

**Space Weather Highlights**  
**18 May - 24 May 2009**

**SWO PRF 1760**  
**26 May 2009**

Solar activity was very low. No flares were observed. New-cycle polarity Region 1017 (N18, L=184, class/area Bxo/020 on 14 May) was numbered on 13 May. It was inactive and simply-structured during the period and rotated off the disk on 24 May as spotless plage. New-cycle polarity Region 1018 (S33, L= 046, class/area, Bxo/030 on 23 May) was numbered on 23 May. The region decayed as spotless plage on 24 May. The region was inactive during its short lifespan.

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 at all latitudes during most of the period. However, activity briefly increased to active levels at high latitudes on 22 May. ACE observations indicated the active period (22/1500 – 22/1800 UTC) was due to solar wind changes associated with a period of sustained southward IMF Bz (minimum – 4 nT) and a modest increase in velocities (approximately 370 km/sec).

**Space Weather Outlook**  
**27 May – 22 June 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 flux levels.

Geomagnetic field activity is expected to be at quiet levels through 02 June. Activity is expected to increase to mostly unsettled levels during 03 – 05 June with a chance for active levels at high latitudes on 04 June due to a recurrent coronal hole high-speed stream. Mostly quiet conditions are expected during 06 – 09 June. Activity is expected to increase to quiet to unsettled levels on 10 – 11 June due to a recurrent coronal hole wind stream. Mostly quiet conditions are expected during 12 –22 June.

**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 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
18 May	73	14	30	<A1.0	0	0	0	0	0	0	0	0
19 May	72	11	10	<A1.0	0	0	0	0	0	0	0	0
20 May	72	0	0	<A1.0	0	0	0	0	0	0	0	0
21 May	72	0	0	<A1.0	0	0	0	0	0	0	0	0
22 May	72	0	0	<A1.0	0	0	0	0	0	0	0	0
23 May	70	13	30	<A1.0	0	0	0	0	0	0	0	0
24 May	69	0	0	<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
	18 May	9.9e+05	2.0e+04	4.4e+03		9.6e+05
19 May	7.1e+05	2.0e+04	4.2e+03		6.3e+05	
20 May	1.0e+06	2.0e+04	4.4e+03		8.4e+05	
21 May	7.4e+05	1.9e+04	4.4e+03		6.6e+05	
22 May	6.5e+05	1.9e+04	4.3e+03		4.4e+05	
23 May	7.4e+05	1.9e+04	4.1e+03		2.8e+05	
24 May	5.4e+05	2.0e+04	4.3e+03		2.5e+05	

