

**Space Weather Highlights**  
**01 February - 07 February 2016**

**SWPC PRF 2110**  
**08 February 2016**

Solar activity was at low levels throughout the entire period. Several regions produced low level C-class events, the largest a C5/Sf at 04/1822 UTC from Region 2494 (S11, L=162, class/area Dki/270 on 07 Feb). A filament eruption observed beginning on 05/1939 UTC near S19W28 was associated with a CME that is anticipated to be a glancing blow midday on 09 Feb. Several other small filament eruptions occurred but none were expected to be geoeffective.

No proton events were observed at geosynchronous orbit.

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

Geomagnetic field activity began the week at quiet to unsettled levels. Active to minor storm conditions were observed early on 03 Feb due to a co-rotating interactive region (CIR) followed by the onset of a positive polarity coronal hole high speed stream (CH HSS). Quiet to unsettled conditions were observed during largely nominal solar wind conditions from 04-07 Feb, with the exception of an isolated active period on 07 Feb due to prolonged negative Bz.

**Space Weather Outlook**  
**08 February - 05 March 2016**

Solar activity is expected to be at low levels throughout 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 with high levels possible from 12-16 Feb and 19-23 Feb following subsequent CH HSS events.

Geomagnetic field activity is expected to be at unsettled to active levels with isolated minor storm periods on 08 Feb due to prolonged negative Bz and negative polarity CH HSS effects. Quiet to active conditions are likely to continue into 09 Feb as effects continue along with a possible glancing blow from the 05 Feb CME. Quiet to unsettled conditions are expected from 10-12 Feb as a recurrent positive polarity HSS moves into a geoeffective position. Mostly quiet conditions are expected from 13-16 Feb. Quiet to unsettled conditions are expected from 17-19 Feb with active periods possible on 18 Feb due to effects from a recurrent negative polarity HSS. Predominately quiet conditions are expected from 20-29 Feb. Quiet to unsettled conditions are expected with isolated active periods possible on 01-03 Mar as another positive polarity CH HSS becomes geoeffective. Quiet conditions are expected to close out the forecast 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
01 February	100	42	320	B2.4	1	0	0	0	0	0	0	0
02 February	102	52	300	B2.2	1	0	0	3	0	0	0	0
03 February	112	78	380	B3.8	5	0	0	4	0	0	0	0
04 February	123	95	500	B4.5	7	0	0	4	0	0	0	0
05 February	120	113	400	B3.9	5	0	0	1	0	0	0	0
06 February	117	71	390	B3.8	3	0	0	12	0	0	0	0
07 February	117	84	460	B3.8	3	0	0	7	1	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
	01 February	1.1e+05	1.2e+04	2.8e+03	2.9e+04	
02 February	1.2e+05	1.3e+04	3.0e+03	3.0e+04		
03 February	5.6e+04	1.4e+04	3.5e+03	2.7e+04		
04 February	9.7e+04	1.2e+04	2.8e+03	3.8e+04		
05 February	2.8e+05	1.2e+04	2.8e+03	4.7e+05		
06 February	3.9e+05	1.3e+04	2.8e+03	7.5e+06		
07 February	1.6e+05	1.2e+04	3.0e+03	3.4e+06		

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	01 February	6	2-3-3-2-0-1-1-0	8	2-3-4-3-0-0-0-0	9
02 February	4	0-0-1-0-2-1-1-3	5	0-0-0-1-3-3-1-1	6	0-1-2-1-1-2-2-3
03 February	10	4-4-2-1-1-1-1-1	11	4-4-2-3-1-1-1-1	14	4-5-2-1-1-1-1-1
04 February	5	0-1-2-1-3-2-1-1	10	0-0-2-3-5-2-1-1	6	0-1-2-2-3-2-2-1
05 February	8	2-3-2-2-2-2-2-1	18	1-4-2-5-4-3-2-2	12	3-3-3-2-2-2-3-2
06 February	5	1-2-2-1-1-2-1-2	11	2-1-1-5-3-1-1-1	8	2-3-2-2-1-2-2-3
07 February	6	2-0-1-1-2-3-2-2	13	1-0-0-4-3-5-2-1	6	2-1-1-2-2-4-2-2

