

Space Weather Highlights
03 August – 09 August 2009

SWO PRF 1771
11 August 2009

Solar activity was very low. No flares were observed. The visible disk was spotless.

No proton events were observed at geosynchronous orbit.

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

The geomagnetic field was initially unsettled early on 3 August but decreased to quiet levels by mid-day. Conditions remained quiet until 0600-1500 UTC on 5 August when there was an increase to unsettled levels. Conditions returned to quiet levels for the remainder of 5 August, but then increased to unsettled to active levels between 0000-0900 UTC on 6 August, followed by quiet to unsettled levels from 0900-1800 UTC. Predominately quiet levels followed until 2100-2359 UTC on 7 August when there was an increase to unsettled levels. Quiet levels followed until 0600-1500 UTC on 9 August when there was another increase to generally unsettled levels with active to minor storm periods at high latitudes. Observations from the ACE spacecraft showed that the increase early on 3 August was due to an extended negative Bz interval (minimum value of -6.5 nT at 02/2115 UTC) which was associated with a solar sector boundary crossing. The activity increases on 5 and 6 August appeared to be associated with the onset of a co-rotating interaction region (CIR) which was followed by a high speed stream from a negative polarity coronal hole. During the initial part of the CIR there was an extended negative Bz interval (minimum value of -4.9 nT at 05/0744 UTC), followed by a northward turning of Bz and strengthening of Bt (peak value 13.0 nT at 05/2130 UTC), followed by another southward Bz interval (minimum value of about -13.5 nT 06/0514 UTC). The solar wind velocity observed during the high speed stream reached maximum values around 535 km/s at 06/1123 UTC. After a gradual decline in solar wind velocity there was another density and magnetic field enhancement late on 7 August (Bz minimum of about -4.2 nT at 07/1936 UTC) followed by a second increase in solar wind speed (peak of 533 km/s 08/0615 UTC) which caused the geomagnetic activity increase that occurred at that time. A similar structure was seen again early on 9 August with an extended interval from 0200-1040 UTC of negative Bz values (minimum of -4.4 nT at 09/0300 UTC) and solar wind velocity reaching 481 km/s at 09/1120 UTC.

Space Weather Outlook
12 August – 07 September 2009

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 be at high levels during 21 - 22 August. Normal to moderate flux levels are expected during the rest of the period.

Geomagnetic field activity is expected to be quiet from 12 - 17 August. Activity is expected to increase to active levels on 18 August with a chance for minor storm levels due to a recurrent CH HSS. Activity is expected to decrease to unsettled levels on 19-21 August as the CH HSS subsides. Mostly quiet conditions are expected for 22 August - 07 September with the exception



of 30 August and 02-03 September when recurrent effects are expected to increase activity to unsettled levels.

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
03 August	67	0	0	<A1.0	0	0	0	0	0	0	0	0
04 August	66	0	0	<A1.0	0	0	0	0	0	0	0	0
05 August	66	0	0	<A1.0	0	0	0	0	0	0	0	0
06 August	67	0	0	<A1.0	0	0	0	0	0	0	0	0
07 August	68	0	0	<A1.0	0	0	0	0	0	0	0	0
08 August	67	0	0	<A1.0	0	0	0	0	0	0	0	0
09 August	67	0	0	<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
03 August	1.7e+06	2.0e+04	4.7e+03		1.3e+06	
04 August	1.2e+06	2.0e+04	4.5e+03		1.3e+06	
05 August	1.8e+06	2.0e+04	4.4e+03		6.7e+05	
06 August	8.1e+05	1.9e+04	3.8e+03		1.2e+05	
07 August	6.4e+05	1.8e+04	3.7e+03		8.7e+04	
08 August	1.5e+06	1.8e+04	4.0e+03		4.2e+05	
09 August	1.8e+06	1.9e+04	4.2e+03		1.0e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
03 August	7	3-3-2-2-1-1-1-1	6	2-2-3-3-0-0-0-0	10	3-3-3-2-2-2-2-1
04 August	4	1-2-1-0-1-1-2-1	4	2-2-1-0-2-2-1-0	4	1-1-1-0-1-0-1-1
05 August	5	1-1-2-2-2-1-0-2	8	1-1-3-4-3-0-0-1	6	2-2-2-2-2-2-2-2
06 August	8	2-2-3-1-2-2-2-2	11	2-3-4-3-2-2-1-1	14	3-4-4-2-2-3-2-2
07 August	8	3-2-1-2-1-2-1-3	6	1-1-1-3-1-2-1-2	8	2-2-1-2-1-2-3-3
08 August	2	1-1-0-0-1-1-1-0	3	2-2-0-0-0-1-1-0	4	2-1-0-0-1-1-1-1
09 August	6	2-2-3-1-1-1-1-1	15	2-2-4-5-4-1-1-0	8	2-3-3-2-1-1-2-2