**Daily Geomagnetic Data**

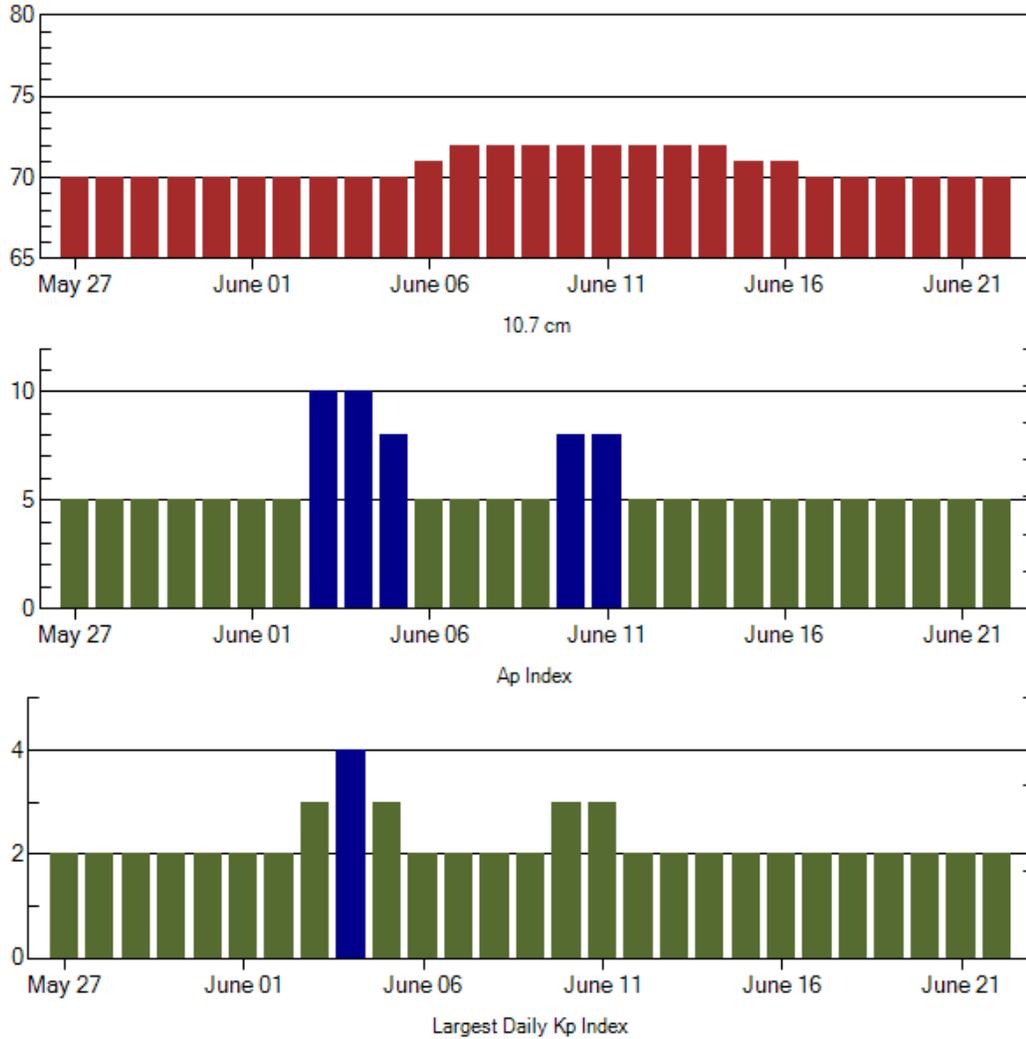
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	18 May	2	1-0-0-0-1-0-0-2	1	0-0-1-0-0-1-0-1	4
19 May	2	1-1-1-0-1-1-0-0	3	1-1-2-2-0-0-0-0	5	2-2-1-1-1-1-1-2
20 May	4	1-1-0-0-1-0-3-2	2	1-1-0-0-0-0-1-1	4	1-1-0-0-1-1-2-2
21 May	2	1-0-1-1-1-0-1-1	3	1-1-1-3-0-0-0-1	5	2-1-1-1-1-1-2-2
22 May	4	0-0-1-2-2-2-1-1	5	1-1-1-1-4-1-0-0	5	1-0-1-2-2-2-1-2
23 May	3	0-0-1-1-0-1-2-2	2	0-0-1-1-0-1-1-1	4	0-0-1-1-0-2-2-2
24 May	4	1-2-1-1-1-1-1-1	3	2-1-1-1-1-0-0-1	4	2-2-1-0-0-1-1-2

**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
27 May	70	5	2	10 Jun	72	8	3
28	70	5	2	11	72	8	3
29	70	5	2	12	72	5	2
30	70	5	2	13	72	5	2
31	70	5	2	14	72	5	2
01 Jun	70	5	2	15	71	5	2
02	70	5	2	16	71	5	2
03	70	10	3	17	70	5	2
04	70	10	4	18	70	5	2
05	70	8	3	19	70	5	2
06	71	5	2	20	70	5	2
07	72	5	2	21	70	5	2
08	72	5	2	22	70	5	2
09	72	5	2				



