

Space Weather Highlights
21 – 27 July 2008

SEC PRF 1717
29 July 2008

Solar activity was very low. No flares were detected. The visible disk was spotless.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels during 21 July and 23 - 27 July.

Geomagnetic field activity was at mostly quiet levels on 21 July. Activity increased to active levels during 22 - 24 July with minor to major storm periods observed at high latitudes. Activity decreased to mostly quiet levels during 25 - 26 July. Activity increased to active levels on 27 July. ACE solar wind data indicated a co-rotating interaction region (CIR) began near the start of the period, in advance of a recurrent coronal hole high-speed stream (HSS). The CIR was associated with increased velocities and proton densities (peak 13 p/cc at 21/1159 UTC), increased IMF Bt (peak 11 nT at 22/1031 UTC); as well as intermittent periods of southward IMF Bz (minimum -10 nT at 22/1219 UTC). The HSS commenced late on 22 July and eventually reached a maximum velocity of 678 km/sec at 23/2039 UTC. Velocities gradually decreased during 24 - 27 July. Another period of increased velocities (peak 454 km/sec at 27/2357 UTC) began late on 27 July, possibly associated with a northward extension of the southern polar crown coronal hole wind stream.

Space Weather Outlook
30 July – 25 August 2008

Solar activity is expected to be very low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels during 09 - 23 August.

Geomagnetic field activity is expected to be at mostly quiet levels during 30 July - 06 August. Activity is expected to increase to unsettled levels on 07 August. A further increase to active levels is expected during 08 - 09 August with minor storm levels at high latitudes due to a recurrent coronal hole high-speed stream. Activity is expected to decrease to unsettled levels during 10 - 13 August as coronal hole effects subside. Quiet conditions are expected during 14 - 17 August. Activity is expected to increase to unsettled to active levels during 18 - 19 August due to a recurrent coronal hole high-speed stream. Activity is expected to decrease to unsettled levels on 20 August as the high-speed stream subsides. Quiet conditions are expected during 21 - 25 August.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
21 July	66	0	0	<A1.0	0	0	0	0	0	0	0	0
22 July	66	0	0	<A1.0	0	0	0	0	0	0	0	0
23 July	66	0	0	<A1.0	0	0	0	0	0	0	0	0
24 July	65	0	0	<A1.0	0	0	0	0	0	0	0	0
25 July	66	0	0	<A1.0	0	0	0	0	0	0	0	0
26 July	66	0	0	<A1.0	0	0	0	0	0	0	0	0
27 July	66	0	0	<A1.0	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	>.6 MeV	>2MeV	>4 MeV
21 July	2.5E+6	1.8E+4	4.0E+3		6.4E+7	
22 July	2.4E+6	1.8E+4	3.9E+3		2.2E+7	
23 July	4.4E+6	1.7E+4	3.9E+3		4.5E+7	
24 July	2.2E+6	1.7E+4	3.9E+3		4.0E+8	
25 July	2.8E+6	1.7E+4	3.8E+3		6.4E+8	
26 July	1.9E+6	1.8E+4	4.1E+3		3.5E+8	
27 July	2.1E+6	1.7E+4	4.1E+3		2.5E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	21 July	5	0-1-2-2-2-1-2-1	14	1-2-4-5-3-1-1-1	6
22 July	9	1-1-2-2-3-2-3-3	10	1-1-2-4-3-2-2-2	11	1-1-2-2-3-2-3-4
23 July	12	3-3-3-2-3-2-3-2	29	3-4-4-5-6-4-2-1	16	3-4-3-2-3-3-3-3
24 July	7	3-3-2-1-1-0-1-2	20	5-2-5-4-4-1-1-0	11	4-3-3-2-2-1-2-2
25 July	2	0-1-0-1-0-1-0-1	4	1-2-1-3-0-0-0-0	3	1-2-0-2-0-0-0-1
26 July	4	1-1-0-1-2-2-1-1	4	1-2-0-3-1-1-0-0	5	2-1-1-1-1-1-2-2
27 July	4	0-0-0-2-1-1-2-3	4	1-0-0-3-2-0-1-2	7	0-0-0-2-1-2-2-4

