

Solar activity was low. Three C-class events were observed on 06 and 07 April from the East Limb. On 08 April, Region 1185 (N23, L=033, class/area Cso/100 on 05 April) was redefined as two distinct groups, the second of which was designated Region 1189 (N23, L=033, class/area Dso/040 on 08 April). Six regions, numbered 1184 through 1189, populated the visible disk by the end of the period. Of those, Region 1184 (N17, L=110, class/area Dso/170 on 04 April) was the largest. The remaining regions were small B or C type groups with simple Beta magnetic characteristics. While x-ray activity was low, several CMEs were observed during the period. The first CME launched at 02/2347 UTC from Region 1176 (S15, L=200, class/area Eko/490 on 23 March). Additional CMEs were observed on 04 April, including one from the northeast limb at 04/0509 UTC associated with a long duration B-class flare. Two more CMEs were observed on 07 April. The first originated from an active filament channel on the southeast limb and was observed in SOHO/LASCO C3 imagery at 07/0754 UTC. The second, seen at 07/1042 UTC, was thought to originate from old Region 1176 which had rotated around the west limb on 04 April. Finally, a slow partial halo CME was observed in SOHO/LASCO C2 imagery at 09/0024UTC.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels from 04 - 06 April. Moderate levels were observed throughout the rest of the period.

Geomagnetic field activity ranged from quiet to major storm levels. The period began at unsettled to active levels in the midst of a coronal hole high speed stream (CH HSS). The CME observed at 02/2347 UTC arrived at the ACE spacecraft at approximately 06/0854 UTC. A sudden impulse of 24 nT was observed at Boulder at 06/0942 UTC. Solar wind speeds at ACE jumped from 494 to 559 km/s, then climbed to a peak of 591 km/s at 06/1700 UTC. The Interplanetary Magnetic Field (IMF Bt) initially rose from +07 to +14 nT following the shock and peaked at +17 nT at 06/1030 UTC. The IMF Bz turned southward following shock passage and remained mostly southward until approximately 06/2000 UTC. A maximum southward deflection of -11 nT was observed at 06/1213 UTC. The geomagnetic field was at quiet to unsettled levels in the days prior to the CME arrival (04 - 06 April). Activity increased to unsettled to major storm levels once the CME arrived. Active to minor storm levels were recorded at Boulder and minor to major storm levels detected at high latitudes. Activity decreased to mostly unsettled levels after 06/1800 UTC as Bt decreased and Bz became variable at +03 to -03 nT. Geomagnetic activity returned to quiet to unsettled levels for the remainder of the week.

**Space Weather Outlook**  
**13 April - 09 May 2011**

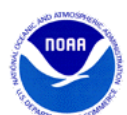
Solar activity is expected to be at predominantly low levels for the entire period, with a slight chance for an M-class event when old Region 1176 returns on 17 April.

No proton events are expected at geosynchronous orbit.



The greater than 2 MeV electron flux at geosynchronous orbit is expected to begin the period at high levels following the increased windspeeds associated with the CH HSS. A return to normal to moderate levels is expected from 17 April until 01 May. High levels are expected to return from 02 - 05 May following a second CH HSS. Normal to moderate levels are expected for the remainder of the period.

Geomagnetic field activity is expected to be at predominantly quiet levels from 12 April until a CH HSS arrives on 17 April. Three days of unsettled to active conditions are anticipated, with a return to mostly quiet conditions on 20 April. Quiet to unsettled conditions with isolated active and minor storm periods are expected from 28 April - 01 May due to a second recurrent CH HSS becoming geoeffective. Quiet conditions are expected to return and persist until 07 May. Unsettled to active conditions with a chance for isolated minor storm periods are expected from 08 - 09 May as a third CH HSS rotates into a geoeffective position.



