

Solar activity ranged from very low to moderate levels during the period. The period began with low levels on 13 June with a C1 x-ray event at 13/0055 UTC from an area on the east limb near N20. A partial halo CME (estimated plane-of-sky speed of 600 km/s) was observed off the southeast limb; first observed in C2 SOHO LASCO imagery at 13/0424 UTC, also observed in C3 imagery at 13/0454 UTC. Activity increased to moderate levels on 14 June when an M1 X-ray event occurred at 14/2147 UTC from Region 1236 (N17, L=166, class/area Ehi/350 on 16 June). A north-south oriented filament channel erupted near the southeast limb between 0609 and 1500 UTC on 14 June. A partial halo CME off the east limb was associated with the filament eruption (first seen in STEREO-Behind COR2 imagery at 14/1500 UTC). The plane-of-sky speed was estimated at approximately 750 km/s. Activity decreased to low levels for 15 - 17 June. Two C-class X-ray flares were observed on 15 June: a C2/Sf at 15/1150 UTC from Region 1236, and a C3/1f at 15/1432 UTC from Region 1234 (S16, L=246, class/area Dsi/150 on 19 June). Four C-class events were observed on 16 June. The most significant was a C7/1N at 16/1022 UTC from Region 1236 associated with weak radio emissions in the 2695 MHz to 15.4 GHz range, including a 130 sfu 10cm burst. Two C-class flares were observed on 17 June: C1/Sf X-ray flare on 17/2313 UTC and a C3/Sn X-ray flare at 17/2342 UTC from Region 1234. Activity decreased to very low levels on 18 June. Activity returned to low levels on 19 June as two C-class events were observed. The most significant was a C4 event from Region 1234 at 19/1522 UTC.

The greater than 10 MeV proton flux at geosynchronous orbit was slightly enhanced during 12-18 June (peak 8 pfu at 17/0805 UTC), likely associated with an eruptive prominence on the limb at 10/1828 UTC.

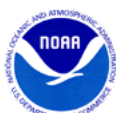
The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels during the period.

Geomagnetic activity ranged from quiet to minor storm levels during the period. Activity was at quiet to unsettled levels, with an isolated active period at high latitudes on 13-14 June due to a coronal hole high speed stream (CH HSS). Activity was at quiet levels on 15 - 16 June. A geomagnetic sudden impulse (SI) was observed at Boulder at 17/0244 UTC (31 nT) and indicated the arrival of the partial-halo CME observed in C2 SOHO LASCO imagery at 13/0424 UTC. The geomagnetic field was at quiet to unsettled levels, with isolated active and minor storm periods at high latitudes. Activity decreased to quiet levels for 18-19 June.

## **Space Weather Outlook**

### **22 June - 18 July 2011**

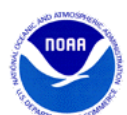
Solar activity is expected to be at low levels, with a slight chance for isolated M-class flares during 22 - 27 June. Activity is expected to decrease to very low to low levels during the rest of the period as Region 1236 departs. Activity is expected to remain very low until 03 July with the return of old Region 1234. Activity is then expected to be low with a chance for isolated M-class activity for the remainder of the forecast period.



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 from 22 - 24 June. An increase to high levels is expected for 25 June - 01 July due to a recurrent CH HSS. A brief return to normal to moderate levels is expected on 02 July and then high levels are expected once again from 03 - 05 July due to another recurrent CH HSS. Normal to moderate levels are expected for the remainder of the period.

Geomagnetic field activity is expected to be mostly quiet on 22 - 23 June. An increase to mostly active conditions is expected on 24 June with a chance for isolated minor to major storm periods due to the combination of the CH HSS and a halo CME observed early on 21 June. Unsettled to active conditions are expected from 25 - 26 June as the effects persist. The geomagnetic field is expected to be quiet to unsettled on 26 - 28 June as the disturbance subsides. Quiet conditions are expected from 29 June - 01 July. A slight increase to quiet to unsettled conditions is expected from 02 - 03 July due to another recurrent CH HSS followed by a return to quiet conditions until 07 July. A third CH HSS is expected to bring unsettled conditions from 08 - 09 July. Predominately quiet conditions are expected until the arrival of a fourth CH HSS due to arrive on 17 July. Quiet to unsettled conditions are expected for the remainder of the period.