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
21 Jul 1105	WARNING: Geomagnetic K = 4	21 Jul 1106 - 1600
21 Jul 1108	ALERT: Geomagnetic K = 4	21 Jul 1107
21 Jul 1407	ALERT: Electron 2MeV Integral Flux ≥1000pfu	21 Jul 1335
23 Jul 0000	ALERT: Geomagnetic K = 4	22 Jul 2330
23 Jul 0006	WARNING: Geomagnetic K = 4	23 Jul 0010 - 1600
23 Jul 0429	ALERT: Geomagnetic K = 5	23 Jul 0425
23 Jul 1437	ALERT: Electron 2MeV Integral Flux ≥1000pfu	23 Jul 1415
24 Jul 0756	ALERT: Geomagnetic K = 4	24 Jul 0754
24 Jul 0846	ALERT: Electron 2MeV Integral Flux ≥1000pfu	24 Jul 0825

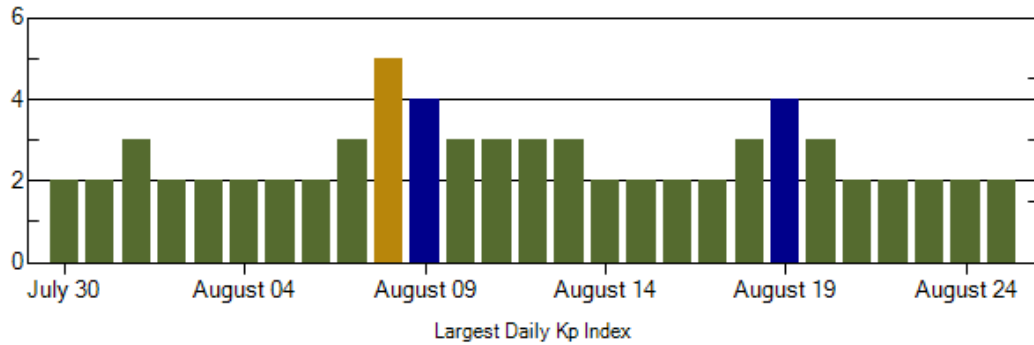
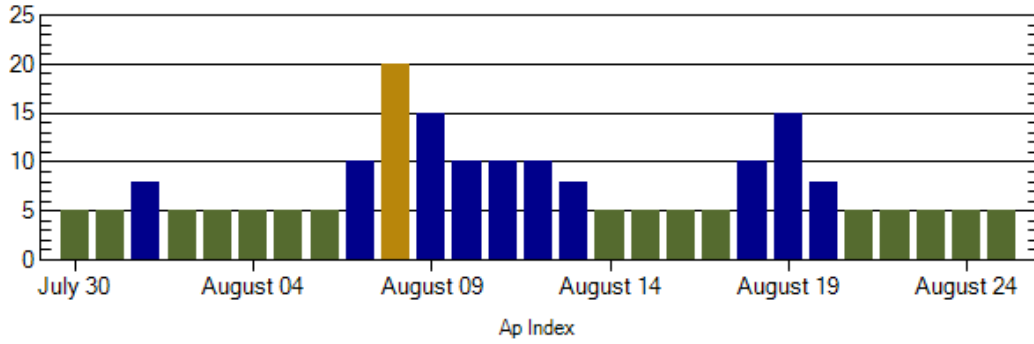
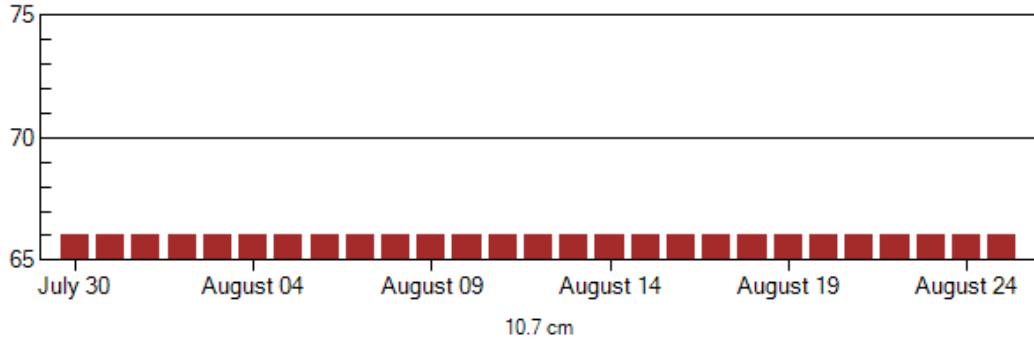


Alerts and Warnings Issued – continued.