### *Daily Solar Data*

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
04 April	113	83	340	B3.3	0	0	0	1	0	0	0	0
05 April	109	65	380	B2.8	0	0	0	0	0	0	0	0
06 April	117	56	230	B3.1	3	0	0	0	0	0	0	0
07 April	112	73	290	B3.1	3	0	0	0	0	0	0	0
08 April	109	97	330	B2.6	0	0	0	1	0	0	0	0
09 April	105	56	150	B2.9	1	0	0	2	0	0	0	0
10 April	105	56	150	B2.2	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	>0.6 MeV	>2MeV	>4 MeV
	04 April	5.3e+05	1.7e+04	3.2e+03		1.3e+09
05 April	1.6e+06	1.8e+04	3.1e+03		1.2e+09	
06 April	8.3e+05	1.2e+04	2.8e+03		2.7e+07	
07 April	2.3e+05	1.3e+04	3.2e+03		5.4e+06	
08 April	4.1e+05	1.2e+04	3.1e+03		1.1e+07	
09 April	1.0e+05	1.3e+04	3.4e+03		9.6e+06	
10 April	1.4e+05	1.3e+04	3.5e+03		2.9e+07	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	04 April	6	3-2-2-1-1-1-1-1	6	3-2-2-3-1-1-0-0	8
05 April	4	2-1-1-2-0-0-1-2	4	1-1-1-3-0-0-1-2	7	2-1-1-2-1-2-2-3
06 April	16	3-2-1-4-4-3-3-3	41	3-2-1-6-6-6-5-3	26	3-3-1-4-6-5-3-3
07 April	4	3-2-0-0-1-1-1-1	2	2-1-1-0-0-0-1-0	6	3-2-1-1-1-2-1-1
08 April	5	1-0-0-2-2-1-2-3	13	2-1-2-2-5-2-2-3	8	2-0-1-1-3-2-3-3
09 April	4	2-2-2-1-1-0-0-1	13	3-3-4-4-3-2-0-0	10	3-3-3-1-2-3-1-1
10 April	3	1-0-0-0-2-2-0-1	3	1-0-0-1-2-2-0-0	5	2-0-0-0-1-3-2-2

