

**Space Weather Highlights**  
**15 – 21 August 2005**

**SWO PRF 1564**  
**23 August 2005**

Solar activity was at very low to low levels. Region 798 (S11, L=224, class/area, Dkc/560 on 21 August) was responsible for the only C-flare of the summary period, a C2.8 at 21/2029 UTC. Region 798 grew significantly beginning on 19 August. By 21 August, this region had an area of 560 millionths and a beta gamma magnetic structure. The remainder of the disk and limb was quiet and stable.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. Late on 15 August, solar wind speed and temperature began to rise. This was soon followed by a positive/negative oscillation of the Bz component of the magnetic field indicating the onset of a coronal hole high speed stream. Wind speed rose to a maximum near 700 km/s by 17 August and the IMF Bz oscillated between +/- 10 nT. Solar wind speed gradually decreased by 18 August and the IMF Bz did not vary much beyond +/- 5 nT. On 21 August, wind speed increased once again from around 400 km/s to 530 km/s. The IMF Bz spiked to around -12 nT, temperature increased, and Phi became positive; all indicative of a solar sector boundary crossing followed by another coronal hole high speed stream.

No greater than 10 MeV proton events occurred during the summary period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 18 – 21 August.

The geomagnetic field ranged from quiet to minor storm levels. The period began with quiet to unsettled conditions on 15 August. By 16 August, unsettled to active levels with minor storm periods at high latitudes were observed. Quiet to active levels continued on 17 and 18 August. From 19 to 21 August, mostly quiet conditions were observed.

**Space Weather Outlook**  
**24 August - 19 September 2005**

Solar activity is expected to be at very low to moderate levels. Region 798 is capable of producing M-class flares until it rotates around the visible disk on 24 August. Thereafter, very low to low conditions are expected.

At the time of this writing, a greater than 10 MeV proton event was in progress. This event will persist into the early stages of this period and may be further enhanced by additional proton flares from Region 798 as it rotates around the west limb on 24 August.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 26 – 27 August, 02 – 08 September, and again on 14 – 19 September.

The geomagnetic field is expected to range from quiet to major storm levels. Recurrent coronal hole high speed wind streams along with the CME activity that occurred on 22 August are expected to produce active to major storm levels on 24 – 25 August. Unsettled to minor storm conditions are possible on 31 August, 09 – 10 September, 12 – 14 September, and 18 – 19 September due to recurrent coronal hole high speed wind streams. Otherwise, expect mostly quiet to unsettled conditions.



**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	
15 August	76	49	170	A3.7	0	0	0	0	0	0	0	0	0
16 August	76	48	140	A3.3	0	0	0	0	0	0	0	0	0
17 August	77	42	110	A3.6	0	0	0	0	0	0	0	0	0
18 August	83	42	130	A6.1	0	0	0	0	0	0	0	0	0
19 August	93	61	320	B1.0	0	0	0	0	0	0	0	0	0
20 August	98	74	680	B1.4	0	0	0	0	0	0	0	0	0
21 August	99	77	680	B1.8	1	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	>.6 MeV	>2MeV	>4 MeV
	15 August	4.5E+5	1.3E+4	3.4E+3		1.1E+7
16 August	7.7E+5	1.4E+4	3.4E+3		1.4E+7	
17 August	7.9E+5	1.6E+4	4.1E+3		2.4E+7	
18 August	1.2E+6	1.6E+4	3.8E+3		1.2E+8	
19 August	1.2E+6	1.6E+4	4.1E+3		1.8E+8	
20 August	1.1E+6	1.6E+4	4.0E+3		2.3E+8	
21 August	1.1E+6	1.6E+4	4.3E+3		1.6E+8	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	15 August	6	1-1-0-1-2-2-2-3	5	1-1-0-0-1-2-2-3	8
16 August	12	3-3-2-3-3-2-2-3	23	3-4-2-5-5-3-2-3	19	3-4-4-4-3-3-3-3
17 August	11	3-3-2-2-3-2-2-3	18	3-4-3-4-4-3-2-2	18	4-4-3-2-3-3-3-4
18 August	9	3-2-2-3-2-1-2-2	17	3-3-4-4-4-2-2-2	16	3-3-4-4-3-2-3-3
19 August	6	2-1-2-2-2-1-1-2	5	1-1-1-3-2-1-1-1	7	2-1-2-3-2-2-1-2
20 August	2	2-0-0-0-1-1-1-0	2	1-1-1-0-1-1-1-0	5	2-1-1-0-2-2-2-2
21 August	5	1-1-1-1-2-3-1-1	6	1-1-2-2-1-3-1-1	8	1-1-1-1-2-4-2-2