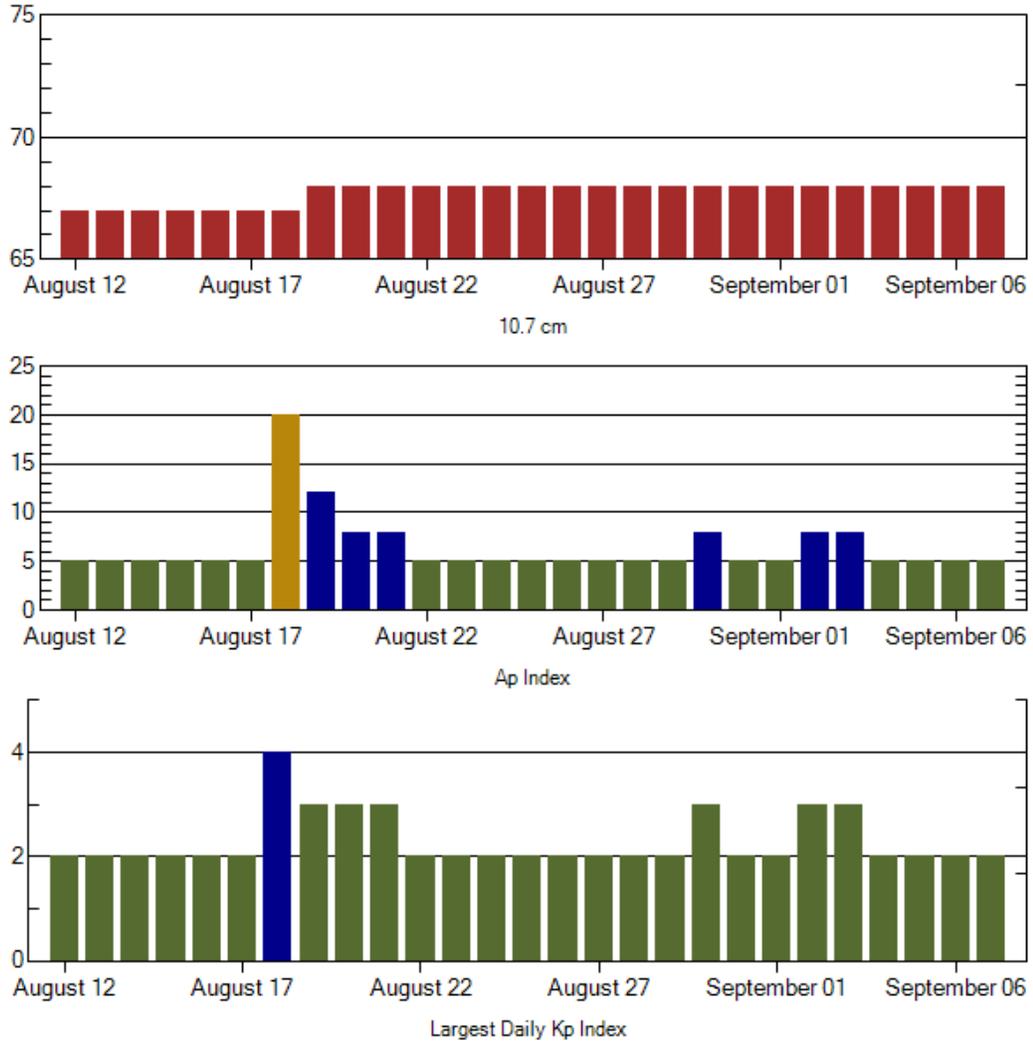


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
03 Aug 0844	ALERT: Geomagnetic K = 4	03 Aug 0844
06 Aug 0523	WARNING: Geomagnetic K = 4	06 Aug 0530 - 1600
06 Aug 0539	ALERT: Geomagnetic K = 4	06 Aug 0538
06 Aug 0636	ALERT: Geomagnetic K = 4	06 Aug 0635



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
12 Aug	67	5	2	26 Aug	68	5	2
13	67	5	2	27	68	5	2
14	67	5	2	28	68	5	2
15	67	5	2	29	68	5	2
16	67	5	2	30	68	8	3
17	67	5	2	31	68	5	2
18	67	20	4	01 Sep	68	5	2
19	68	12	3	02	68	8	3
20	68	8	3	03	68	8	3
21	68	8	3	04	68	5	2
22	68	5	2	05	68	5	2
23	68	5	2	06	68	5	2
24	68	5	2	07	68	5	2
25	68	5	2				



Energetic Events

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

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
03 August	No Flares Observed							
04 August	No Flares Observed							
05 August	No Flares Observed							
06 August	No Flares Observed							
07 August	No Flares Observed							
08 August	No Flares Observed							
09 August	No Flares Observed							