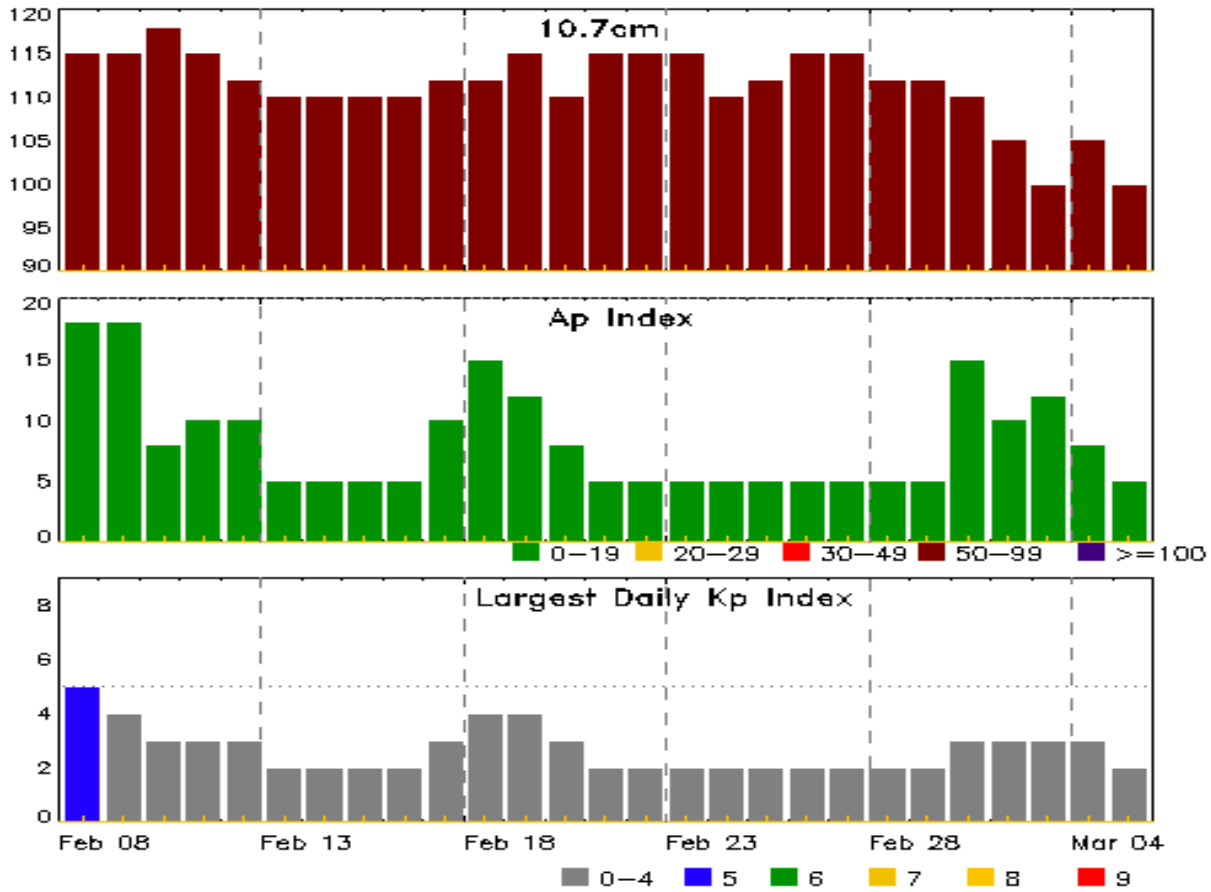


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
01 Feb 0002	ALERT: Geomagnetic K = 4	31/2359
01 Feb 0556	EXTENDED WARNING: Geomagnetic K = 4	31/2228 - 01/1500
03 Feb 0055	WARNING: Geomagnetic K = 4	03/0055 - 1300
03 Feb 0128	ALERT: Geomagnetic K = 4	03/0127
03 Feb 0525	WARNING: Geomagnetic K = 5	03/0525 - 1000
03 Feb 0536	ALERT: Geomagnetic K = 5	03/0535
07 Feb 1642	WARNING: Geomagnetic K = 4	07/1640 - 08/0900
07 Feb 1740	ALERT: Geomagnetic K = 4	07/1740



## 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
08 Feb	115	18	5	22 Feb	115	5	2
09	115	18	4	23	115	5	2
10	118	8	3	24	110	5	2
11	115	10	3	25	112	5	2
12	112	10	3	26	115	5	2
13	110	5	2	27	115	5	2
14	110	5	2	28	112	5	2
15	110	5	2	29	112	5	2
16	110	5	2	01 Mar	110	15	3
17	112	10	3	02	105	10	3
18	112	15	4	03	100	12	3
19	115	12	4	04	105	8	3
20	110	8	3	05	100	5	2
21	115	5	2				



