Space Weather Highlights **SWO PRF 1742**
12 January - 18 January 2009 **20 January 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 levels.

Geomagnetic field activity was at mostly quiet levels during the period. However, brief unsettled to active periods occurred at high latitudes during 14 - 15 January. In addition, a 13 nT sudden impulse (SI) was detected at Boulder at 14/0121 UTC; likely associated with a faint, slow CME observed on 09 January. ACE solar wind measurements indicated minor changes during the period. Velocities ranged from 289 to 433 km/sec. A weak shock was observed at the ACE spacecraft at 14/0015 UTC, in advance of the SI mentioned above, with minor changes detected in velocity and IMF.

Space Weather Outlook
21 January - 16 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.

The geomagnetic field is expected to be at quiet levels during 21 - 26 January. Activity is expected to increase to quiet to unsettled levels, with isolated active levels at high latitudes during 27 - 30 January due to a recurrent coronal hole high-speed stream (CH HSS). Activity is expected to decrease to quiet levels during 31 January - 14 February. Activity is expected to increase to quiet to unsettled levels on 15 February with isolated active levels due to a recurrent CH HSS. Activity is expected to decrease to quiet levels on 16 February as the HSS subsides.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	4
12 January	69	12	10	<A1.0	0	0	0	0	0	0	0	0
13 January	71	11	10	<A1.0	0	0	0	0	0	0	0	0
14 January	71	0	0	<A1.0	0	0	0	0	0	0	0	0
15 January	71	0	0	<A1.0	0	0	0	0	0	0	0	0
16 January	71	0	0	<A1.0	0	0	0	0	0	0	0	0
17 January	72	0	0	<A1.0	0	0	0	0	0	0	0	0
18 January	71	0	0	<A1.0	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2}-day-sr) >1 MeV	>10 MeV	>100 MeV	Electron Fluence (electrons/cm^2-day-sr) >.6 MeV	>2MeV	>4 MeV
12 January	8.6E+5	1.9E+4	4.3E+3		7.5E+5	
13 January	9.4E+5	2.0E+4	4.4E+3		5.7E+5	
14 January	9.2E+5	1.9E+4	4.4E+3		7.0E+4	
15 January	1.1E+6	2.0E+4	4.5E+3		6.0E+4	
16 January	5.4E+5	1.9E+4	4.4E+3		5.6E+4	
17 January	7.0E+5	1.9E+4	4.5E+3		4.8E+4	
18 January	7.6E+5	1.9E+4	4.3E+3		7.1E+4	

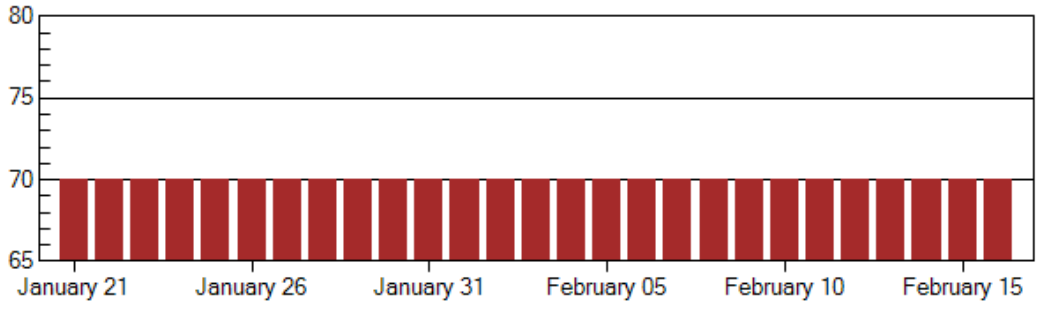
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
12 January	0	0-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0
13 January	2	0-1-1-0-1-1-1-1	1	0-0-0-0-1-1-0-0	3	1-1-1-0-1-1-0-1
14 January	6	2-2-2-2-2-1-1-1	8	1-0-0-4-4-1-0-0	5	2-2-1-2-2-1-0-2
15 January	4	1-1-1-1-1-2-2-1	5	0-1-1-3-2-0-2-1	4	1-1-2-1-0-1-2-2
16 January	2	1-1-0-0-1-1-1-0	1	1-1-0-0-1-0-1-0	2	2-1-0-0-0-0-1-0
17 January	2	0-1-1-0-0-1-1-0	1	0-0-0-1-1-0-1-0	2	0-1-1-0-0-1-1-1
18 January	2	1-0-0-0-0-1-1-1	1	0-0-0-1-1-0-0-0	2	0-0-0-0-0-0-1-1

