

Space Weather Highlights
19 – 25 November 2007

SEC PRF 1682
27 November 2007

Solar activity was very low. New Region 975 (N02, L=103, class/area, Bxo/020 on 25 November) formed on the solar disk on the 24th.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on the 19, 22, and 24 - 25 November.

The geomagnetic field was at quiet to major storm levels on 19 - 20 November. Activity decreased to quiet to active levels through the remainder of the period. ACE solar wind measurements indicated a recurrent co-rotating interaction region (CIR) late on 19 November in advance of a coronal hole high speed stream which arrived late on 20 November. During the CIR, the Interplanetary Magnetic Field (IMF) Bt peaked at 20 nT (20/1122 UTC), with a variable Bz of +10 nT to -17 nT. Wind velocities increased to a maximum of 702 km/sec (21/0920 UTC) during the coronal hole high speed stream. Wind speed gradually declined until mid day on 22 November when another coronal hole high speed stream was detected at ACE. Maximum wind speed values are uncertain due to a gap in data acquisition (22/2138 - 23/0654 UTC). Wind speed before and after the gap was in the 620 - 630 km/s range. Bt reached at peak of 11 nT (22/1657 UTC), and Bz ranged from +9 nT to -8 nT. Wind speed again declined until mid day on 24 November, when yet another coronal hole high speed stream became geoeffective. The maximum speed for this stream was uncertain due to another data acquisition gap (24/2137 - 25/0031 UTC), however, the wind speed after the gap was at approximately 640 km/s.

Space Weather Outlook
28 November – 24 December 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 01, 16, and 18 - 24 December.

Activity is expected to be at predominantly quiet levels 28 November - 16 December. Geomagnetic activity may increase to quiet to unsettled conditions on 11 - 13 December. Activity is expected to increase to active to minor storm levels on 17 - 18 December as a coronal hole high speed stream becomes geoeffective. From 19 - 23 December, activity should be unsettled to active due to a series of coronal hole high speed streams. Activity should decline to mostly quiet levels on 24 December.



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
19 November	70	0	0	<A1.0	0	0	0	0	0	0	0	0
20 November	70	0	0	<A1.0	0	0	0	0	0	0	0	0
21 November	69	0	0	<A1.0	0	0	0	0	0	0	0	0
22 November	70	0	0	<A1.0	0	0	0	0	0	0	0	0
23 November	70	0	0	<A1.0	0	0	0	0	0	0	0	0
24 November	71	15	20	<A1.0	0	0	0	0	0	0	0	0
25 November	71	12	10	<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
19 November	2.8E+6	1.7E+4	3.9E+3		5.2E+7	
20 November	6.8E+6	1.7E+4	3.7E+3		3.3E+6	
21 November	2.8E+6	1.6E+4	3.3E+3		2.6E+7	
22 November	2.0E+6	1.6E+4	3.4E+3		1.5E+8	
23 November	8.5E+5	1.7E+4	3.6E+3		3.0E+7	
24 November	4.0E+6	1.6E+4	3.5E+3		1.3E+8	
25 November	1.8E+6	1.7E+4	3.9E+3		1.3E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
19 November	2	0-0-0-0-0-0-2-2	1	0-0-0-0-0-0-1-1	3	0-0-0-0-0-1-2-3
20 November	10	2-2-2-3-3-3-2-2	48	2-2-3-6-7-6-4-4	28	2-2-3-4-6-5-3-3
21 November	9	3-3-3-3-2-1-1-0	31	5-4-5-5-5-3-2-1	13	3-4-4-4-2-2-1-1
22 November	6	1-2-1-1-1-2-2-3	20	0-2-1-4-3-5-5-3	13	1-3-2-1-2-4-4-4
23 November	8	3-3-2-2-2-1-1-2	14	3-2-3-4-4-2-2-1	10	3-3-3-2-2-2-1-1
24 November	8	3-1-2-1-2-3-2-2	24	1-1-3-4-6-5-3-1	12	3-2-3-2-2-4-3-2
25 November	8	2-2-3-1-2-2-2-2	22	2-2-3-5-3-4-2-5	11	3-3-3-2-2-3-2-3