## *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

**No Events Observed**

## *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location	Rgn #
	Begin	Max	End				
01 Feb	0109	0114	0117	C1.6			
01 Feb	0331	0336	0339	B9.4			
01 Feb	1515	1522	1529	B3.9			
01 Feb	1610	1613	1617	B3.6			
02 Feb	0452	0500	0514	B4.6			2492
02 Feb	0700	0701	0705		SF	N14E72	2492
02 Feb	0733	0739	0756		SF	N15E73	2492
02 Feb	1125	1130	1137	B3.6			
02 Feb	1422	1452	1553	C1.2			
02 Feb	1525	1526	1529		SF	N03E43	2491
03 Feb	0209	0235	0245	B7.8			2490
03 Feb	0439	0459	0524	B6.8			2490
03 Feb	1203	1223	1242	C1.0			2492
03 Feb	1447	1453	1502	C1.0			
03 Feb	1512	1524	1531	C1.8			
03 Feb	1629	1634	1639	C1.4	SF	S07W26	2493
03 Feb	1825	1833	1840	B7.5	SF	S06W26	2493
03 Feb	2139	2145	2151		SF	N12E54	2492
03 Feb	2205	2210	2217	C1.1	SF	S07W28	2493
04 Feb	0211	0215	0217	C1.0			2494
04 Feb	0709	0713	0716	C1.1			2490
04 Feb	0916	0920	0925	B8.9			2494
04 Feb	1216	1221	1225	C2.4			2494
04 Feb	B1341	U1357	A1501	C2.1	SF	S12E18	2494
04 Feb	1514	1525	1544		SF	S12E15	2494
04 Feb	1644	1649	1653	C3.6			2494
04 Feb	1815	1822	1828	C5.1	SF	S12E14	2494
04 Feb	1946	1955	1959	C1.1			2490
04 Feb	2239	2244	2248	B8.6	SF	S13E12	2494
05 Feb	0029	0033	0040	C1.4			
05 Feb	0049	0056	0103	C3.0			2494



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
05 Feb	0322	0326	0332	B8.4			2491
05 Feb	0715	0722	0730	C2.9	SF	S12E06	2494
05 Feb	0845	0850	0859	B9.3			2490
05 Feb	1305	1311	1317	C1.1			2496
05 Feb	1802	1807	1813	B7.7			2495
05 Feb	1900	2120	2349	C1.0			
06 Feb	0240	0311	0330	C1.1			2494
06 Feb	0356	0421	0439	B8.5	SF	S11W07	2494
06 Feb	1548	1551	1553	B6.6	SF	S13E12	2494
06 Feb	1743	1743	1747		SF	N15E69	2497
06 Feb	1826	1828	1831		SF	N15E69	2497
06 Feb	1906	1907	1912		SF	N11E66	2497
06 Feb	1933	1938	1942	C1.0	SF	S13W11	2494
06 Feb	2003	2005	2009		SF	N11E66	2497
06 Feb	2121	2121	2124		SF	N11E66	2497
06 Feb	2148	2151	2153	B7.8			2494
06 Feb	2156	2156	2158		SF	N11E66	2497
06 Feb	2209	2210	2218		SF	N11E49	2492
06 Feb	2226	2227	2232		SF	N11E49	2492
06 Feb	2237	2244	2248	C1.5	SF	S13W13	2494
07 Feb	0152	0158	0203	B8.2			2494
07 Feb	0439	0445	0449	C1.7			2496
07 Feb	0526	0531	0555		SF	S11W70	2495
07 Feb	0611	0633	0705		1F	S11W71	2495
07 Feb	0655	0658	0701	B7.0	SF	S11W66	2495
07 Feb	0735	0737	0738		SF	S10W68	2495
07 Feb	0918	0919	0922		SF	S10W69	2495
07 Feb	0924	0927	0929		SF	S10W69	2495
07 Feb	1029	1035	1041	C1.1	SF	N09E43	2496
07 Feb	1154	1202	1212	C2.7	SF	N15E38	2496



## Region Summary

Date	Location		Sunspot Characteristics				Flares										
	Lat CMD	Lon	Helio 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 2489</b>																	
25 Jan	N09E54	251	60	3	Dso	6	B	2			5						
26 Jan	N10E39	253	100	9	Dao	8	B				1						
27 Jan	N10E27	252	250	9	Dki	15	B	1			6						
28 Jan	N09E14	252	300	10	Dko	15	B										
29 Jan	N10W01	253	300	11	Eko	6	B										
30 Jan	N10W14	253	260	10	Dho	6	B										
31 Jan	N10W29	255	240	4	Cso	4	B										
01 Feb	N10W43	256	250	6	Cho	3	B										
02 Feb	N10W58	258	220	4	Hax	1	A										
03 Feb	N09W72	259	200	4	Hax	2	A										
04 Feb	N09W84	257	100	3	Hsx	1	A										
								3	0	0	12	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 253

<b>Region 2490</b>																	
25 Jan	S18E75	230	10	5	Bxo	1	B				2						
26 Jan	S18E57	235	20	5	Cro	2	B				1						
27 Jan	S17E41	238	20	10	Dro	4	B				2						
28 Jan	S18E29	237	20	8	Cro	4	B										
29 Jan	S18E13	239	10	2	Bxo	5	B										
30 Jan	S18W01	240	plage														
31 Jan	S20W16	242	10	3	Bxo	3	B										
01 Feb	S21W29	242	10	3	Bxo	5	B										
02 Feb	S20W42	242	20	5	Cro	5	B										
03 Feb	S21W56	243	60	7	Dao	10	B										
04 Feb	S21W70	243	130	9	Dao	9	B	2									
05 Feb	S20W81	240	80	9	Cao	5	B										
06 Feb	S20W95	242	plage														
								2	0	0	5	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 240