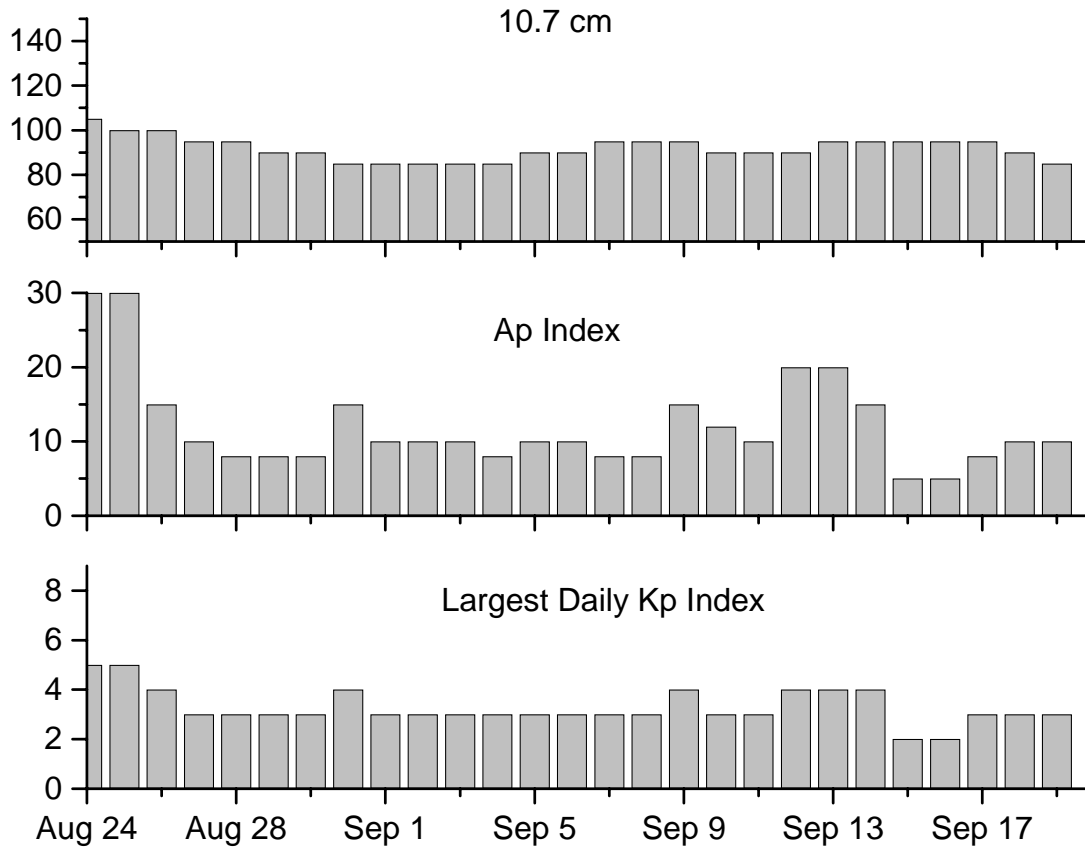


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UTC</u>
15 Aug 2323	WARNING: Geomagnetic K = 4	15 Aug 2330 -16 Aug 2359
16 Aug 0356	ALERT: Geomagnetic K = 4	16 Aug 0353
16 Aug 2355	EXTENDED WARNING: Geomagnetic K = 4	15 Aug 2330 -17 Aug 1500
18 Aug 0002	ALERT: Geomagnetic K = 4	17 Aug 2358
18 Aug 0010	WARNING: Geomagnetic K = 4	18 Aug 0015 - 1200
18 Aug 1156	EXTENDED WARNING: Geomagnetic K = 4	18 Aug 0015 - 1800
18 Aug 1204	ALERT: Electron 2MeV Integral Flux > 1000pfu	18 Aug 1145
19 Aug 1149	ALERT: Electron 2MeV Integral Flux > 1000pfu	19 Aug 0800
20 Aug 0030	2 - 245 MHz Radio Bursts	18 Aug
20 Aug 0545	ALERT: Electron 2MeV Integral Flux > 1000pfu	20 Aug 0500
21 Aug 0325	7 - 245 MHz Radio Bursts	20 Aug
21 Aug 0325	2 - 245 MHz Radio Noise Storms	20 Aug
21 Aug 0621	ALERT: Electron 2MeV Integral Flux > 1000pfu	21 Aug 0605
21 Aug 1630	WARNING: Geomagnetic K = 4	21 Aug 1630 - 2359
21 Aug 1631	ALERT: Geomagnetic K = 4	21 Aug 1631



