Space Weather Highlights **SWPC PRF 1837**
08 - 14 November 2010 **16 November 2010**

Solar activity was at very low to low levels. Activity was at mostly very low levels during the first half of the period. Activity increased to low levels during the second half of the period with frequent flares including some C-class from Regions 1021 (S20, L = 213, class/area Ero/050 on 08 November), 1023 (S23, L = 190, class/area Dai/080 on 11 November), and 1024 (N15, L = 171, class/area Dsi/080 on 13 November). A few C-class flares from Region 1023 during 11 – 13 November were associated with front-sided halo and partial-halo CMEs. Another front-sided partial-halo CME occurred around 13/0600Z associated with a filament disappearance near N31W09.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels for the beginning of the period and reached high levels on 13-14 November.

Geomagnetic field activity was mostly quiet during 08 – 10 November. Activity increased to unsettled levels late on 10 November as a CME passage began to disturb the field. Activity increased to quiet to active levels during 11 – 12 November with minor to major storm periods at high latitudes as the CME passage continued. Field activity decreased to quiet levels after 12/1500Z as CME effects subsided. Quiet to unsettled levels occurred on 13-14 November.

Space Weather Outlook
17 November – 13 December 2010

Solar activity is expected to be very low to low during 17 – 22 November as many of the active regions rotate off the visible disk. Activity is expected to be very low during 23 November – 04 December. Very low to low levels are once again expected 05-13 December as older regions rotate back onto the visible disk.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels during 17 - 19 November. Flux levels are expected to return to normal levels for the remainder of the forecast period.

Geomagnetic field activity is expected to be at quiet to unsettled levels on 17-19 November due to the arrival of CMEs observed during 12 – 13 November in association with elevated solar wind speeds due to a recurrent coronal hole high-speed stream (CH HSS). Quiet conditions are expected from 20 November -11 December. Quiet to unsettled levels are expected on 12-13 December as another CH HSS moves into geoeffective position.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	4
08 November	84	36	80	A9.6	0	0	0	0	0	0	0	0
09 November	84	35	70	A9.0	0	0	0	0	0	0	0	0
10 November	86	55	70	A9.9	0	0	0	5	0	0	0	0
11 November	85	48	110	B1.0	6	0	0	7	0	0	0	0
12 November	85	68	100	B1.0	5	0	0	3	0	0	0	0
13 November	85	63	190	B1.0	2	0	0	4	0	0	0	0
14 November	86	69	150	B1.1	0	0	0	1	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2}-day-sr) >1 MeV	>10 MeV	>100 MeV	Electron Fluence (electrons/cm^2-day-sr) >.6 MeV	>2MeV	>4 MeV
08 November	8.2e+05	1.5e+04	3.8e+03		6.4e+06	
09 November	3.3e+05	1.4e+04	3.5e+03		3.3e+06	
10 November	8.1e+05	1.4e+04	3.4e+03		4.5e+06	
11 November	6.4e+05	1.3e+04	3.1e+03		1.5e+06	
12 November	1.8e+06	1.4e+04	3.5e+03		2.7e+07	
13 November	6.8e+05	1.4e+04	3.6e+03		7.9e+07	
14 November	6.2e+05	1.4e+04	3.2e+03		4.6e+07	