Region Summary

Date	Location		Sunspot Characteristics				Flares								
	° Lat	° CMD	Helio Lon	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
									C	M	X	S	1	2	3
<i>No Active Regions</i>															



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

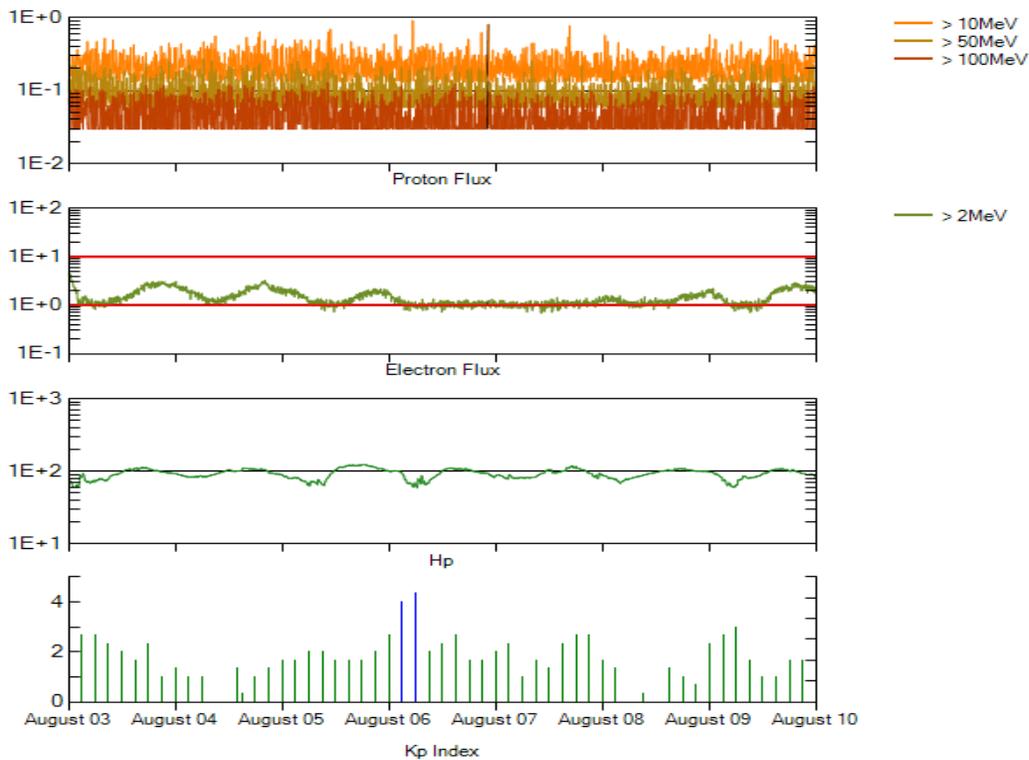
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
August	9.9	6.0	0.63	10.2	6.0	69.2	71.8	7	7.6
September	4.8	2.4	0.50	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.0	65.5	71.5	9	7.9
November	2.5	1.7	0.68	9.4	5.7	69.7	71.1	5	7.8
December	16.2	10.1	0.62	8.1	4.9	78.6	70.5	4	7.8
2008									
January	5.1	3.3	0.67	6.9	4.2	72.1	70.0	6	7.7
February	3.8	2.1	0.55	5.9	3.6	71.2	69.6	9	7.6
March	15.9	9.3	0.58	5.3	3.3	72.9	69.5	10	7.4
April	4.9	2.9	0.59	5.3	3.4	70.3	69.6	9	7.1
May	5.7	3.2	0.51	5.7	3.5	68.4	69.7	6	6.9
June	4.2	3.4	0.74	5.2	3.3	65.9	69.2	7	6.8
July	1.0	0.8	0.50	4.5	2.8	65.8	68.8	6	6.6
August	0.0	0.5	**	4.4	2.7	66.4	68.6	5	6.2
September	1.5	1.1	0.73	3.7	2.3	67.1	68.4	5	5.8
October	5.2	2.9	0.56	2.9	1.9	68.3	68.2	6	5.4
November	6.8	4.1	0.60	2.7	1.8	68.6	68.3	3	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	2	4.9
2009									
January	2.8	1.3	0.54	3.0	1.8	69.8	68.7	3	4.8
February	2.5	1.4	0.56			70.0		4	
March	0.7	0.7	1.00			69.2		4	
April	1.2	1.2	1.00			69.7		4	
May	3.9	2.9	0.74			70.6		4	
June	6.6	2.6	0.39			68.6		5	
July	5.0	3.5	0.70			68.3		5	

NOTE: All values are preliminary estimates except for RI Sunspot Numbers which are final values when available.

