

Space Weather Highlights
09 February - 15 February 2015

SWPC PRF 2059
16 February 2015

Solar activity began the period at moderate levels but decreased to low levels for the remainder of the week. Region 2282 (N11, L=187, class/area=Eho/250 on 11 Feb) produced an M2 flare at 2335 UTC on 09 Feb which was the largest event of the period. Solar activity decreased to low levels for the remainder of the period (10-15 Feb) with only C-class flare activity observed, the largest of which were a C8/1n flare at 10/0202 UTC and a C6/1n flare at 12/0212 UTC which were credited to Region 2280 (S07, L=284, class/area=Ekc/300 on 10 Feb). No Earth-directed coronal mass ejections were observed throughout the period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit followed a diurnal pattern and ranged from low to moderate levels throughout the period, reaching a peak flux of 530 pfu on 09 Feb due to an enhanced solar wind environment associated with a weak positive polarity coronal hole high speed stream.

Geomagnetic field activity was generally quiet throughout the week with periods of unsettled activity observed on 09-11 and 15 Feb due to weak coronal hole high speed stream influence early in the week and a solar sector boundary crossing followed by weak co-rotating interaction region activity late in the week.

Space Weather Outlook
16 February - 14 March 2015

Solar activity is expected to be at low to moderate levels throughout the period due to the return of Regions 2268 (S11, L=048), 2277 (N09, L=328), 2280 (S07, L=284), and 2282 (N15, L=187), all of which produced M-class flare activity during their previous transits of the visible solar disk.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at low levels on 16, 18, 22-24 Feb with moderate levels likely on 17, 19-21, 25 Feb and 01, 05-14 Mar and high levels likely on 02-04 Mar due to coronal hole high speed stream activity.

Geomagnetic field activity is expected to be at predominately quiet to unsettled levels throughout the period with active conditions likely on 16, 22-23, 28 Feb and 01-02 Mar due to weak coronal hole high speed stream activity.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
09 February	146	82	470	B8.0	9	1	0	15	0	0	0	0
10 February	141	82	610	B9.1	5	0	0	10	1	0	0	0
11 February	131	76	510	B5.2	2	0	0	3	0	0	0	0
12 February	128	50	400	B4.6	2	0	0	4	1	0	0	0
13 February	125	59	290	B4.3	0	0	0	3	0	0	0	0
14 February	120	49	250	B3.8	0	0	0	1	0	0	0	0
15 February	120	45	240	B3.6	0	0	0	1	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	>0.6 MeV	>2MeV	>4 MeV
	09 February	2.8e+05	1.2e+04	2.7e+03		2.1e+07
10 February	1.3e+05	1.1e+04	2.8e+03		1.1e+07	
11 February	1.4e+05	1.1e+04	2.8e+03		1.4e+07	
12 February	1.4e+05	1.1e+04	2.7e+03		1.1e+07	
13 February	1.2e+05	1.1e+04	2.8e+03		6.7e+06	
14 February	2.7e+05	1.1e+04	2.6e+03		1.1e+07	
15 February	1.9e+05	1.1e+04	2.6e+03		4.1e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	09 February	5	2-0-1-0-2-2-2-2	7	2-0-0-1-4-3-1-1	8
10 February	6	1-2-1-1-2-2-2-2	3	0-1-0-0-2-1-1-2	7	1-3-1-1-1-2-2-3
11 February	5	2-3-0-0-2-2-1-1	8	1-1-0-2-5-1-0-0	7	2-3-1-1-2-1-0-1
12 February	3	1-0-0-1-2-1-1-1	4	0-0-0-0-3-3-1-0	5	2-1-1-1-2-2-2-1
13 February	2	0-0-0-1-2-1-1-1	2	0-0-0-3-1-0-0-0	3	0-0-0-1-1-1-1-1
14 February	2	0-1-1-0-1-1-1-1	0	0-0-0-0-0-0-0-1	3	0-1-1-1-0-0-1-1
15 February	5	0-2-2-1-3-1-1-1	11	1-0-2-3-5-3-1-0	6	1-2-2-2-3-1-1-1