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
25 Jul 0501	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Jul 0500
26 Jul 0517	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	26 Jul 0500
27 Jul 0524	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	27 Jul 2230
27 Jul 2233	ALERT: Geomagnetic K = 4	27 Jul 2230
27 Jul 2242	WARNING: Geomagnetic K = 4	27 Jul 2242 - 28/0700



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
30 July	66	5	2	13 August	66	8	3
31	66	5	2	14	66	5	2
01 August	66	8	3	15	66	5	2
02	66	5	2	16	66	5	2
03	66	5	2	17	66	5	2
04	66	5	2	18	66	10	3
05	66	5	2	19	66	15	4
06	66	5	2	20	66	8	3
07	66	10	3	21	66	5	2
08	66	20	5	22	66	5	2
09	66	15	4	23	66	5	2
10	66	10	3	24	66	5	2
11	66	10	3	25	66	5	2
12	66	10	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq
	Begin	Max	Max	Class	Flux	Imp/	Location	Radio Flux		Intensity
						Brtns	Lat CMD	245	2695	II
<i>No Events Observed</i>										

Flare List

Date	Time			Optical	Imp / Brtns	Location	Rgn
	Begin	Max	End	Class.		Lat CMD	
21 Jul	<i>No Flares Observed</i>						
22 Jul	<i>No Flares Observed</i>						
23 Jul	<i>No Flares Observed</i>						
24 Jul	<i>No Flares Observed</i>						
25 Jul	<i>No Flares Observed</i>						
26 Jul	<i>No Flares Observed</i>						
27 Jul	<i>No Flares Observed</i>						

Region Summary

Date	Location		Sunspot Characteristics					X-ray		Optical									
	(° Lat ° CMD)	Helio Lon	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S	Flares							
												1	2	3	4				
<i>Region 1000</i>																			
18 Jul	S13E24	177	0010	01	Hrx	001	A												
19 Jul	S12E10	178	0020	02	Bxo	002	B												
20 Jul	S12W05	179	0010	01	Axx	001	A												
21 Jul	S12W18	179																	
22 Jul	S12W31	179																	
23 Jul	S12W44	179																	
24 Jul	S12W57	179																	
25 Jul	S12W70	179																	
26 Jul	S12W83	179																	

