

**Space Weather Highlights**  
**09 – 15 July 2007**

**SEC PRF 1663**  
**17 July 2007**

Solar activity was very low to low. Region 963 (S06, L = 056, class/area Ehi/530 on 10 July) produced C-class flares during 09 – 10 July, the largest of which was a C8/Sf at 10/1240 UTC. Activity dropped to very low levels for the remainder of the period as Region 963 gradually decayed and simplified.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels.

The geomagnetic field was quiet at all latitudes until 10/2100 UTC, then increased to unsettled levels as a recurrent high-speed stream commenced. A further increase to quiet to minor storm levels occurred on 11 July with major storm periods observed at high latitudes as the high-speed stream continued. Field activity decreased to quiet to unsettled levels on 12 – 13 July. Field activity increased to quiet to major storm levels on 14 July as another recurrent coronal hole high-speed stream affected the field. Activity decreased to quiet to active levels on the final day of the period. ACE solar wind data indicated the onset of a recurrent coronal hole high-speed stream late on 10 July. Velocities increased to a peak of 602 km/sec at 11/1743 UTC. Proton densities increased to a peak of 72 p/cc at 10/2341 UTC in advance of the high-speed stream while total IMF intensity peaked at 20 nT at 11/0208 UTC and Bz reached a minimum of -15 nT at 10/2336 UTC. Another recurrent coronal hole high-speed stream was evident in the ACE data as velocities began to increase on 14 July and eventually reached a peak of 631 km/sec at 15/0332 UTC. Proton densities increased to a peak of 17 p/cc at 14/1713 UTC in advance of the high-speed stream while total IMF intensity peaked at 14 nT at 14/1412 UTC and Bz reached a minimum of -12 nT at 14/1755 UTC.

**Space Weather Outlook**  
**18 July – 13 Aug. 2007**

Solar activity is expected to be at very low levels.

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 18 July, 22 – 23 July, 03 August, and 12 – 13 August.

Geomagnetic field activity is expected to be at quiet levels during 18 July. An increase to quiet to active conditions is expected during 20 – 21 July due to a recurrent coronal hole high-speed stream. Mostly quiet conditions are expected during 22 – 30 July. Activity is expected to increase to quiet to active levels on 31 July due to a recurrent coronal hole high-speed stream. Mostly quiet conditions are expected during 01 – 06 August. Activity is expected to increase to unsettled to minor storm levels on 07 August due to a recurrent coronal hole high-speed stream. Quiet to unsettled conditions are expected during 08 – 09 August. Activity is expected to increase to unsettled to minor storm levels on 10 August due to a recurrent coronal hole high-speed stream. Quiet to unsettled conditions are expected for the rest of the period.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
09 July	77	20	260	B1.0	3	0	0	11	0	0	0	0
10 July	78	25	530	A6.3	12	0	0	12	3	0	0	0
11 July	79	28	370	A2.4	0	0	0	1	0	0	0	0
12 July	77	25	430	A1.2	0	0	0	0	0	0	0	0
13 July	78	38	350	A1.1	0	0	0	0	0	0	0	0
14 July	76	41	250	<A1.0	0	0	0	0	0	0	0	0
15 July	75	41	320	A1.3	0	0	0	1	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	>.6 MeV	>2MeV	>4 MeV
09 July	1.5E+6	1.7E+4	4.0E+3		3.8E+7	
10 July	2.2E+6	1.8E+4	4.3E+3		3.7E+7	
11 July	1.9E+6	1.7E+4	3.7E+3		1.1E+6	
12 July	7.9E+5	1.7E+4	3.8E+3		3.0E+6	
13 July	1.4E+6	1.7E+4	3.9E+3		9.6E+6	
14 July	2.3E+6	1.7E+4	3.7E+3		4.0E+6	
15 July	7.7E+5	1.7E+4	3.7E+3		1.9E+7	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
09 July	2	1-1-0-0-1-1-1-0	1	1-1-0-0-0-0-0-0	3	1-1-0-0-1-1-1-1
10 July	5	0-0-1-0-1-1-2-3	3	0-0-1-1-2-0-0-2	6	1-0-0-1-1-2-1-3
11 July	14	3-3-4-4-2-2-2-2	32	2-4-6-6-3-4-2-2	23	5-5-5-4-2-2-2-2
12 July	6	2-2-3-0-1-1-1-2	10	2-3-4-0-3-1-1-1	8	2-3-3-0-1-2-2-2
13 July	5	1-1-0-0-1-3-3-3	2	1-1-0-0-0-0-0-1	4	1-1-0-0-0-1-1-3
14 July	12	2-1-2-3-3-3-3-3	39	1-1-1-6-6-6-5-3	23	2-1-2-4-4-4-6-3
15 July	11	4-4-3-2-1-1-1-1	19	4-4-3-5-4-1-1-1	13	4-4-3-2-2-2-1-2