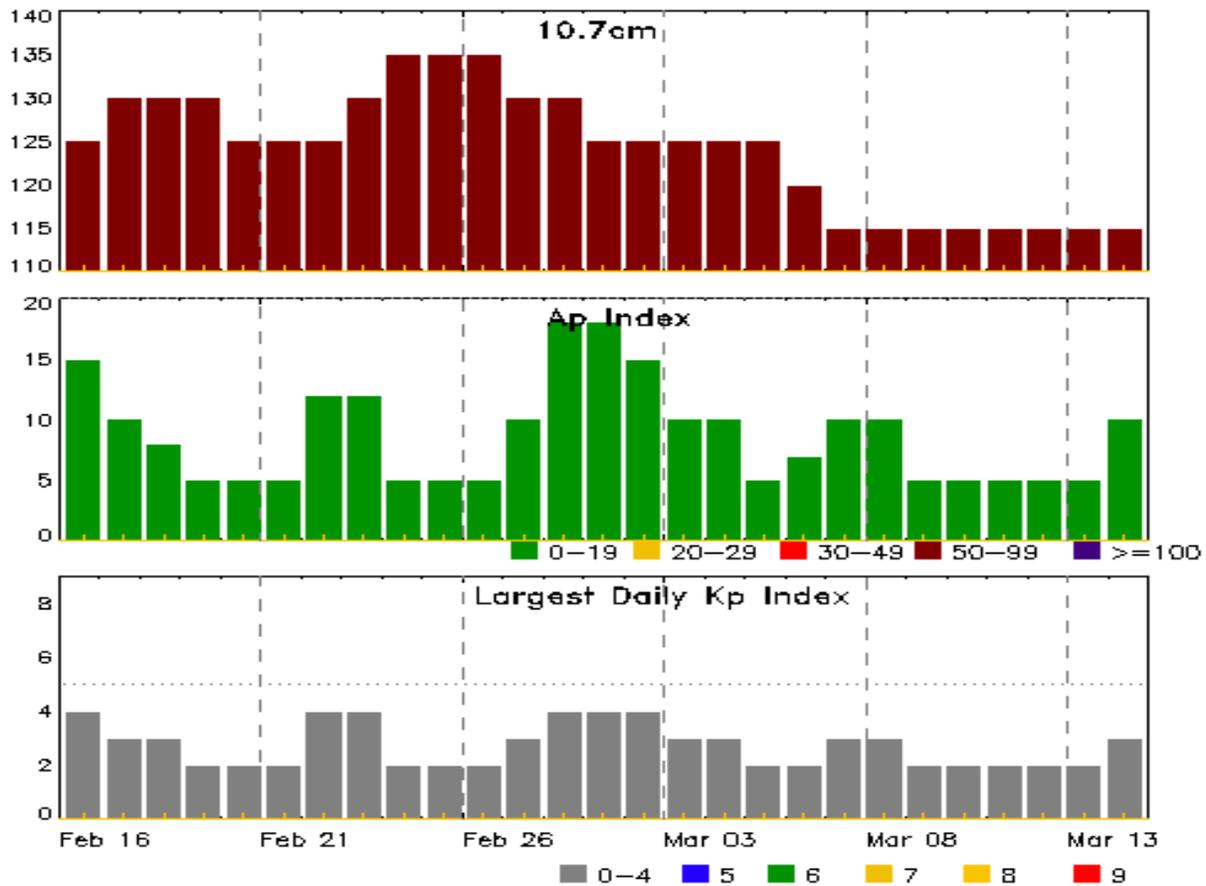


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
09 Feb 2358	ALERT: Type II Radio Emission	09/2323
10 Feb 0033	ALERT: Type IV Radio Emission	09/2335
11 Feb 0428	WARNING: Geomagnetic K = 4	11/0427 - 1400



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
16 Feb	125	15	4	02 Mar	125	15	4
17	130	10	3	03	125	10	3
18	130	8	3	04	125	10	3
19	130	5	2	05	125	5	2
20	125	5	2	06	120	7	2
21	125	5	2	07	115	10	3
22	125	12	4	08	115	10	3
23	130	12	4	09	115	5	2
24	135	5	2	10	115	5	2
25	135	5	2	11	115	5	2
26	135	5	2	12	115	5	2
27	130	10	3	13	115	5	2
28	130	18	4	14	115	10	3
01 Mar	125	18	4				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location	Rgn #	245	2695	II	IV
09 Feb	2259	2335	0014	M2.4	0.076			2282	480		1	2