### *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
13 June	87	16	20	B2.6	1	0	0	0	0	0	0	0
14 June	99	48	230	B2.4	2	1	0	1	0	0	0	0
15 June	102	48	450	B2.4	2	0	0	7	1	0	0	0
16 June	103	62	450	B3.0	4	0	0	4	1	0	0	0
17 June	104	65	360	B2.9	3	0	0	3	0	0	0	0
18 June	99	67	350	B2.3	0	0	0	3	0	0	0	0
19 June	99	47	270	B2.0	2	0	0	5	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
	13 June	2.2e+06	3.0e+05	3.1e+03		1.0e+07
14 June	1.6e+06	1.1e+05	3.0e+03		1.5e+07	
15 June	9.5e+05	4.3e+04	2.9e+03		2.8e+07	
16 June	4.3e+06	6.7e+04	2.9e+03		3.1e+07	
17 June	3.2e+07	1.8e+05	2.8e+03		1.5e+07	
18 June	2.8e+07	3.8e+04	2.8e+03		6.9e+06	
19 June	5.0e+06	1.6e+04	2.9e+03		5.5e+06	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	13 June	6	1-1-1-2-2-2-2-2	10	2-2-1-3-4-2-2-1	8
14 June	7	2-2-2-3-1-1-1-2	11	3-3-3-4-1-1-1-1	7	2-2-2-3-1-1-1-2
15 June	7	2-2-2-1-2-2-2-2	7	2-2-3-2-2-1-1-1	7	2-2-2-2-2-2-1-3
16 June	3	1-0-0-1-1-2-1-1	3	1-1-1-0-0-2-1-0	4	1-1-1-1-1-2-1-2
17 June	8	3-2-1-1-2-3-1-2	15	3-3-1-1-4-5-2-1	11	4-3-1-1-3-3-2-2
18 June	4	2-1-1-2-1-1-1-1	3	2-2-2-0-0-0-1-0	4	2-1-2-1-1-1-1-1
19 June	3	1-0-1-1-1-1-1-1	6	1-1-2-3-3-0-1-1	4	1-0-1-1-1-1-1-1



