

**Space Weather Highlights**  
**22 – 28 October 2007**

**SEC PRF 1678**  
**30 October 2007**

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 reached high levels throughout the period.

The geomagnetic field was at quiet to unsettled levels during 22 - 24 October. Activity increased to quiet to major storm levels on 25 October with a sudden impulse (15 nT) detected by the Boulder USGS magnetometer at 25/1138 UTC. Activity decreased to quiet to active levels during 26 - 27 October. Activity decreased to quiet to unsettled levels during the rest of the period. ACE solar wind data indicated the 25 - 27 October activity was the result of a recurrent coronal hole high-speed stream (HSS). The HSS was preceded by a co-rotating interaction region (CIR), which reached the ACE spacecraft at approximately 25/1030 UTC. IMF changes associated with the CIR included increased Bt (peak 20.5 nT at 25/1406 UTC) and increased Bz variability (minimum -16.8 nT at 25/1358 UTC). A proton density increase was also associated with the CIR (peak 17.6 p/cc at 25/1240 UTC). Solar wind velocities increased during 25 October and reached a peak of 733.8 km/sec at 25/2340 UTC. The HSS began to gradually subside on 26 October.

**Space Weather Outlook**  
**31 October – 26 November 2007**

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 31 October - 08 November and 16 - 26 November.

The geomagnetic field was at quiet to unsettled levels during 22 - 24 October. Activity increased to quiet to major storm levels on 25 October with a sudden impulse (15 nT) detected by the Boulder USGS magnetometer at 25/1138 UTC. Activity decreased to quiet to active levels during 26 - 27 October. Activity decreased to quiet to unsettled levels during the rest of the period. ACE solar wind data indicated the 25 - 27 October activity was the result of a recurrent coronal hole high-speed stream (HSS). The HSS was preceded by a co-rotating interaction region (CIR), which reached the ACE spacecraft at approximately 25/1030 UTC. IMF changes associated with the CIR included increased Bt (peak 20.5 nT at 25/1406 UTC) and increased Bz variability (minimum -16.8 nT at 25/1358 UTC). A proton density increase was also associated with the CIR (peak 17.6 p/cc at 25/1240 UTC). Solar wind velocities increased during 25 October and reached a peak of 733.8 km/sec at 25/2340 UTC. The HSS began to gradually subside on 26 October.



### 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
22 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
23 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
24 October	68	0	0	<A1.0	0	0	0	0	0	0	0	0
25 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
26 October	68	0	0	<A1.0	0	0	0	0	0	0	0	0
27 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
28 October	68	0	0	<A1.0	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	>.6 MeV	>2MeV	>4 MeV
22 October	1.4E+6	1.6E+4	3.5E+3		9.9E+7	
23 October	1.0E+6	1.6E+4	3.3E+3		4.7E+7	
24 October	7.9E+5	1.6E+4	3.5E+3		4.3E+7	
25 October	1.2E+6	1.6E+4	3.5E+3		2.6E+7	
26 October	1.9E+6	1.6E+4	3.8E+3		2.2E+7	
27 October	4.9E+6	1.7E+4	3.7E+3		2.3E+8	
28 October	3.3E+6	1.7E+4	4.1E+3		5.7E+8	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
22 October	3	1-1-0-0-1-1-2-2	4	0-1-0-0-3-1-2-2	5	1-1-0-0-1-2-3-3
23 October	6	3-3-1-1-2-0-1-0	6	2-1-2-3-2-1-1-0	7	3-3-2-1-1-1-1-1
24 October	2	0-0-0-1-1-1-1-0	2	0-0-0-2-2-0-0-0	3	1-0-0-1-1-1-1-1
25 October	10	0-1-0-2-3-3-4-3	32	0-0-1-3-6-6-5-4	20	1-1-0-2-3-6-5-3
26 October	10	3-3-1-2-2-2-3-2	36	3-2-4-6-6-5-4-1	14	3-3-2-2-3-3-4-2
27 October	8	2-3-1-3-2-2-0-2	25	3-1-4-6-5-3-2-2	10	2-3-2-4-2-2-2-2
28 October	4	2-2-1-1-1-2-1-0	9	3-2-2-2-2-3-2-1	7	2-3-2-2-2-3-1-1