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location	Rgn #
	Begin	Max	End				
09 Feb	0126	0148	0202	C2.1	SF	S07W26	2280
09 Feb	0311	0331	0351	C1.5			2280
09 Feb	0318	0319	0322		SF	N08E75	
09 Feb	0325	0341	0352		SF	N08E75	
09 Feb	0514	0522	0528	C1.7	SF	N13E67	2282
09 Feb	0557	0607	0614	C3.7	SF	S13E65	
09 Feb	0704	0712	0726	C1.7	SF	N13E03	2281
09 Feb	0822	0827	0832	C1.4	SF	N08E71	2282
09 Feb	0902	0905	0908	C1.5	SF	N09E73	2281
09 Feb	0905	0905	0909		SF	N11W00	2281
09 Feb	0908	0910	0915		SF	N09E73	
09 Feb	1500	1508	1514		SF	N08E68	
09 Feb	1813	1826	1932	C3.1	SF	S08W33	2280
09 Feb	2219	2222	2243		SF	S08W33	2280
09 Feb	2259	2335	0014	M2.4			2282
09 Feb	2236	2240	2245	C1.8			2280
09 Feb	2237	2239	2243		SF	N08E68	2282
09 Feb	2251	2251	2259		SF	S08W33	2280
10 Feb	0017	0021	A0034		SF	N06W73	2277
10 Feb	0158	0202	0207	C8.3	1N	S08W42	2280
10 Feb	0311	0331	0351	C1.5	SF	S13E51	2280
10 Feb	0353	0358	0402		SF	S13E51	
10 Feb	0417	0421	0430	C2.9			2280
10 Feb	0518	0519	0529		SF	N07E56	
10 Feb	0715	0726	0759		SF	N07E55	
10 Feb	0829	0844	0853	C2.7	SF	N10E62	2282
10 Feb	0938	0939	0951		SF	N07E56	
10 Feb	1356	1407	1419	C1.5			2277
10 Feb	1541	1550	1558		SF	N07E52	
10 Feb	1612	1615	1619		SF	N09E52	



Flare List

Date	Time			Optical			Rgn #
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	
10 Feb	1731	1733	1735		SF	N07E50	
11 Feb	0137	0206	0220	C1.0	SF	N05E42	2282
11 Feb	0517	0520	0615	C1.0	SF	N05E40	2282
11 Feb	1131	1136	1143		SF	N08E36	2282
12 Feb	0203	0212	0217	C6.0	1N	S06W70	2280
12 Feb	0405	0408	0410	B8.7	SF	N08E26	2282
12 Feb	0431	0439	0445		SF	N11E29	2282
12 Feb	0753	0756	0809	B7.4			2282
12 Feb	1159	1214	1309		SF	N09E26	2282
12 Feb	1405	1409	1428	C1.0	SF	N08E25	2282
13 Feb	0220	0228	0251	B9.6	SF	N12E17	2282
13 Feb	1336	1338	1344		SF	N11E09	2282
13 Feb	1456	1526	1541		SF	N11E05	2282
14 Feb	B1229	U1237	1249	B7.1	SF	N13W04	2282
14 Feb	2249	2254	2257	B6.9			2284
15 Feb	0046	0051	0056	B9.0	SF	N07W37	2283
15 Feb	0902	0907	0914	B6.2			2282



Region Summary

Date	Location		Sunspot Characteristics				Flares										
	Lat CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
								C	M	X	S	1	2	3	4		
Region 2277																	
28 Jan	N07E67	336	30	2	Hax	1	A	1	1		3						
29 Jan	N07E61	329	260	20	Fhc	17	BG	12			14	1					
30 Jan	N08E47	330	510	21	Fkc	41	BG	1	1		3						
31 Jan	N08E33	331	480	22	Fkc	32	BG	2			1						
01 Feb	N08E20	331	440	26	Fkc	46	BG	2			5						
02 Feb	N08E06	331	400	27	Fki	40	B	2			2						
03 Feb	N09W06	329	440	28	Fko	36	BG	5			12	1					
04 Feb	N08W18	328	490	28	Fki	34	BG	1	1		7		1				
05 Feb	S08W32	330	340	28	Fki	42	BG	3			3	1					
06 Feb	N09W44	329	200	28	Fai	20	BG	1			1						
07 Feb	N09W57	329	200	27	Fai	14	BG	2			2						
08 Feb	N09W70	328	100	25	Fai	14	BG	3			5						
09 Feb	N09W83	328	50	5	Cso	8	B										
10 Feb	N08W94	326	30	3	Hsx	1	A	1			1						
								36	3	0	59	3	1	0	0		

Crossed West Limb.

