

**Space Weather Highlights**  
**05 January - 11 January 2009**

**SWO PRF 1741**  
**13 January 2009**

Solar activity was very low. New-cycle polarity Region 1010 (N19, L=021, class/area Bxo/050 on 11 January) emerged on 09 January. It produced isolated low-level B-class flares on 10 January, then gradually decayed during the rest 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 throughout the period.

Geomagnetic field activity was at mostly quiet levels during the period. ACE solar wind measurements indicated no significant changes during the period. Solar wind velocities ranged from 275 to 453 km/sec. IMF Bz was variable in the -06 to +08 nT range while Bt ranged from 01 to 08 nT during the period.

**Space Weather Outlook**  
**14 January - 09 February 2009**

Solar activity is expected to be at very low levels.

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 throughout the period.

The geomagnetic field is expected to be at quiet levels through 18 January. Field activity is expected to increase to quiet to unsettled levels, with isolated active periods possible at high latitudes during 19 January due to a recurrent coronal hole high speed stream (CH HSS). Activity is expected to decrease to quiet levels during 20 - 26 January. Activity is expected to increase to quiet to unsettled levels, with isolated active levels possible at high latitudes during 27 - 30 January due to another recurrent CH HSS. Activity is expected to decrease to quiet levels during 31 January - 09 February.



**Daily Solar Data**

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
05 January	69	0	0	<A1.0	0	0	0	0	0	0	0	0
06 January	69	0	0	<A1.0	0	0	0	0	0	0	0	0
07 January	69	0	0	<A1.0	0	0	0	0	0	0	0	0
08 January	69	0	0	<A1.0	0	0	0	0	0	0	0	0
09 January	70	14	20	<A1.0	0	0	0	0	0	0	0	0
10 January	71	17	30	<A1.0	0	0	0	0	0	0	0	0
11 January	70	20	50	<A1.0	0	0	0	0	0	0	0	0

**Daily Particle Data**

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	05 January	7.0E+5	1.8E+4	3.8E+3		2.7E+7
06 January	4.2E+5	1.9E+4	4.1E+3		1.8E+7	
07 January	6.7E+5	1.8E+4	4.3E+3		2.1E+7	
08 January	1.0E+6	2.0E+4	4.7E+3		1.4E+7	
09 January	1.2E+6	2.0E+4	4.2E+3		2.7E+6	
10 January	7.3E+5	1.8E+4	4.3E+3		6.2E+5	
11 January	4.6E+5	1.9E+4	4.2E+3		3.5E+5	

