

Space Weather Highlights
21 – 27 September 2009

SWO PRF 1778
29 September 2009

Solar activity was at very low to low levels. Very low levels occurred during most of the period with isolated B-class flares from Region 1026 (S30, L = 213, class/area Hsx/070 on 24 September) and Region 1027 (N24, L=240, class/area Dao/110 on 24 September). Activity increased to low levels on 25 September by virtue of a C2 flare at 25/0102 UTC from Region 1026. Both regions began to gradually decay during the latter half of the period.

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 to unsettled levels on 21 September with brief minor storm periods detected at high latitudes. Activity decreased to quiet levels at all latitudes during 22 - 26 September. Activity increased to quiet to unsettled levels on 27 September with a brief period of minor storm at high latitudes. ACE solar wind measurements indicated the activity of 21 September was associated with a recurrent coronal hole high-speed stream (CH HSS). The CH HSS commenced late on 20 September and continued through 22 September (peak velocity 489 km/sec at 21/1611 UTC). IMF changes associated with the CH HSS included increased IMF Bt (peak 10 nT at 21/0048 UTC) and intermittent periods of southward Bz (minimum -8 nT at 21/0641 UTC). The activity increase of 27 September was associated with a solar sector boundary crossing (SSBC (toward to away)). IMF changes associated with the SSBC included increased Bt and intermittent periods of southward Bz (minimum -8 nT at 27/0055 UTC).

Space Weather Outlook
30 September – 26 October 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 levels through the period.

Geomagnetic field activity is expected to be at quiet levels during 30 September - 01 October. Activity is expected to increase to quiet to unsettled levels during 02 - 03 October with a slight chance for active levels due to a coronal hole high-speed stream. Quiet conditions are expected during 04 - 23 October. Activity is expected to increase to quiet to unsettled levels during 24 - 25 October due to recurrence. A return to quiet conditions is expected on the last day of the period.



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
21 September	72	11	10	<A1.0	0	0	0	0	0	0	0	0
22 September	75	26	70	A1.4	0	0	0	0	0	0	0	0
23 September	76	31	140	A1.3	0	0	0	0	0	0	0	0
24 September	75	32	180	<A1.0	0	0	0	1	0	0	0	0
25 September	72	25	80	<A1.0	1	0	0	0	0	0	0	0
26 September	72	14	60	<A1.0	0	0	0	0	0	0	0	0
27 September	72	11	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
	21 September	4.5e+05	1.9e+04	4.1e+03		4.7e+04
22 September	3.9e+05	1.9e+04	4.1e+03		4.1e+04	
23 September	4.3e+05	2.0e+04	4.3e+03		4.8e+04	
24 September	6.8e+05	2.1e+04	4.4e+03		5.1e+04	
25 September	7.0e+05	2.1e+04	4.9e+03		4.5e+04	
26 September	1.1e+06	2.1e+04	4.7e+03		5.2e+04	
27 September	1.1e+06	2.0e+04	4.4e+03		3.6e+04	

