

Solar activity was at very low levels during the summary period. The visible disk was populated by three simple, bi-polar spot groups. The most active of these groups, Region 1152 (S18, L=155, class/area Cro/030 on 04 February), produced the largest event of the period, a B9.5 X-ray event at 04/1220 UTC. Region 1153 (N15, L=171, class/area Dro/050 on 08 February) appeared on 04 February and remained stable until the 7th, when it began growing and producing several low-level B-class X-ray events which will be discussed further in the highlights next week.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels on 31 January - 04 February. Flux increased on 05 February, reaching high levels on the 6th and remaining there through the summary period.

The geomagnetic field ranged from quiet to major storm levels during the period. The field was mostly at quiet to unsettled levels until mid-day on 01 February when the onset of a recurrent coronal hole high speed stream (CH HSS) brought a period of active to minor storm conditions. These levels lasted through mid-day on 02 February, after which the field returned to quiet levels. A sudden impulse was observed at 04/0236 UTC (8 nT detected at the Boulder magnetometer) from a shock behind a slow moving CME. Late on the 4th, Bz was southward between -15 to -20 nT and geomagnetic activity had increased to active to major storm levels. Solar wind speeds approached 500 km/s after the initial shock and peaked near 675 km/s early on the 5th. The CME originated on 30 January and was embedded in a recurrent CH HSS, which arrived mid-day on 05 February. As a result, active to minor storm levels persisted through 06 February. The following day saw a return to quiet geomagnetic conditions.

### **Space Weather Outlook** **09 February - 07 March 2011**

Solar activity is expected to be at very low levels with a chance for a C-class X-ray event through the period. The return of old Region 1149 (N17, L= 349) on 10 February will add a slight chance for M-class events through 23 February.

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, returning to low levels by 11 February.

Geomagnetic activity is expected to be mostly quiet early, with occasional unsettled periods through 10 February in response to a weak CH HSS. Conditions are expected to be quiet from 11-28 February. A second CH HSS is expected to be geoeffective 01-04 March, bringing unsettled to occasionally active geomagnetic field conditions.



### *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	
31 January	81	21	70	A5.8	0	0	0	0	0	0	0	0	0
01 February	80	22	80	A4.9	0	0	0	0	0	0	0	0	0
02 February	79	22	80	A4.3	0	0	0	0	0	0	0	0	0
03 February	80	32	20	A3.9	0	0	0	1	0	0	0	0	0
04 February	82	45	90	A4.6	0	0	0	1	0	0	0	0	0
05 February	81	26	25	A4.4	0	0	0	5	0	0	0	0	0
06 February	80	41	30	A4.4	0	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
	31 January	9.2e+05	1.4e+04	3.5e+03		1.3e+06
01 February	6.3e+05	1.4e+04	3.2e+03		8.9e+05	
02 February	1.7e+05	1.3e+04	3.2e+03		8.8e+05	
03 February	1.1e+05	1.4e+04	3.5e+03		1.1e+06	
04 February	1.0e+06	1.4e+04	3.4e+03		1.3e+06	
05 February	2.8e+05	1.4e+04	3.3e+03		8.0e+06	
06 February	9.4e+05	1.4e+04	3.5e+03		2.8e+08	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	31 January	4	0-1-0-0-0-2-3-2	1	0-0-0-0-0-1-1-1	5
01 February	7	2-2-2-1-2-3-2-1	12	2-0-4-1-1-5-2-1	8	2-1-2-1-1-4-3-1
02 February	5	3-1-1-1-2-1-1-0	9	1-1-2-4-4-2-0-0	5	3-1-1-1-2-1-1-0
03 February	0	0-0-1-0-0-0-0-0	0	0-0-1-0-0-0-0-0	1	0-0-1-0-0-0-0-1
04 February	12	1-3-2-1-1-2-4-4	13	1-2-2-0-1-2-4-5	21	1-3-2-1-1-2-6-5
05 February	11	4-3-3-1-1-1-3-1	19	4-3-3-5-3-3-3-2	13	4-3-3-2-1-2-3-2
06 February	8	2-3-2-2-2-3-1-1	25	2-3-4-6-5-3-2-1	11	2-3-3-3-3-2-2-2