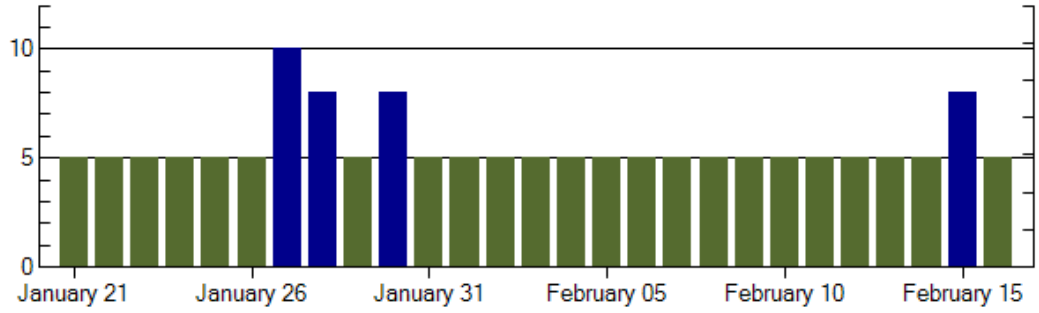
Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
14 Jan 0127	SUMMARY: Geomagnetic Sudden Impulse	14 Jan 0121

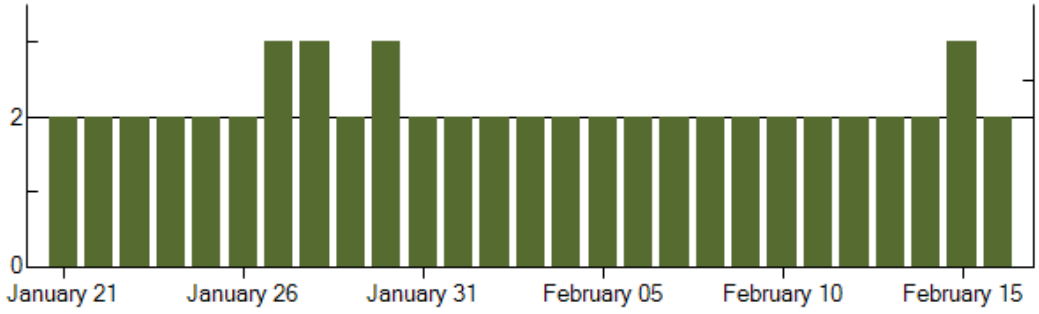
Twenty-seven Day Outlook



10.7 cm



Ap Index



Largest Daily Kp Index

Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
21 Jan	70	5	2	03 Feb	70	5	2
22	70	5	2	04	70	5	2
23	70	5	2	05	70	5	2
24	70	5	2	06	70	5	2
25	70	5	2	07	70	5	2
26	70	5	2	08	70	5	2
27	70	10	3	09	70	5	2
28	70	8	3	10	70	5	2
29	70	5	2	11	70	5	2
30	70	8	3	12	70	5	2
31	70	5	2	13	70	5	2
01 Feb	70	5	2	14	70	5	2
02	70	5	2	15	70	8	3
03	70	5	2	16	70	5	2

Energetic Events

Date	Time Begin	Time Max	Time ½ Max	X-ray Class	X-ray Integ Flux	Optical Information Imp/ Brtns	Optical Information Location Lat CMD	Optical Information Rgn #	Peak Radio Flux 245	Peak Radio Flux 2695	Sweep Freq Intensity II	Sweep Freq Intensity IV

