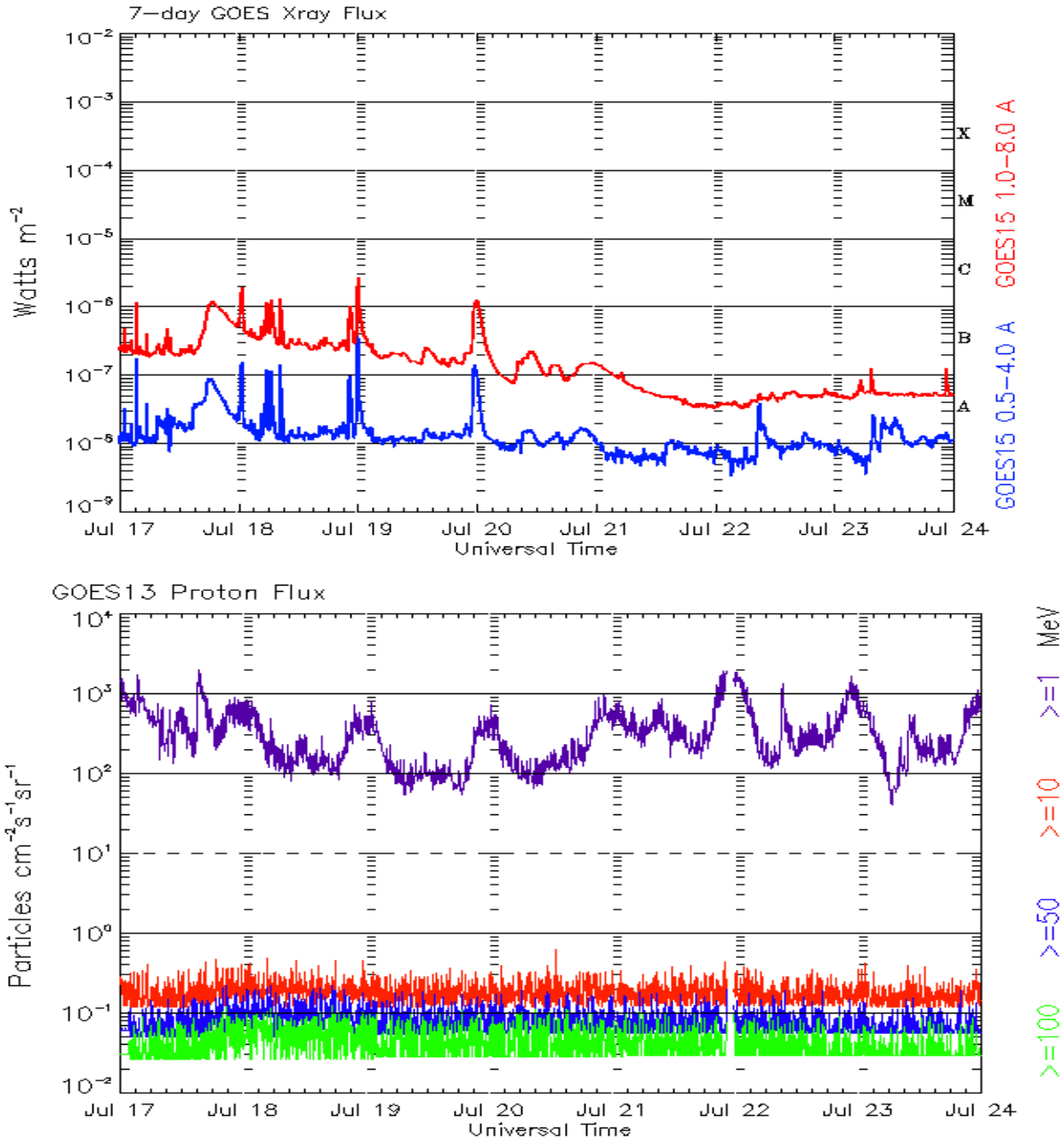
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 17 July 2017*

The x-ray plots contains five-minute averages x-ray flux (Watt/m<sup>2</sup>) 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<sup>2</sup> -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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