Absolute heliographic longitude: 331

Region 2280

02 Feb	S09E55	282	20	5	Bxo	6	B	1			1						
03 Feb	S06E42	281	80	5	Dai	10	B	2			4						
04 Feb	S08E30	280	150	10	Dac	7	B	1			2						
05 Feb	S08E15	283	140	10	Dac	9	BG				1						
06 Feb	S07E01	284	160	10	Dac	16	BG	1			3						
07 Feb	S08W13	285	180	9	Dac	19	BG	2			5						
08 Feb	S07W25	283	210	9	Dac	28	BGD	3			9	1					
09 Feb	S07W40	285	260	11	Ekc	16	BGD	4			4						
10 Feb	S07W53	284	300	11	Ekc	17	BGD	3				1					
11 Feb	S07W66	284	240	10	Dac	16	B										
12 Feb	S06W81	287	140	6	Cso	3	B	1			1						
13 Feb	S09W95	288	30	2	Cso	2	B										
								18	0	0	29	3	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 284



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares								
	Lat	CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
			Lon	10 ⁻⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 2281																
03 Feb	N13E75		249	60	2	Cao	1	B								
04 Feb	N13E61		249	50	10	Cao	3	B					4			
05 Feb	N13E46		252	80	10	Cao	5	B								
06 Feb	N14E34		251	80	8	Cao	5	B	1				5			
07 Feb	N13E23		249	70	4	Dao	6	BG								
08 Feb	N14E09		249	110	6	Dac	10	BG								
09 Feb	N14W06		251	50	8	Dac	11	BG	2				2			
10 Feb	N12W20		252	60	11	Eac	14	BG								
11 Feb	N13W34		252	20	14	Cao	17	B								
12 Feb	N13W48		254	plage												
13 Feb	N13W62		255	plage												
14 Feb	N13W76		255	plage												
15 Feb	N13W90		256	plage												
									3	0	0	11	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 251

Region 2282																
07 Feb	N15E76		196	30	2	Hsx	1	A								
08 Feb	N15E65		193	90	3	Cao	2	B	1				2	1		
09 Feb	N14E51		194	110	3	Dso	7	B	2	1			2			
10 Feb	N11E48		184	220	9	Dso	10	BG	1							
11 Feb	N11E31		187	250	13	Eho	13	B	2				3			
12 Feb	N10E16		190	240	13	Eso	15	BG	1				4			
13 Feb	N10E04		189	220	12	Csi	10	BG					3			
14 Feb	N11W09		188	220	11	Csi	13	BG					1			
15 Feb	N11W24		190	210	10	Cso	8	B								
									7	1	0	15	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 189

Region 2283																
12 Feb	N06W11		217	20	3	Cro	2	B								
13 Feb	N06W24		217	10	3	Bxo	4	B								
14 Feb	N07W38		217	10	1	Axx	1	A								
15 Feb	N07W53		219	plage									1			
									0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 217



Region Summary - continued

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

Region 2284

13 Feb	N14E56	137	30	4	Cro	3	B										
14 Feb	N13E43	136	20	6	Cro	5	B										
15 Feb	N14E29	137	10	6	Bxo	2	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 137

