

Space Weather Highlights
13 July – 19 July 2009

SWO PRF 1768
21 July 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 to moderate levels during the period.

Geomagnetic field activity was at quiet levels early on 13 July. From midday on 13 July through mid-afternoon on 14 July, activity increased to quiet to unsettled levels, with isolated active periods. Solar wind data at ACE indicated the increase in activity was associated with a coronal hole high-speed stream. Solar wind speed increased from 330 km/s at 13/1109 UTC to 569 km/s at 14/0213 UTC. Intermittent periods of southward IMF Bz were observed between 13/1017 – 14/0115 UTC, with a minimum of -10 nT at 13/2347 UTC. Wind speeds gradually decreased to 276 km/s, beginning at 14/2050 UTC and lasting through the end of the period. Geomagnetic activity decreased to predominantly quiet levels on 15 July. The remainder of the period was quiet.

Space Weather Outlook
22 July – 17 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 normal to moderate levels.

Geomagnetic field activity is expected to be at quiet levels during 22 July – 04 August. Quiet levels, with isolated unsettled periods, are expected on 05-06 August due to a recurrent coronal hole. Activity is expected to decrease to predominantly quiet levels during the rest of the period, with possible isolated unsettled periods on 05-06 August and 09-10 August due to recurrent coronal holes.



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
13 July	67	0	0	<A1.0	0	0	0	0	0	0	0	0
14 July	67	0	0	<A1.0	0	0	0	0	0	0	0	0
15 July	67	0	0	<A1.0	0	0	0	0	0	0	0	0
16 July	67	0	0	<A1.0	0	0	0	0	0	0	0	0
17 July	66	0	0	<A1.0	0	0	0	0	0	0	0	0
18 July	67	0	0	<A1.0	0	0	0	0	0	0	0	0
19 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
	13 July	1.3e+06	2.0e+04	4.8e+03		5.8e+05
14 July	6.6e+05	2.0e+04	4.5e+03		3.7e+05	
15 July	5.1e+05	2.0e+04	4.5e+03		2.8e+06	
16 July	5.2e+05	2.0e+04	4.7e+03		5.6e+06	
17 July	6.5e+05	2.0e+04	4.4e+03		8.8e+06	
18 July	8.9e+05	2.1e+04	4.5e+03		1.2e+07	
19 July	8.8e+05	2.0e+04	4.6e+03		9.6e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	13 July	5	0-1-0-1-2-2-3	8	1-0-0-1-4-3-2-2	10
14 July	6	3-3-1-1-1-1-1	11	3-2-2-4-4-1-1-0	8	4-3-2-1-2-1-1-2
15 July	3	1-2-1-1-1-0-0-1	5	2-2-2-1-3-2-0-0	5	1-3-2-1-2-0-1-1
16 July	2	0-0-1-0-1-1-1-1	1	0-0-1-1-0-0-0-0	4	1-0-1-0-2-1-1-1
17 July*	0	0-0-0-0-0-0-0-0	0-	0-0-0-0-0-0	2	0-0-0-0-1-1-1-1
18 July	1	0-0-0-0-2-0-1-0	0	0-0-0-0-0-0-0-1	3	0-1-1-0-1-1-1-1
19 July	1	0-0-0-0-1-1-1-0	0	0-0-0-0-0-0-0-0	2	0-0-0-0-1-0-1-1

