

**Space Weather Highlights**  
**06 February - 12 February 2012**

**SWPC PRF 1902**  
**14 February 2012**

Solar activity began the week at moderate levels due to an M1/Sf flare produced by Region 1410 (N18, L=056, class/area Cso/240 on 01 February) at 06/2000 UTC. Activity levels decreased to very low to low levels for the remainder of the week. Noteworthy events include a long duration C7 limb event from Region 1410 at 07/2219 UTC, and a CME associated with a filament eruption at 10/1154 UTC. Region 1410 produced a long duration C7 limb event at 07/2219 UTC.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit started the period at normal background levels, increased to moderate levels on 07 February, and reached high levels on 08-09 February. The electron flux returned to moderate levels for the remainder of the period.

The geomagnetic field was at mostly quiet levels for the majority of the period. There were a few periods of unsettled to active conditions at mid-latitudes with active to minor storm conditions at high latitudes, early in the week on 7 and 8 February. This activity was associated with solar wind speeds between 450-500 km/s and periods of southward Bz. Mid-day on 09 February, unsettled to active periods were observed at high latitudes due to the arrival of a co-rotating interaction region followed by a weak coronal hole high speed stream. From late on 09 February until the end of the period, mostly quiet conditions prevailed.

**Space Weather Outlook**  
**15 February - 12 March 2012**

Solar activity is expected to be low with a slight chance of M-class activity until Region 1419 rotates off the visible disk on 26 February. Very low to low levels are expected to prevail for the remainder of the period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at low to moderate levels.

Geomagnetic field activity is expected to be at mostly quiet levels throughout the period, with the exception of any currently unanticipated future CME events. Increased field activity due to recurrent disturbances is expected on 18-19 February, 23 February, 2-3 March, and 7 March.

**\*\* Attention\*\*** Beginning Monday, March 12, 2012, the Weekly bulletin will now be issued and available on the SWPC web page every Monday morning by 1500 UTC.



### *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
06 February	112	27	210	B2.2	1	1	0	4	0	0	0	0
07 February	107	24	210	B2.5	5	0	0	2	1	0	0	0
08 February	97	28	90	B3.1	1	0	0	3	0	0	0	0
09 February	99	33	150	B2.7	1	0	0	0	0	0	0	0
10 February	111	51	120	B2.7	2	0	0	4	0	0	0	0
11 February	112	62	430	B3.0	8	0	0	0	0	0	0	0
12 February	110	80	550	B2.4	3	0	0	1	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
	06 February	3.8e+05	1.8e+04	3.1e+03		1.6e+07
07 February	3.5e+05	1.4e+04	2.8e+03		7.0e+06	
08 February	1.6e+05	1.3e+04	3.1e+03		3.3e+07	
09 February	3.4e+05	1.4e+04	3.1e+03		8.6e+07	
10 February	1.3e+05	1.3e+04	3.0e+03		1.2e+07	
11 February	1.4e+05	1.4e+04	3.1e+03		1.1e+07	
12 February	2.1e+05	1.3e+04	2.9e+03		1.3e+07	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 February	5	2-2-1-1-2-2-1-0	2	0-1-1-0-0-0-0-0	4
07 February	10	1-2-2-3-3-2-3-2	20	1-2-2-5-5-4-2-3	12	1-2-1-3-3-2-4-3
08 February	9	3-2-3-2-2-2-2-1	12	2-2-3-4-4-1-1-1	10	3-2-3-2-2-2-2-1
09 February	4	1-1-0-1-2-2-2-1	8	0-0-0-4-3-2-3-0	4	1-1-0-1-2-2-2-1
10 February	4	1-1-2-1-1-1-2-1	2	0-0-1-1-2-0-1-1	4	1-1-1-0-1-1-2-1
11 February	3	3-1-1-0-1-0-1-0	2	1-1-2-1-1-0-0-0	4	2-1-1-0-0-1-1-1
12 February	3	1-1-0-1-2-1-1-0	2	0-1-0-0-1-1-1-0	4	1-2-0-0-1-1-1-1