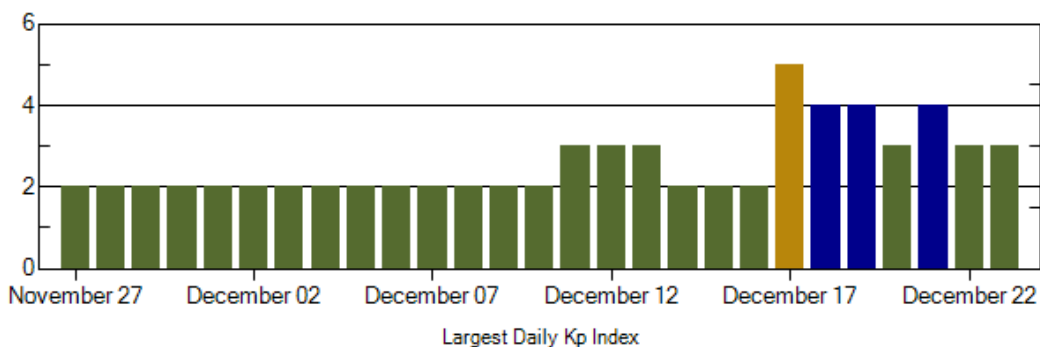
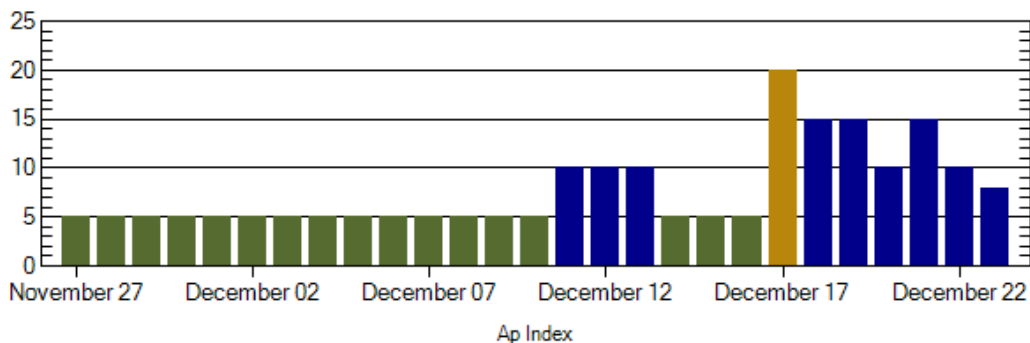
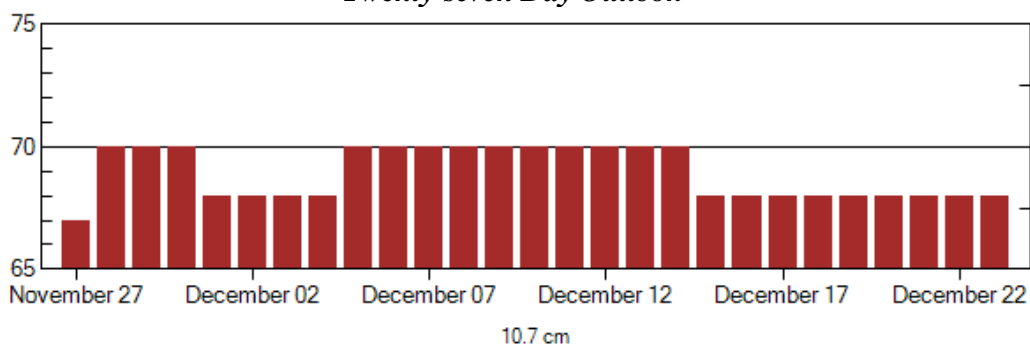


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
19 Nov 1823	SUMMARY: Geomagnetic Sudden Impulse	19 Nov 1811
19 Nov 1832	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	19 Nov 1810
20 Nov 0914	WARNING: Geomagnetic K = 4	20 Nov 0915 – 1600
20 Nov 1017	ALERT: Geomagnetic K = 4	20 Nov 1016
20 Nov 1036	WARNING: Geomagnetic K = 5	20 Nov 1036 – 1600
20 Nov 1303	ALERT: Geomagnetic K = 5	20 Nov 1302
20 Nov 1405	WARNING: Geomagnetic K = 6	20 Nov 1405 – 1600
20 Nov 1421	ALERT: Geomagnetic K = 6	20 Nov 1421
20 Nov 1519	EXTENDED WARNING: Geomagnetic K = 5	20 Nov 1036 – 2359
20 Nov 2327	EXTENDED WARNING: Geomagnetic K = 4	20 Nov 0915 – 21/1600
22 Nov 1051	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	22 Nov 1050
22 Nov 1751	WARNING: Geomagnetic K = 4	22 Nov 1752 – 2359
23 Nov 0501	WARNING: Geomagnetic K = 4	23 Nov 0501 – 1600
23 Nov 0504	ALERT: Geomagnetic K = 4	23 Nov 0503
24 Nov 1006	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	24 Nov 0950
24 Nov 1909	WARNING: Geomagnetic K = 4	24 Nov 1909 – 2359
25 Nov 0941	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Nov 0925



