

Space Weather Highlights
06 July – 12 July 2009

SWO PRF 1767
14 July 2009

Solar activity was very low to low. Activity was low on 06 July due to an isolated C1/Sf flare at 06/1704 UTC from Region 1024 (S26, L=247, class/area Eao/230 on 09 July). Activity dropped to low levels for the rest of the period with isolated B-class X-ray flares during 07 - 08 July from Region 1024. No flares were detected during the rest of the period as Region 1024 gradually decayed and simplified. Region 1024 quietly departed the west limb early on 12 July.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels during the period.

Geomagnetic field activity was at quiet levels during 06 - 08 July. Activity increased to quiet to unsettled levels during 09 - 10 July. Activity decreased to quiet levels at all latitudes during 11 - 12 July. ACE solar wind measurements indicated the unsettled periods during 09 - 10 July were associated with a coronal hole high-speed stream (CH HSS). Solar wind velocities gradually increased during 09 - 10 July and reached a peak of 468 km/sec at 10/1436 UTC. Interplanetary magnetic field changes associated with the CH HSS included increased IMF Bt (peak 12 nT at 09/1848 UTC) and intermittent periods of southward IMF Bz (minimum -8 nT at 10/0301 UTC). Solar wind velocities gradually decreased during 10 - 12 July.

Space Weather Outlook
15 July – 10 August 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 16 - 17 July. Normal to moderate flux levels are expected during the remainder of the period.

Geomagnetic field activity is expected to be at unsettled levels on 15 July. Activity is expected to decrease to quiet levels during 16 - 20 July. Activity is expected to increase to unsettled to active levels during 21 - 22 July due to a recurrent coronal hole high-speed stream (CH HSS). Activity is expected to decrease to quiet levels during 23 July to 08 August. Activity is expected to increase to unsettled levels during 09 - 10 August due to a recurrent CH HSS.

Notice: On May 8, 2009 the Solar Cycle 24 Prediction Panel released a consensus decision on the prediction of the next solar cycle (Cycle 24). See <http://www.swpc.noaa.gov/SolarCycle/> for more details.



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
06 July	70	23	160	<A1.0	1	0	0	1	0	0	0	0
07 July	71	21	180	<A1.0	0	0	0	1	0	0	0	0
08 July	71	18	190	A1.0	0	0	0	0	0	0	0	0
09 July	69	15	230	<A1.0	0	0	0	0	0	0	0	0
10 July	68	13	60	<A1.0	0	0	0	0	0	0	0	0
11 July	68	0	0	<A1.0	0	0	0	0	0	0	0	0
12 July	68	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
	06 July	8.4e+05	2.0e+04	4.6e+03		4.0e+06
07 July	1.1e+06	1.9e+04	4.5e+03		3.9e+06	
08 July	7.0e+05	1.9e+04	4.7e+03		1.1e+06	
09 July	9.4e+05	2.1e+04	4.8e+03		1.2e+06	
10 July	8.3e+05	2.0e+04	4.5e+03		4.4e+05	
11 July	6.8e+05	2.0e+04	4.5e+03		4.8e+05	
12 July	7.2e+05	2.0e+04	4.6e+03		7.1e+05	