### *Alerts and Warnings Issued*

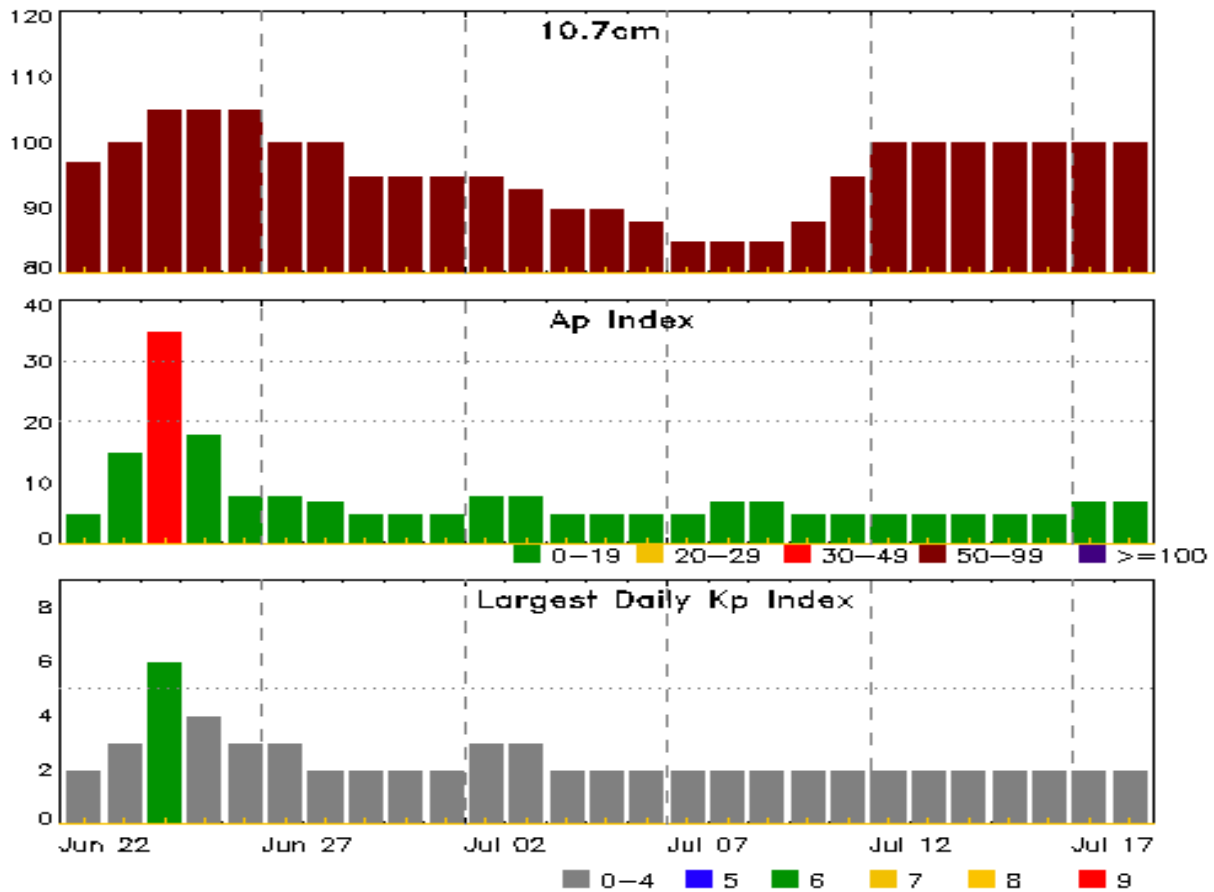
---

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
14 Jun 0957	WARNING: Geomagnetic K = 4	14/0957 - 1600
14 Jun 1011	ALERT: Geomagnetic K = 4	14/1010
14 Jun 1555	EXTENDED WARNING: Geomagnetic K = 4	14/0957 - 2359
16 Jun 1031	SUMMARY: 10cm Radio Burst	16/1020 - 1021
17 Jun 0245	WARNING: Geomagnetic K = 4	17/0244 - 0900
17 Jun 0255	WARNING: Geomagnetic Sudden Impulse expected	17/0251 - 0300
17 Jun 0255	SUMMARY: Geomagnetic Sudden Impulse	17/0244
17 Jun 0817	WARNING: Proton 10MeV Integral Flux > 10pfu	17/0820 - 18/0900
17 Jun 1409	WARNING: Geomagnetic K = 4	17/1415 - 18/0000
17 Jun 1443	CANCELLATION: Proton 10MeV Integral Flux > 10pfu	
17 Jun 2009	CANCELLATION: Geomagnetic K = 4	

---



## 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
22 Jun	97	5	2	06 Jul	88	5	2
23	100	15	3	07	85	5	2
24	105	35	6	08	85	7	2
25	105	18	4	09	85	7	2
26	105	8	3	10	88	5	2
27	100	8	3	11	95	5	2
28	100	7	2	12	100	5	2
29	95	5	2	13	100	5	2
30	95	5	2	14	100	5	2
01 Jul	95	5	2	15	100	5	2
02	95	8	3	16	100	5	2
03	93	8	3	17	100	7	2
04	90	5	2	18	100	7	2
05	90	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	Intensity IV
14 Jun	2136	2147	2210	M1.3	0.018	SF	N15E77	1236				

### *Flare List*

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
13 Jun	0049	0055	0103	C1.2			1236
13 Jun	0612	0616	0618	B9.7			1234
13 Jun	1442	1445	1449	B5.4			1234
13 Jun	1544	1547	1555	B4.7			1234
13 Jun	1933	1937	1941	B5.3			1235
13 Jun	2016	2019	2023	B5.9			
13 Jun	2211	2219	2226	B7.1			1236
14 Jun	0012	0016	0022	B4.6			
14 Jun	0032	0041	0049	C1.8			1236
14 Jun	0204	0212	0220	B5.7			1234
14 Jun	0737	0745	0751	B3.0			
14 Jun	1113	1129	1136	C2.2			1236
14 Jun	1319	1326	1332	B7.8			1236
14 Jun	2136	2147	2210	M1.3	SF	N15E77	1236
15 Jun	1141	1150	1212	C2.6	SF	N16E69	1236
15 Jun	1343	1350	1402	B7.9	SF	N14E72	1236
15 Jun	1419	1432	1445	C3.2	1F	S16W17	1234
15 Jun	1519	1530	1543	B8.3	SF	S16W16	1234
15 Jun	1713	1718	1727	B6.3			
15 Jun	1901	1905	1908		SF	S16W18	1234
15 Jun	2058	2102	2104	B7.5	SF	S16W19	1234
15 Jun	2131	2132	2136		SF	S15W20	1234
15 Jun	2143	2143	2147		SF	S15W20	1234
16 Jun	0355	0407	0414	B8.8	SF	N15E59	1236
16 Jun	0447	0447	0457		SF	S17W26	1234
16 Jun	0618	0623	0628	C1.2			
16 Jun	1013	1022	1029	C7.1	1N	N16E56	1236
16 Jun	1042	1042	1055		SF	N18E58	1236
16 Jun	1156	1208	1214	C1.8			
16 Jun	1537	1543	1548	C1.0	SF	N12E48	1236
16 Jun	2310	2316	2319	B6.3			1236