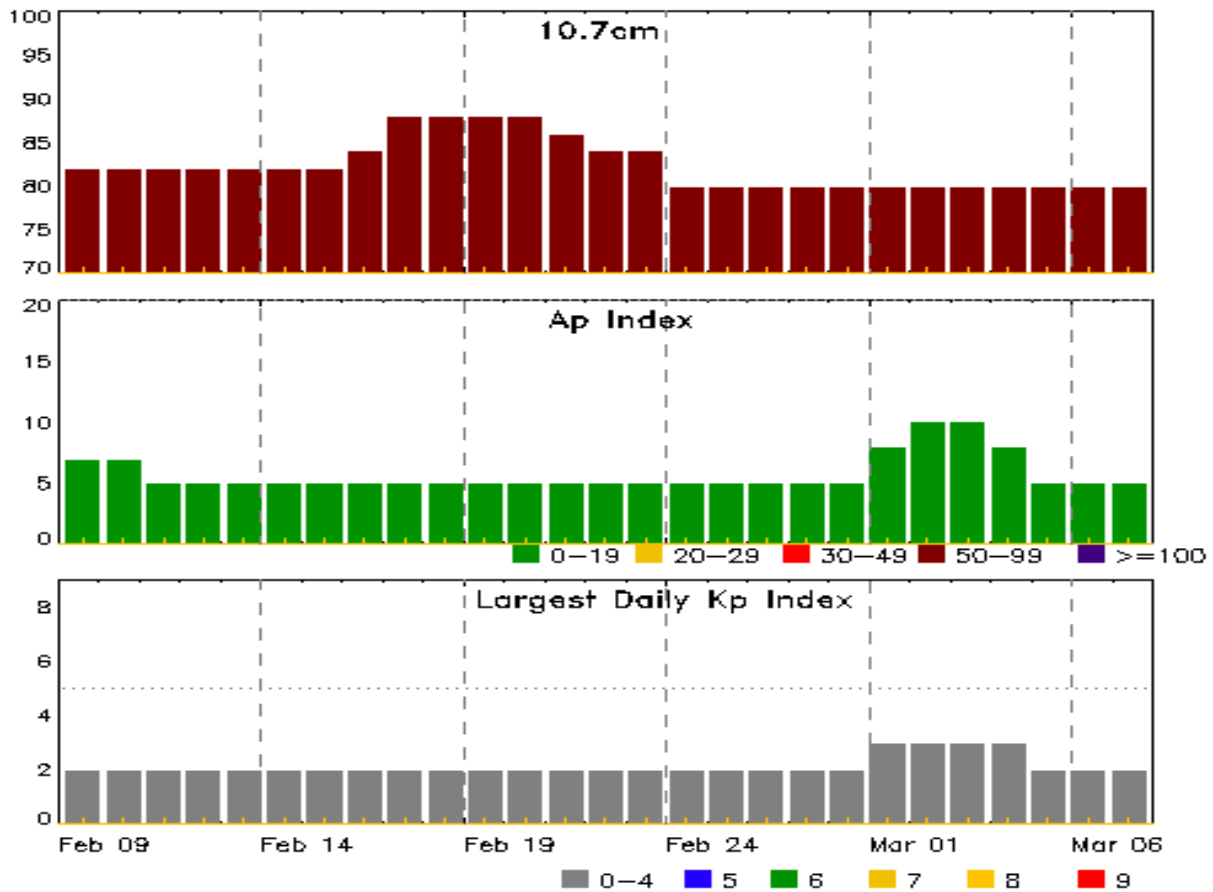


### *Alerts and Warnings Issued*

<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 1412	WARNING: Geomagnetic K = 4	01/1530 - 2100
01 Feb 1632	ALERT: Geomagnetic K = 4	01/1631
04 Feb 0223	WARNING: Geomagnetic K = 4	04/0300 - 0900
04 Feb 0548	SUMMARY: Geomagnetic Sudden Impulse	04/0236
04 Feb 1823	WARNING: Geomagnetic K = 4	04/1930 - 05/0600
04 Feb 1916	WARNING: Geomagnetic K = 5	04/1930 - 05/0030
04 Feb 2054	ALERT: Geomagnetic K = 4	04/2053
04 Feb 2334	ALERT: Geomagnetic K = 5	04/2333
05 Feb 0020	EXTENDED WARNING: Geomagnetic K = 5	04/1930 - 0330
05 Feb 0541	EXTENDED WARNING: Geomagnetic K = 4	04/1930 - 05/1500
05 Feb 1456	EXTENDED WARNING: Geomagnetic K = 4	04/1930 - 05/2359
06 Feb 0655	WARNING: Geomagnetic K = 4	06/0654 - 1600
06 Feb 0701	ALERT: Geomagnetic K = 4	06/0701
06 Feb 0952	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	06/0935



## 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
09 Feb	82	7	2	23 Feb	84	5	2
10	82	7	2	24	80	5	2
11	82	5	2	25	80	5	2
12	82	5	2	26	80	5	2
13	82	5	2	27	80	5	2
14	82	5	2	28	80	5	2
15	82	5	2	01 Mar	80	8	3
16	84	5	2	02	80	10	3
17	88	5	2	03	80	10	3
18	88	5	2	04	80	8	3
19	88	5	2	05	80	5	2
20	88	5	2	06	80	5	2
21	86	5	2	07	80	5	2
22	84	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

**No Events Observed**

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
31 Jan	0210	0214	0221	B1.0			1150
31 Jan	0612	0619	0626	B1.3			1150
31 Jan	1351	1406	1422	B1.7			
31 Jan	1901	1905	1908	B1.0			1150
31 Jan	1957	2001	2004	B1.5			1150