Daily Geomagnetic Data

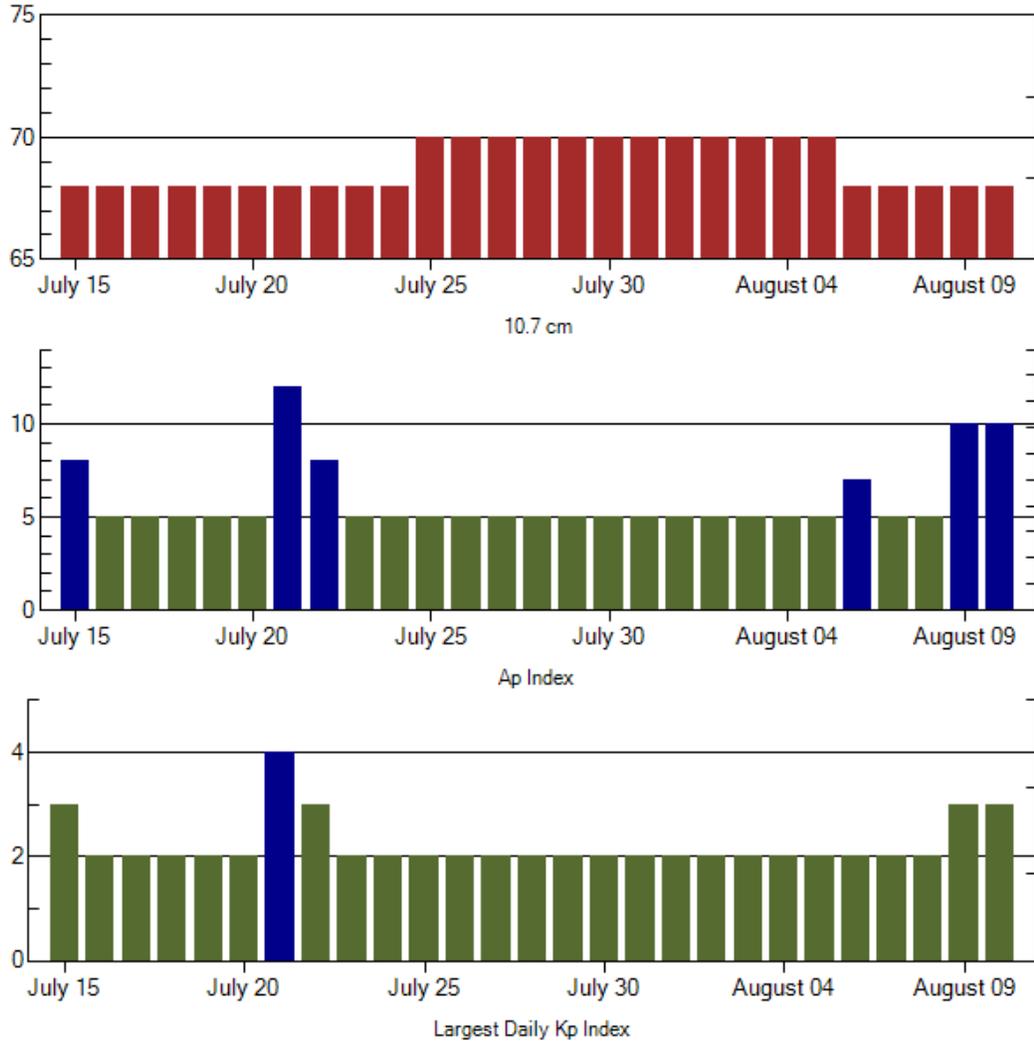
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 July	3	2-2-0-0-1-0-1-1	3	1-2-1-0-1-0-1-1	4
07 July	3	0-1-0-1-1-2-2-1	2	1-1-0-1-0-2-1-0	5	1-1-0-1-1-2-2-2
08 July	3	1-0-2-2-1-1-1-0	7	1-0-2-4-3-0-0-0	6	1-1-2-2-1-2-2-1
09 July	6	1-0-2-2-1-1-3-2	3	0-0-2-1-1-1-2-1	6	1-0-2-1-0-1-3-3
10 July	7	3-3-1-1-2-2-1-1	5	2-3-1-1-1-1-1-0	7	3-3-1-1-1-1-1-2
11 July	2	1-1-1-0-1-0-0-1	2	1-1-1-1-1-0-0-0	4	1-1-0-0-1-1-1-2
12 July	4	1-1-1-1-2-2-0-2	2	1-1-1-0-0-0-0-1	5	1-1-1-1-1-2-1-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
<i>No Alerts Issued</i>		



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
15 Jul	68	8	3	29 Jul	70	5	2
16	68	5	2	30	70	5	2
17	68	5	2	31	70	5	2
18	68	5	2	01 Aug	70	5	2
19	68	5	2	02	70	5	2
20	68	5	2	03	70	5	2
21	68	12	4	04	70	5	2
22	68	8	3	05	70	5	2
23	68	5	2	06	68	7	2
24	68	5	2	07	68	5	2
25	70	5	2	08	68	5	2
26	70	5	2	09	68	10	3
27	70	5	2	10	68	10	3
28	70	5	2				



Energetic Events

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

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
06 July	0220	0226	0228	B1.5				
	0402	0406	0409	B1.5				
	1703	1704	1725	C1.0	SF	S25W23	1024	
07 July	1707	1708	1710	1710	SF	S25W37	1024	
	2158	2206	2214	B1.2				
	2341	2344	2347	B1.0				
08 July	0132	0136	0139	B1.2				
	0524	0529	0535	B4.4				
09 July	No Flares Observed							
10 July	No Flares Observed							
11 July	No Flares Observed							
12 July	No Flares Observed							