### *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	4		
<b>Region 2491</b>																		
31 Jan	N02E70	156	10	6	Bxo	2	B											
01 Feb	N01E57	156	60	9	Dao	4	B											
02 Feb	N02E44	156	50	8	Dao	3	B					1						
03 Feb	N03E30	157	30	8	Dro	6	B											
04 Feb	N02E16	157	20	8	Cro	6	B											
05 Feb	N02E03	156	10	2	Axx	2	A											
06 Feb	N01W10	157	plage															
07 Feb	N01W25	159	plage															
										0	0	0	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 156

<b>Region 2492</b>																		
02 Feb	N15E60	140	10	7	Dao	3	B					2						
03 Feb	N15E49	138	60	8	Dsi	5	B	1				1						
04 Feb	N14E36	137	50	9	Dai	7	B											
05 Feb	N14E23	136	50	7	Dso	8	B											
06 Feb	N13E10	136	40	6	Dri	8	B					2						
07 Feb	N15W04	137	30	6	Dro	7	B											
										1	0	0	5	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 137

<b>Region 2493</b>																		
03 Feb	S06W31	218	30	6	Dao	5	B	2				3						
04 Feb	S07W46	219	50	6	Dao	5	B											
05 Feb	S05W58	217	10	7	Dro	5	B											
06 Feb	S06W73	220	plage															
07 Feb	S06W88	222	plage															
										2	0	0	3	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 218





**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	4	
<b>Region 2494</b>																	
04 Feb	S12E09	164	150	7	Dai	7	BGD	5			4						
05 Feb	S12W04	163	230	7	Dai	16	BG	2			1						
06 Feb	S11W17	163	270	8	Dai	9	B	3			4						
07 Feb	S12W29	162	270	8	Dki	9	BD										
								10	0	0	9	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 163

<b>Region 2495</b>																	
05 Feb	S07W46	205	10	4	Bxo	6	B										
06 Feb	S08W61	208	30	3	Cro	4	B										
07 Feb	S08W74	207	70	4	Dao	5	B				5	1					
								0	0	0	5	1	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 205

<b>Region 2496</b>																	
05 Feb	N09E56	103	10		Axx	1	A	1									
06 Feb	N09E43	104	plage														
07 Feb	N08E34	98	20	5	Bxi	4	B	3			2						
								4	0	0	2	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 98

<b>Region 2497</b>																	
06 Feb	N13E58	88	50	3	Dai	10	B				6						
07 Feb	N13E49	84	70	7	Dai	9	B										
								0	0	0	6	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 84