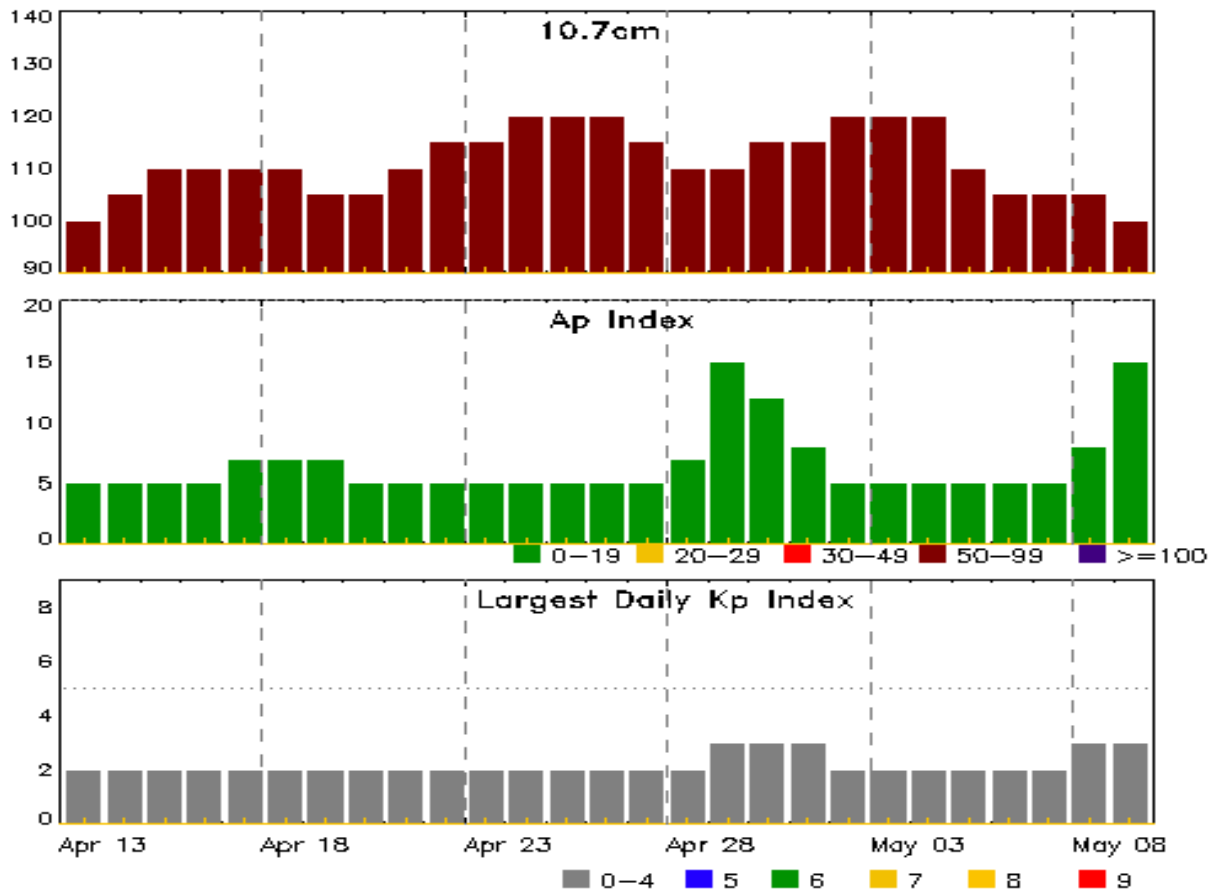


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
04 Apr 0502	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	03/0735
05 Apr 0501	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	03/0735
05 Apr 1820	WARNING: Geomagnetic Sudden Impulse expected	05/1845 - 1945
06 Apr 0926	WARNING: Geomagnetic Sudden Impulse expected	06/0940 - 1045
06 Apr 0947	SUMMARY: Geomagnetic Sudden Impulse	06/0942
06 Apr 1026	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	03/0735
06 Apr 1056	WARNING: Geomagnetic K = 4	06/1058 - 1500
06 Apr 1059	ALERT: Geomagnetic K = 4	06/1058
06 Apr 1345	WARNING: Geomagnetic K = 5	06/1350 - 1800
06 Apr 1347	ALERT: Geomagnetic K = 5	06/1347
06 Apr 1357	WARNING: Geomagnetic K = 6	06/1400 - 1800
06 Apr 1457	EXTENDED WARNING: Geomagnetic K = 4	06/1057 - 2100
06 Apr 2057	EXTENDED WARNING: Geomagnetic K = 4	06/1057 - 07/0600
08 Apr 1940	WARNING: Geomagnetic K = 4	08/2130 - 09/0300
09 Apr 0256	EXTENDED WARNING: Geomagnetic K = 4	08/2130 - 09/1200



## Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
13 Apr	100	5	2	27 Apr	115	5	2
14	105	5	2	28	110	7	2
15	110	5	2	29	110	15	3
16	110	5	2	30	115	12	3
17	110	7	2	01 May	115	8	3
18	110	7	2	02	120	5	2
19	105	7	2	03	120	5	2
20	105	5	2	04	120	5	2
21	110	5	2	05	110	5	2
22	115	5	2	06	105	5	2
23	115	5	2	07	105	5	2
24	120	5	2	08	105	8	3
25	120	5	2	09	100	15	3
26	120	5	2				