Daily Geomagnetic Data

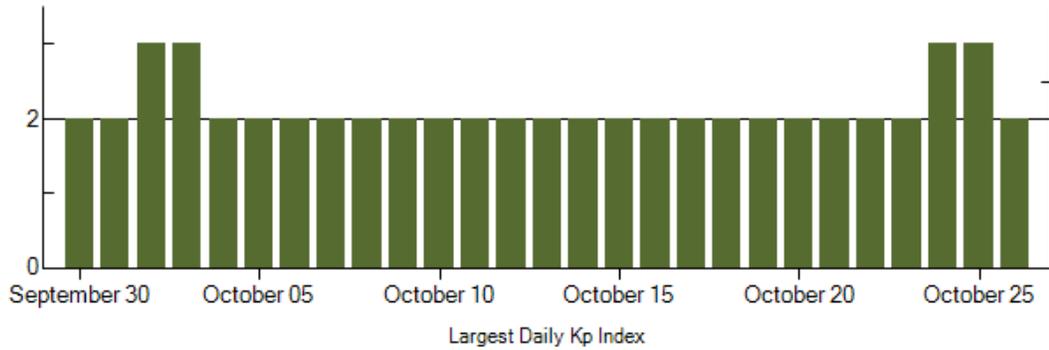
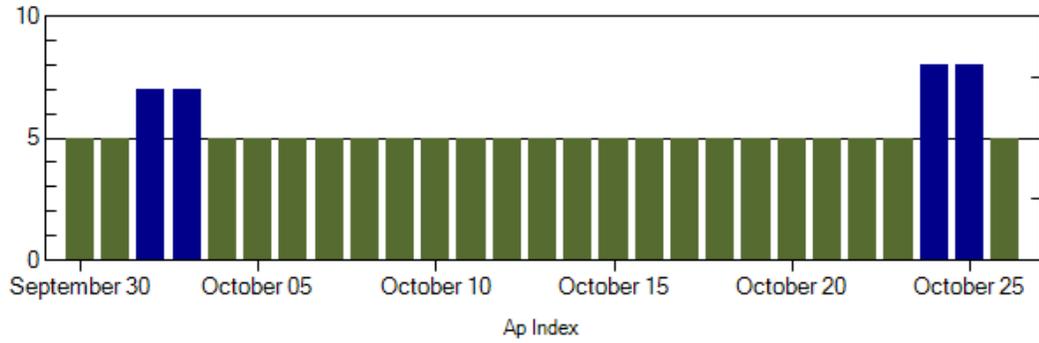
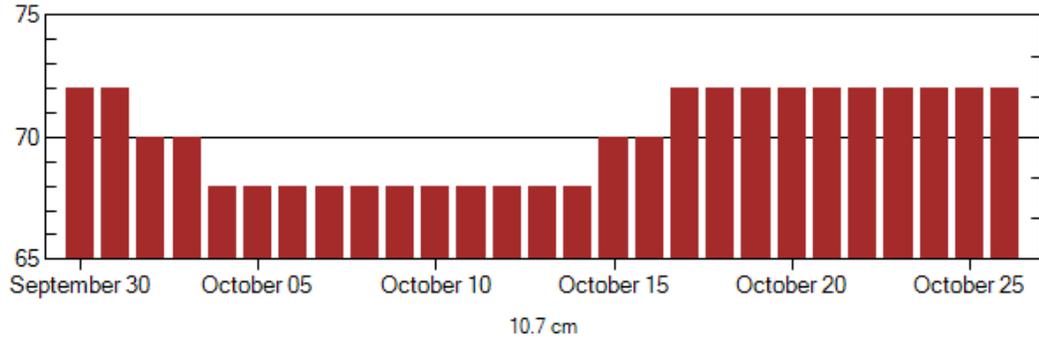
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	21 September	5	2-1-2-2-2-1-1-0	16	2-1-5-5-3-1-0-0	7
22 September	2	1-0-1-1-1-0-0-0	4	1-0-2-2-3-0-0-0	4	1-0-1-1-2-1-0-1
23 September	1	0-0-0-0-0-1-1-0	0	0-0-0-0-0-0-0-0	2	0-0-0-0-1-1-0-1
24 September	1	0-0-0-0-0-0-1-1	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-1-0-1
25 September	1	0-1-0-1-1-0-0-0	0	0-0-0-1-0-0-0-0	2	0-1-0-0-0-1-0-1
26 September	3	0-0-0-0-2-1-1-2	0	0-0-0-0-0-0-0-1	3	0-0-0-0-1-1-1-2
27 September	8	4-3-1-2-1-1-1-1	10	2-2-2-5-2-0-1-0	8	2-3-2-3-1-0-0-1

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
27 Sep 1036	ALERT: Geomagnetic K = 4	27 Sep 1035



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
30 Sep	72	5	2	14 Oct	68	5	2
01 Oct	72	5	2	15 Oct	70	5	2
02 Oct	70	7	3	16 Oct	70	5	2
03 Oct	70	7	3	17 Oct	72	5	2
04 Oct	68	5	2	18 Oct	72	5	2
05 Oct	68	5	2	19 Oct	72	5	2
06 Oct	68	5	2	20 Oct	72	5	2
07 Oct	68	5	2	21 Oct	72	5	2
08 Oct	68	5	2	22 Oct	72	5	2
09 Oct	68	5	2	23 Oct	72	5	2
10 Oct	68	5	2	24 Oct	72	8	3
11 Oct	68	5	2	25 Oct	72	8	3
12 Oct	68	5	2	26 Oct	72	5	2
13 Oct	68	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray	Imp /	Optical		Rgn
	Begin	Max	End	Class.	Brtns	Location		
						Lat	CMD	
21 September	1251	1256	1302	B1.1				
22 September	1054	1057	1101	B3.6				
	2031	2041	2047	B4.2				
23 September	No Flares Observed							
24 September	0016	0020	0024	B1.1				
	2345	2353	0001	B2.6	SF	S32E28		1026
25 September	0047	0102	0116	C2.0				
	0854	0858	0903	B1.1				
26 September	No Flares Observed							
27 September	No Flares Observed							