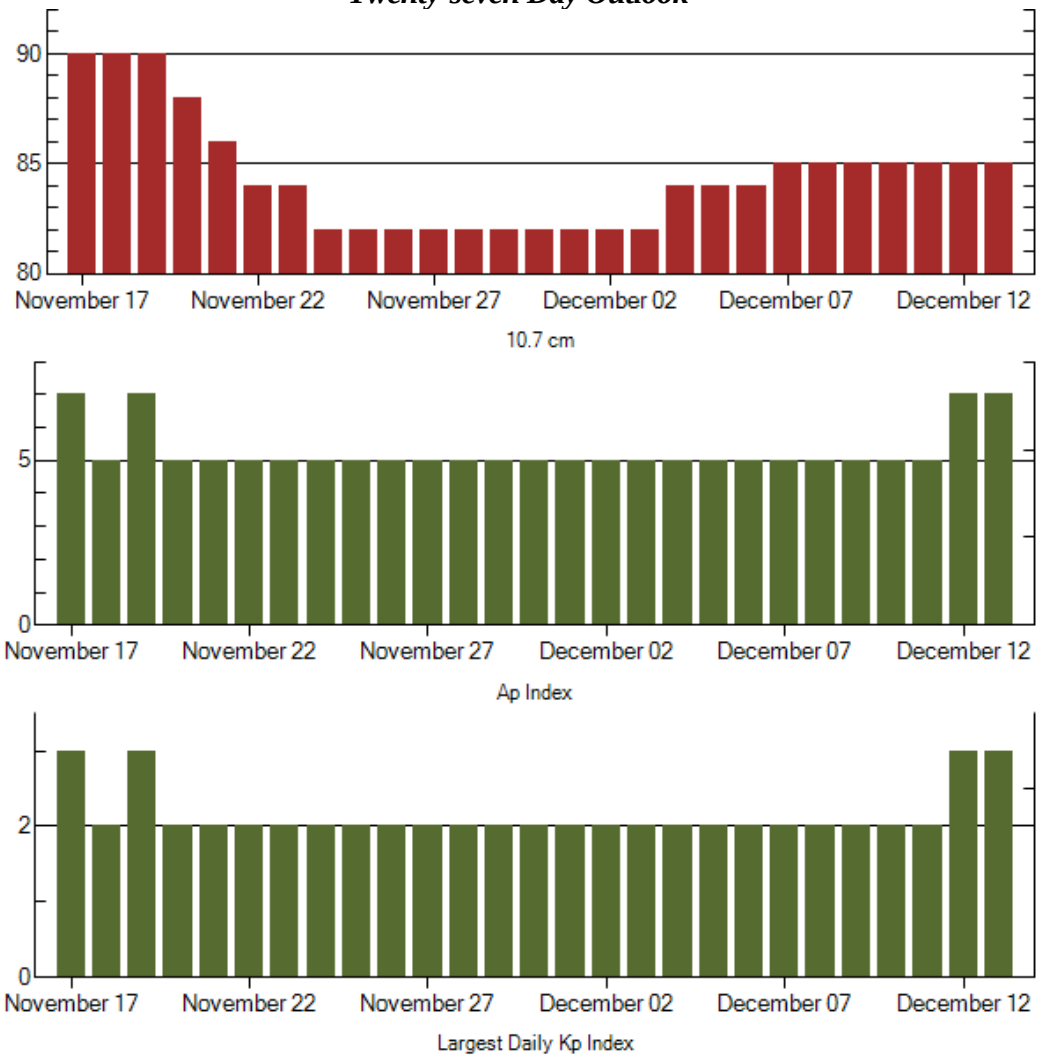
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
08 November	2	0-0-1-1-2-1-1-0	3	0-0-0-1-3-1-1-0	3	0-0-1-0-2-2-1-1
09 November	1	0-2-0-0-0-0-0-0	1	0-0-1-1-1-0-0-0	3	1-2-1-1-0-0-0-0
10 November	3	0-0-0-0-0-1-2-3	1	0-0-1-0-0-0-1-1	4	0-0-0-0-0-1-2-3
11 November	12	3-2-1-3-3-2-1-4	24	1-0-2-5-6-4-3-3	15	3-1-2-3-4-3-2-4
12 November	9	3-3-2-3-2-1-1-2	24	3-3-3-6-5-2-1-2	15	4-3-3-4-3-2-2-2
13 November	4	1-1-1-1-1-1-2-1	6	1-0-1-3-3-1-1-2	8	2-0-1-1-2-2-3-3
14 November	5	1-2-1-1-1-2-2-2	6	1-0-0-2-1-3-3-2	7	1-2-0-0-1-3-3-3

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
11 Nov 1024	WARNING: Geomagnetic K = 4	11 Nov 1024 - 1600
11 Nov 1250	ALERT: Geomagnetic K = 4	11 Nov 1250
11 Nov 2203	WARNING: Geomagnetic K = 4	11 Nov 2205 - 12/1600
11 Nov 2315	ALERT: Geomagnetic K = 4	11 Nov 2315
12 Nov 0408	ALERT: Type II Radio Emission	12 Nov 0139
13 Nov 1131	ALERT: Electron 2MeV Integral Flux >= 1000pfu	13 Nov 1115
14 Nov 1245	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	13 Nov 1115
14 Nov 2111	WATCH: Geomagnetic A >= 20	15 Nov
14 Nov 2126	WARNING: Geomagnetic K = 4	14 Nov 2230 - 15/1600