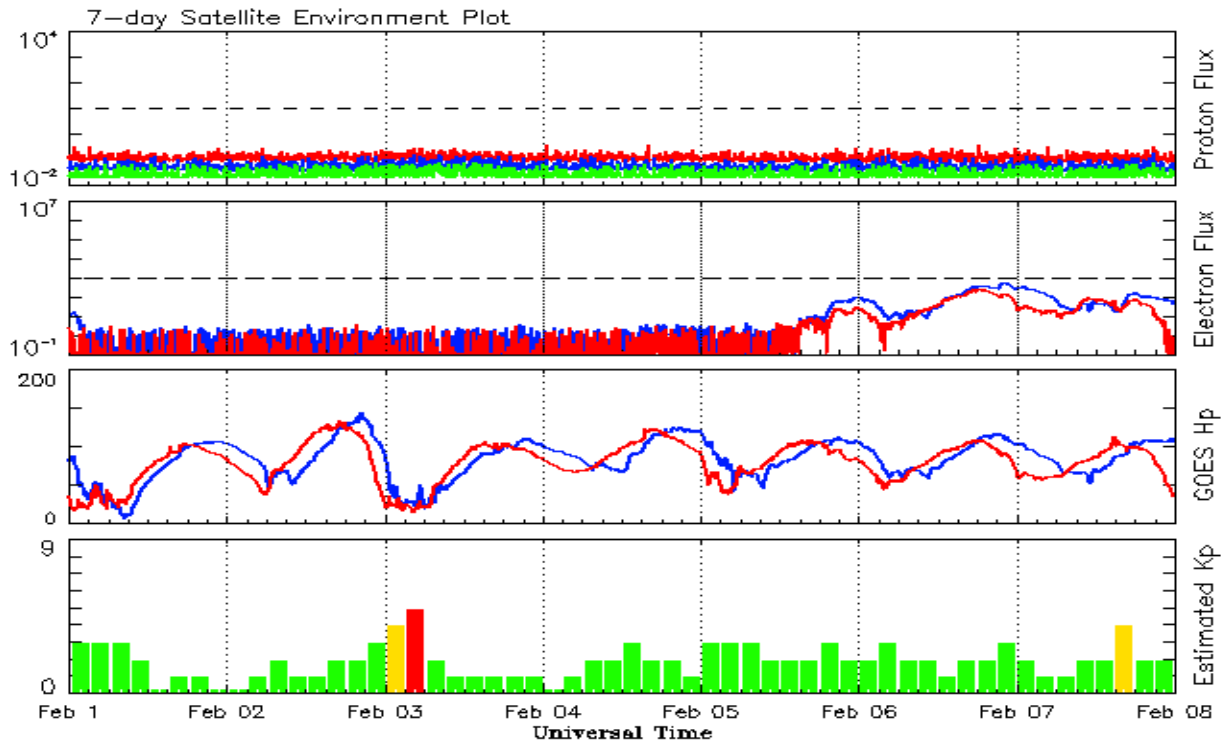


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2014</b>										
February	174.6	102.3	0.59	119.5	119.5	78.3	170.3	138.6	12	6.9
March	141.1	91.9	0.65	123.2	123.2	80.8	149.9	140.8	6	7.2
April	130.5	67.5	0.65	124.8	124.8	69.8	144.3	143.5	9	7.5
May	116.8	67.5	0.64	122.3	122.3	69.0	130.0	144.7	7	7.9
June	107.7	61.7	0.66	121.4	121.4	68.5	122.2	145.5	7	8.4
July	113.6	60.1	0.64	120.4	120.4	67.6	137.3	145.2	5	8.8
August	106.2	64.1	0.70	115.1	115.1	65.0	124.7	142.8	9	8.9
September	127.4	78.0	0.69	107.4	107.4	61.1	146.1	140.1	11	9.3
October	92.0	54.0	0.66	101.7	101.7	58.4	153.7	138.4	10	9.9
November	101.8	62.2	0.69	97.9	97.9	56.8	155.3	137.4	10	10.1
December	120.0	67.7	0.65	95.2	95.2	55.3	158.7	137.0	12	10.5
<b>2015</b>										
January	101.2	55.8	0.66	92.1	92.1	53.6	141.7	135.8	10	11.0
February	70.6	40.0	0.63	88.3	88.3	51.7	128.8	133.8	10	11.5
March	61.7	32.7	0.62	84.2	84.2	49.3	126.0	131.2	17	12.0
April	72.5	45.2	0.75	80.5	80.5	47.3	129.2	127.3	12	12.4
May	83.0	53.3	0.71	77.5	77.5	45.6	120.1	123.3	9	12.7
June	77.3	39.9	0.53	73.1	73.1	43.2	123.2	119.5	14	13.0
July	68.4	39.5	0.58	68.2	68.2	40.9	107.0	116.0	10	13.1
August	61.6	38.6	0.63				106.2		16	
September	72.5	47.2	0.65				102.1		16	
October	59.5	37.0	0.62				104.1		15	
November	61.8	37.9	0.61				109.6		13	
December	54.1	34.6	0.64				112.8		15	
<b>2016</b>										
January	50.4	34.0	0.67				103.5		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 01 February 2016*

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.