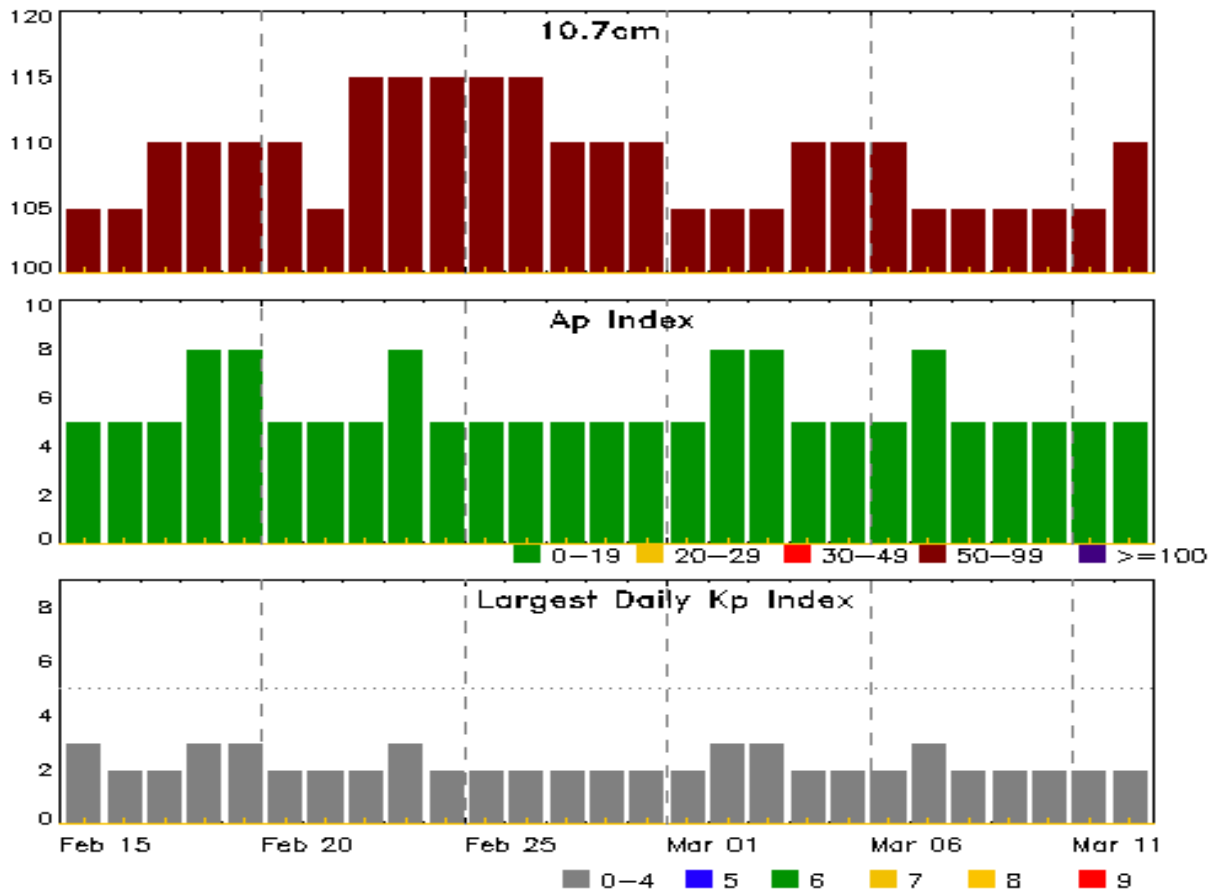


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
07 Feb 2033	WARNING: Geomagnetic K = 4	07/2040 - 08/0600
07 Feb 2101	ALERT: Geomagnetic K = 4	07/2059
08 Feb 2132	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	08/2115
09 Feb 1127	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	08/2115