Region Summary

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

Region 1026

21 Sep		S29E63	221	10	1	A	X	1	A								
22 Sep		S30E54	217	30	9	C	S	2	B								
23 Sep		S36E34	224	40	2	H	S	2	A								
24 Sep		S29E28	221	70	1	H	S	1	A								1
25 Sep		S30E15	217	20	1	A	X	1	A								
26 Sep		S34E05	213														
27 Sep		S34W08	213														
																	0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 213



Region 1027

22 Sep	N24E32	239	40	5	DRO	4	B
23 Sep	N23E21	238	100	7	DSC	9	B
24 Sep	N24E05	240	110	8	DAO	11	B
25 Sep	N24W08	239	60	8	CAO	4	B
26 Sep	N24W21	239	60	7	BXO	4	B
27 Sep	N24W34	239	10	1	AXX	1	A

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 240



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

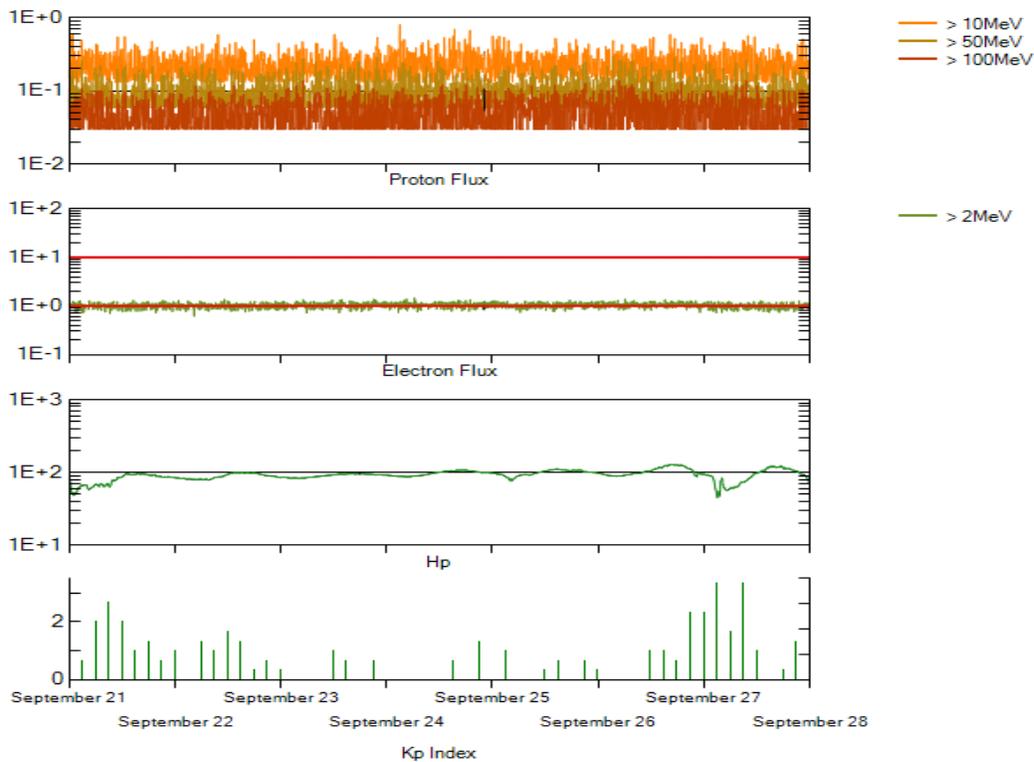
Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	SEC	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2007									
September	4.8	2.4	0.50	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.0	65.5	71.5	9	7.9
November	2.5	1.7	0.68	9.4	5.7	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	-1.00	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	3.1	1.9	70.0	68.9	4	4.7
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	
August	0.3	0.0	0.00			67.3		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 21 September 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.