**Daily Geomagnetic Data**

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

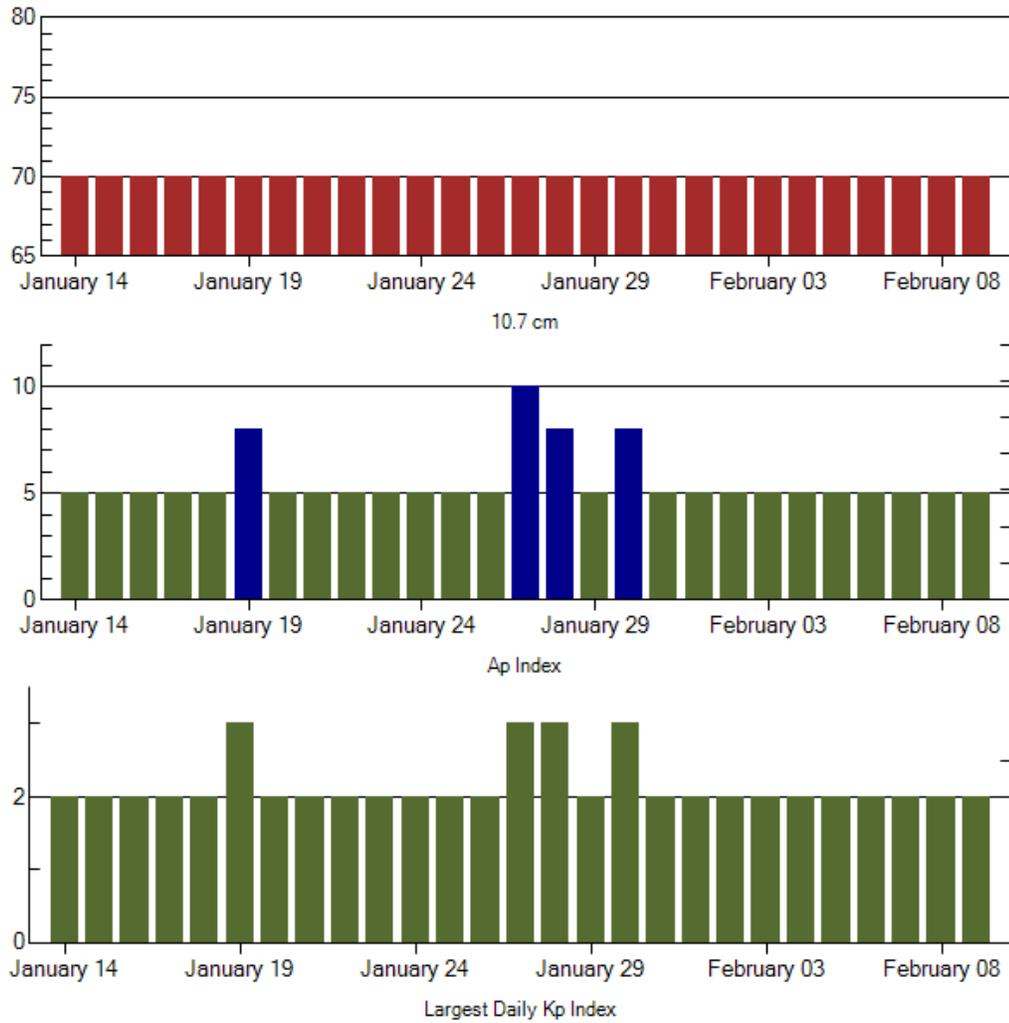
**Alerts and Warnings Issued**

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
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**No Alerts Issued**



## 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
14 Jan	70	5	2	28	70	8	3
15	70	5	2	29	70	5	2
16	70	5	2	30	70	8	3
17	70	5	2	31	70	5	2
18	70	5	2	01 Feb	70	5	2
19	70	8	3	02	70	5	2
20	70	5	2	03	70	5	2
21	70	5	2	04	70	5	2
22	70	5	2	05	70	5	2
23	70	5	2	06	70	5	2
24	70	5	2	07	70	5	2
25	70	5	2	08	70	5	2
26	70	5	2	09	70	5	2
27	70	10	3				



***Energetic Events***

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	1/2		Integ		Imp/	Location		Radio Flux		Intensity		
	Begin	Max	Max	Class	Flux	Brtns	Lat	CMD	#	245	2695	II

***No Events Observed***

***Flare List***

Date	Time			X-ray Class.	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
05 January	No Flares Observed						
06 January	No Flares Observed						
07 January	No Flares Observed						
08 January	No Flares Observed						
09 January	2358	0003	0005	B4.0			1010
10 January	0047	0051	0055	B1.2			1010
10 January	0233	0236	0239	B1.0			1010
11 January	No Flares Observed						

***Region Summary***

Date	Location		Sunspot Characteristics				Flares								
	Helio		Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray				Optical			
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4

*Region 1010*

09 Jan	N18E33	019	0020	03	Bxo	004	B										
10 Jan	N20E19	020	0030	05	Dso	007	B										
11 Jan	N18E05	021	0050	06	Bxo	010	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 21