## 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
15 Feb	105	5	3	29 Feb	110	5	2
16	105	5	2	01 Mar	105	5	2
17	110	5	2	02	105	8	3
18	110	8	3	03	105	8	3
19	110	8	3	04	110	5	2
20	110	5	2	05	110	5	2
21	105	5	2	06	110	5	2
22	115	5	2	07	105	8	3
23	115	8	3	08	105	5	2
24	115	5	2	09	105	5	2
25	115	5	2	10	105	5	2
26	115	5	2	11	105	5	2
27	110	5	2	12	110	5	2
28	110	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		Intensity
									245	2695	II IV
06 Feb	1931	2000	2017	M1.0	0.019	SF	N19W60	1410			

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Optical Location Lat CMD	Rgn #
	Begin	Max	End				
06 Feb	0312	0313	0315		SF	N18W59	1410
06 Feb	0723	0733	0746	B9.3			1410
06 Feb	1120	1123	1130	B3.9			
06 Feb	1310	1314	1319	B6.8			
06 Feb	1442	1447	1452	B7.9	SF	N20W57	1410
06 Feb	1515	1518	1521	B5.2			
06 Feb	1618	1623	1626	B6.2			
06 Feb	1649	1654	1712	B6.6			
06 Feb	1720	1727	1737	C1.2	SF	N20W58	1410
06 Feb	1931	2000	2017	M1.0	SF	N19W60	1410
07 Feb	0115	0123	0130	C3.5	SF	N20W61	1410
07 Feb	0232	0237	0242	B4.0			1410
07 Feb	0417	0424	0447	C1.7	SF	N19W61	1410
07 Feb	1034	1039	1042	B8.0			1410
07 Feb	1056	1103	1111	C5.1			1410
07 Feb	1233	1238	1252	B5.2			
07 Feb	1611	1734	1742	C6.8			
07 Feb	1729	1731	1745		1F	N17W72	1410
07 Feb	2018	2219	2321	C7.3			1410
08 Feb	0131	0133	0135		SF	N21W75	1410
08 Feb	0407	0411	0417		SF	N11W49	
08 Feb	0707	0714	0722	B8.1			
08 Feb	2148	2217	2228	C2.9	SF	N12W59	1415
09 Feb	0459	0509	0514	B9.3			1416
09 Feb	0920	0933	0950	C1.1			1415
09 Feb	1200	1216	1228	B9.9			1416
09 Feb	2201	2207	2217	B7.5			
10 Feb	0006	0027	0047	B7.7	SF	S19E25	1416
10 Feb	0434	0435	0437	B8.8			1416
10 Feb	0810	0813	0815	B3.2			



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
10 Feb	1205	1212	1219	C1.0			1415
10 Feb	1520	1536	1600	C1.1			1415
10 Feb	1827	1831	1833	B9.9	SF	S18E15	1416
10 Feb	2055	2104	2119	B8.6			
10 Feb	2321	2326	2330	B8.4	SF	S19E12	1416
10 Feb	2348	2352	2354	B7.5	SF	S19E12	1416
11 Feb	0849	0855	0901	C1.4			
11 Feb	0955	1004	1011	C7.9			
11 Feb	1041	1044	1049	C1.5			1416
11 Feb	1210	1214	1218	B7.2			1416
11 Feb	1512	1526	1532	B6.0			1416
11 Feb	1555	1605	1609	C2.7			
11 Feb	1847	1854	1906	C7.7			1419
11 Feb	1908	1912	1920	C5.3			1419
11 Feb	2038	2044	2050	C2.7			1419
11 Feb	2326	2333	2336	C2.7			1419
12 Feb	0442	0446	0451	C1.3			1419
12 Feb	0653	0701	0705	C1.6			1419
12 Feb	0732	0738	0746	B9.7			1419
12 Feb	1103	1106	1108	B5.2			
12 Feb	1437	1443	1446	C3.9			1419
12 Feb	1618	1622	1624	B5.5			1418
12 Feb	1851	1855	1858	B4.8			1419
12 Feb	2152	2155	2157	B5.1			
12 Feb	2302	2310	2313	B3.4			
12 Feb	2342	2346	2349	B4.5	SF	N27E70	1419