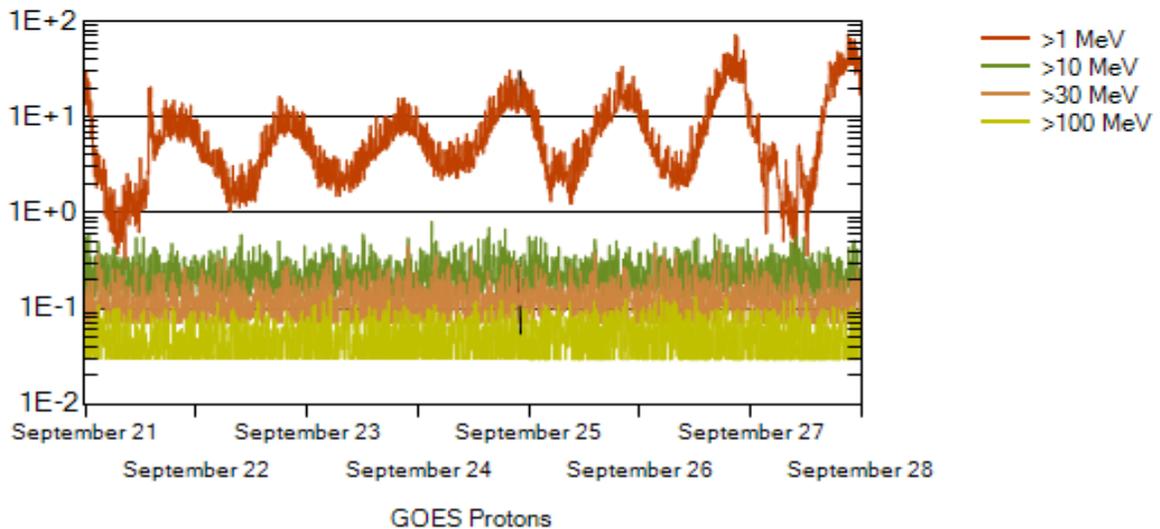
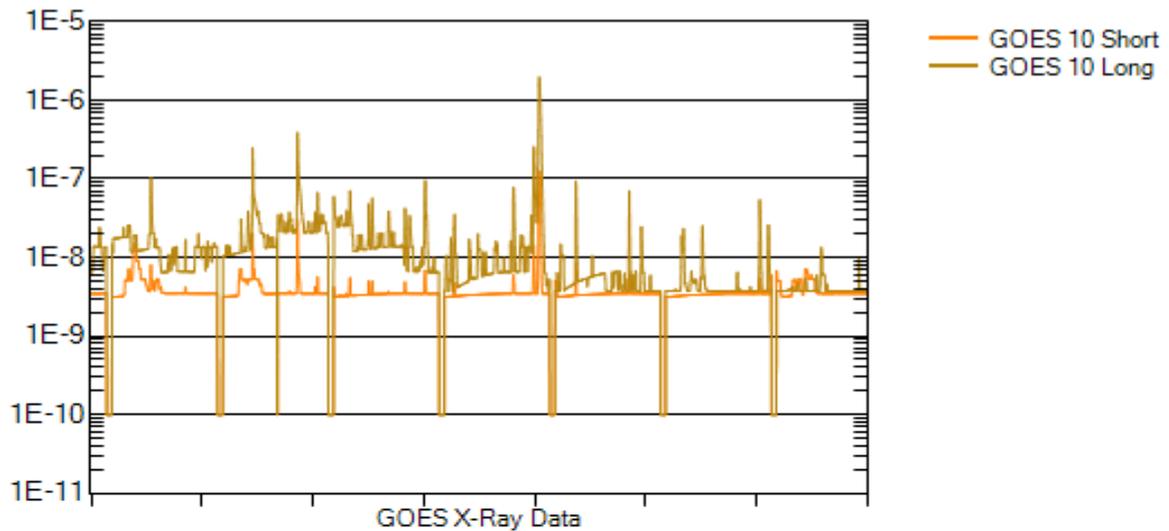
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-11.

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.