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
17 Jun	0237	0241	0244	B6.0			1236
17 Jun	0641	0646	0654	B7.4			1237
17 Jun	1517	1520	1531		SF	S15W47	1234
17 Jun	1607	1610	1612	B5.1			1234
17 Jun	1705	1740	1756	B6.9			1237
17 Jun	2158	2210	2221	C1.1	SF	S16W48	1234
17 Jun	2232	2235	2238	B7.9			1234
17 Jun	2259	2313	2318	C1.4			1234
17 Jun	2337	2342	2349	C3.9	SN	S15W46	1234
18 Jun	0016	0021	0025	B8.6			1234
18 Jun	0054	0100	0104	B8.8			1234
18 Jun	0841	0841	0845		SF	S15E61	1237
18 Jun	1034	1042	1055	B4.8	SF	N14E28	1236
18 Jun	2218	2222	2227	B4.5	SF	S18E57	1237
18 Jun	2316	2319	2323	B3.1			1237
19 Jun	0223	0241	0259	B9.4	SF	N17E21	1236
19 Jun	0944	0950	1001		SF	S15W68	1234
19 Jun	1209	1211	1214		SF	S15W69	1234
19 Jun	1330	1336	1338	B8.4			1234
19 Jun	1517	1522	1524	C4.7	SF	S16W75	1234
19 Jun	1554	1557	1600	B6.5			
19 Jun	1603	1637	1653	C1.5	SF	S19E48	1237



### *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><i>Region 1232</i></b>																				
02 Jun	N10E61	336	80	2	Hsx	1	A	1												
03 Jun	N10E46	336	70	2	Hsx	1	A													
04 Jun	N09E33	337	70	2	Hsx	2	A													
05 Jun	N09E20	337	40	2	Hsx	3	A													
06 Jun	N08E07	337	40	4	Cso	3	B													
07 Jun	N08W06	338	50	3	Cso	4	B													
08 Jun	N09W19	336	50	2	Hsx	1	A													
09 Jun	N09W33	337	30	1	Hax	2	A													
10 Jun	N09W46	337	20	1	Hrx	1	A													
11 Jun	N08W60	337	10	1	Axx	1	A													
12 Jun	N08W73	338	plage										1							
13 Jun	N08W87	339	plage																	
								1	0	0	1	0	0	0	0					

Crossed West Limb.  
 Absolute heliographic longitude: 338

<b><i>Region 1234</i></b>																				
09 Jun	S16E59	245	10	5	Bxo	2	B	1				2								
10 Jun	S16E43	247	10	4	Bxo	3	B													
11 Jun	S16E32	245	10	6	Bxo	5	B													
12 Jun	S15E18	246	10	8	Bxo	6	B													
13 Jun	S16E07	245	20	6	Bxo	6	B													
14 Jun	S15W07	245	40	5	Dso	9	B													
15 Jun	S15W22	247	100	7	Dai	17	B	1			5	1								
16 Jun	S16W35	247	100	8	Dsi	26	B				1									
17 Jun	S16W48	246	100	8	Dsi	17	B	3			3									
18 Jun	S16W61	246	150	9	Dsi	15	B													
19 Jun	S16W74	245	60	9	Dso	4	B	1			3									
								6	0	0	14	1	0	0	0					

Still on Disk.  
 Absolute heliographic longitude: 245





### *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

#### *Region 1235*

11 Jun	N14E27	250	10	1	Axx	1	A										
12 Jun	N14E13	251	plage														
13 Jun	N14W01	253	plage														
14 Jun	N14W15	253	10	3	Bxo	3	B										
15 Jun	N14W29	254	plage														
16 Jun	N14W43	255	plage														
17 Jun	N14W57	256	plage														
18 Jun	N14W71	256	plage														
19 Jun	N14W85	257	plage														
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 253

#### *Region 1236*

13 Jun	N17E78	174	plage								1						
14 Jun	N17E64	174	180	8	Dso	6	B	2	1		1						
15 Jun	N17E58	167	350	11	Ehi	11	BD	1			2						
16 Jun	N17E46	166	350	12	Ehi	16	BD	2			3	1					
17 Jun	N17E33	165	260	10	Dho	17	BG										
18 Jun	N17E18	166	200	12	Esi	21	BG				1						
19 Jun	N16E06	165	200	12	Esi	11	BG				1						
								6	1	0	8	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 165

#### *Region 1237*

17 Jun	S14E66	132	0	1	Axx	1	A										
18 Jun	S15E53	131	0	1	Axx	1	A					2					
19 Jun	S15E39	133	plage					1			1						
								1	0	0	3	0	0	0	0	0	0

Still on Disk.