**Energetic Events**

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

*No Events Observed*

**Flare List**

Date	Time			X-ray	Imp /	Optical	Rgn
	Begin	Max	End	Class.	Brtns	Location Lat CMD	
18 May	No Flares Observed						
19 May	No Flares Observed						
20 May	No Flares Observed						
21 May	No Flares Observed						
22 May	No Flares Observed						
23 May	No Flares Observed						
24 May	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				
<i>Region 1017</i>																			
13 May	N18E27	190	0010	06	BXO	002	B												
14 May	N18E17	186	0020	07	BXO	008	B												
15 May	N18E06	184	0010	01	AXX	002	A												
16 May	N18W09	186	0020	03	BXO	005	B												
17 May	N18W21	185	0010	03	BXO	003	B												
18 May	N18W35	185	0030	03	BXO	004	B												
19 May	N17W50	187	0010	00	HRX	001	A												
20 May	N17W44	187	0000	00		000													
21 May	N17W57	187	0000	00		000													
22 May	N17W70	187	0000	00		000													
23 May	N17W83	187	0000	00		000													
24 May	N17W96	187	0000	00		000													
																			0 0 0 0 0 0 0 0
Crossed West Limb																			
Absolute heliographic longitude: 184																			
<i>Region 1018</i>																			
23 May	S33E38	46	0030	03	BXO	003	B												
24 May	S33E25	46	0000	00		000													
																			0 0 0 0 0 0 0 0
Still on Disk.																			
Absolute heliographic longitude: 46																			



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

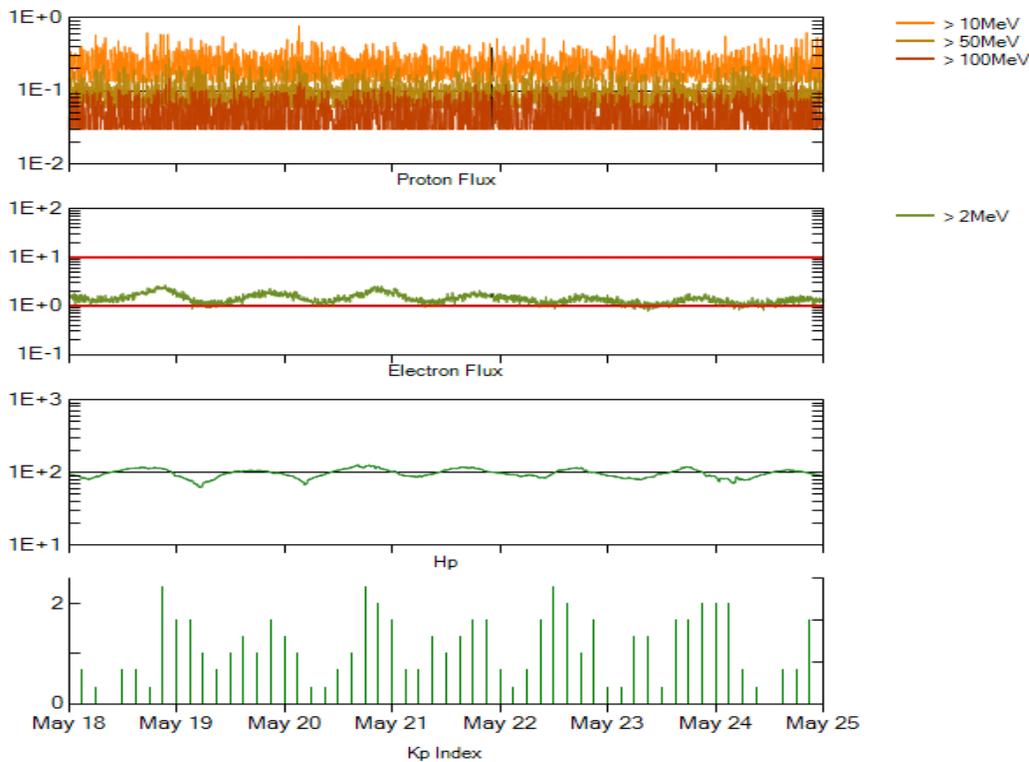
Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	SEC	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2007</b>									
May	19.4	11.7	0.60	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
July	15.6	10.0	0.64	11.6	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	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			68.6		3	
December	1.3	0.8	0.62			69.2		2	
<b>2009</b>									
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	