## Region Summary

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 1410</b>																		
26 Jan	N16E66	69	120	3	Hsx	1	A											
27 Jan	N16E52	70	150	3	Hsx	1	A											
28 Jan	N16E38	71	150	3	Hsx	1	A	1										
29 Jan	N19E37	59	160	6	Cso	4	B											
30 Jan	N20E20	62	170	3	Hsx	4	A	1										
31 Jan	N18E11	59	200	8	Cso	8	B											
01 Feb	N18W00	56	240	13	Cso	13	B											
02 Feb	N18W14	57	240	13	Cso	13	B											
03 Feb	N17W29	59	190	5	Cso	4	B											
04 Feb	N16W44	61	190	3	Cso	2	B											
05 Feb	N17W57	61	130	3	Cso	3	B											
06 Feb	N17W67	58	180	12	Eai	6	BG	1	1			4						
07 Feb	N19W79	56	200	11	Eso	3	B	4				2	1					
08 Feb	N16W90	53	80	4	Dao	3	B					1						
								7	1	0	7	1	0	0	0	0		

Crossed West Limb.  
 Absolute heliographic longitude: 56

<b>Region 1413</b>																		
29 Jan	N08E38	58	20	3	Bxo	8	B											
30 Jan	N08E22	60	80	4	Dso	11	B											
31 Jan	N08E08	60	60	5	Cso	15	B											
01 Feb	N08W07	62	100	6	Csi	24	B											
02 Feb	N08W20	64	100	6	Csi	24	B											
03 Feb	N08W33	63	90	6	Dso	15	B											
04 Feb	N07W47	64	70	4	Dso	9	B											
05 Feb	N08W59	63	30	3	Cso	2	B											
06 Feb	N07W74	64	30	1	Hrx	1	A											
07 Feb	N08W86	62	10	1	Axx	1	A											
								0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.  
 Absolute heliographic longitude: 62



### *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 1414*

04 Feb	S06W19	36	10	3	Bxo	2	B										
05 Feb	S05W34	38	10	3	Bxo	2	B										
06 Feb	S05W49	40	plage														
07 Feb	S05W64	41	plage														
									0	0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 36

#### *Region 1415*

08 Feb	N10W60	24	10	5	Cso	5	B	1			1						
09 Feb	N10W73	24	60	5	Cso	5	B	1									
10 Feb	N08W84	22	10	1	Bxo	2	B	2									
								4	0	0	1	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 24

#### *Region 1416*

09 Feb	S16E24	287	90	7	Dai	8	B										
10 Feb	S17E10	288	100	7	Dsi	17	BG				4						
11 Feb	S19W02	287	400	9	Dhi	27	BG	1									
12 Feb	S19W15	287	380	11	Eki	16	B										
								1	0	0	4	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 287

#### *Region 1417*

10 Feb	N18E59	239	10	1	Bxo	2	B										
11 Feb	N16E44	241	20	4	Cro	3	B										
12 Feb	N18E32	240	30	4	Cso	5	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 240