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
17 Nov	90	7	3	01 Dec	82	5	2
18	90	5	2	02	82	5	2
19	90	7	3	03	82	5	2
20	88	5	2	04	84	5	2
21	86	5	2	05	84	5	2
22	84	5	2	06	84	5	2
23	84	5	2	07	85	5	2
24	82	5	2	08	85	5	2
25	82	5	2	09	85	5	2
26	82	5	2	10	85	5	2
27	82	5	2	11	85	5	2
28	82	5	2	12	85	7	3
29	82	5	2	13	85	7	3
30	82	5	2				

Energetic Events

Date	Time			X-ray		Optical Information				Peak Radio Flux		Sweep Freq Intensity	
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat	CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray	Optical		
	Begin	Max	End	Class.	Imp / Brtns	Location Lat CMD	Rgn
08 November	0236	0239	0242	B1.8			1121
09 November	0125	0128	0131	B1.6			1121
	0510	0515	0519	B1.5			1121
	1355	1400	1403	B3.0			1121
10 November	0142	0149	0153	B2.1			1121
	0243	0246	0259	B1.5			1121
	0339	0406	0442	B6.5			1121
	1226	1228	1252	B8.9	SF	S22E24	1123
	1415	1417	1424	B6.0	SF	S21E22	1123
	1638	1641	1645	B9.0	SF	S22E20	1123
	1747	1747	1751	B2.6	SF	S20E17	1123
	2159	2209	2233	B2.8			1123
	2251	2251	2254	B6.0	SF	S21E17	1123
11 November	0213	0215	0223	C2.9	SF	S24E16	1123
	0438	0455	0501	B5.3			1121
	0510	0524	0539	C1.1			1121
	0721	0724	0734	C4.7	SF	S27E14	1123
	0951	1000	1010	B2.2			1123
	1012	1016	1022	B4.3			1123
	1242	1246	1251	B1.7			
	1258	1307	1312	C2.2			1123
	1610	1614	1651	C4.3	SF	S26E08	1123
	1859	1901	1908	B9.4	SF	N14E28	1124
	1927	1928	1937	C1.1	SF	S26E06	1123
	1943	1944	1953		SF	N14E27	1124
	2051	2055	2101	B9.0	SF	N14E27	1124
	2357	0013	0023	B6.0			
12 November	0133	0134	0142	C4.6	SF	S24E03	1123
	0344	0353	0408	C1.0			1123
	0512	0521	0536	C1.1			1123
	0802	0810	0826	C1.5	SF	S22W00	1123
	0853	0901	0906	B4.0			1123
	1103	1123	1131	B2.1			1123
	1143	1157	1205	B2.2			1123
	1342	U1345	A1408	C1.5	SF	S21W03	1123

Flare List - Continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Optical Rgn
13 November	0611	0615	0621	B1.5			
	1024	1029	1034	B4.3			
	1132	1134	1152	C1.3	SF	S23W16	1123
	1601	1606	1613	B2.0			1124
	1710	1713	1719	B5.7	SF	N18E13	1125
	1750	1750	1754	B2.8	SF	N18E12	1125
	2300	2306	2315	B1.6			
	2355	2356	0002	C1.1	SF	S23W26	1123
14 November	0308	0338	0342	B2.0			1123
	0539	0542	0545	B1.8			1124
	0809	0811	0813		SF	N12W08	1124
	0852	0855	0905	B2.2			1124
	0908	0922	0927	B2.6			1124
	1026	1030	1041	B3.7			1124
	1244	1248	1251	B2.4			1124

