

Space Weather Highlights

17 May - 23 May 2010

SWO PRF 1812
25 May 2010

Solar activity was very low during the period. Occasional low-level B-class flares were observed during 22-23 May. Region 1072 (S15, L=315, class/area Dsi/130 on 23 May) emerged on the disk on 21 May. STEREO COR2 imagery observed a CME on 23/1809 UTC. This CME originated from a filament channel located between N24W05 and N01W23 and was associated with a long duration B1 x-ray flare at 23/1801 UTC. A full halo CME was observed on 23 May in SOHO and STEREO imagery (observed on LASCO C2 imagery at 23/1730 UTC).

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 17 May. Normal to moderate flux levels occurred during the rest of the period.

Geomagnetic field activity ranged from quiet to active levels during the period. Activity was predominantly quiet on 17 May. Activity increased to quiet to active levels during 18-21 May. Predominantly quiet levels occurred during the rest of the period. The active levels that occurred on 18 May appeared to be associated with a solar sector boundary passage. The activity levels that occurred during 19-20 May were associated with a recurrent co-rotating interaction region followed by a coronal hole high-speed stream (CIR/CH HSS).

Space Weather Outlook

26 May – 21 June 2010

Solar activity is expected to be at very low to 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 to moderate levels during 26-29 May. Flux levels are expected to increase to high levels during 30 May – 09 June. Normal levels are expected for the remainder of the period.

Geomagnetic field activity is expected to be at quiet levels on 26 May. Activity is expected to increase to unsettled to minor storm levels during 27-30. The increased activity forecast on 27-28 May is expected due to CME activity that occurred on 23-24 May. The activity on 29-30 May is expected due to a recurrent CIR/CH HSS. Quiet to active levels are expected on 31 May, with quiet to unsettled levels on 01 June, as the effects of the CH HSS subside. Quiet levels are expected during 02-14 June. Quiet to active levels are expected during 15-16 June, as a recurrent CIR/CH HSS affects the field. Quiet levels are expected during the rest 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
17 May	69	0	0	A1.6	0	0	0	0	0	0	0 0
18 May	69	0	0	A1.5	0	0	0	0	0	0	0 0
19 May	69	0	0	A1.6	0	0	0	0	0	0	0 0
20 May	69	12	10	A1.7	0	0	0	0	0	0	0 0
21 May	71	15	30	A2.0	0	0	0	0	0	0	0 0
22 May	73	20	100	A2.9	0	0	0	1	0	0	0 0
23 May	75	23	130	A2.9	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
17 May	4.7e+05	1.9e+04	8.3e+03		4.4e+07	
18 May	1.0e+05	1.9e+04	8.0e+03		3.7e+06	
19 May	2.5e+05	1.9e+04	7.8e+03		3.1e+06	
20 May	1.9e+05	1.8e+04	7.3e+03		2.9e+06	
21 May	1.8e+05	1.9e+04	7.5e+03		4.4e+06	
22 May	2.0e+05	1.9e+04	7.9e+03		5.4e+06	
23 May	2.2e+05	1.9e+04	7.6e+03		6.4e+06	