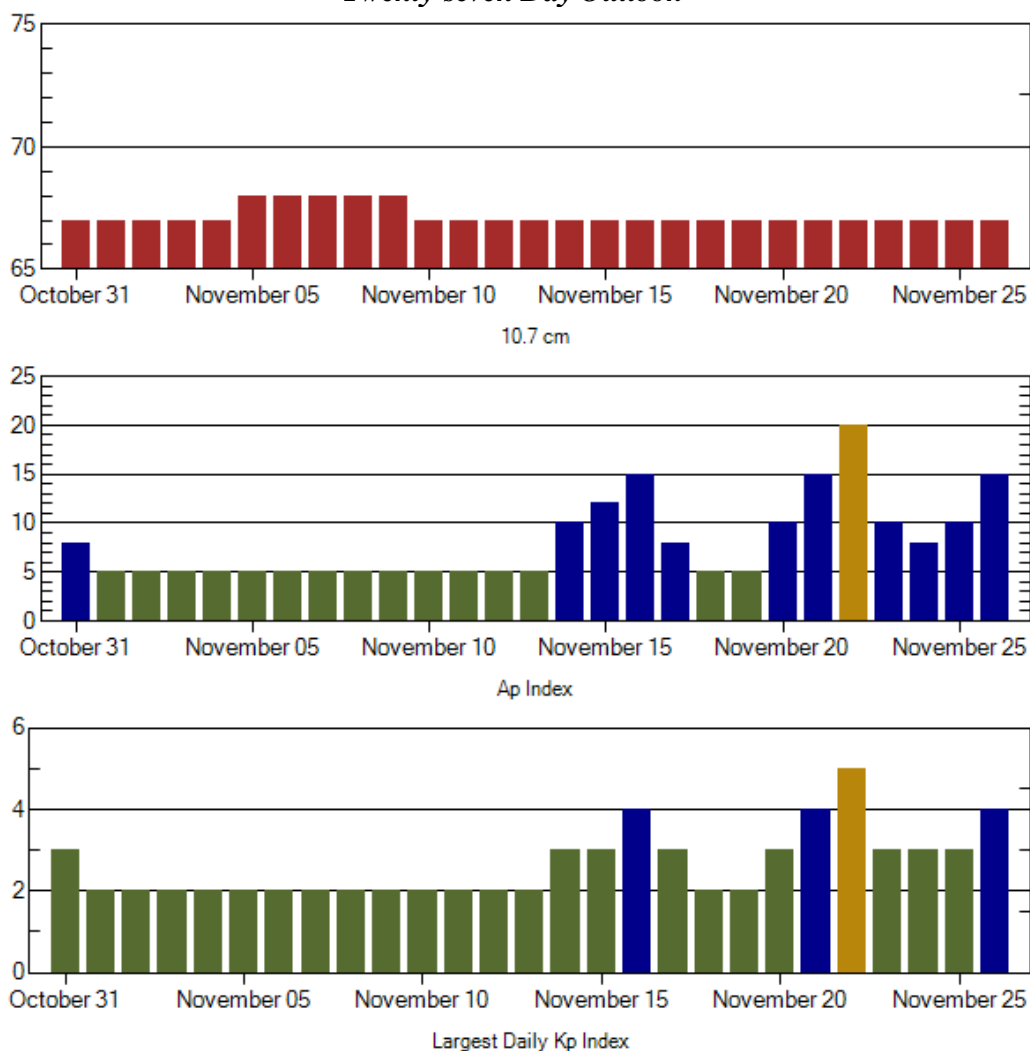


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
22 Oct 1017	ALERT: Electron 2MeV Integral Flux >1000pfu	22 Oct 1000
23 Oct 1502	ALERT: Electron 2MeV Integral Flux >1000pfu	23 Oct 1425
23 Oct 2115	WATCH: Geomagnetic A=20	26 Oct
24 Oct 1622	ALERT: Electron 2MeV Integral Flux >1000pfu	24 Oct 1600
25 Oct 1212	SUMMARY: Geomagnetic Sudden Impulse	25 Oct 1138
25 Oct 1231	ALERT: Electron 2MeV Integral Flux >1000pfu	25 Oct 1215
25 Oct 1506	WARNING: Geomagnetic K=4	25 Oct 1515 - 26/1600
25 Oct 1604	ALERT: Geomagnetic K=4	25 Oct 1600
25 Oct 1609	WARNING: Geomagnetic K=5	25 Oct 1615 - 2359
25 Oct 1725	ALERT: Geomagnetic K=5	25 Oct 1720
26 Oct 1406	EXTENDED WARNING: Geomagnetic K=4	25 Oct 1515 - 26/2359
26 Oct 2222	ALERT: Electron 2MeV Integral Flux >1000pfu	26 Oct 2200
26 Oct 2224	EXTENDED WARNING: Geomagnetic K=4	25 Oct 1515 - 27/1600
27 Oct 1026	ALERT: Electron 2MeV Integral Flux >1000pfu	27 Oct 1010
28 Oct 0502	ALERT: Electron 2MeV Integral Flux >1000pfu	28 Oct 0500