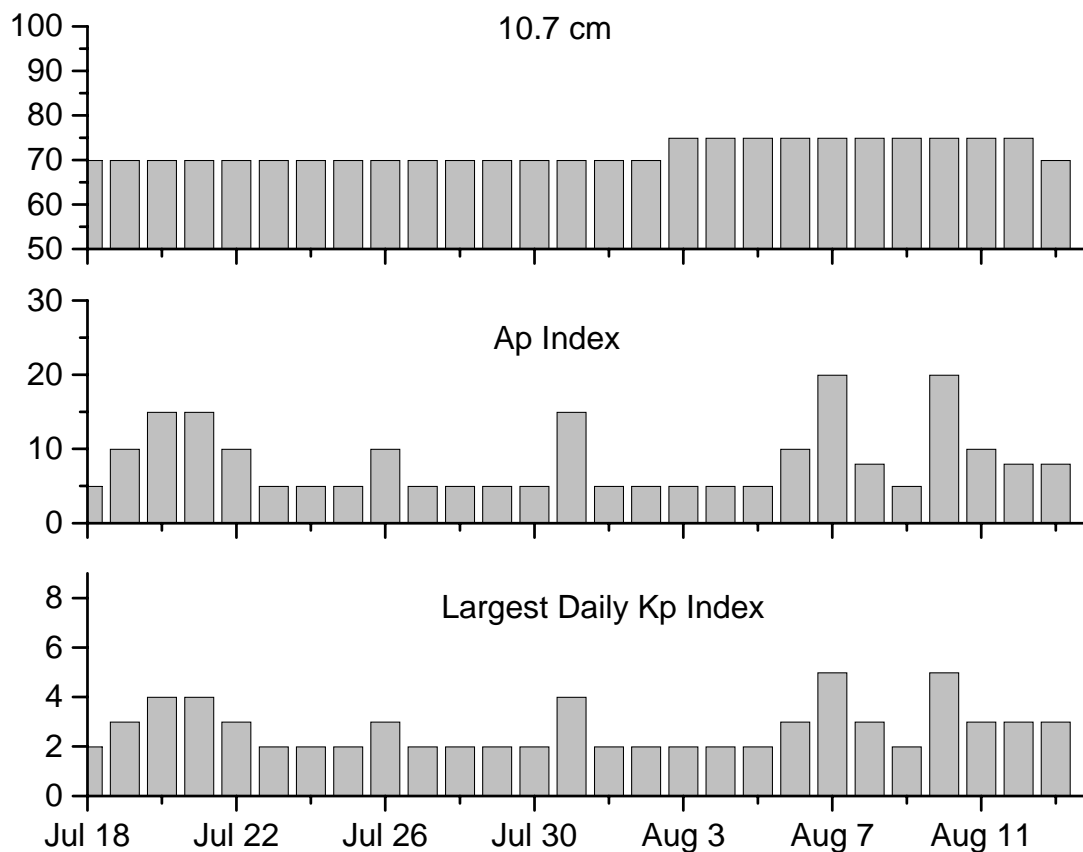


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
10 Jul 2335	WARNING: Geomagnetic K=4	10 Jul 2335 - 11/1600
11 Jul 0129	ALERT: Geomagnetic K=4	11 Jul 0128
11 Jul 0144	WARNING: Geomagnetic K=5	11 Jul 0145 - 0700
11 Jul 0146	ALERT: Geomagnetic K=5	11 Jul 0147
11 Jul 0606	EXTENDED WARNING: Geomagnetic K=5	11 Jul 0145 - 1600
11 Jul 1517	EXTENDED WARNING: Geomagnetic K=4	10 Jul 2335 - 11/2359
14 Jul 0912	WARNING: Geomagnetic K=4	14 Jul 0930 - 1600
14 Jul 1518	EXTENDED WARNING: Geomagnetic K=4	14 Jul 0930 - 2359
14 Jul 1749	ALERT: Geomagnetic K=4	14 Jul 1747
15 Jul 0459	ALERT: Geomagnetic K=4	15 Jul 0457
15 Jul 0624	WARNING: Geomagnetic K=4	15 Jul 0630 - 1600



# *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
18 July	70	5	2	01 Aug	70	5	2
19	70	10	3	02	70	5	2
20	70	15	4	03	75	5	2
21	70	15	4	04	75	5	2
22	70	10	3	05	75	5	2
23	70	5	2	06	75	10	3
24	70	5	2	07	75	20	5
25	70	5	2	08	75	8	3
26	70	10	3	09	75	5	2
27	70	5	2	10	75	20	5
28	70	5	2	11	75	10	3
29	70	5	2	12	75	8	3
30	70	5	2	13	70	8	3