### *Energetic Events*

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

**No Events Observed**

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD	Rgn #	
04 Apr	0307	0447	0517	B8.6				1180
04 Apr	0532	0533	0545		SF	N22E73		
04 Apr	1710	1713	1715	B5.5				1183
04 Apr	2319	2325	2339	B5.2				1185
06 Apr	1546	1549	1552	B9.6				1185
06 Apr	1614	1623	1635	C1.2				
06 Apr	1712	1720	1730	B9.4				1185
06 Apr	1752	1807	1829	C1.9				
06 Apr	2135	2145	2154	C1.4				
07 Apr	0419	0435	0447	C1.8				
07 Apr	0454	0459	0503	C1.5				
07 Apr	1625	1639	1654	C1.5				
08 Apr	1816	1824	1832	B7.4	SF	N16E21		1185
09 Apr	0040	0050	0100	B8.0	SF	N17E18		1185
09 Apr	0157	0202	0206	B4.2	SF	N15W69		1184
09 Apr	0357	0400	0403	B4.4				1184
09 Apr	1448	1545	1558	C1.3				1184
09 Apr	2301	2304	2308	B5.0				1186
10 Apr	0006	0010	0016	B4.3				1186
10 Apr	1606	1612	1624	B5.1				1186
10 Apr	1753	1758	1803	B4.4				1186



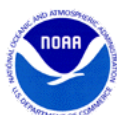
## Region Summary

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 <sup>6</sup> hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
									C	M	X	S	1	2	3	4		
<b>Region 1178</b>																		
24 Mar	S13E68	174	0		1	Axx	1	A										
25 Mar	S15E55	173	50		4	Cao	4	B										
26 Mar	S15E43	172	130		6	Dai	7	B										
27 Mar	S15E32	170	60		5	Dao	8	B										
28 Mar	S15E17	172	40		5	Dao	4	B										
29 Mar	S16E04	171	10		6	Bxo	6	B										
30 Mar	S17W10	172	10		8	Bxo	4	B										
31 Mar	S17W22	171	0			Axx	1	A	1				1					
01 Apr	S17W36	173	plage															
02 Apr	S17W50	173	plage															
03 Apr	S17W64	174	plage															
04 Apr	S17W78	175	plage															
									1	0	0		1	0	0	0	0	0

Crossed West Limb.  
 Absolute heliographic longitude: 171

<b>Region 1180</b>																		
25 Mar	N26E66	162	30		2	Hsx	1	A										
26 Mar	N25E53	162	70		2	Hsx	1	A										
27 Mar	N24E40	162	50		2	Hsx	1	A										
28 Mar	N24E26	163	30		1	Hsx	1	A										
29 Mar	N24E12	162	20		1	Hrx	1	A										
30 Mar	N23W01	163	30		1	Hsx	1	A										
31 Mar	N24W13	162	10		1	Hrx	1	A										
01 Apr	N25W25	161	10			Hrx	1	A										
02 Apr	N24W38	160	20		1	Hsx	1	A										
03 Apr	N25W50	160	30		1	Hsx	1	A										
04 Apr	N24W63	160	20		2	Hsx	1	A										
05 Apr	N25W77	160	plage															
									0	0	0		0	0	0	0	0	0

Died on Disk.  
 Absolute heliographic longitude: 163



### *Region Summary - continued*

Date	Location		Sunspot Characteristics					Flares															
	Lat	CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
<b>Region 1181</b>																							
25 Mar	S25E69		159	10	2	Hsx	1	A															
26 Mar	S25E55		159	10	1	Axx	1	A															
27 Mar	S26E45		157	20	2	Hsx	1	A	1				1										
28 Mar	S26E31		158	10	2	Hrx	1	A															
29 Mar	S25E18		157	10	2	Axx	2	A															
30 Mar	S26E06		157	10	1	Axx	1	A															
31 Mar	S27W08		157	10		Hrx	1	A															
01 Apr	S27W22		159	plage																			
02 Apr	S27W36		159	plage																			
03 Apr	S27W50		160	plage																			
04 Apr	S27W50		147	10	2	Axx	2	A															
05 Apr	S27W64		148	10	1	Axx	2	A															
06 Apr	S27W78		149	plage																			
										1	0	0	1	0	0	0	0	0					