Region Summary

Date	Location		Sunspot Characteristics					Flares															
	° Lat	° CMD	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical												
								C	M	X	S	1	2	3	4								
<i>Region 1024</i>																							
03 Jul	S25E16	246	60	5	DSO	7	B																
04 Jul	S27E02	247	100	6	DSI	14	B														3		
05 Jul	S27W13	247	170	10	DSI	16	B	1													1		
06 Jul	S27W26	247	160	10	DSI	13	B	1													1		
07 Jul	S27W39	248	180	11	EAI	11	B														1		
08 Jul	S25W52	248	190	11	ESI	8	B																
09 Jul	S25W65	248	230	13	EAO	5	B																
10 Jul	S25W79	248	60	14	ESO	3	B																
11 Jul	S25W92	248																					
								2	0	0	6	0	0	0							0		

Crossed West Limb.

Absolute heliographic longitude: 247



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

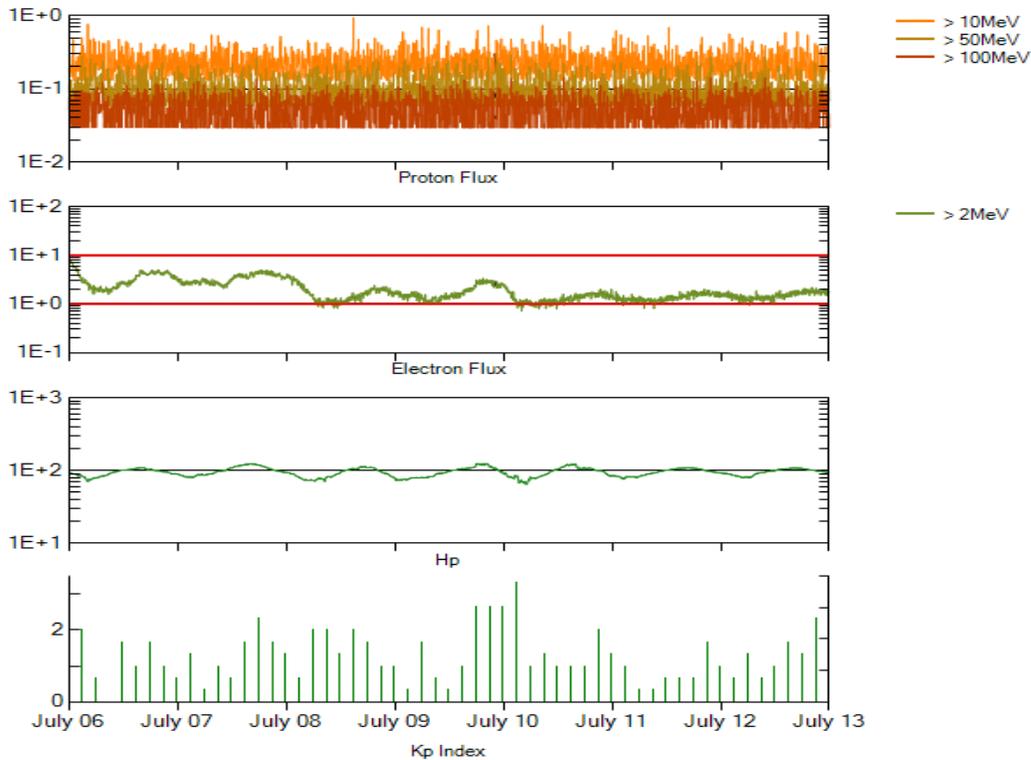
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2007									
July	15.6	10.0	0.64	11.6	7.0	71.6	72.5	8	7.4
August	9.9	6.2	0.63	10.2	6.1	69.2	71.8	7	7.6
September	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	6.1	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	5.0	78.6	70.5	4	7.8
2008									
January	5.1	3.4	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	3.3	70.3	69.6	9	7.1
May	5.7	2.9	0.51	5.7	3.5	68.4	69.7	6	6.9
June	4.2	3.1	0.74	5.2	3.2	65.9	69.2	7	6.8
July	1.0	0.5	0.50	4.5	2.7	65.8	68.8	6	6.6
August	0.0	0.5	**	4.4	2.6	66.4	68.6	5	6.2
September	1.5	1.1	0.73	3.7	2.2	67.1	68.4	5	5.8
October	5.2	2.9	0.56	2.9	1.8	68.3	68.2	6	5.4
November	6.8	4.1	0.60	2.7	1.7	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	1.5	0.54			69.8		3	
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	

NOTE: All smoothed and monthly values are preliminary estimates.