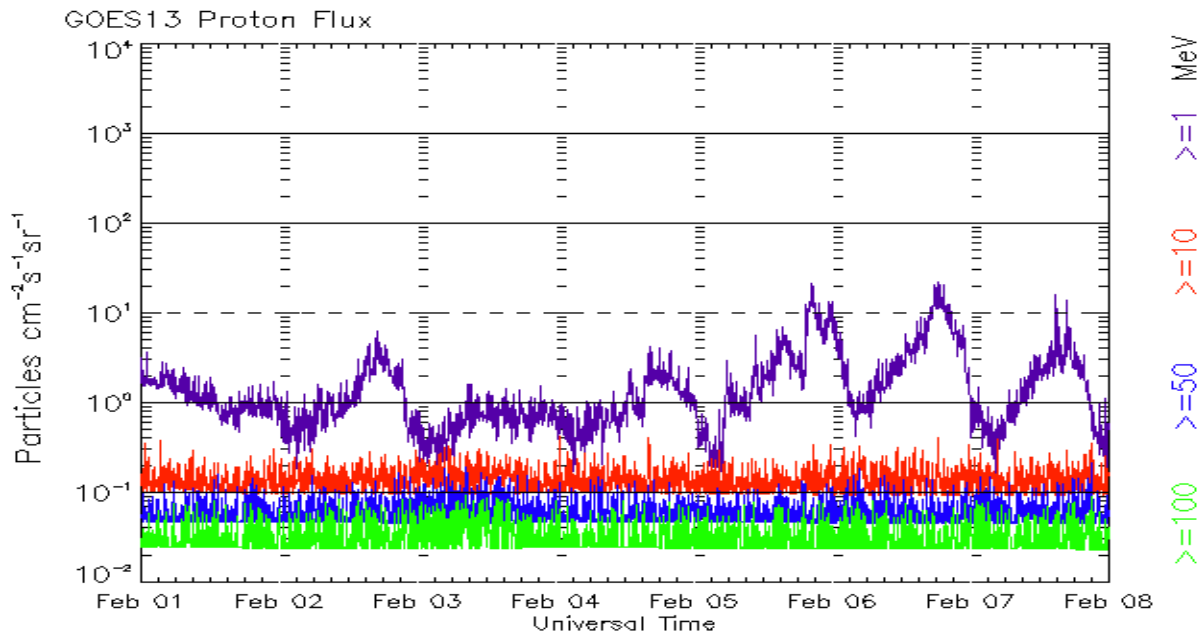
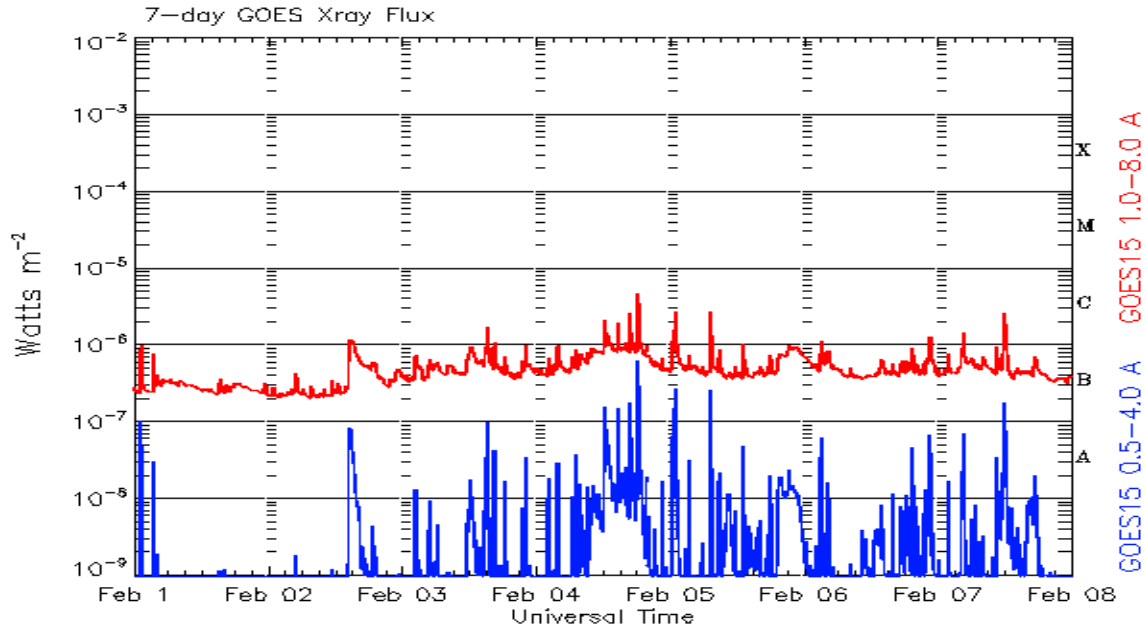
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 01 February 2016*

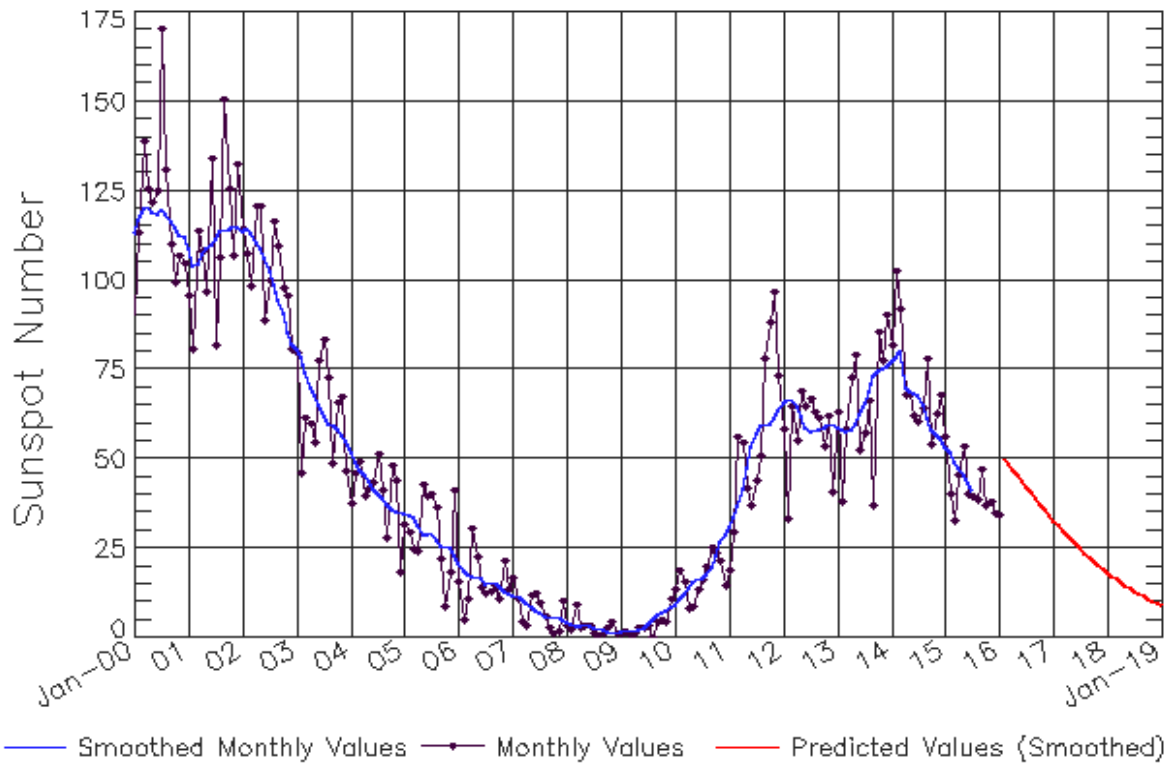
The x-ray plots contains five-minute averages x-ray flux ( $Watt/m^2$ ) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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.