#### *Region 1418*

12 Feb	S24E13	259	10	3	Bxo	4	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 259





**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 1419**

12 Feb	N28E69	203	80	4	Cso	4	B	3			1						
								7	0	0	1	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 203

**Region 1420**

12 Feb	N13E69	203	50	4	Hsx	1	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 203

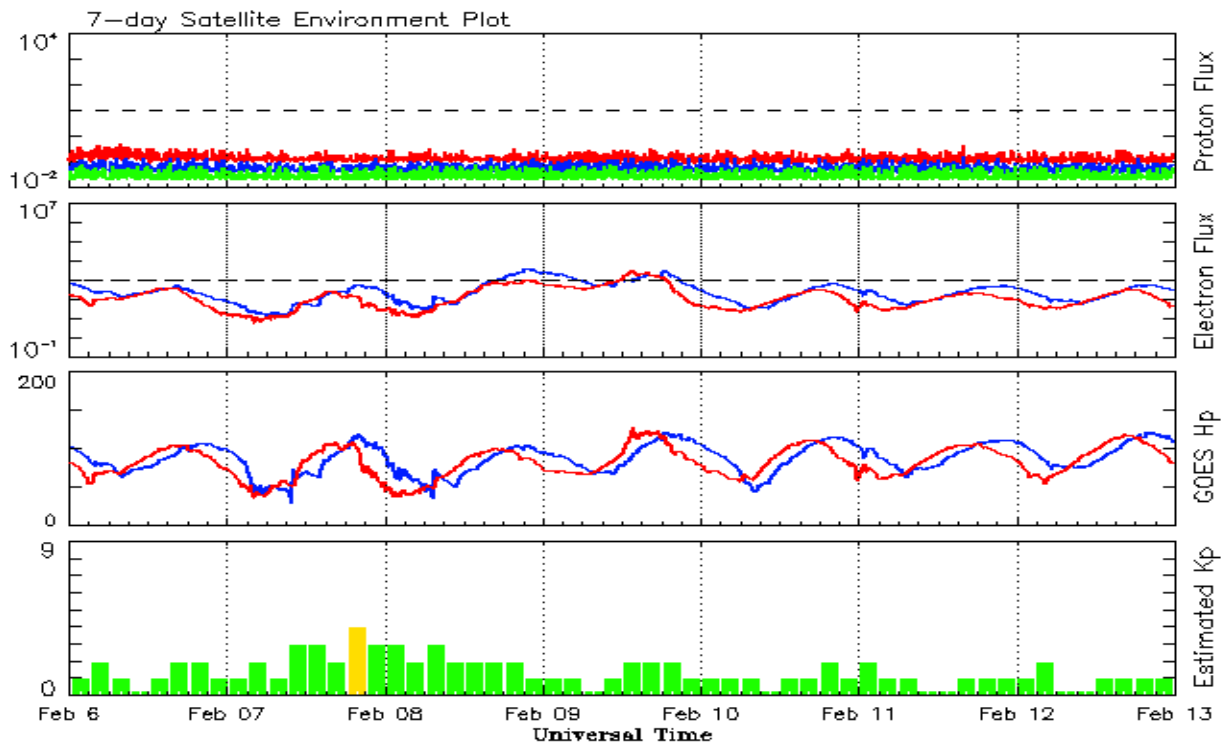


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2010</b>									
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	43.8	28.8	84.3	89.6	4	6.5
<b>2011</b>									
January	32.1	18.8	0.59	47.2	30.9	83.7	91.2	6	6.7
February	53.2	29.6	0.55	50.6	33.4	94.5	92.7	6	6.8
March	81.0	55.8	0.69	55.2	36.9	115.3	95.8	7	7.2
April	81.7	54.4	0.67	61.5	41.8	112.6	100.4	9	7.5
May	61.4	41.5	0.68	69.0	47.6	95.9	105.6	9	7.5
June	55.5	37.0	0.67	76.5	53.2	95.8	110.9	8	7.4
July	67.0	43.8	0.66	82.5	57.2	94.2	115.4	9	7.3
August	66.1	50.6	0.77			101.7		8	
September	106.4	78.0	0.73			134.5		13	
October	116.8	88.0	0.75			137.2		7	
November	133.1	96.7	0.73			153.1		3	
December	106.3	29.6	0.28		33.4	141.2		3	
<b>2012</b>									
January	91.3	58.3	0.64			133.1		6	

**Note:** Values are final except for the most recent 6 months which are considered preliminary.  
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 06 February 2012*

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.