## 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
31 Oct	67	8	3	14 Nov	67	10	3
01 Nov	67	5	2	15	67	12	3
02	67	5	2	16	67	15	4
03	67	5	2	17	67	8	3
04	67	5	2	18	67	5	2
05	68	5	2	19	67	5	2
06	68	5	2	20	67	10	3
07	68	5	2	21	67	15	4
08	68	5	2	22	67	20	5
09	68	5	2	23	67	10	3
10	67	5	2	24	67	8	3
11	67	5	2	25	67	10	3
12	67	5	2	26	67	15	4
13	67	5	2				



### ***Energetic Events***

Date	Time			X-ray		Optical Information			Peak		Sweep Freq
	$\frac{1}{2}$			Integ		Imp/	Location	Rgn	Radio Flux		Intensity
	Begin	Max	Max	Class	Flux	Brtns	Lat	CMD	#	245	2695
<i>No Events Observed</i>											

### ***Flare List***

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
22 October	No Flares Observed						
23 October	No Flares Observed						
24 October	No Flares Observed						
25 October	No Flares Observed						
26 October	No Flares Observed						
27 October	No Flares Observed						
28 October	No Flares Observed						

### ***Region Summary***

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

**No active regions**

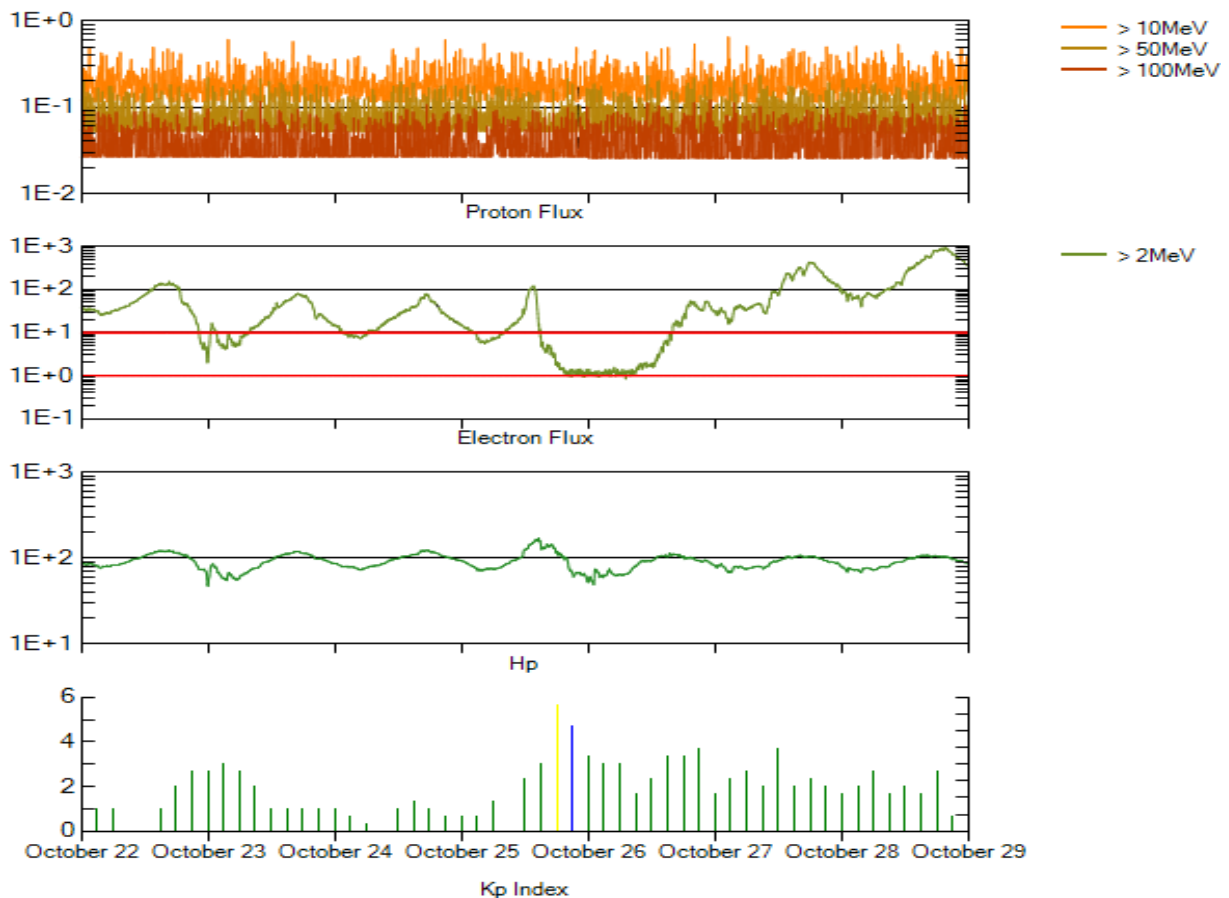


**Recent Solar Indices (preliminary)**  
**Of the observed monthly mean values**

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									
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	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			72.4		9	
May	19.4	11.7	0.60			74.5		9	
June	20.0	12.0	0.60			73.7		7	
July	15.6	10.0	0.64			71.6		8	
August	9.9	6.2	0.63			69.2		7	
September	4.8	2.4	0.50			67.1		8	

**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 22 October 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.