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 179



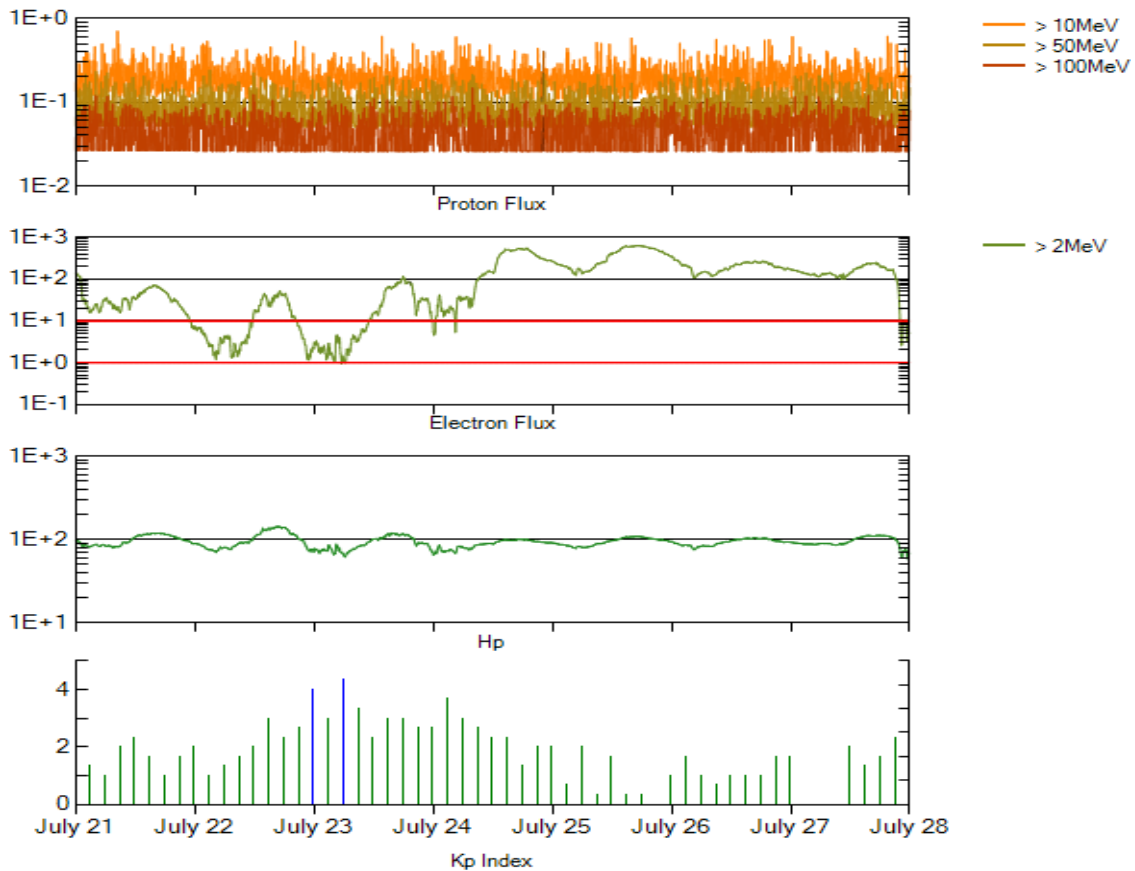
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2006									
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57	27.6	15.6	79.0	80.3	9	8.7
September	25.2	14.5	0.58	27.7	15.6	77.8	80.2	8	8.7
October	15.7	10.4	0.66	25.2	14.2	74.3	79.4	8	8.6
November	31.5	21.5	0.68	22.3	12.7	86.4	78.5	9	8.5
December	22.2	13.6	0.61	20.7	12.1	84.3	77.9	15	8.5
2007									
January	26.6	16.9	0.64	19.7	12.0	83.5	77.5	6	8.4
February	17.2	10.6	0.62	18.9	11.6	77.8	76.9	6	8.4
March	9.7	4.8	0.49	17.5	10.8	72.3	76.0	8	8.4
April	6.9	3.7	0.54	16.0	9.9	72.4	75.2	9	8.5
May	19.4	11.7	0.60	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
July	15.6	10.0	0.64	11.6	7.0	71.6	72.5	8	7.4
August	9.9	6.2	0.63	10.2	6.1	69.2	71.8	7	7.6
September	4.8	2.4	0.50	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.1	65.5	71.5	9	7.9
November	2.5	1.7	0.68	9.4	5.7	69.7	71.1	5	7.8
December	16.2	10.1	0.62	8.1	5.0	78.6	70.5	4	7.8
2008									
January	5.1	3.4	0.67			72.1		6	
February	3.8	2.1	0.55			71.2		9	
March	15.9	9.3	0.58			72.9		10	
April	4.9	2.9	0.59			70.3		9	
May	5.7	2.9	0.51			68.4		6	
June	4.2	3.1	0.74			65.9		7	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000.