Crossed West Limb.  
 Absolute heliographic longitude: 157

<b>Region 1183</b>																							
27 Mar	N15E62		140	150	13	Eai	8	BG															
28 Mar	N15E54		135	250	12	Eac	11	BG					5										
29 Mar	N15E39		136	210	12	Eac	14	B	2														
30 Mar	N15E27		135	330	14	Eai	20	B	1														
31 Mar	N15E14		135	140	12	Eso	13	B	1														
01 Apr	N17E01		135	220	12	Esi	16	B					1										
02 Apr	N15W12		134	130	12	Eso	18	B															
03 Apr	N17W25		135	150	13	Eso	13	B															
04 Apr	N15W41		138	90	6	Cso	7	B															
05 Apr	N14W54		140	100	3	Cso	7	B															
06 Apr	N15W71		140	40	2	Hsx	1	A															
07 Apr	N14W83		140	10	1	Axx	1	A															
										4	0	0	6	0	0	0	0	0					

Crossed West Limb.  
 Absolute heliographic longitude: 135





### *Region Summary - continued*

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

#### *Region 1184*

01 Apr	N15E29	107	0		Axx	1	A										
02 Apr	N15E15	108	30	3	Bxo	4	B										
03 Apr	N18E01	109	70	6	Dso	15	B										
04 Apr	N17W13	110	170	9	Dso	22	B										
05 Apr	N15W26	109	170	9	Dso	11	B										
06 Apr	N16W41	110	110	10	Dso	9	B										
07 Apr	N16W57	113	160	10	Dso	7	B										
08 Apr	N15W68	113	170	6	Hsx	2	A										
09 Apr	N14W85	115	80	3	Hsx	1	A	1				1					
								1	0	0		1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 109

#### *Region 1185*

04 Apr	N23E62	35	50	3	Hsx	1	A										
05 Apr	N23E50	33	100	7	Cso	5	B										
06 Apr	N22E38	33	70	5	Cso	5	B										
07 Apr	N24E24	33	50	6	Cso	6	B										
08 Apr	N20E14	29	20	8	Cso	14	B					1					
09 Apr	N18E15	26	30	7	Cso	9	B					1					
10 Apr	N17W08	25	60	7	Dsi	15	B										
								0	0	0		2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 25

#### *Region 1186*

06 Apr	N22E58	13	10	1	Axx	1	A										
07 Apr	N22E44	13	60	14	Cso	8	B										
08 Apr	N22E37	12	50	8	Dso	8	B										
09 Apr	N23E18	12	40	7	Cro	5	B										
10 Apr	N23E06	11	70	10	Dso	8	B										
								0	0	0		0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 11



**Region Summary - continued**

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

**Region 1187**

07 Apr	S19E62	354	10		Axx	1	A											
08 Apr	S18E50	353	30	4	Cso	4	B											
09 Apr	S18E38	352	40	4	Cso	4	B											
10 Apr	S18E23	354	20	2	Bxo	3	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 354

**Region 1188**

08 Apr	S25W06	50	20	3	Cro	3	B											
09 Apr	S24W20	51	10	3	Bxo	2	B											
10 Apr	S24W34	52	plage															
										0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 50

**Region 1189**

08 Apr	N23E11	33	40	7	Dso	6	B											
09 Apr	N23W02	32	30	5	Cso	3	B											
10 Apr	N23W16	34	plage															
										0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 32