Cycle 23 started in May 1996 with an RI=8.0. Cycle 23 maximum was April 2000 with an RI=120.8.

**SWPC sunspot number was less than RI value, so a ratio could not be computed.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 03 August 2009*

GOES-11 designated Primary Electron Satellite and GOES-10 Secondary: December 1, 2008 the GOES-12 Electron sensor began experiencing periods of noise and sensor is unreliable.

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.

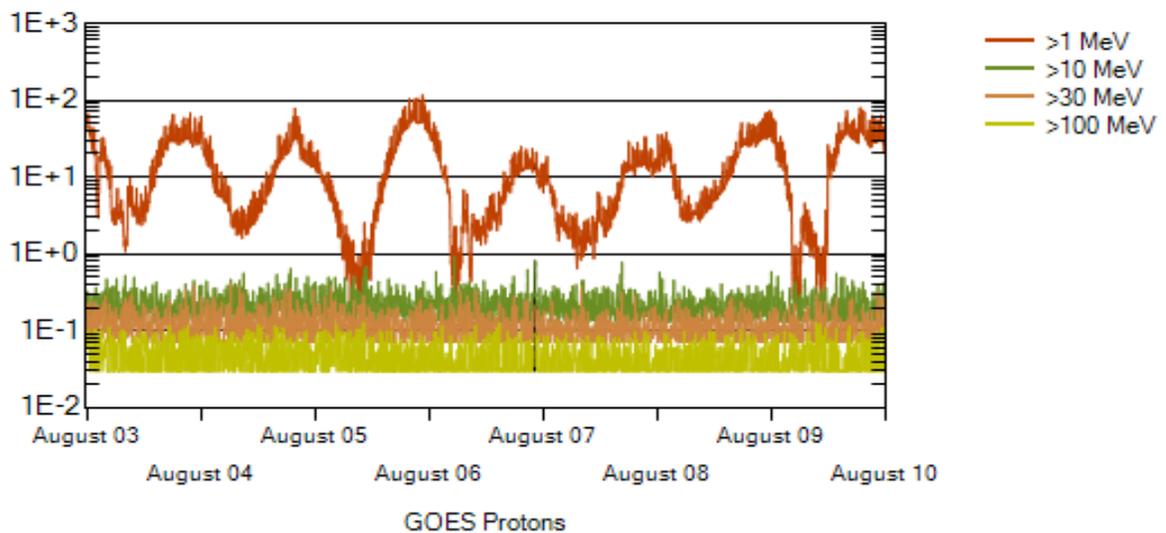
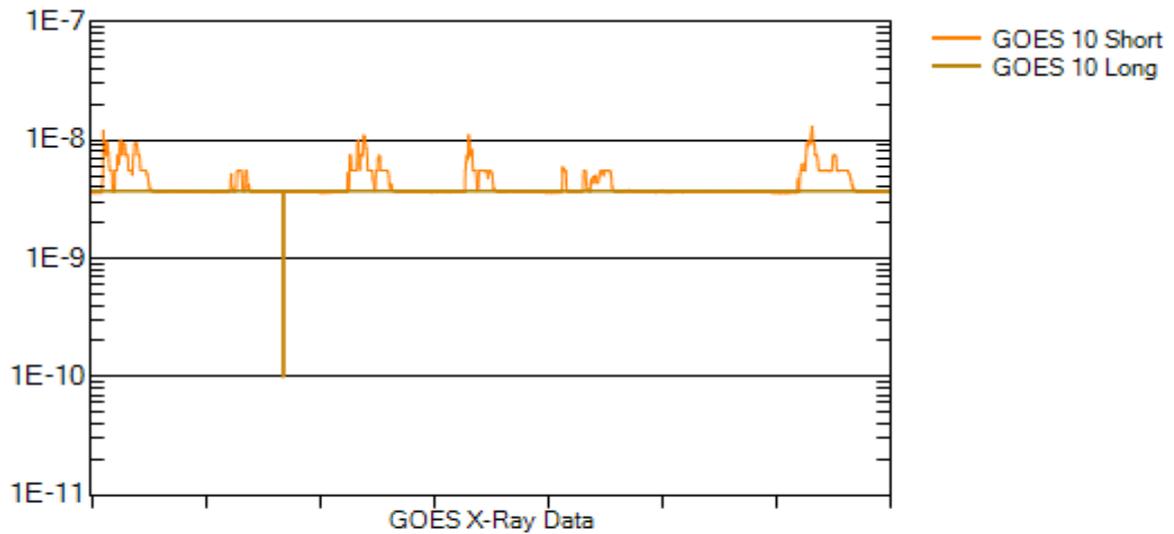
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-11.

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-11. 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 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

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 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.