31	70	15	4				



### ***Energetic Events***

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

**No Events Observed**

### ***Flare List***

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
09 July	0025	0107	0121	B4.7			
	0127	0134	0139	B7.8			
	0145	0159	0216	C1.0			
	0250	0254	0259	B6.3			
	0418	0437	0455	B5.3	Sn	S07E62	963
	0456	0542	A0629	C1.7	Sf	S07E62	963
	0749	0801	0806	B4.7			
	0847	0920	0939	B5.8			
	1007	1011	1013	B3.0			
	1126	1129	1134	B1.6			
	1143	1146	1148	B1.5			
	1156	1159	1201	B1.4			
	1215	1222	1226	B1.9			
	1301	1305	1307	B1.3			
	1317	1325	1334	B2.0			
	1345	1350	1354	B3.8			
	1521	1524	1528	B4.7	Sf	N00E63	963
	1619	1620	1625	B6.9	Sf	S07E59	963
	1646	1649	1651	B2.7			
	1657	1701	1704	B2.8			
	1712	1715	1723		Sf	S02E59	963
	1805	1807	1809	B1.6	Sf	S07E58	963
	1907	1909	1921	B2.9	Sf	S07E56	963
	1947	1947	1952		Sf	S07E57	963
	2000	2000	2009		Sf	S07E57	963
	2035	2039	2044		Sf	S07E54	963
	2109	2117	2125	B3.8	Sf	S07E54	963
	2147	2156	2200	B3.7			
	2232	2305	2308	C1.3			
	2346	2352	2354	B2.5			