## 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
24 Aug	105	30	5	07 Sep	95	8	3
25	100	30	5	08	95	8	3
26	100	15	4	09	95	15	4
27	95	10	3	10	90	12	3
28	95	8	3	11	90	10	3
29	90	8	3	12	90	20	4
30	90	8	3	13	95	20	4
31	85	15	4	14	95	15	4
01 Sep	85	10	3	15	95	5	2
02	85	10	3	16	95	5	2
03	85	10	3	17	95	8	3
04	85	8	3	18	90	10	3
05	90	10	3	19	85	10	3
06	90	10	3				



***Energetic Events***

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

***No Events Observed***

***Flare List***

Date	Time			Optical	Imp / Brtns	Location	Rgn
	Begin	Max	End	X-ray Class.		Lat	
15 August	0035	0041	0048	B1.2			797
	1524	1529	1532	B1.2			797
16 August	1233	1236	1239	B1.0			
17 August	0503	0506	0512	B1.0			
	1922	1926	1934	B1.1			
18 August	1141	1148	1151	B5.6			
	1556	1605	1608	B2.6			
	1739	1743	1750	B2.0			
19 August	0009	0013	0015	B1.4			
	0129	0135	0141	B2.6			797
	0142	0204	0220	B3.1			
	0433	0441	0447	B1.8			798
	0721	0724	0730	B1.4			
	0958	1004	1008	B2.0			
	1218	1223	1228	B2.7			799
	1331	1338	1347	B2.1			
	1505	1512	1518	B3.8			
	1534	1539	1544	B3.1			800
	1549	1552	1557	B4.0			799
	1735	1745	1757	B2.8			799
	2013	2018	2023	B2.7			
	2200	2204	2208	B1.5			
	2315	2320	2325	B2.0			
20 August	0258	0338	0358	B3.4			
	0745	0813	0904	B6.4			
	0917	0921	0926	B4.0			798
	1253	1257	1259	B3.1			798
	1532	1541	1545	B2.9			798
21 August	1646	1653	1708	B3.2			
	2044	2048	2051	B3.5			798
	0054	0100	0105	B8.0			798
	1006	1019	1024	C2.8			798
	1431	1437	1443	B4.6			799
	1501	1505	1507	B4.0			799
	1943	1946	1948	B2.4			
2230	2234	2239	B3.9			798	



### Region Summary

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

#### Region 797

11 Aug S13E55	254	0040	02	Hax	002	A												
12 Aug S13E42	254	0060	06	Dso	012	B												
13 Aug S13E29	254	0080	07	Dai	012	B												
14 Aug S13E16	254	0180	08	Dai	013	B												
15 Aug S13E03	252	0150	08	Dai	028	Bg												
16 Aug S14W10	252	0130	08	Dsi	025	Bg												
17 Aug S14W23	252	0090	09	Dso	020	B												
18 Aug S14W38	254	0080	02	Hsx	001	A												
19 Aug S13W52	255	0110	03	Hsx	001	A												
20 Aug S13W66	255	0070	02	Hsx	001	A												
21 Aug S14W78	254	0080	02	Hax	001	A												
											0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 252

#### Region 798

14 Aug S05E54	216	0010	01	Hrx	001	A												
15 Aug S08E39	216	0020	01	Hsx	001	A												
16 Aug S08E25	217	0010	03	Cso	003	B												
17 Aug S09E12	217	0020	02	Cso	002	B												
18 Aug S10W05	221	0030	07	Dso	009	B												
19 Aug S10W19	222	0160	10	Dai	014	Bg												
20 Aug S11W33	222	0510	12	Eki	012	Bg												
21 Aug S11W48	224	0560	08	Dkc	018	Bg												
											1							
											1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 221

#### Region 799

18 Aug S12W56	272	0020	03	Cso	002	B												
19 Aug S10W70	273	0020	02	Axx	002	A												
20 Aug S09W82	271	0030	05	Cao	002	B												
											0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 272



**Region Summary - continued.**

Date	Location		Sunspot Characteristics				Flares							
	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 800*