Region 2285

15 Feb	S09W14	180	20	3	Cro	5	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 180

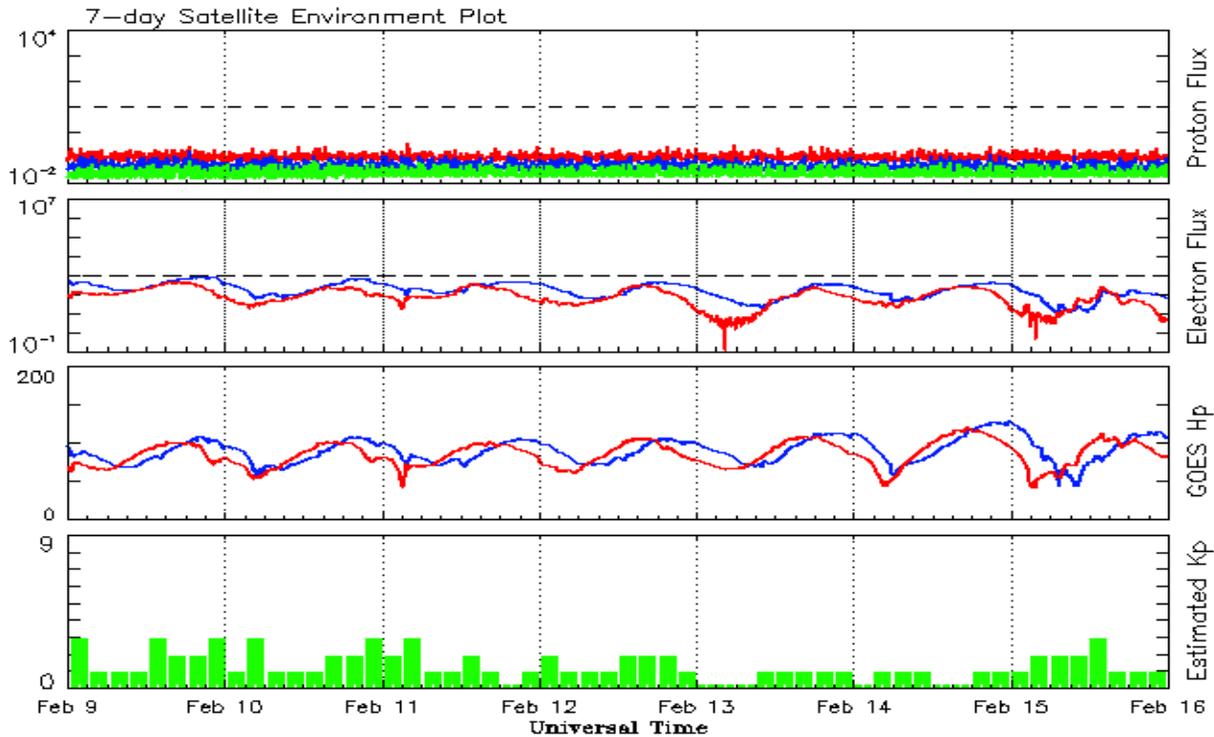


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2013									
February	60.0	38.1	0.63	86.7	58.4	104.4	118.0	5	7.4
March	81.0	57.9	0.71	85.7	57.6	111.2	117.1	9	7.4
April	112.8	72.4	0.64	86.7	57.9	125.0	116.6	5	7.2
May	125.5	78.7	0.63	90.5	59.9	131.3	118.1	10	7.0
June	80.1	52.5	0.66	94.4	62.6	110.2	120.9	13	7.1
July	86.1	57.0	0.66	97.9	65.5	115.6	123.9	9	7.3
August	90.2	66.0	0.73	103.7	68.9	114.7	127.9	9	7.6
September	55.0	37.0	0.67	111.0	73.0	102.7	132.3	5	7.8
October	127.1	85.6	0.67	114.3	74.9	132.3	134.7	7	7.8
November	125.7	77.6	0.62	114.6	75.3	148.4	135.4	5	7.9
December	118.2	90.3	0.76	115.4	75.9	147.7	135.9	5	7.5
2014									
January	125.9	81.8	0.65	117.7	77.3	158.6	137.3	6	7.1
February	174.6	102.3	0.59	119.5	78.3	170.3	138.6	12	6.9
March	141.1	91.9	0.65	123.2	80.8	149.9	140.8	6	7.2
April	130.5	84.7	0.65	124.8	81.9	144.3	143.5	9	7.5
May	116.8	75.2	0.64	122.3	80.5	130.0	144.7	7	7.9
June	107.7	71.0	0.66	121.4	79.7	122.2	145.5	7	8.4
July	113.6	72.4	0.64	120.4	78.6	137.3	145.2	5	8.8
August	106.2	74.6	0.70			124.7		9	
September	127.4	87.6	0.69			146.1		11	
October	92.0	60.6	0.66			153.7		10	
November	101.8	70.1	0.69			155.3		10	
December	120.0	78.0	0.65			158.7		12	
2015									
January	101.2	67.0	0.66			141.7		10	

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 09 February 2015*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-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.