# ISES Solar Cycle Sunspot Number Progression

Observed data through Jan 2016



Updated 2016 Feb 8

NOAA/SWPC Boulder, CO USA

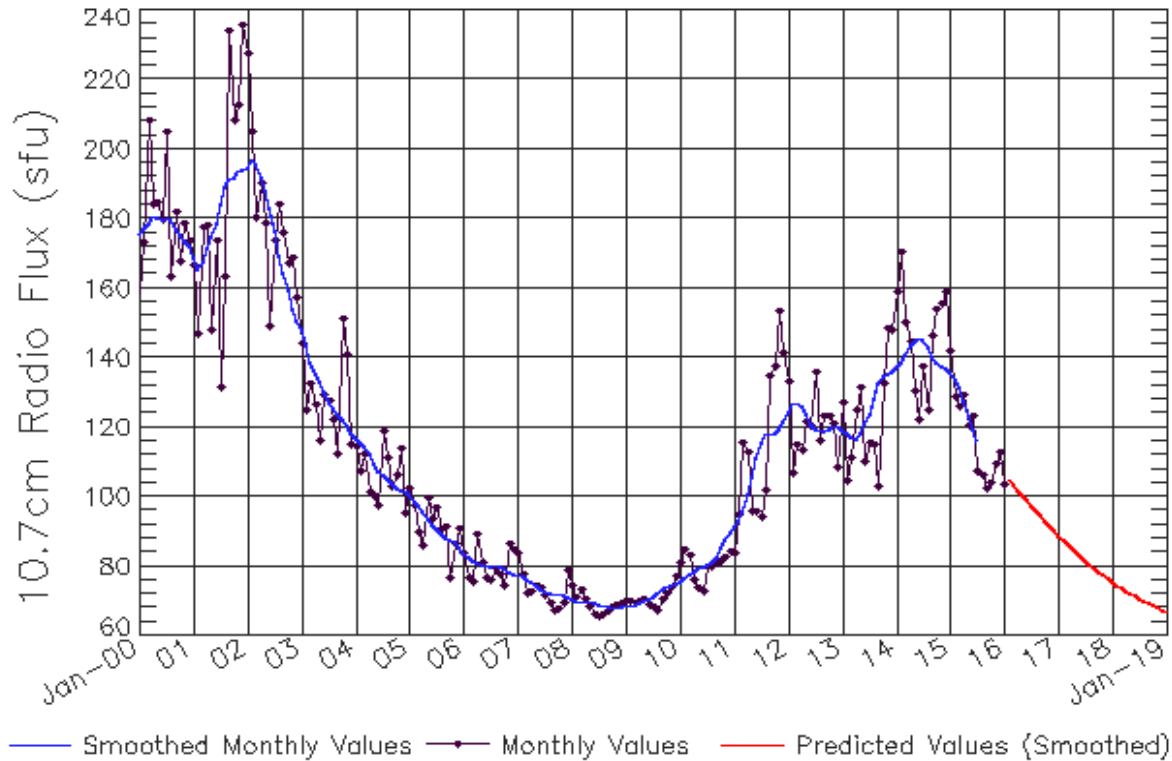
## Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	9	10	11	13	15	16	17	17	20	23	27	29
	(1)	(2)	(3)	(5)	(5)	(6)	(7)	(7)	(8)	(9)	(9)	(10)
2011	19	30	56	54	42	37	44	51	78	88	97	73
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2012	58	33	64	55	69	65	67	63	61	53	62	41
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2013	63	38	58	72	79	53	57	66	37	86	78	90
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2014	82	102	92	68	68	62	60	64	78	54	62	68
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2015	56	40	33	45	53	40	40	39	47	37	38	35
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2016	34	50	49	47	45	44	42	40	39	37	36	34
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2017	33	31	30	29	27	26	25	24	23	21	20	19
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2018	18	17	16	15	15	14	13	12	12	11	10	10
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2019	9	8	8	7	7	6	6	6	5	5	4	4
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Jan 2016