19 Aug	N16E46	157	0030	05	Cao	004	B										
20 Aug	N16E33	156	0050	07	Dso	008	B										
21 Aug	N17E19	157	0030	08	Cso	017	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:157

*Region 801*

20 Aug	N06E54	135	0020	01	Hsx	001	A										
21 Aug	N07E38	138	0010	01	Axx	001	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:138



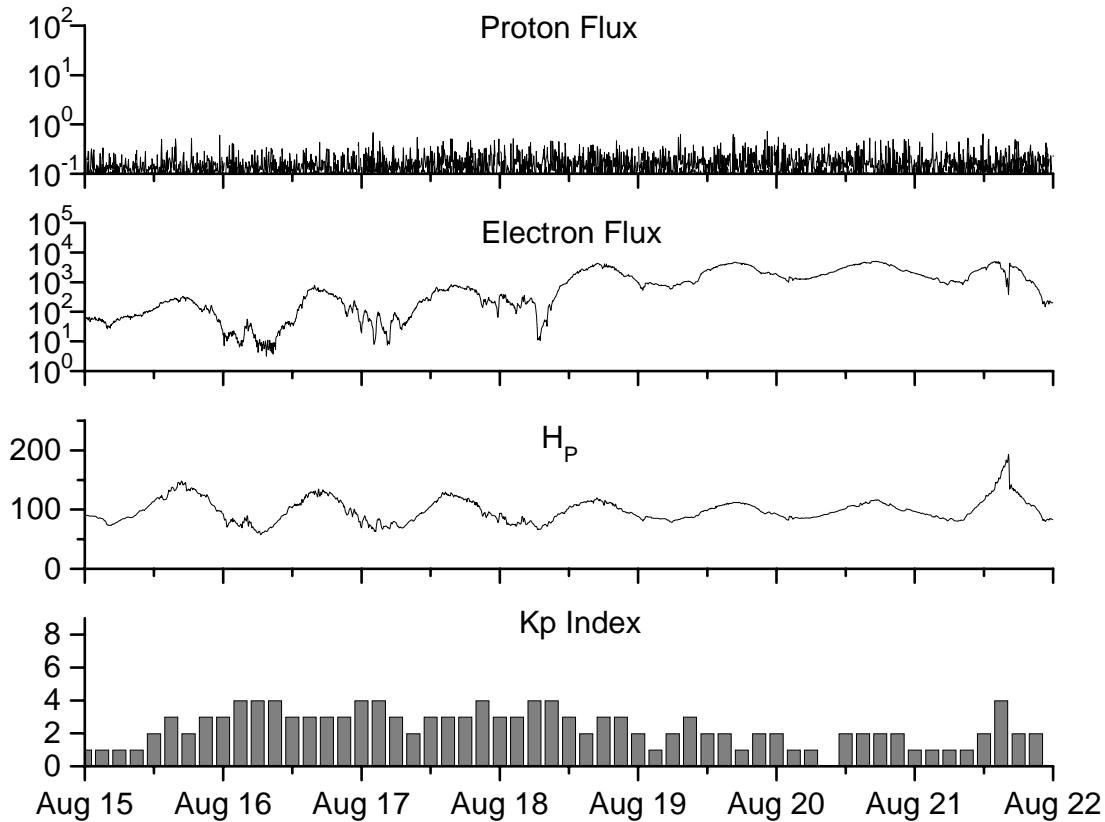
**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2003</b>									
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
<b>2004</b>									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
<b>2005</b>									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64			97.3		11	
March	41.0	24.8	0.60			90.0		12	
April	41.5	24.4	0.59			85.9		12	
May	65.4	42.6	0.65			99.5		20	
June	59.8	39.6	0.66			93.7		13	
July	71.0	39.9	0.56			96.6		16	

**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 15 August 2005*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