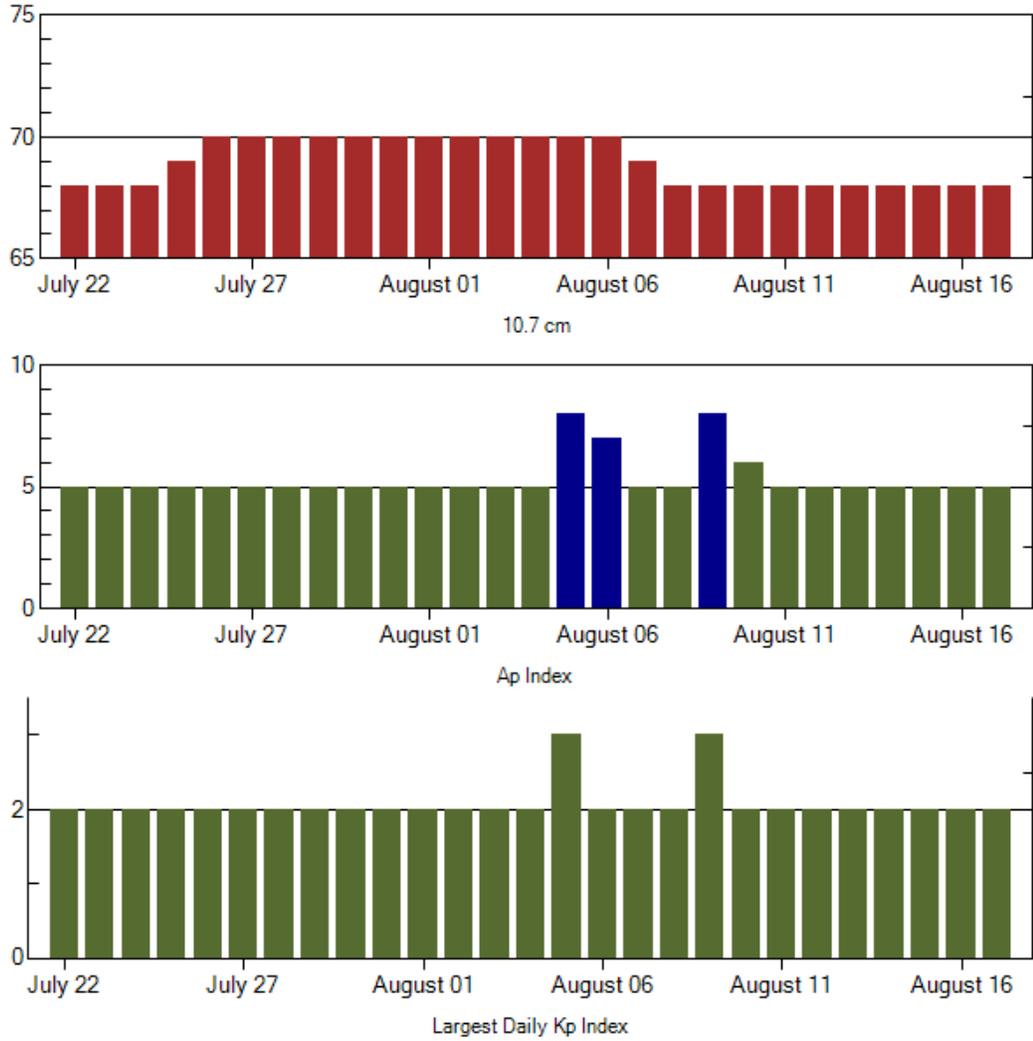
Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
14 Jul 0210	ALERT: Geomagnetic K = 4	14 Jul 0210
14 Jul 0211	WARNING: Geomagnetic K = 4	14 Jul 0215 - 0600

* College geomagnetic data was partially missing on 17 July



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
22 Jul	68	5	2	05 Aug	70	8	3
23	68	5	2	06	70	7	2
24	68	5	2	07	69	5	2
25	69	5	2	08	68	5	2
26	70	5	2	09	68	8	3
27	70	5	2	10	68	6	2
28	70	5	2	11	68	5	2
29	70	5	2	12	68	5	2
30	70	5	2	13	68	5	2
31	70	5	2	14	68	5	2
01 Aug	70	5	2	15	68	5	2
02	70	5	2	16	68	5	2
03	70	5	2	17	68	5	2
04	70	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn
	Begin	Max	End			Location Lat CMD	
13 July	No Flares Observed						
14 July	No Flares Observed						
15 July	No Flares Observed						
16 July	No Flares Observed						
17 July	No Flares Observed						
18 July	No Flares Observed						
19 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

No Active Regions



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

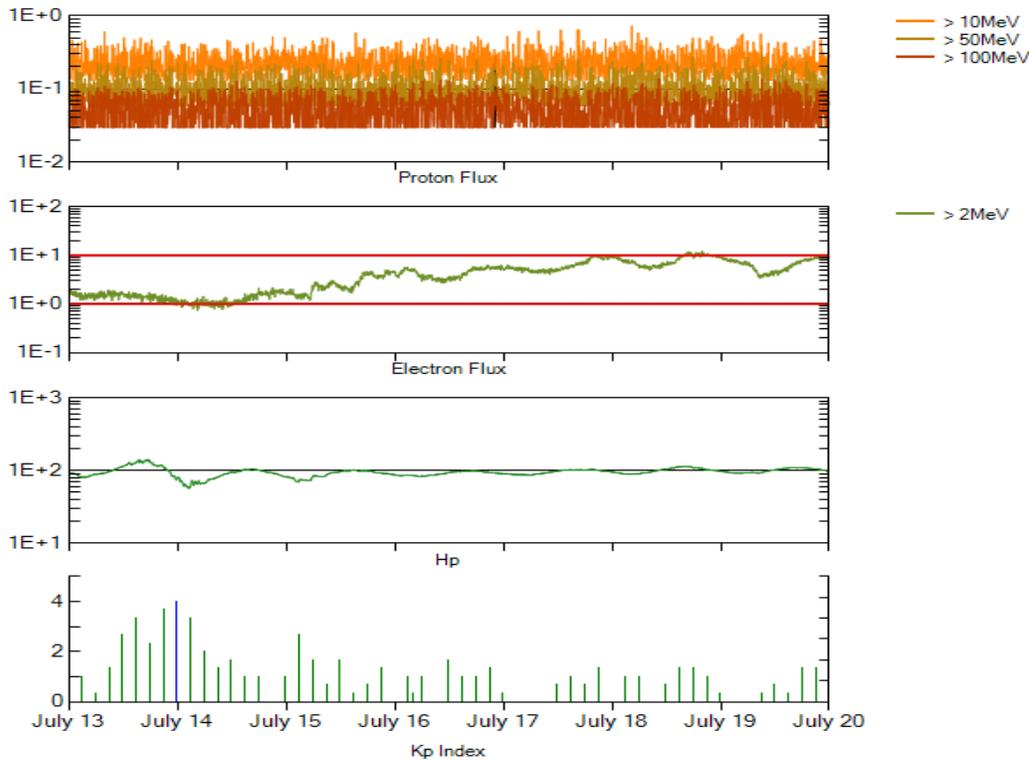
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2007									
July	15.6	10.0	0.64	11.6	7.0	71.6	72.5	8	7.4
August	9.9	6.2	0.63	10.2	6.1	69.2	71.8	7	7.6
September	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 13 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.