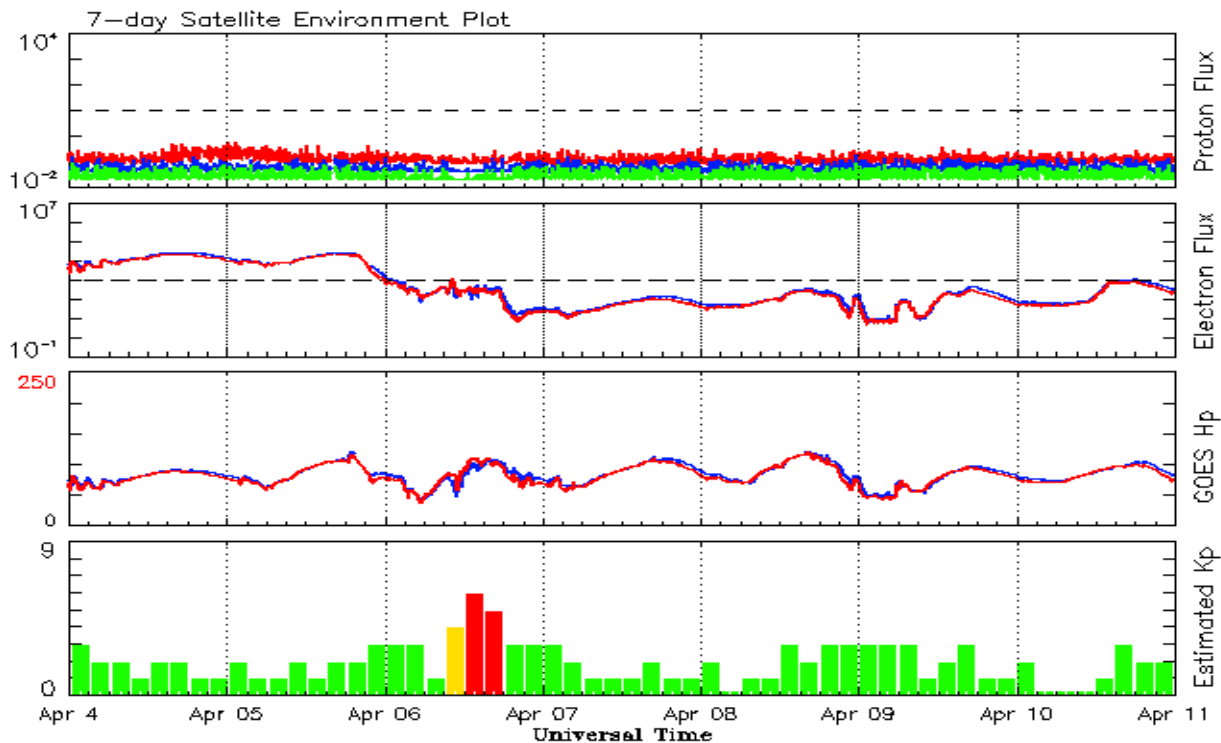


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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
<b>2009</b>									
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	6.2	70.5	73.3	4	3.8
October	7.0	4.8	0.66	11.3	7.1	72.3	74.1	3	4.1
November	7.7	4.1	0.55	12.4	7.6	73.6	74.5	3	4.5
December	15.7	10.8	0.68	13.6	8.3	76.8	74.9	2	4.8
<b>2010</b>									
January	21.3	13.2	0.62	14.8	9.3	81.1	75.5	3	5.0
February	31.0	18.8	0.60	16.7	10.6	84.7	76.5	5	5.1
March	24.7	15.4	0.62	19.1	12.3	83.3	77.5	5	5.3
April	11.2	8.0	0.71	21.4	14.0	75.9	78.3	10	5.5
May	19.9	8.7	0.44	23.8	15.5	73.8	79.0	8	5.7
June	17.9	13.6	0.75	25.2	16.4	72.6	79.7	7	5.8
July	23.1	16.1	0.70	25.9	16.7	79.9	80.1	5	6.0
August	28.2	19.6	0.70	27.3	17.4	79.7	80.7	8	6.2
September	35.6	25.2	0.71	30.6	19.6	81.1	82.4	5	6.3
October	35.0	23.5	0.67			81.6		6	
November	36.1	21.5	0.60			82.5		5	
December	22.0	14.4	0.66			84.3		4	
<b>2011</b>									
January	32.1	19.0	0.59			83.7		6	
February	53.2	29.4	0.55			94.5		6	
March	81.0	56.2	0.69			115.3		7	

**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. Solar minimum for Cycle 23 was December 2008.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 04 April 2011*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