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
28 Nov	70	5	2	12 Dec	70	10	3
29	70	5	2	13	70	10	3
30	70	5	2	14	70	5	2
01 Dec	68	5	2	15	68	5	2
02	68	5	2	16	68	5	2
03	68	5	2	17	68	20	5
04	68	5	2	18	68	15	4
05	70	5	2	19	68	15	4
06	70	5	2	20	68	10	3
07	70	5	2	21	68	15	4
08	70	5	2	22	68	10	3
09	70	5	2	23	68	8	3
10	70	5	2	24	68	5	2
11	70	10	3				



Energetic Events

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	II	IV
No Events Observed													

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			

19 November **No Flares Observed**
 20 November **No Flares Observed**
 21 November **No Flares Observed**
 22 November **No Flares Observed**
 23 November **No Flares Observed**
 24 November **No Flares Observed**
 25 November **No Flares Observed**

Region Summary

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

Region 974

16 Nov N12W04	200	0020	02	Bxo	003	B							
17 Nov N13W21	201	0040	03	Dao	003	Bg					1		
18 Nov N13W34	201												
19 Nov N13W47	201												
20 Nov N13W60	201												
21 Nov N13W73	201												
22 Nov N13W86	201												

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 200

Region 975

24 Nov N02W15	103	0020	02	Bxo	005	B							
25 Nov N02W27	102	0010	03	Bxo	002	B							

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 103



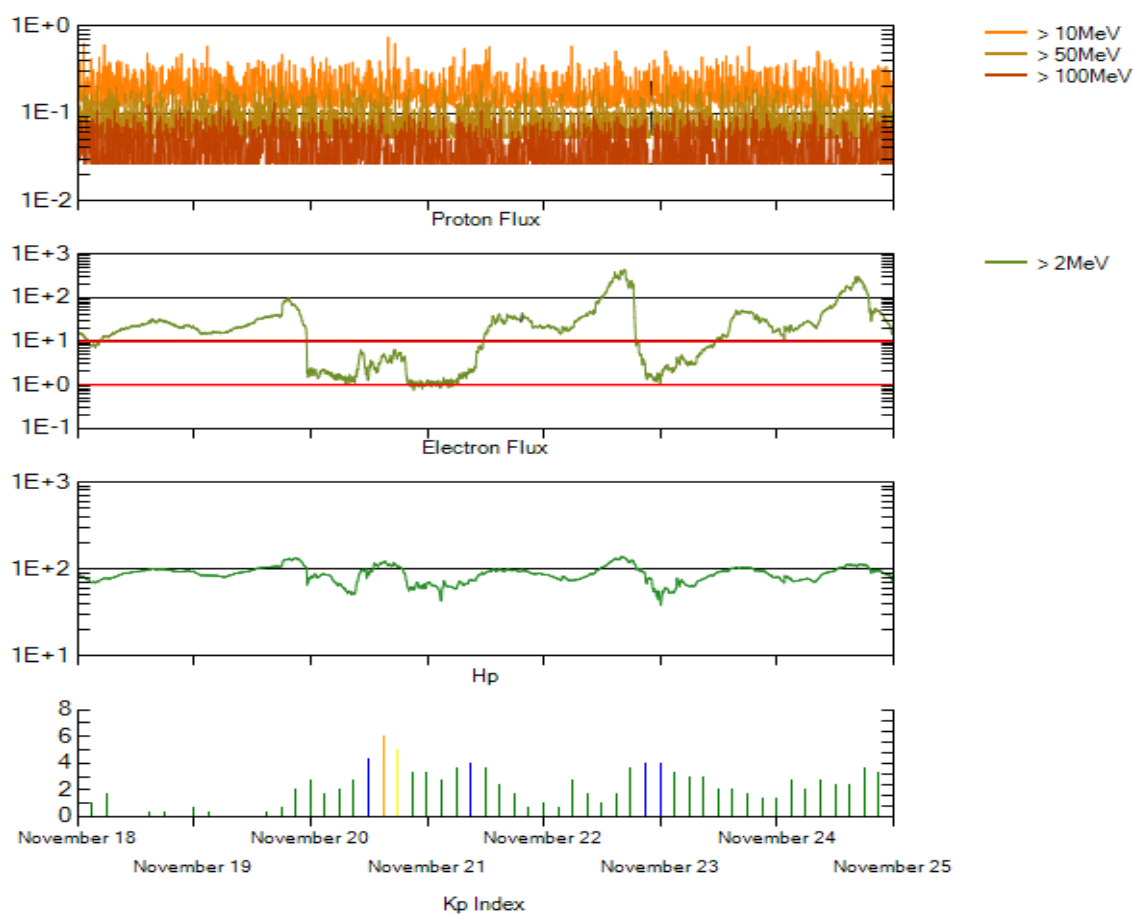
Recent Solar Indices (preliminary)
Of the observed monthly mean values