Updated 2016 Feb 8

NOAA/SWPC Boulder, CO USA

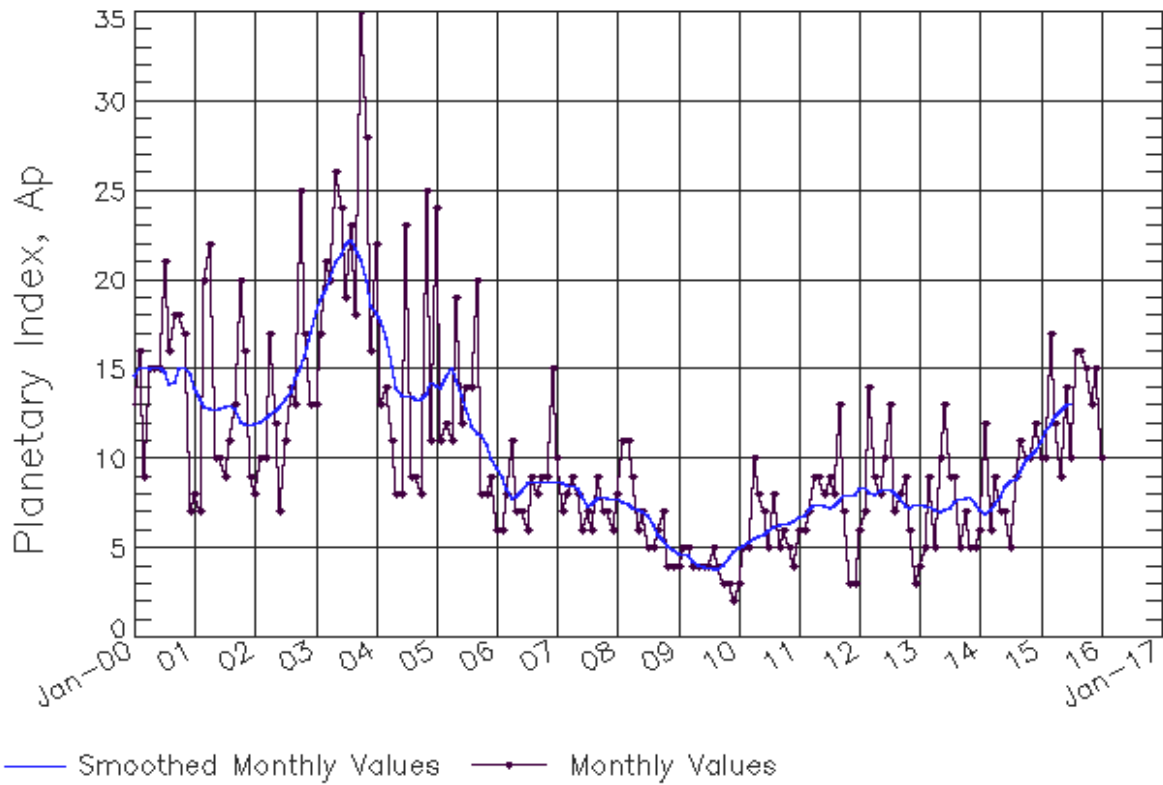
## Smoothed F10.7cm Radio Flux Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	76 (***)	77 (***)	78 (***)	78 (***)	79 (***)	80 (***)	80 (***)	81 (***)	82 (***)	85 (***)	88 (***)	90 (***)
2011	91 (***)	93 (***)	96 (***)	100 (***)	106 (***)	111 (***)	115 (***)	118 (***)	118 (***)	118 (***)	120 (***)	122 (***)
2012	124 (***)	127 (***)	127 (***)	126 (***)	124 (***)	121 (***)	120 (***)	119 (***)	119 (***)	119 (***)	120 (***)	120 (***)
2013	119 (***)	118 (***)	117 (***)	117 (***)	118 (***)	121 (***)	124 (***)	128 (***)	132 (***)	135 (***)	135 (***)	136 (***)
2014	137 (***)	139 (***)	141 (***)	144 (***)	145 (***)	146 (***)	145 (***)	143 (***)	140 (***)	138 (***)	137 (***)	137 (***)
2015	136 (***)	134 (***)	131 (***)	127 (***)	123 (***)	120 (***)	116 (***)	113 (1)	111 (1)	109 (2)	107 (3)	106 (4)
2016	104 (4)	103 (5)	103 (6)	102 (7)	101 (8)	99 (8)	97 (9)	96 (9)	94 (9)	93 (9)	92 (9)	90 (9)
2017	89 (9)	88 (9)	86 (9)	85 (9)	84 (9)	83 (9)	82 (9)	80 (9)	79 (9)	78 (9)	77 (9)	76 (9)
2018	75 (9)	75 (9)	74 (9)	73 (9)	72 (9)	71 (9)	71 (9)	70 (9)	69 (9)	69 (9)	68 (9)	67 (9)
2019	67 (9)	66 (9)	66 (9)	65 (9)	65 (9)	65 (9)	64 (9)	64 (9)	63 (9)	63 (9)	63 (9)	63 (9)



# ISES Solar Cycle Ap Progression

Observed data through Jan 2016



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NOAA/SWPC Boulder, CO USA

*Solar Cycle Comparison charts are temporarily unavailable.*



## ***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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