No Events Observed

Flare List

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

Region Summary

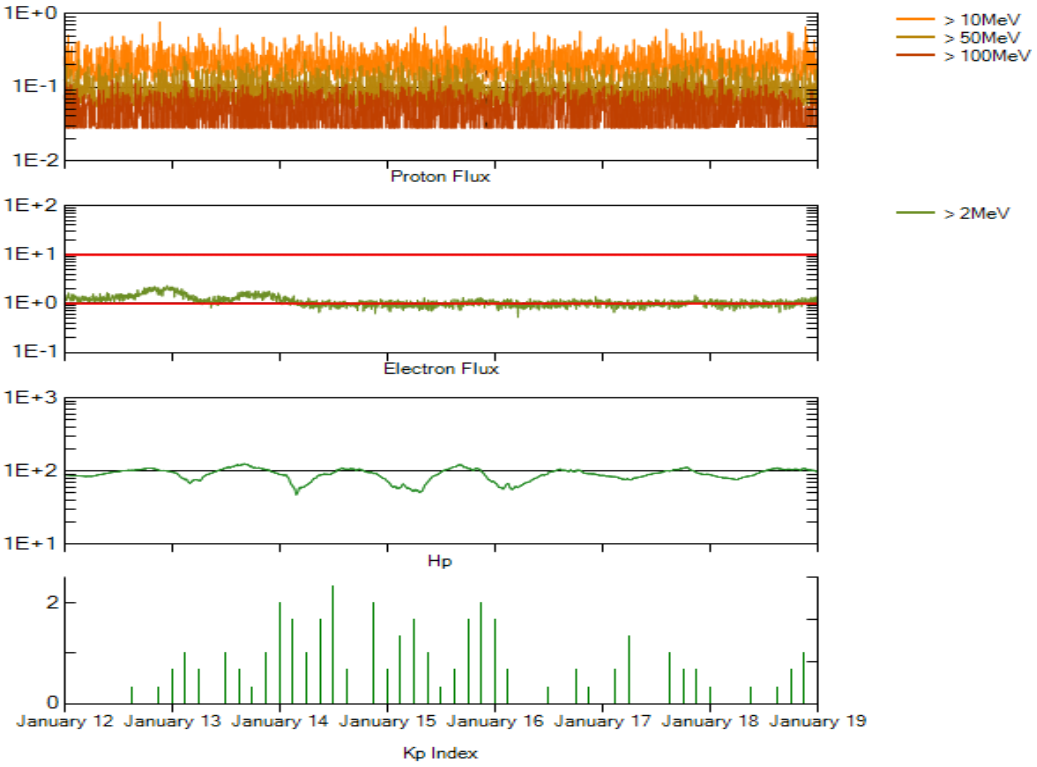
Date	Location (° Lat ° CMD)	Location Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Sunspot Characteristics Extent (helio)	Sunspot Characteristics Spot Class	Sunspot Characteristics Spot Count	Sunspot Characteristics Mag Class	Flares X-ray C	Flares X-ray M	Flares X-ray X	Flares Optical S	Flares Optical 1	Flares Optical 2	Flares Optical 3	Flares Optical 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								
12 Jan	N19W08	021	0010	01	Axx	002	A								
13 Jan	N18W20	019	0010	01	Axx	001	A								
14 Jan	N18W33	019													
15 Jan	N18W46	019													
16 Jan	N18W59	019													
17 Jan	N18W72	019													
18 Jan	N18W85	019	0000	00		000									
								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

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2007					
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
				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			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 12 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.