*After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 21 July 2008*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

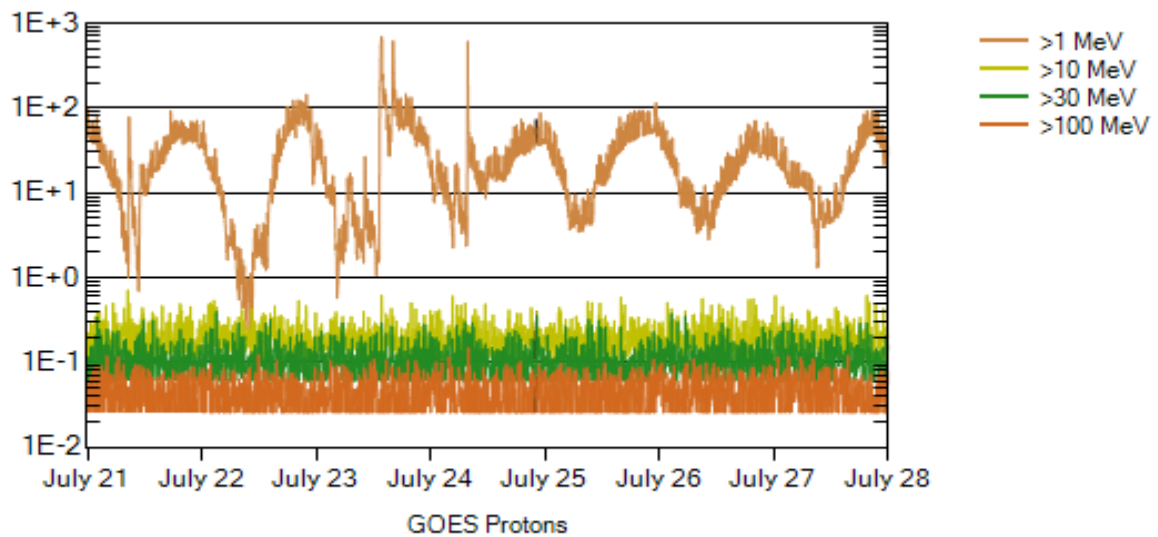
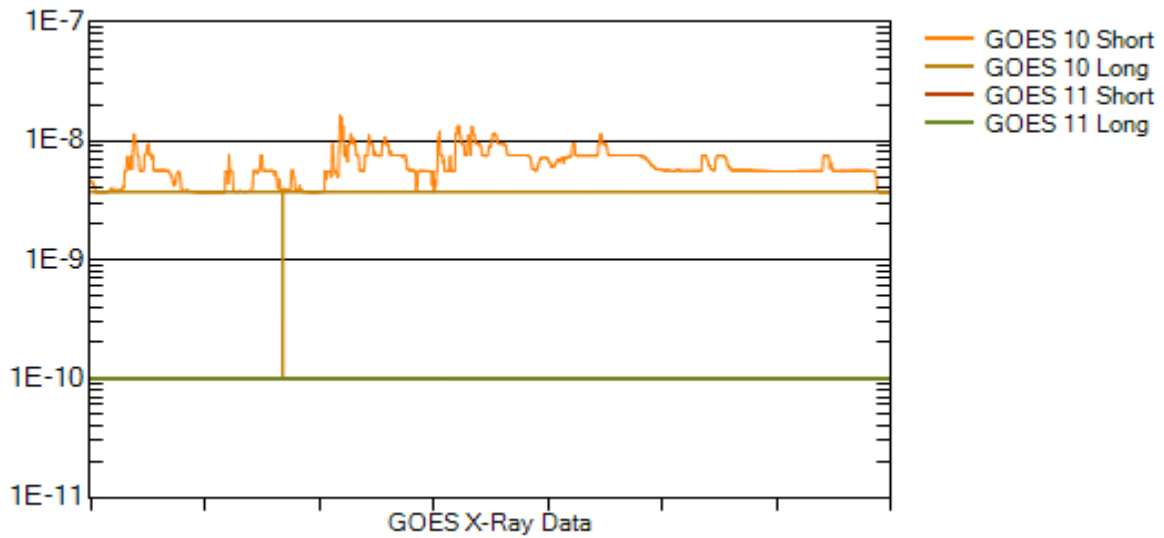
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SEC 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

X-ray plot contains five-minute averaged x-ray flux (watts/m^2) as measured by GOES 10 (W060) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.