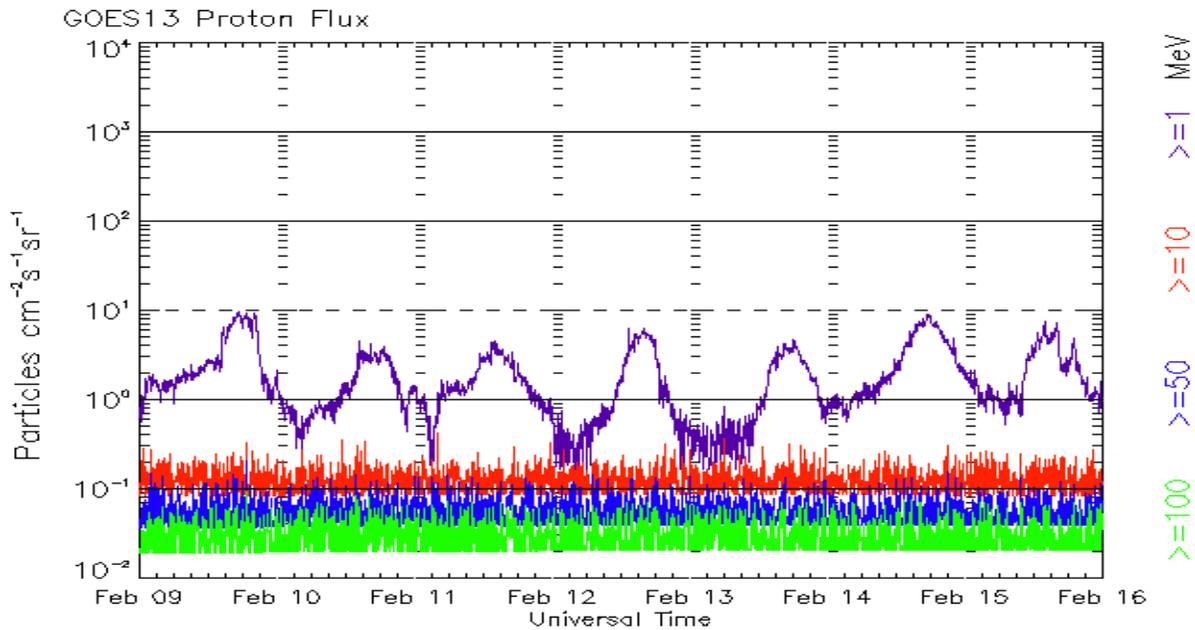
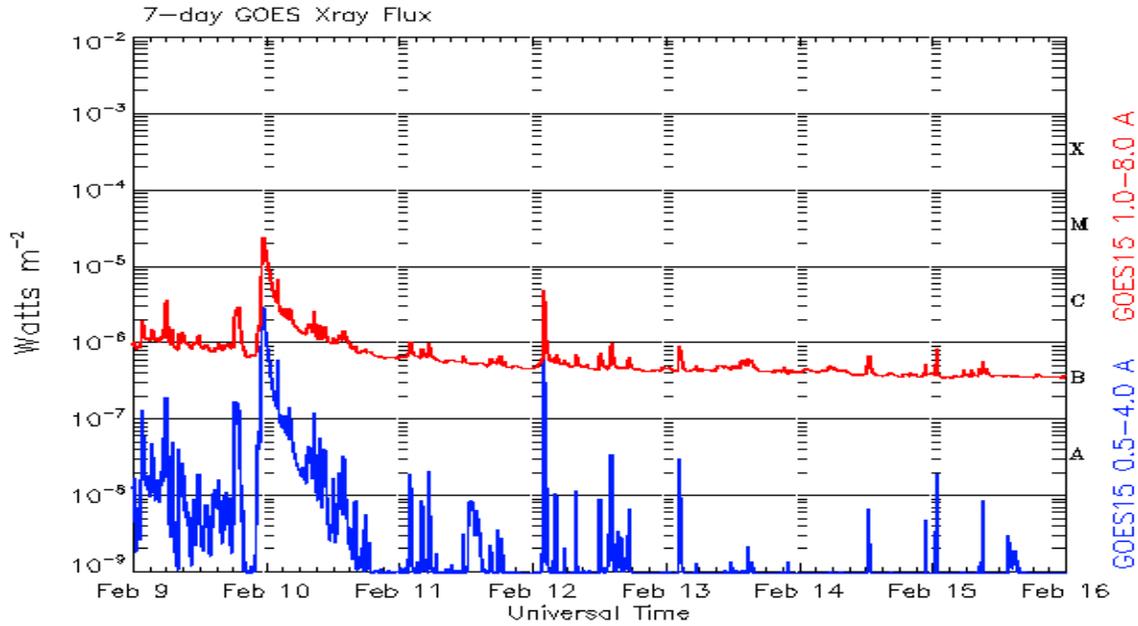
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 09 February 2015

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

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