Region Summary

Date	Location (° Lat ° CMD)	Helio Lon	Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 1120												
30 Oct	N39E69	283	10	4	BXO	3	B				2				
31 Oct	N40E53	286	40	9	CRO	4	B								
01 Nov	N39E41	285	120	11	ESO	7	B								
02 Nov	N38E31	283	80	13	ESO	7	B								
03 Nov	N39E17	281	50	13	CAO	8	B								
04 Nov	N38E04	282	10	13	BXO	7	B								
05 Nov	N38W09	282	10	14	BXO	2	B								
06 Nov	N41W13	273		1	AXX	2	A								
07 Nov	N41W26	273													
08 Nov	N41W39	273													
09 Nov	N41W52	273													
10 Nov	N41W65	273													
11 Nov	N41W78	273													
12 Nov	N41W91	273													
								0	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 282

Date	Location (° Lat ° CMD)	Helio Lon	Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 1121												
03 Nov	S20E84	218						1							
04 Nov	S20E70	218	10	1	AXX	7	A	1	1		1				
05 Nov	S18E58	215	70	11	CRO	7	B	1	1		2				
06 Nov	S18E48	211	80	13	EAI	9	B	4	1		2	1			
07 Nov	S18E36	211	90	13	ESI	11	BG	1				1			
08 Nov	S19E20	213	50	13	ERO	12	BG								
09 Nov	S19E07	212	50	12	EAO	9	B								
10 Nov	S20W01	207	10	3	AXX	3	A								
11 Nov	S23W28	217						1							
12 Nov	S23W41	217													
13 Nov	S23W54	217													
14 Nov	S23W67	217													
								9	3	0	5	2	0	0	0

Still on Disk.
Absolute heliographic longitude: 207

Region Summary - continued

Date	Location (° Lat ° CMD)	Helio Lon	Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					Region 1122										
06 Nov	N13W02	262	10	5	CSO	2	B								
07 Nov	N14W18	263	10	7	CAO	3	B								
08 Nov	N13W31	263	30	7	DRO	4	B								
09 Nov	N14W43	263	20	4	BXO	6	B								
10 Nov	N13W53	260	10	2	AXX	2	A								
11 Nov	N12W66	260													
12 Nov	N12W79	260													
13 Nov	N12W92	260													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 262

					Region 1123										
10 Nov	S23E16	193	30	6	DRO	8	B				5				
11 Nov	S22E03	190	80	5	DAI	12	B	5			4				
12 Nov	S22W10	192	50	6	DAI	15	B	5			3				
13 Nov	S23W24	191	50	5	CRO	7	B	2			2				
14 Nov	S22W37	191	10	6	BXO	7	B								
								12	0	0	14	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 190

					Region 1124										
10 Nov	N14E38	168	20	3	DRO	2	B								
11 Nov	N16E27	164	15	7	CAO	3	B				3				
12 Nov	N14E12	169	30	4	DAO	8	B								
13 Nov	N14W03	171	80	6	DSI	11	B								
14 Nov	N14W17	171	100	8	DSI	15	B				1				
								0	0	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 171

Region Summary - continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 1125												
11 Nov	N19E34	160	15	2	CRO	3	B								
12 Nov	N19E23	156	10	5	BXO	3	B								
13 Nov	N19E08	160	30	3	CRO	3	B				2				
14 Nov	N18W06	160	10	4	BXO	5	B								
								0	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 160