01 Feb	0009	0013	0017	B3.0			1150
01 Feb	0548	0554	0604	B1.8			1150
01 Feb	1227	1231	1233	B1.4			1150
01 Feb	2306	2342	2358	B4.5			1150
02 Feb	0027	0035	0045	B4.1			1150
02 Feb	0244	0248	0315	B1.1			1150
02 Feb	0614	0620	0628	B4.1			1150
02 Feb	1020	1029	1036	B2.0			1150
03 Feb	0551	0556	0602	B2.6			1150
03 Feb	1254	1255	1257		SF	S20W09	1150
03 Feb	1728	1735	1741	B2.0			1152
04 Feb	0137	0143	0157	B2.0			1152
04 Feb	0359	0410	0415	B1.1			1152
04 Feb	0729	0740	0749	B2.7			1152
04 Feb	1213	1220	1226	B9.5			1152
04 Feb	1730	1736	1740	B1.3			1152
04 Feb	1930	1939	1948	B6.9	SF	S17W01	1152
05 Feb	0003	0007	0011	B3.6			1152
05 Feb	1045	1047	1049		SF	S19W09	1152
05 Feb	1112	1113	1116		SF	S19W09	1152
05 Feb	1132	1139	1141		SF	S18W10	1152
05 Feb	1153	1153	1156		SF	N15W25	1153
05 Feb	1201	1201	1203		SF	N15W26	1153



## 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

### Region 1150

28 Jan	S22E62	184	10	3	Bxo	5	B					2					
29 Jan	S22E50	182	20	6	Bxo	6	B					1					
30 Jan	S21E37	182	50	8	Dao	12	B										
31 Jan	S20E24	183	70	7	Dao	11	B										
01 Feb	S22E11	183	80	8	Dsi	12	B										
02 Feb	S20W02	182	80	10	Dso	12	B										
03 Feb	S22W13	178	10	11	Bxo	6	B					1					
04 Feb	S20W30	187	30	3	Cro	5	B										
05 Feb	S20W46	187															
06 Feb	S22W51	178		1	Axx	1	A										
										0	0	0	4	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 182

### Region 1151

28 Jan	N09W60	306	20	2	Cro	2	B										
29 Jan	N11W71	303	5	1	Axx	1	A										
30 Jan	N11W84	303															
										0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 306