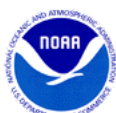
Absolute heliographic longitude: 133

#### *Region 1238*

19 Jun	S17E11	160	10	1	Axx	2	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 160

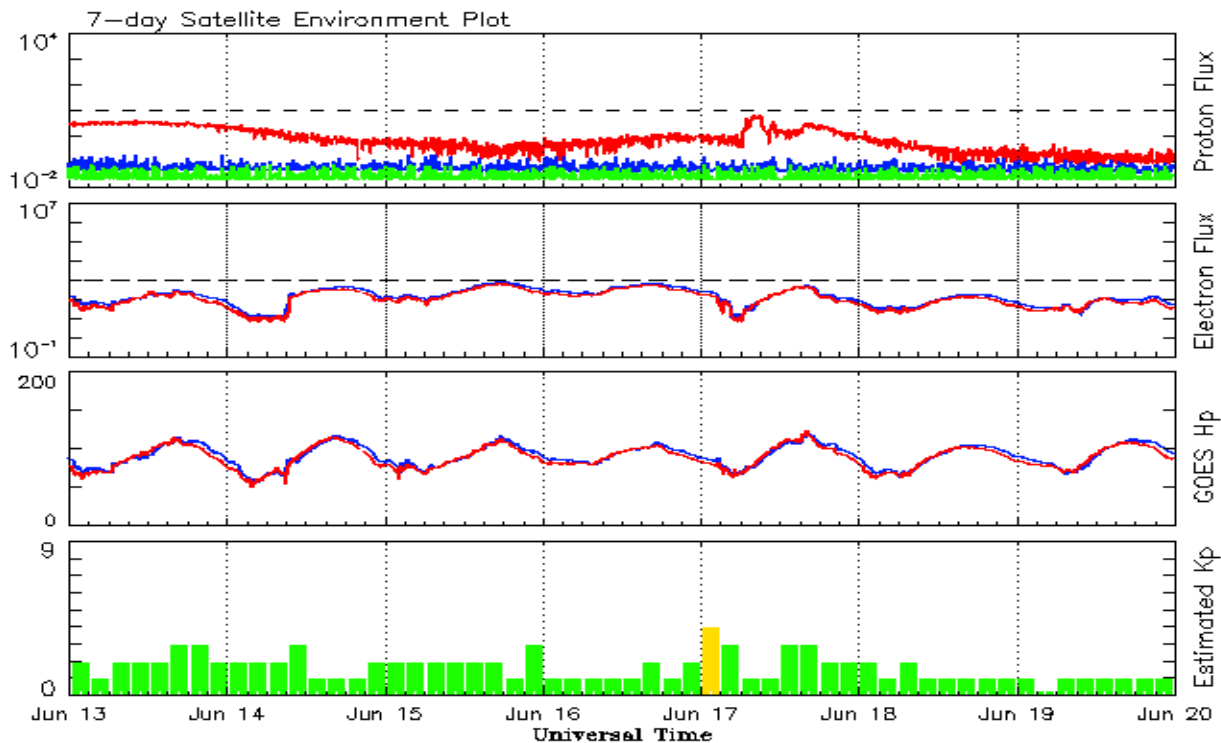


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>									
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	35.9	23.2	81.6	85.3	6	6.4
November	36.1	21.5	0.60	40.5	26.5	82.5	87.7	5	6.4
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	
April	81.7	54.4	0.67			112.6		9	
May	61.4	41.6	0.68			95.9		9	