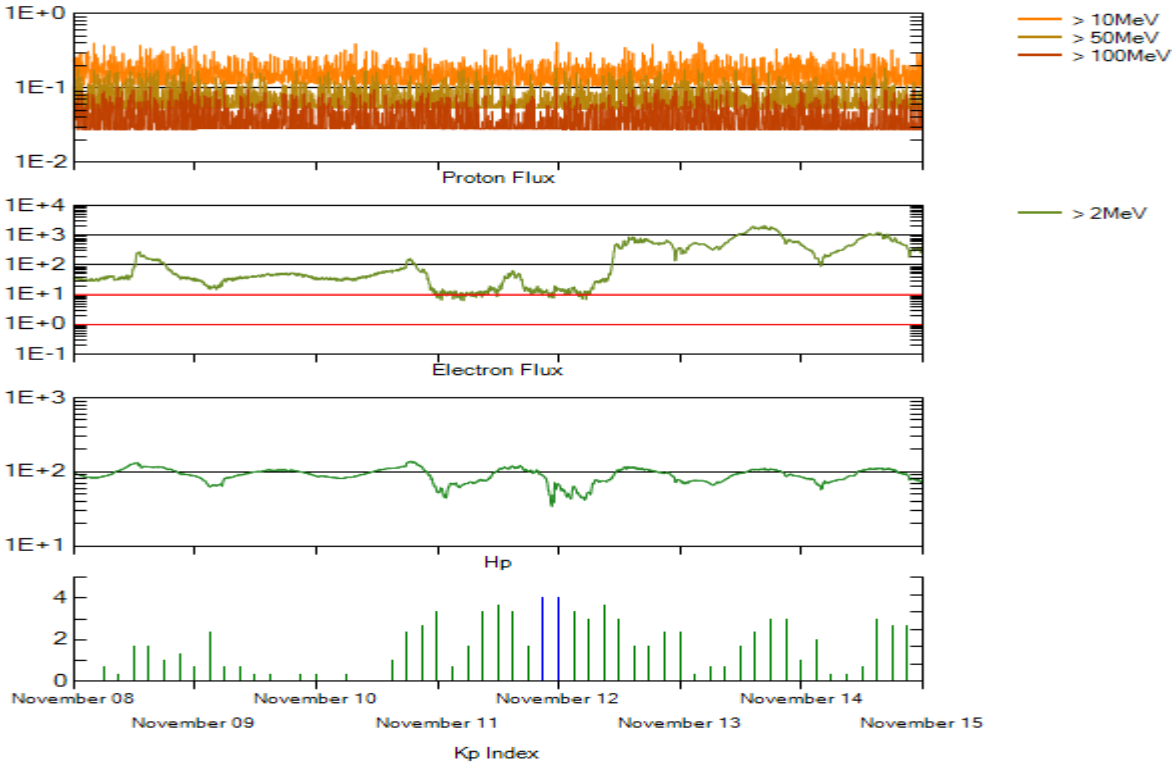
Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 1126												
12 Nov	S28E73	108	10	3	DSO	2	B								
13 Nov	S30E59	109	30	2	CRO	2	B								
14 Nov	S30E47	108	30	3	CRO	2	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 108

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

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
November	6.8	4.1	0.60	2.7	1.7	68.6	68.3	4	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	4	4.9
				2009					
January	2.8	1.3	0.46	3.0	1.8	69.8	68.7	4	4.7
February	2.5	1.4	0.56	3.1	1.9	70.0	68.8	5	4.7
March	0.7	0.7	1.00	3.4	2.0	69.2	69.0	5	4.6
April	1.2	0.8	1.00	3.7	2.2	69.7	69.3	4	4.3
May	3.9	2.9	0.74	3.8	2.3	70.5	69.7	4	4.1
June	6.6	2.9	0.39	4.4	2.7	68.6	70.2	4	4.0
July	5.0	3.2	0.70	5.8	3.6	68.2	71.0	4	3.9
August	0.3	0.0	0.00	7.7	4.8	67.4	72.1	5	3.8
September	6.6	4.3	0.64	9.9	6.2	70.5	73.3	4	3.8
October	7.0	4.8	0.66	11.3	7.1	72.3	74.1	3	4.1
November	7.7	4.1	0.55	12.4	7.6	73.6	74.5	3	4.5
December	15.7	10.8	0.68	13.6	8.3	76.8	74.9	2	4.8
				2010					
January	21.3	13.2	0.62	14.8	9.3	81.1	75.5	3	5.0
February	31.0	18.8	0.60	16.7	10.6	84.7	76.5	5	5.1
March	24.7	15.4	0.62	19.1	12.3	83.3	77.5	5	5.3
April	11.2	8.0	0.71	21.4	14.0	75.9	78.3	10	5.5
May	19.9	8.7	0.44			73.8		8	
June	17.9	13.6	0.75			72.6		7	
July	23.1	16.1	0.70			79.9		5	
August	28.2	19.6	0.70			79.7		8	
September	35.6	25.2	0.71			81.1		5	
October	35.0	23.5	0.67			81.6		6	

NOTE: Values are final except for the most recent 6 months which are considered preliminary. Cycle 23 started in May 1996 with an RI=8.0. Cycle 23 maximum was April 2000 with an RI=120.8. Solar minimum, marking the start of Cycle 24, was December 2008.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 08 November 2010