***Flare List-Continued***

Date	Time			Optical	Imp / Brtns	Location	Rgn
	Begin	Max	End	X-ray Class.		Lat CMD	
10 July	0020	0031	0043	B3.3	1f	S07E54	963
	0054	0100	0237	C3.8	1b	S06E52	963
	0132	0137	0146	C4.3			
	0238	0243	0249		Sf	S07E53	963
	0255	0257	0307	B3.1	Sf	S07E53	963
	0315	0318	0323		Sf	S07E53	963
	0331	0333	0616	C4.4	1n	S07E53	963
	0432	0436	0439	B7.0			
	0446	0503	0505	C1.2			
	0539	0544	0548	B2.6			
	0620	0626	0648	C1.4	Sf	S07E51	963
	0711	0721	0739	C7.4	Sf	S04E50	963
	0740	0742	0800	C2.8	Sf	S04E49	963
	0919	0942	0952	B1.8			
	1004	1004	1010	B4.4	Sf	S04E47	963
	1032	1040	1055	B5.4			
	1114	1117	1129	C1.9	Sf	S04E47	963
	1238	1240	1258	C8.2	Sf	S04E47	963
	1511	1516	1522	B2.2			
	1551	1603	1606	B4.6			
	1641	1651	1657	B3.2			
	1713	1719	1724	B1.6			
	1728	1732	1746	B2.2			
	1750	1754	1811	C5.2	Sf	S07E45	963
	2050	2101	2106	C1.8			
	2218	2223	2229	B6.1	Sf	S06E41	963
	2232	2234	2249	C1.0	Sf	S06E41	963
11 July	0008	0010	0017	B1.3	Sf	S07E39	963
	0537	0541	0548	B1.1			
	1002	1020	1032	B2.2			
	1141	1206	1226	B7.8			
12 July	No Flares Observed						
13 July	No Flares Observed						
14 July	2215	2219	2224	B1.1			
15 July	0630	0632	0636		Sf	N05W45	964
	1130	1139	1146	B2.6			



### Region Summary

Location			Sunspot Characteristics											
Date	Helio ( ° Lat ° CMD) Lon		Flares					X-ray			Optical			
			Area	Extent	Spot	Spot	Mag							
	(10 <sup>-6</sup> hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4	

#### Region 962

28 Jun	S12E67	190	0040	06	Bxo	002	B								2
29 Jun	S12E53	190	0020	07	Bxo	002	B	1							4
30 Jun	S10E37	193	0030	03	Axx	002	A								
01 Jul	S08E25	189	0010	01	Axx	002	A								
02 Jul	S08E15	189													
03 Jul	S08E02	189													
04 Jul	S08W11	189													
05 Jul	S05W25	188	0060	02	Axx	001	A								
06 Jul	S05W38	188													
07 Jul	S05W51	188													
08 Jul	S05W64	188													
09 Jul	S05W77	188													
10 Jul	S05W90	187													
								1	0	0	6	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 189

#### Region 963

07 Jul	S09E83	054	0050	05	Axx	001	A								
08 Jul	S07E66	058	0150	04	Dao	006	B								10
09 Jul	S07E54	057	0260	10	Dai	010	Bg	1							11
10 Jul	S06E40	057	0530	13	Ehi	015	Bg	9							12 3
11 Jul	S06E28	056	0370	13	Ekc	018	B								1
12 Jul	S05E15	056	0430	13	Ekc	015	B								
13 Jul	S06E01	056	0310	12	Ekc	011	B								
14 Jul	S06W14	058	0200	13	Eac	014	B								
15 Jul	S06W27	057	0270	13	Eai	016	B								
								10	0	0	34	3	0	0	0

Still on Disk.

Absolute heliographic longitude: 056



### *Region Summary-Continued*

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

#### *Region 964*

12 Jul	N05W14	084													
13 Jul	N04W30	087	0040	05	Cao	007	B								
14 Jul	N03W40	084	0050	06	Dso	007	B								
15 Jul	N02W54	084	0050	07	Cso	005	B				1				
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 084