**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 18May 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.

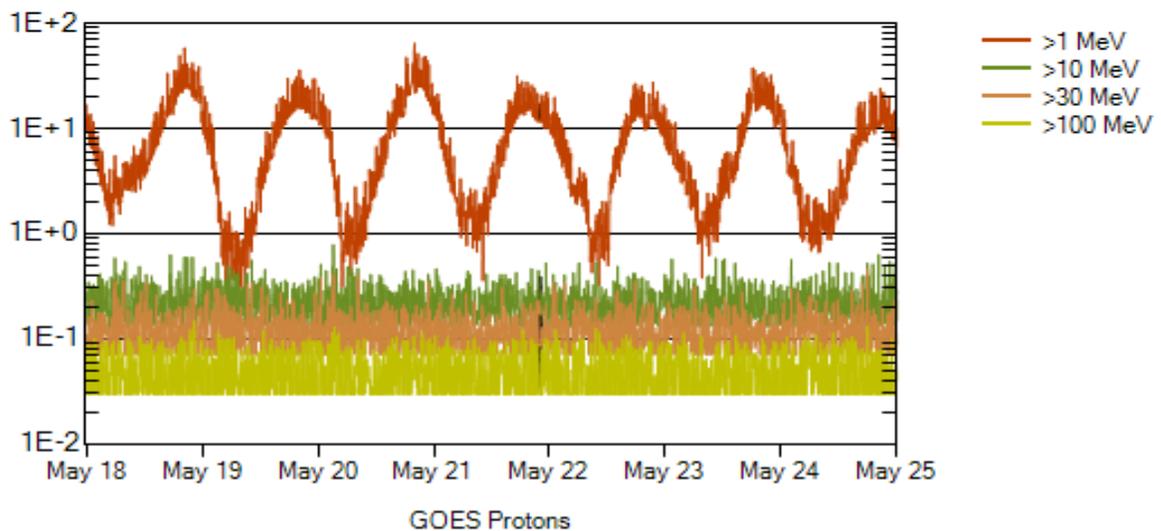
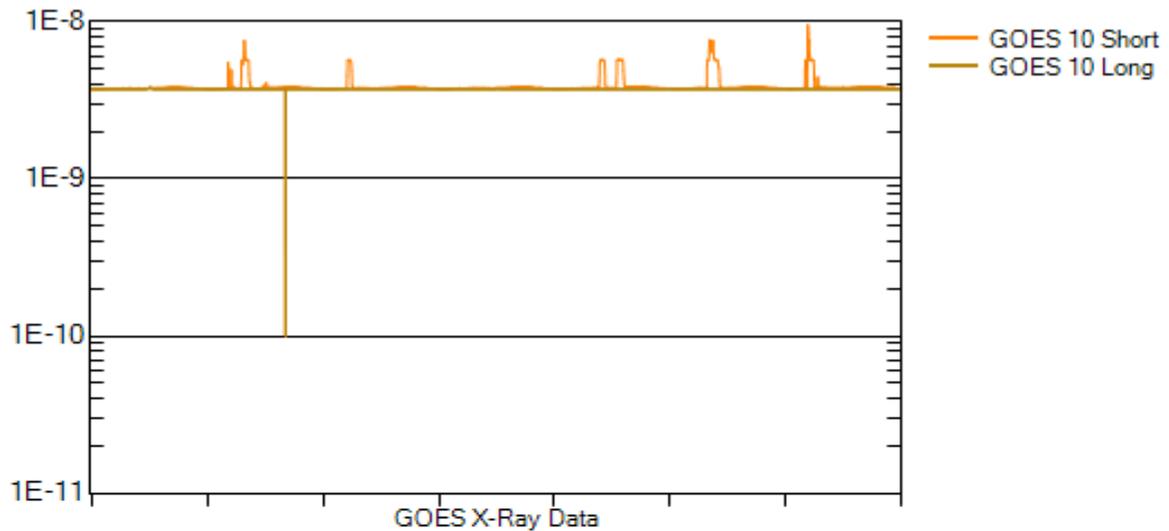
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-11 (W135).

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.