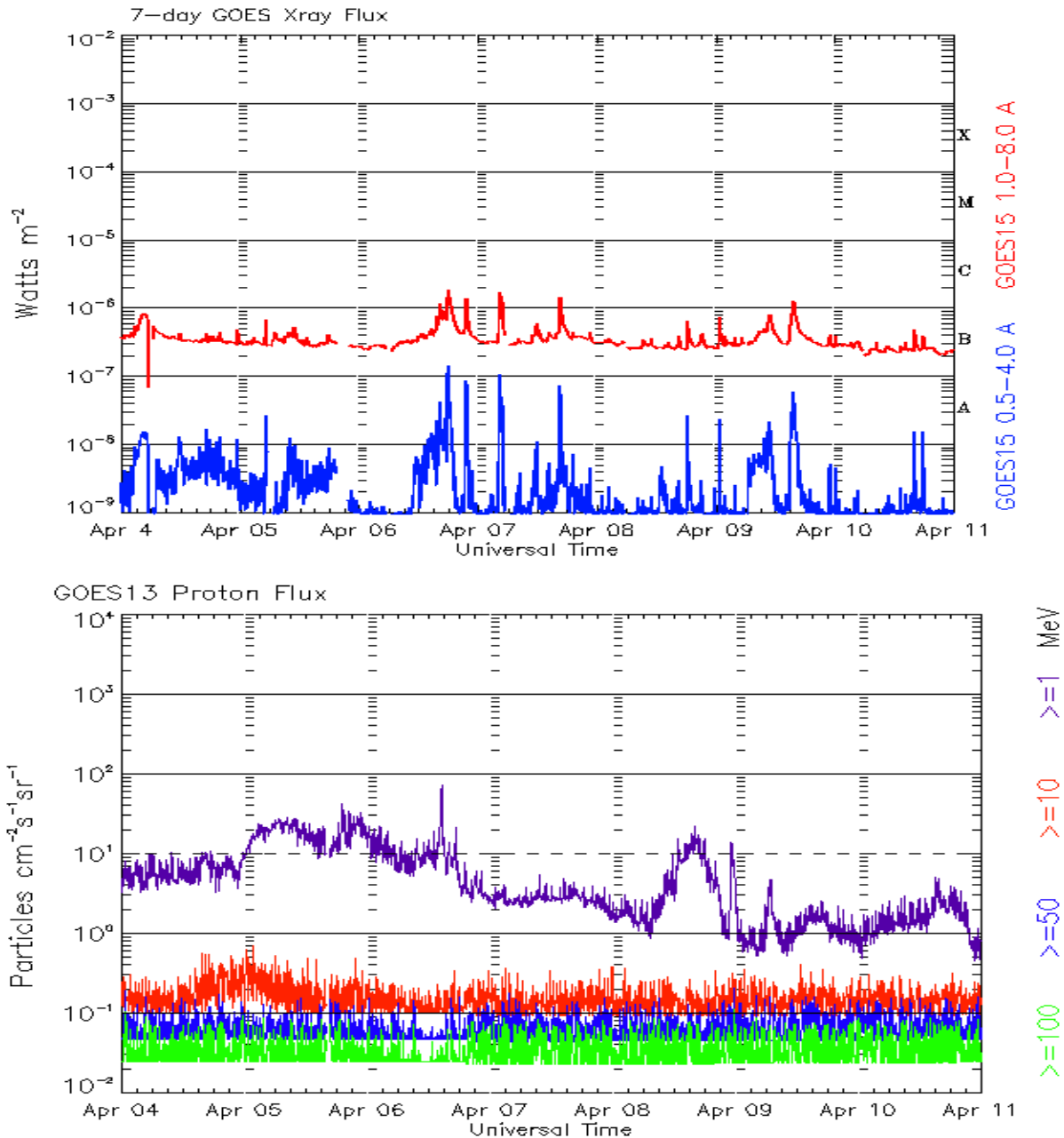
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. 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  
Week Beginning 04 April 2011*

The x-ray plots contains five-minute averages x-ray flux (Watt/m<sup>2</sup>) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, 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 intergral flux units (pfu = protons/cm<sup>2</sup>-sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.



## ***Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)***

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**Notice:** The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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