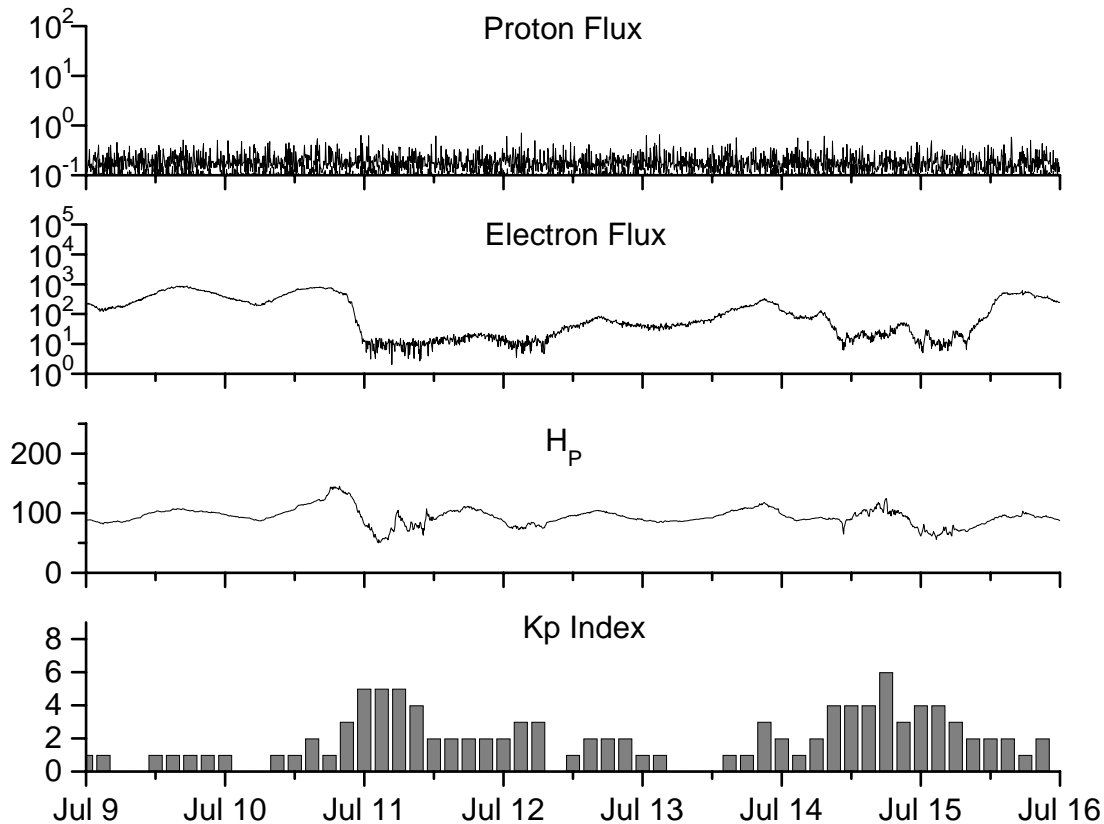


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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
2005									
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
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			84.3		15	
2007									
January	26.6	16.9	0.64			83.5		6	
February	17.2	10.6	0.62			77.8		6	
March	9.7	4.8	0.49			72.3		7	
April	6.9	3.7	0.54			72.4		9	
May	19.4	11.7	0.60			74.5		8	
June	20.0	12.0	0.60			73.7		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 09 July 2007*