Daily Geomagnetic Data

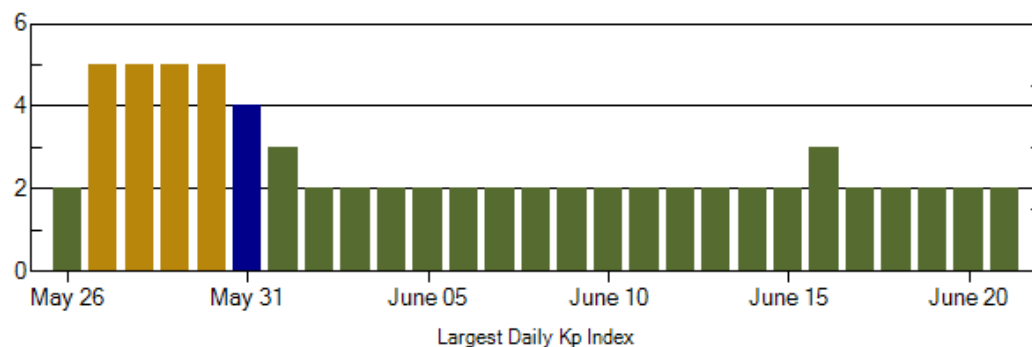
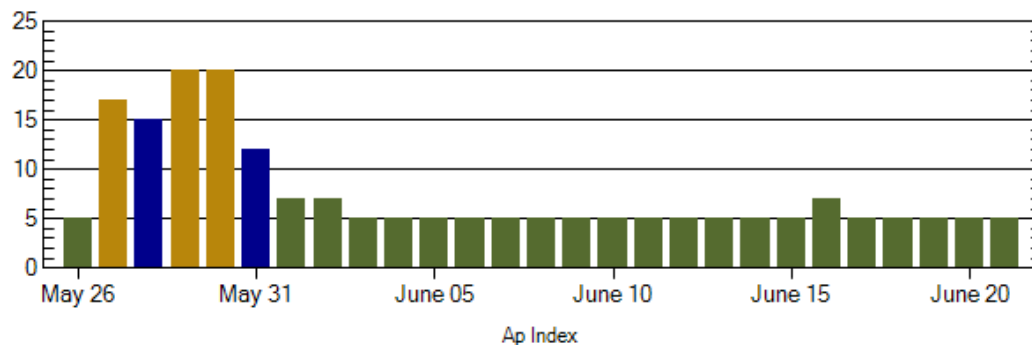
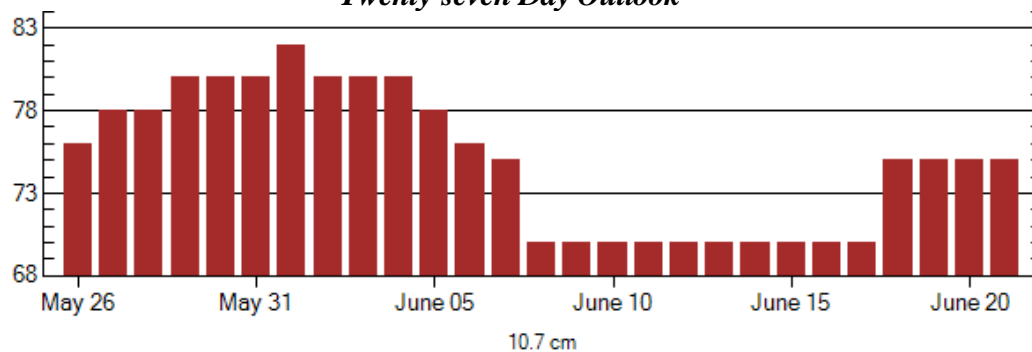
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
17 May	4	2-1-1-1-1-1-1	6	1-2-1-3-3-0-1-1	6	2-2-1-1-2-1-2-1
18 May	4	1-2-2-1-2-0-1-1	10	1-1-3-4-4-1-0-0	6	2-2-2-2-2-1-1-1
19 May	7	1-1-1-2-3-3-1-2	8	1-1-1-1-3-4-1-2	8	1-1-1-2-3-3-2-2
20 May	9	3-1-2-2-3-2-1-3	13	3-2-4-3-4-2-1-1	9	4-1-2-1-2-2-1-3
21 May	4	3-1-1-0-1-0-1-1	3	1-1-2-0-1-1-0-1	5	3-1-2-0-1-1-1-1
22 May	2	0-1-1-1-0-0-1-0	1	0-1-1-1-0-0-0-0	4	0-2-1-1-1-1-0-1
23 May	0	0-1-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0	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
17 May 1204	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	03 May 1235
19 May 1350	WARNING: Geomagnetic K = 4	19 May 1351 - 2359
20 May 0106	WARNING: Geomagnetic K = 4	20 May 0106 - 1600
20 May 0111	ALERT: Geomagnetic K = 4	20 May 0111



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
26 May	76	5	2	09 Jun	70	5	2
27	78	17	5	10	70	5	2
28	78	15	5	11	70	5	2
29	80	20	5	12	70	5	2
30	80	20	5	13	70	5	2
31	80	12	4	14	70	5	2
01 Jun	82	7	3	15	70	5	2
02	80	7	2	16	70	7	3
03	80	5	2	17	70	5	2
04	80	5	2	18	75	5	2
05	78	5	2	19	75	5	2
06	76	5	2	20	75	5	2
07	75	5	2	21	75	5	2
08	70	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	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II IV

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
17 May	No Flares Observed							
18 May	No Flares Observed							
19 May	No Flares Observed							
20 May	No Flares Observed							
21 May	No Flares Observed							
22 May	1452	1456	1503		SF	S15E10		1072
	2139	2147	2152	B1.3				
23 May	0509	0515	0521	B1.4				
	1652	1801	2008	B1.3				
	2134	2139	2145	B1.1				

Region Summary

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

Region 1072

20 May	S15E31	316	10	2	BXO	2	B								
21 May	S16E14	319	30	4	BXO	5	B								
22 May	S16E08	312	100	6	CAO	10	B				1				
23 May	S15W09	315	130	6	DSI	13	B								
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 312