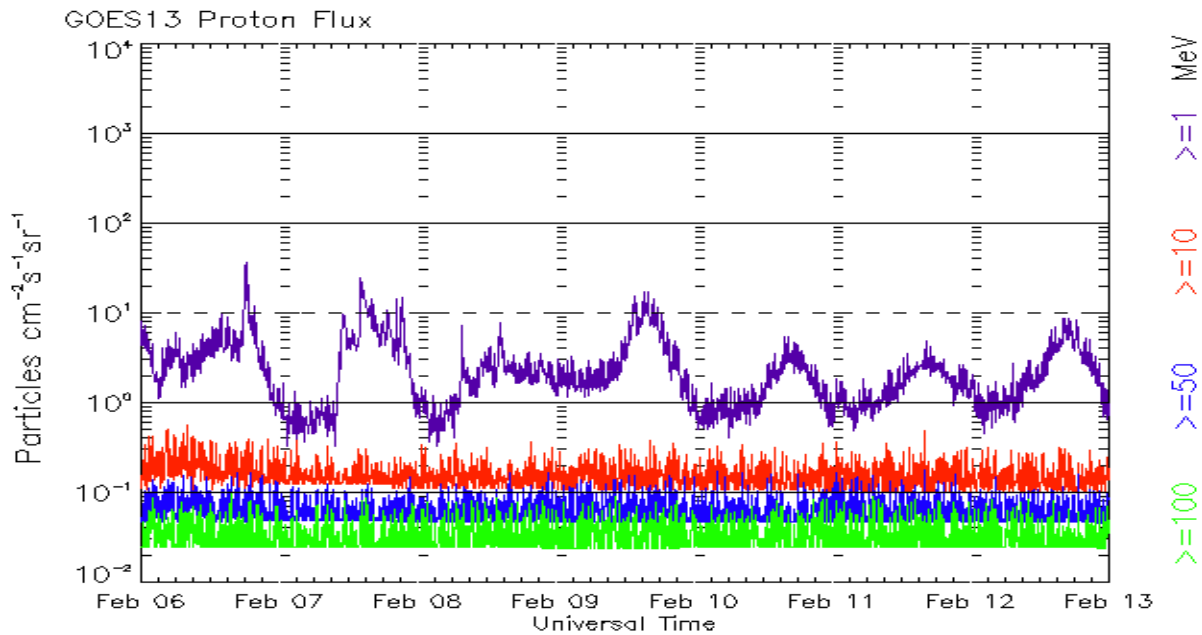
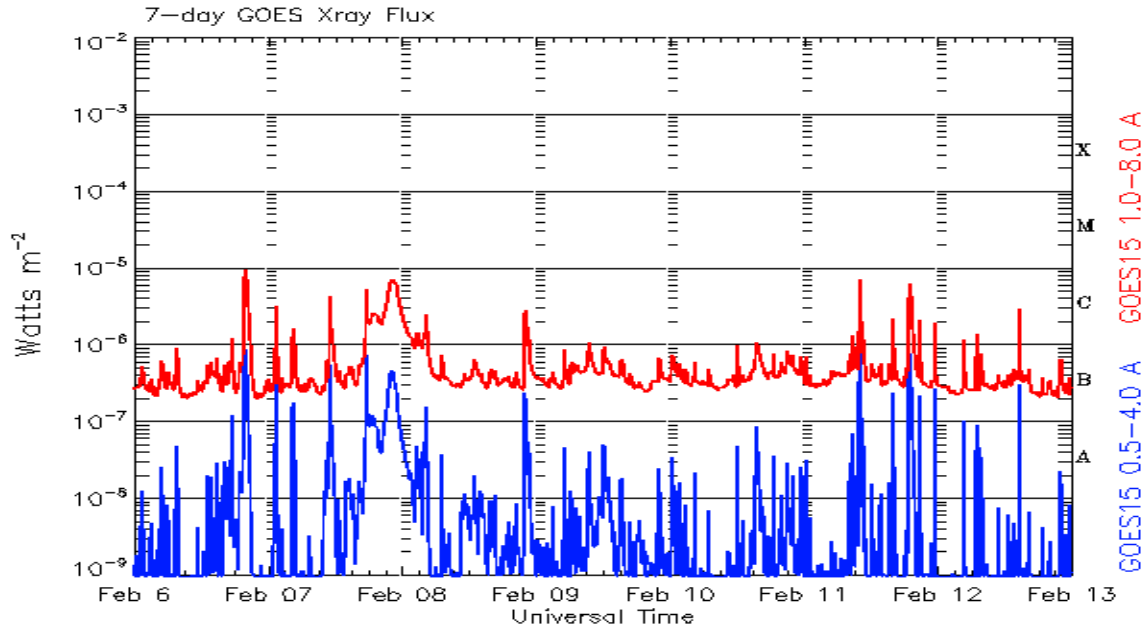
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

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 06 February 2012*

The x-ray plots contains five-minute averages x-ray flux (Watt/ $m^2$ ) 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/ $cm^2$  -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

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

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