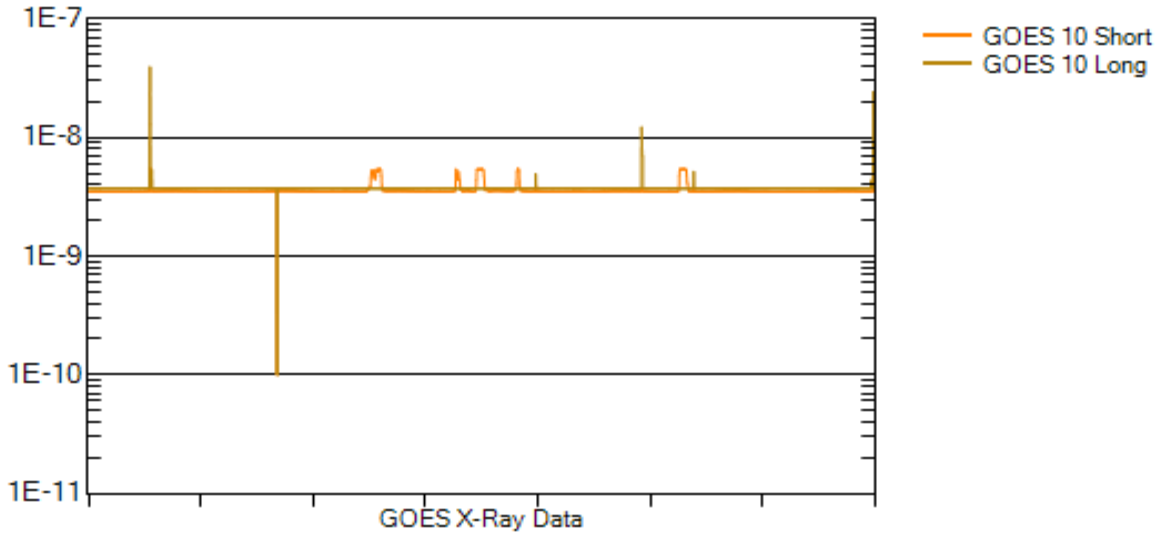
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec –sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

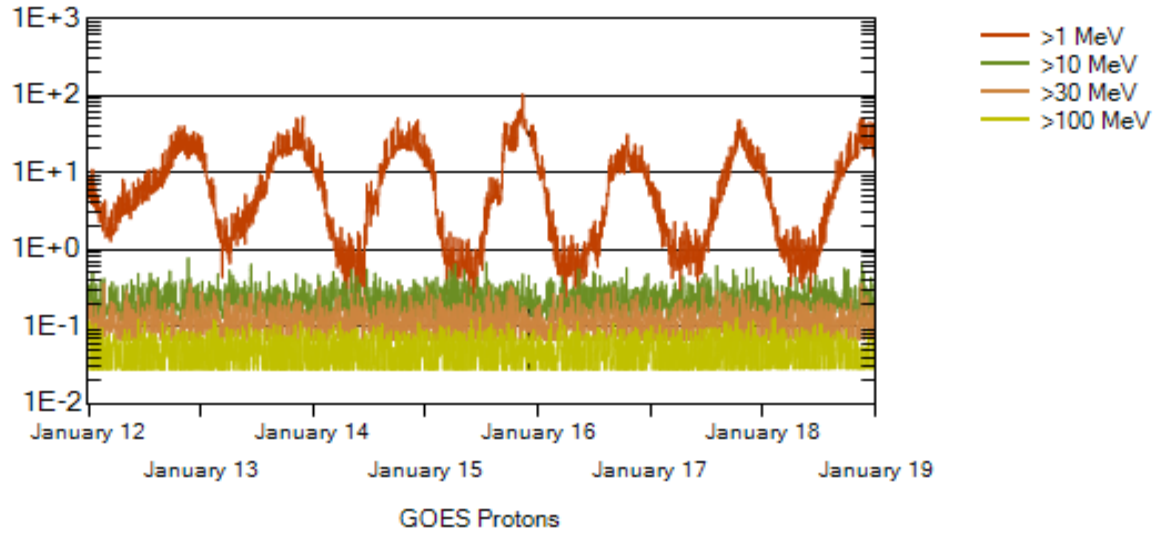
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-11 (W135).

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 (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 (protons/cm^2 –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 (protons/cm^2-sec-sr) at greater than 10 MeV.