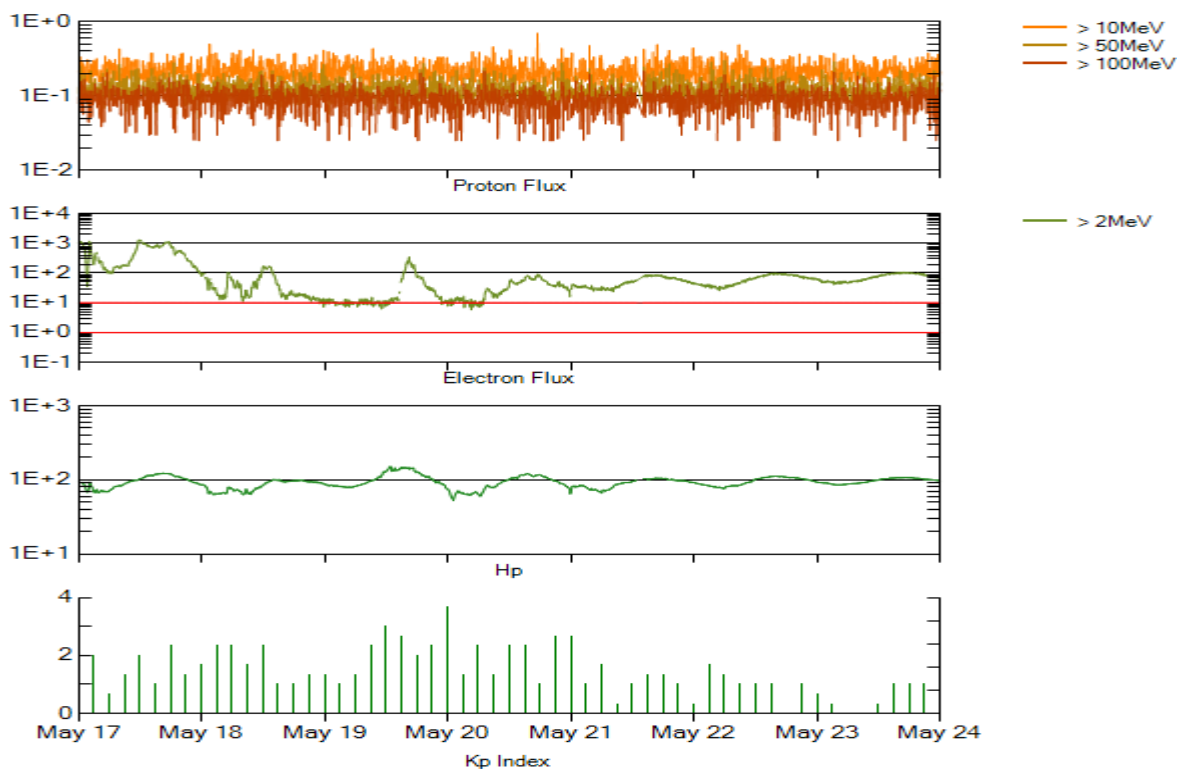
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed	values	Ratio	Smooth	values	*Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2008									
May	5.7	3.2	0.56	5.7	3.5	68.4	69.8	6	7.2
June	4.2	3.4	0.81	5.2	3.3	65.9	69.4	7	7.0
July	1.0	0.8	0.80	4.5	2.8	65.7	68.8	5	6.8
August	0.0	0.5	**	4.4	2.7	66.3	68.6	5	6.3
September	1.5	1.1	0.73	3.7	2.3	67.1	68.4	6	5.8
October	5.2	2.9	0.56	2.9	1.8	68.3	68.2	7	5.4
November	6.8	4.1	0.60	2.7	1.7	68.6	68.3	4	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	4	4.9
2009									
January	2.8	1.3	0.46	3.0	1.8	69.8	68.7	4	4.7
February	2.5	1.4	0.56	3.1	1.9	70.0	68.8	5	4.7
March	0.7	0.7	1.00	3.4	2.0	69.2	69.0	5	4.6
April	1.2	0.8	1.00	3.7	2.2	69.7	69.3	4	4.3
May	3.9	2.9	0.74	3.8	2.3	70.5	69.7	4	4.1
June	6.6	2.9	0.39	4.4	2.7	68.6	70.2	4	4.0
July	5.0	3.2	0.70	5.8	3.6	68.2	71.0	4	3.9
August	0.3	0.0	0.00	7.7	4.8	67.4	72.1	5	3.8
September	6.6	4.3	0.64	9.9	6.1	70.5	73.3	4	3.8
October	7.0	4.6	0.66	11.3	7.0	72.3	74.1	3	4.0
November	7.7	4.2	0.55			73.6		3	
December	15.7	10.6	0.68			76.8		2	
2010									
January	21.3	13.1	0.62			81.1		3	
February	31.0	18.6	0.60			84.7		5	
March	24.7	15.4	0.62			83.3		4	
April	11.2	7.9	0.71			75.9		10	