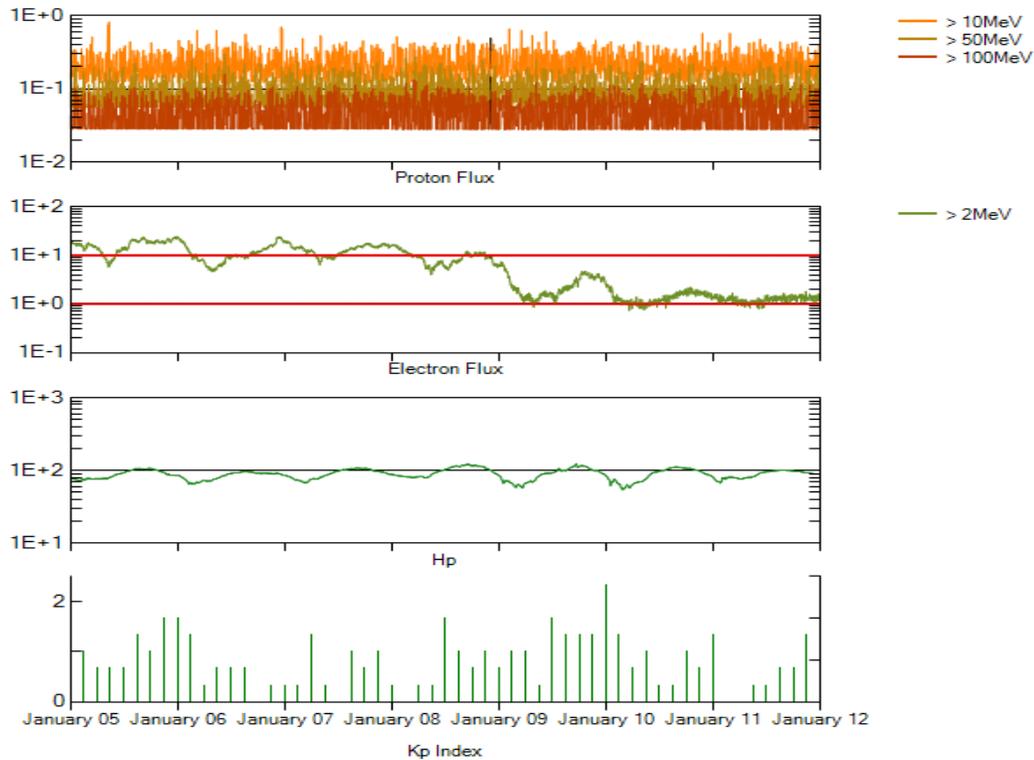
**Recent Solar Indices (preliminary)**  
**Of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SEC	values RI	Ratio RI/SEC	Smooth SEC	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2007</b>									
January	26.6	16.9	0.64	19.7	12.0	83.5	77.5	6	8.4
February	17.2	10.6	0.62	18.9	11.6	77.8	76.9	6	8.4
March	9.7	4.8	0.49	17.5	10.8	72.3	76.0	8	8.4
April	6.9	3.7	0.54	16.0	9.9	72.4	75.2	9	8.5
May	19.4	11.7	0.60	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
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
<b>2008</b>									
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			65.8		6	
August	0.0	0.5	**			66.4		5	
September	1.5	1.1	0.73			67.1		5	
October	5.2	2.9	0.56			68.3		6	
November	6.8	4.1	0.60			68.6		3	
December	1.3	0.8	0.62			69.2		2	

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. \*After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.