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 06 July 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.

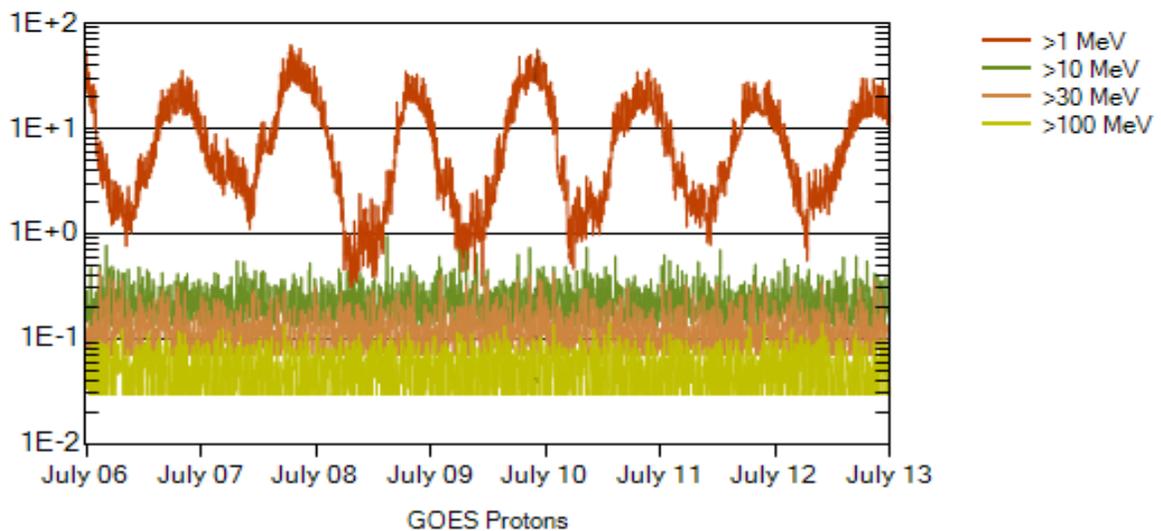
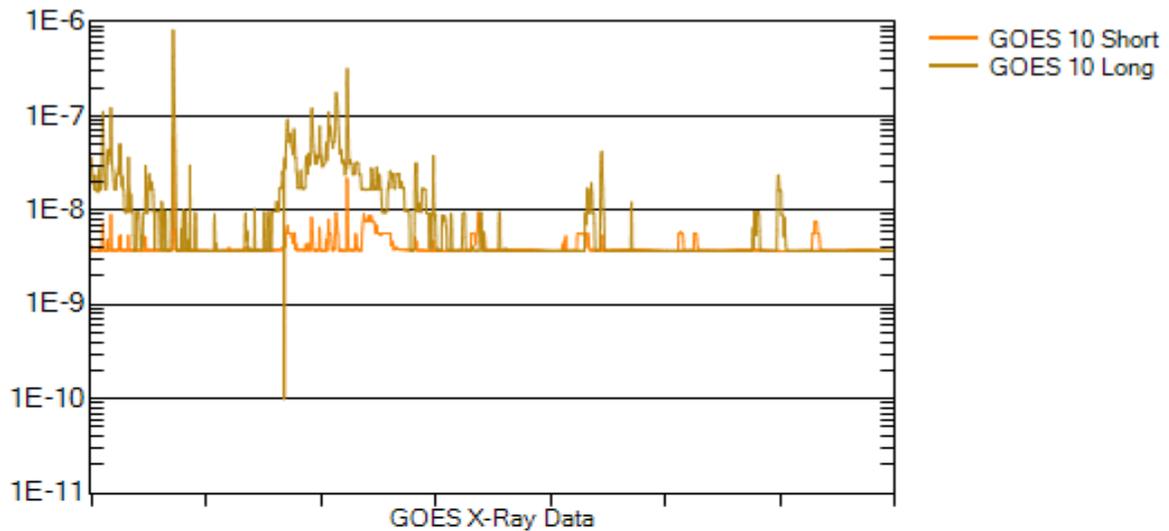
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-11.

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.