NOTE: Values are final except for the most recent 6 months which are considered preliminary. 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 zero, so a ratio could not be computed.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 17 May 2010

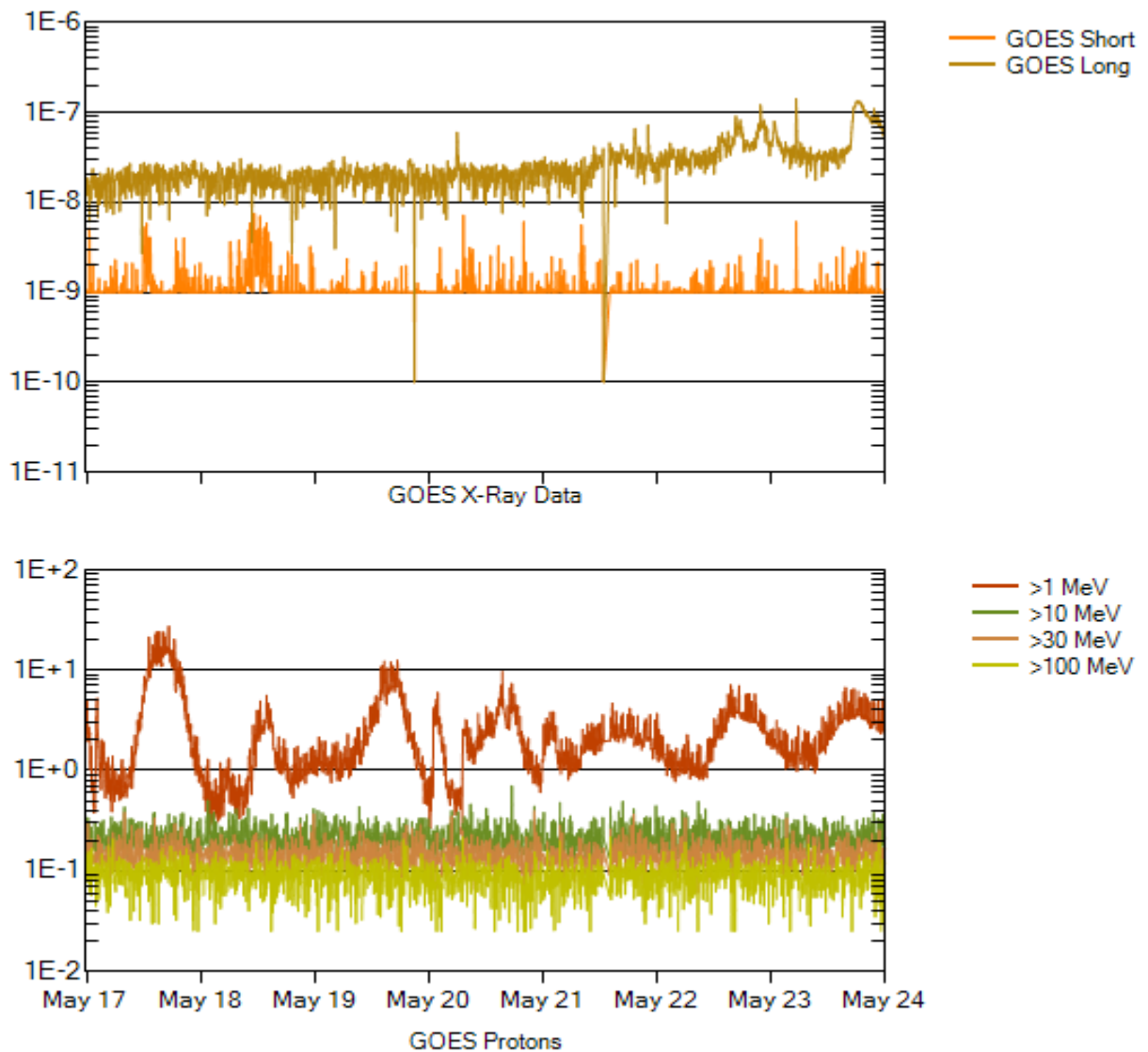
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²–sec–sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²–sec–sr) with energies greater than 2 MeV at GOES-13.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as measured by GOES-13. The Hp 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

The x-ray plot contains five-minute averaged x-ray flux (Watts/m²) as measured by GOES 14 (W105) in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-13 for each of the energy thresholds: >1 , >10 , >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