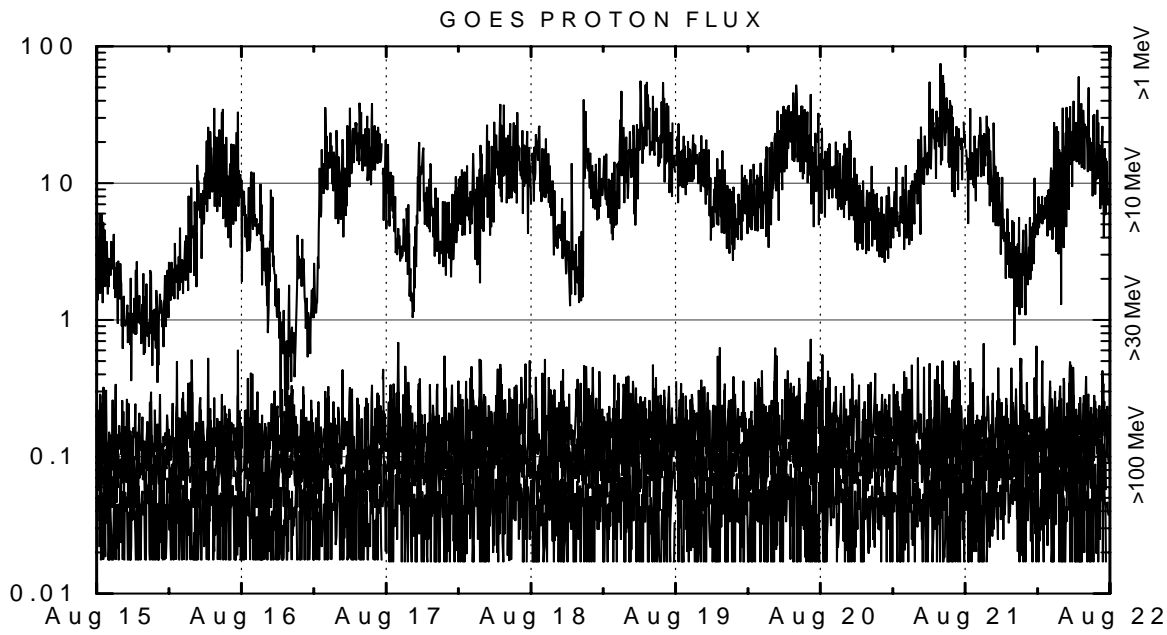
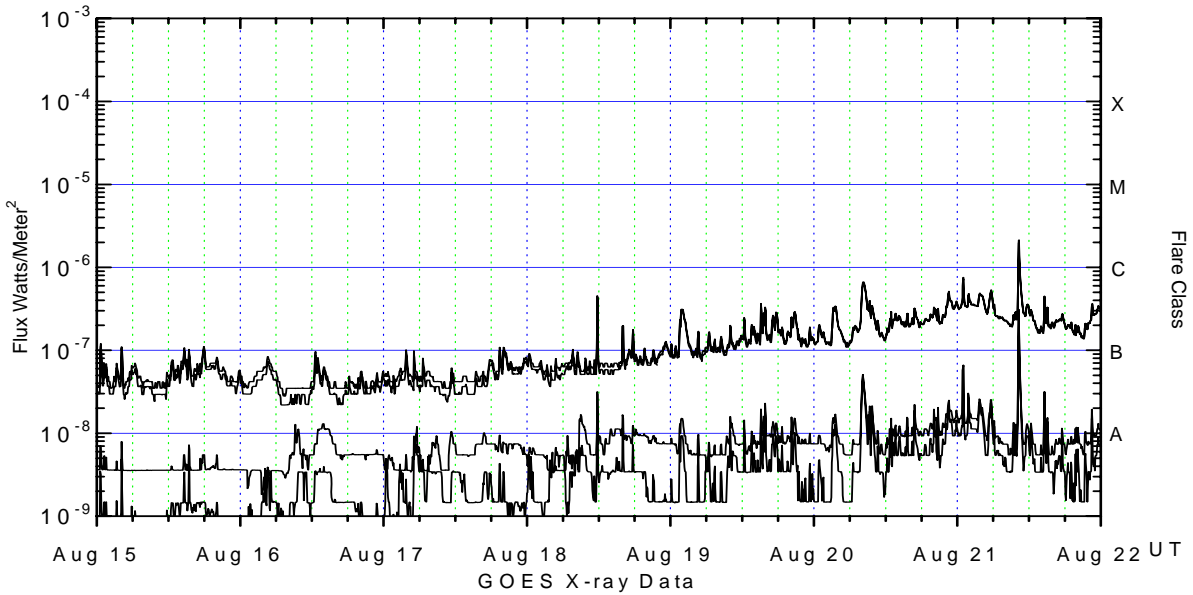
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*H<sub>p</sub>* 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.

*K<sub>p</sub>* 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 K<sub>p</sub> values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO 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 K<sub>p</sub> 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<sup>2</sup>) as measured by GOES 12 (W75) and GOES 10 (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 (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W113) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