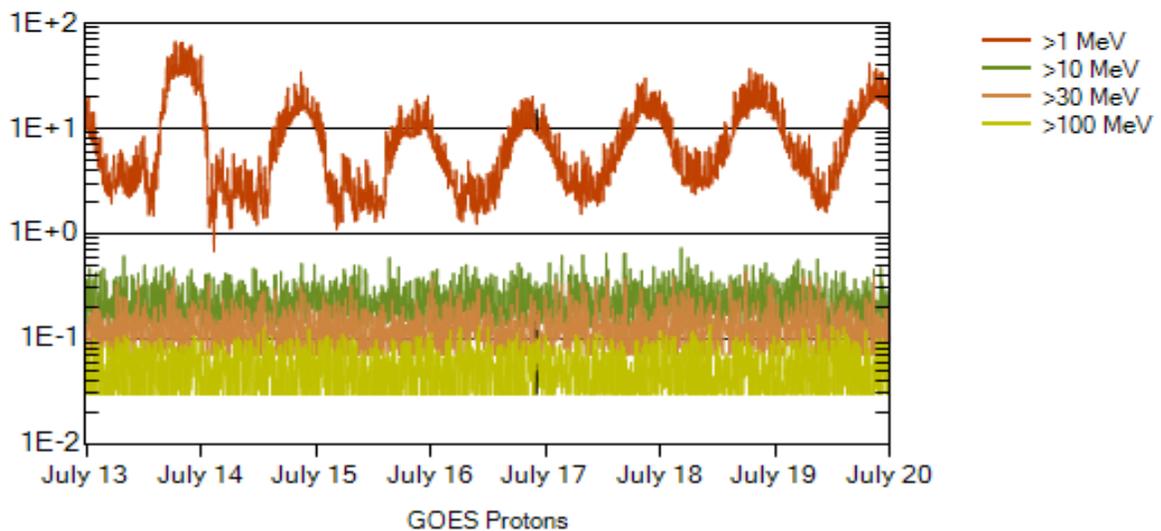
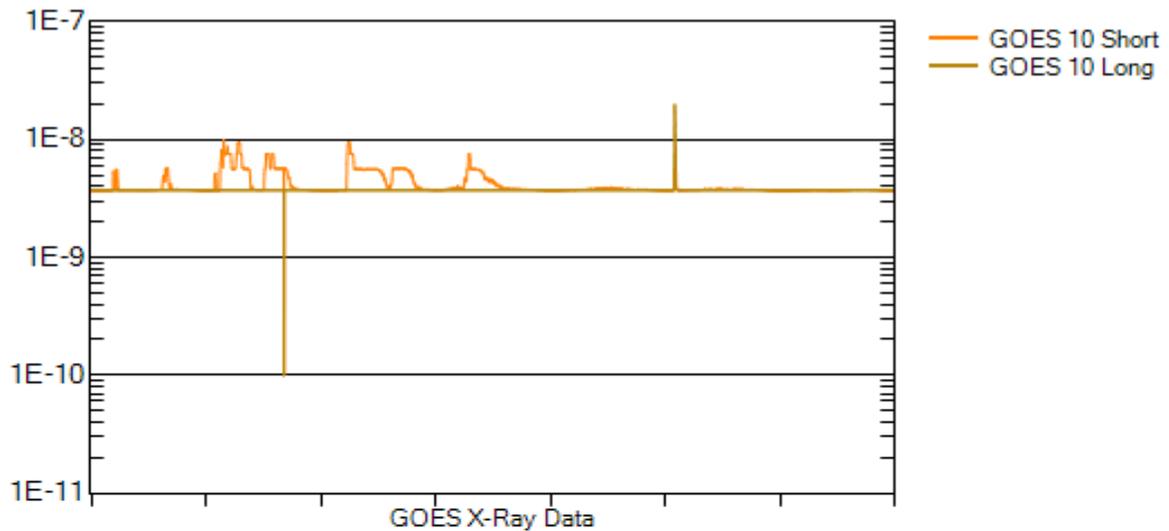
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-11.

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.