**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 13 June 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.

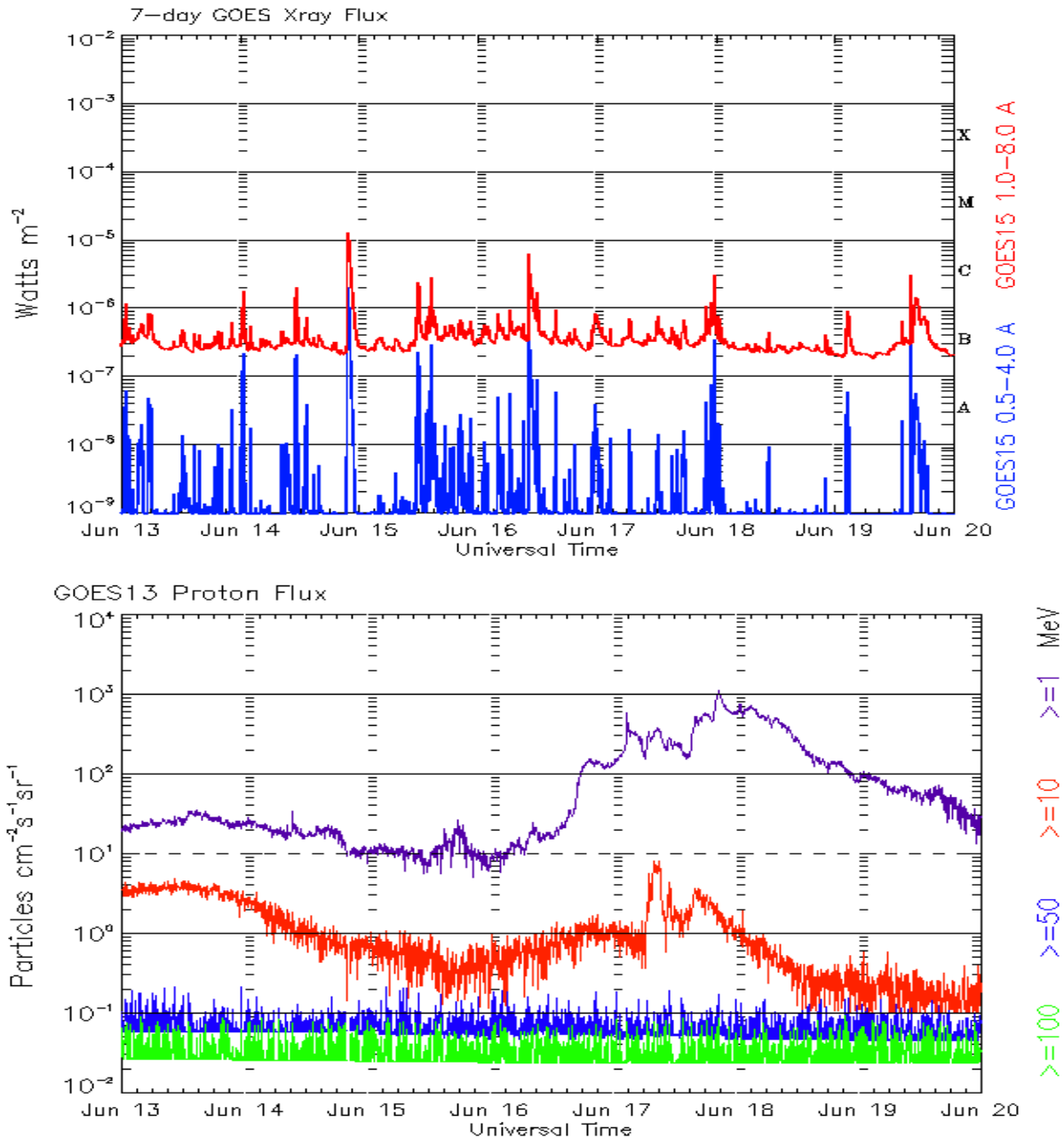
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 13 June 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)***

Published every Tuesday by the Space Weather Prediction Center.

U.S. Department of Commerce  
NOAA / National Weather Service  
Space Weather Prediction Center  
325 Broadway, Boulder CO 80305

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

The Weekly has been published continuously since 1951 and is available online since 1997.

<http://spaceweather.gov/weekly/> -- Current and previous year

<http://spaceweather.gov/ftpmenu/warehouse.html> -- Online archive from 1997

<http://spaceweather.gov/ftpmenu/> -- Some content as ascii text

<http://spaceweather.gov/SolarCycle/> -- Solar Cycle Progression web site

<http://spaceweather.gov/contacts.html> -- Contact and Copyright information

[http://spaceweather.gov/weekly/Usr\\_guide.pdf](http://spaceweather.gov/weekly/Usr_guide.pdf) -- User Guide