\*\*SEC sunspot number was less than RI value, so a ratio could not be done.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 05 January 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/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

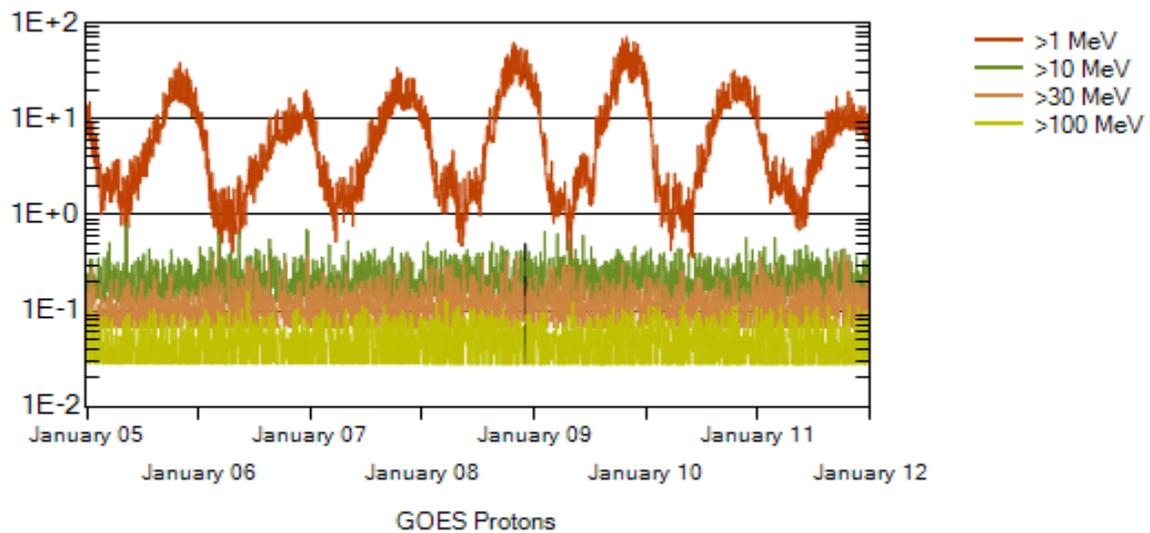
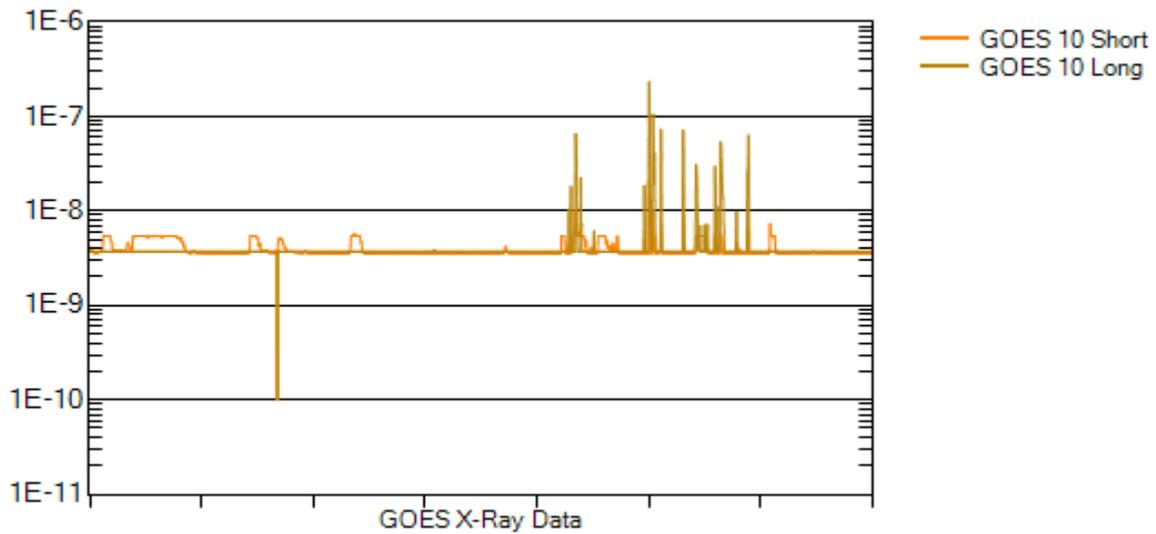
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-11 (W135).

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 ( $\text{watts/m}^2$ ) 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 (W135) 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.