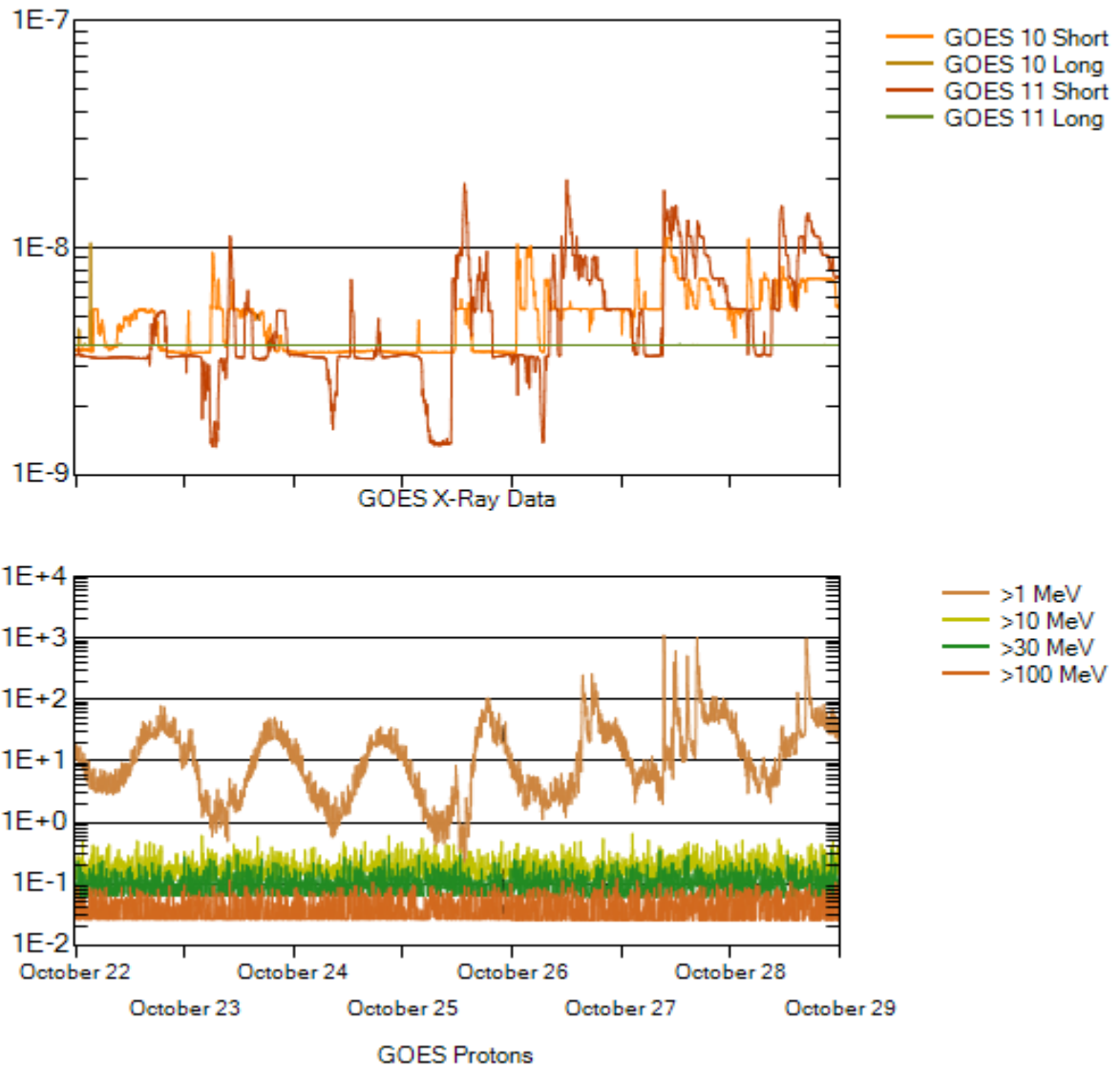
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>–sec –sr) with energies greater than 2 MeV at GOES-12 (W075).

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<sup>2</sup>) 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 (protons/cm<sup>2</sup>-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 (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