Protons plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

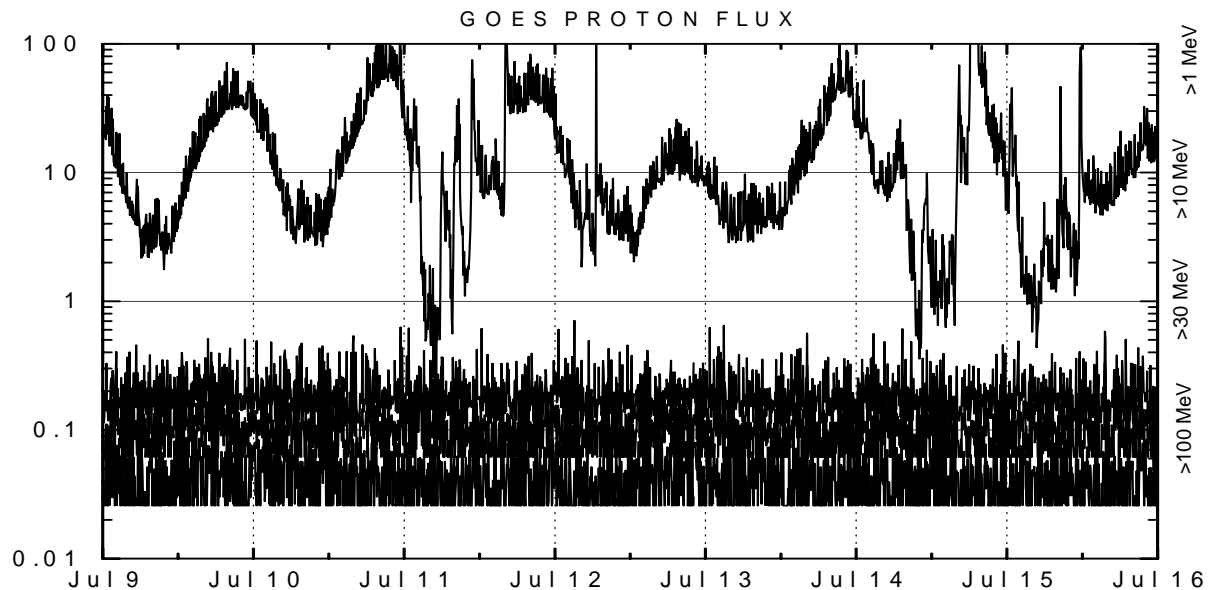
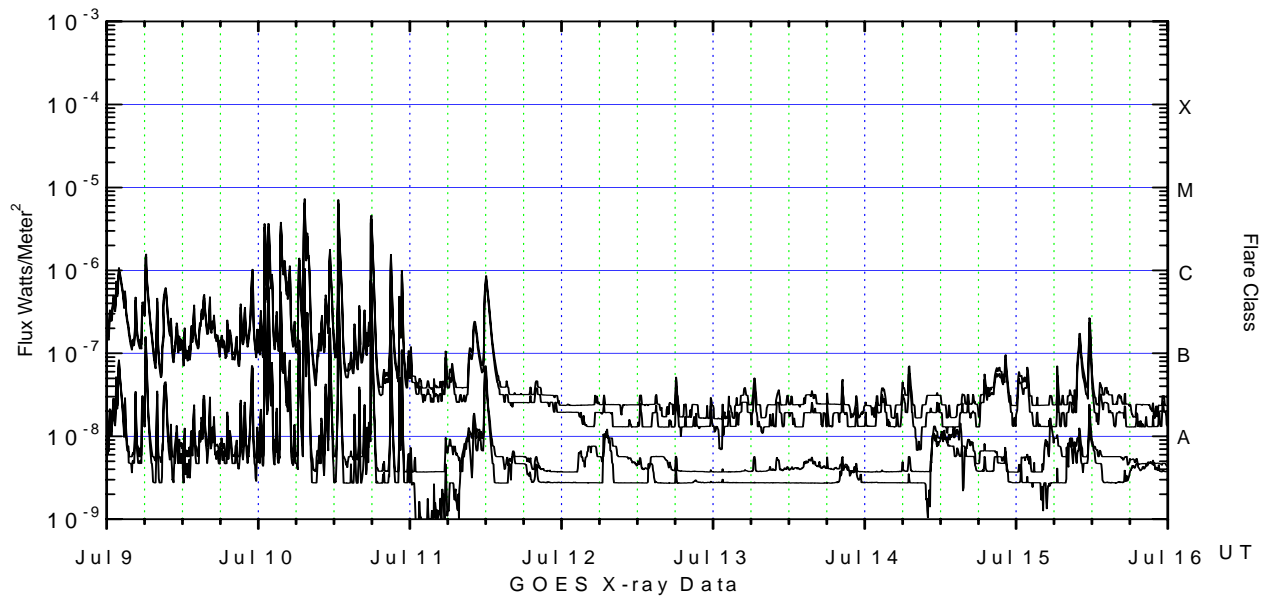
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

$H_p$  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 ( $\text{watts/m}^2$ ) 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.