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									
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	16.0	9.9	72.4	75.2	9	8.5
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	
October	1.3	0.9	0.70			65.5		9	

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 19 November 2007

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.

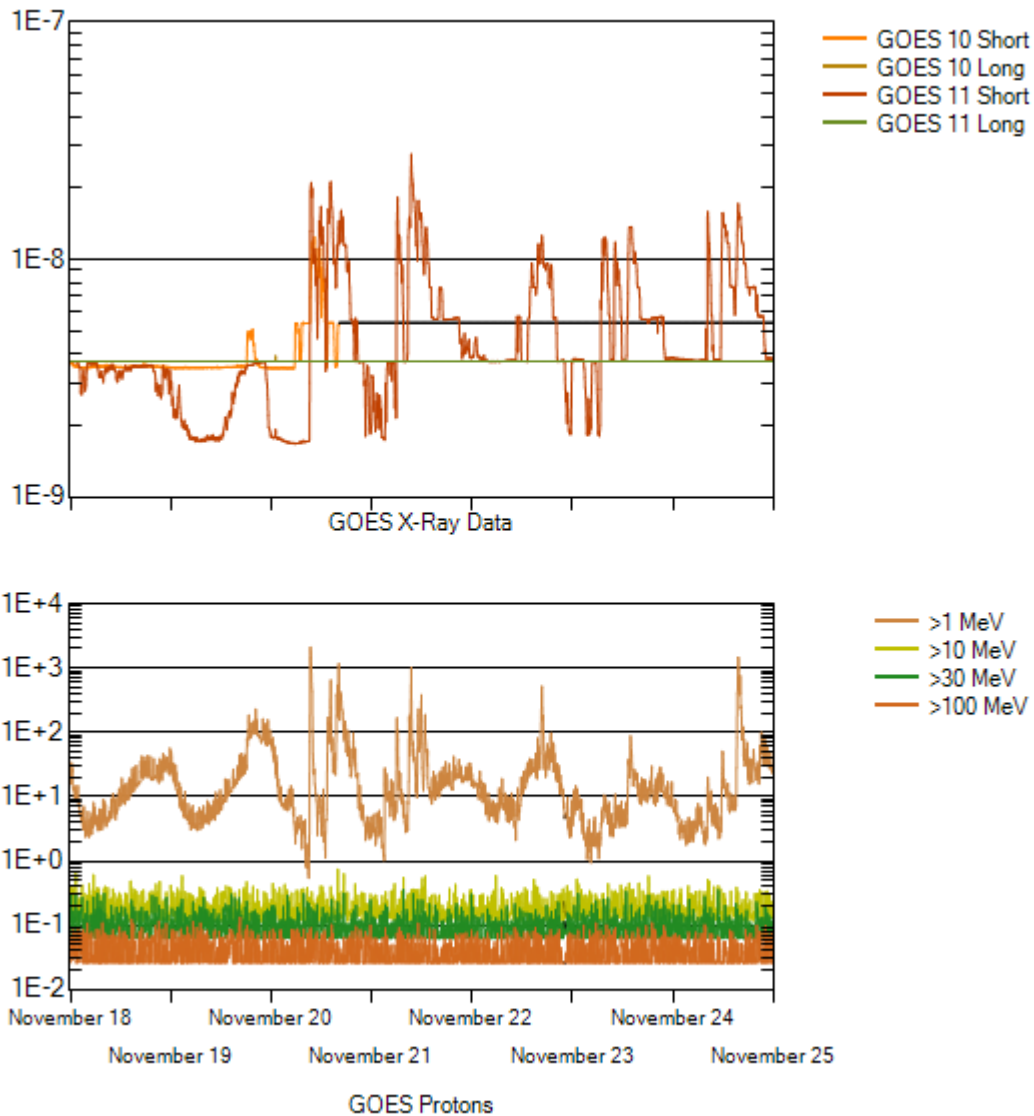
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

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 Meadok, 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.