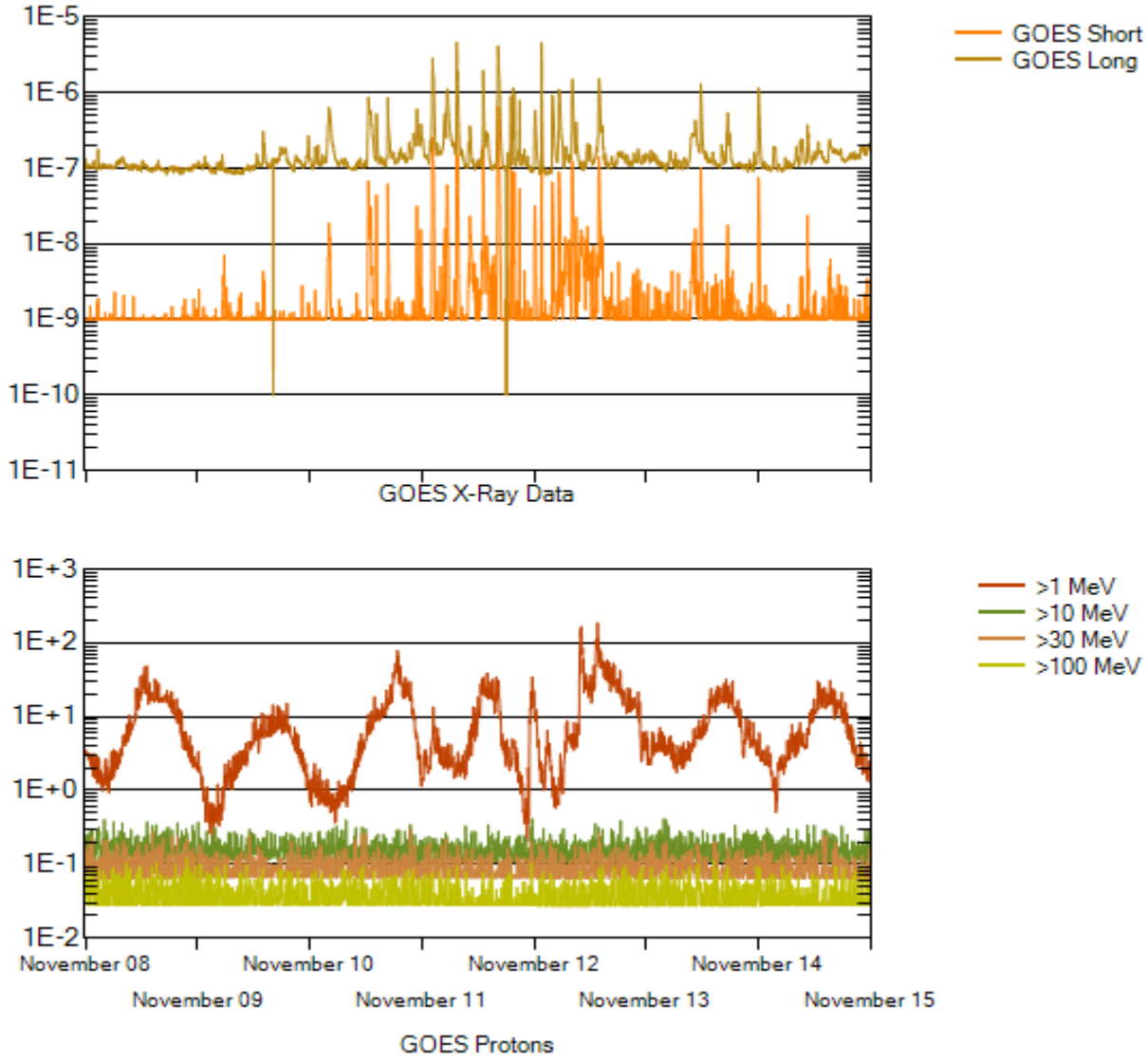
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec –sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-13.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as measured by GOES-13. The Hp 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 SWPC 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

The x-ray plot contains five-minute averaged x-ray flux (Watts/m^2) as measured by GOES 14 (W105) in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral proton flux (protons/cm^2–sec-sr) as measured by GOES-13 for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.