### Region 1152

03 Feb	S18E11	157	10	5	Bxo	6	B										
04 Feb	S18W01	155	30	5	Cro	6	B					1					
05 Feb	S18W14	154	15	4	Bxo	3	B					3					
06 Feb	S20W26	154	15	2	Bxo	5	B										
										0	0	0	4	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 155

### Region 1153

04 Feb	N15W18	172	30	5	Cro	4	B										
05 Feb	N15W31	172	10	4	Bxo	3	B					2					
06 Feb	N16W42	168	15	8	Bxo	5	B										
										0	0	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 172

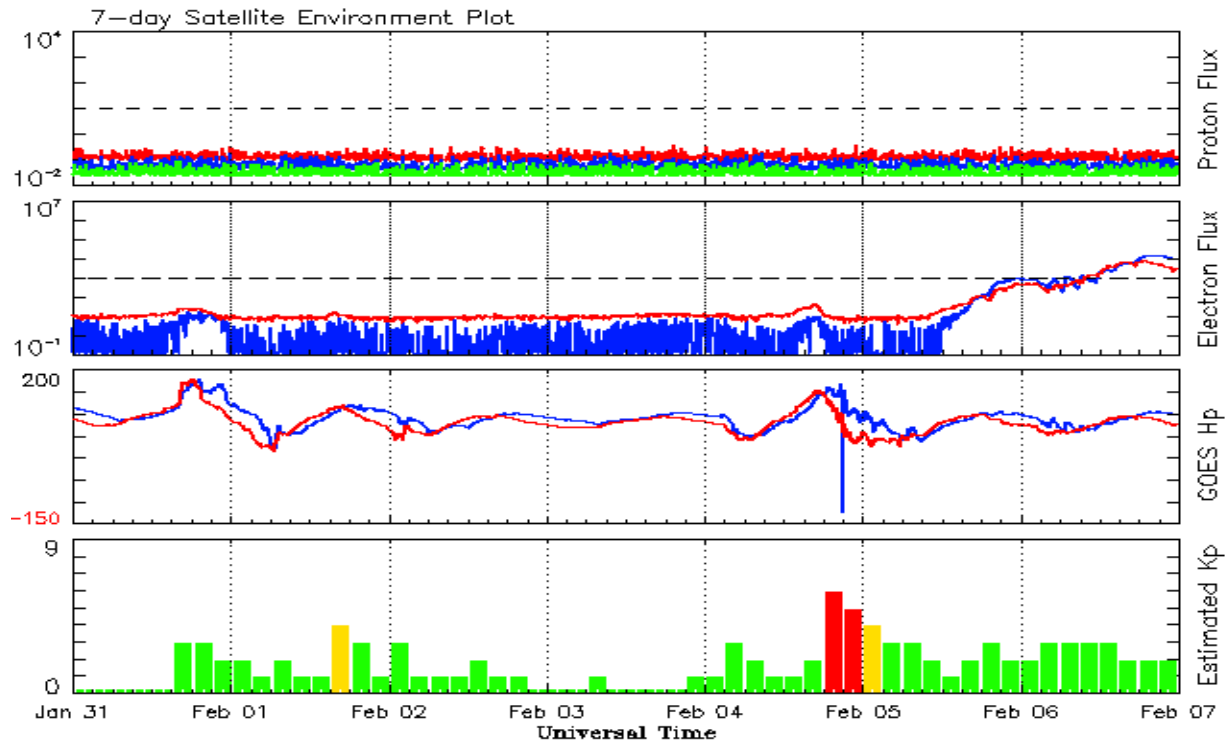


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>									
February	2.5	1.4	0.56	3.1	1.9	70.0	68.8	5	4.7
March	0.7	0.7	1.00	3.4	2.0	69.2	69.0	5	4.6
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	16.8	79.9	80.1	5	6.0
August	28.2	19.6	0.70			79.7		8	
September	35.6	25.2	0.71			81.1		5	
October	35.0	23.5	0.67			81.6		6	
November	36.1	21.6	0.60			82.5		5	
December	22.0	14.5	0.66			84.3		4	
<b>2011</b>									
January	32.1	19.0	0.59			83.7		4	

**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 31 January 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.

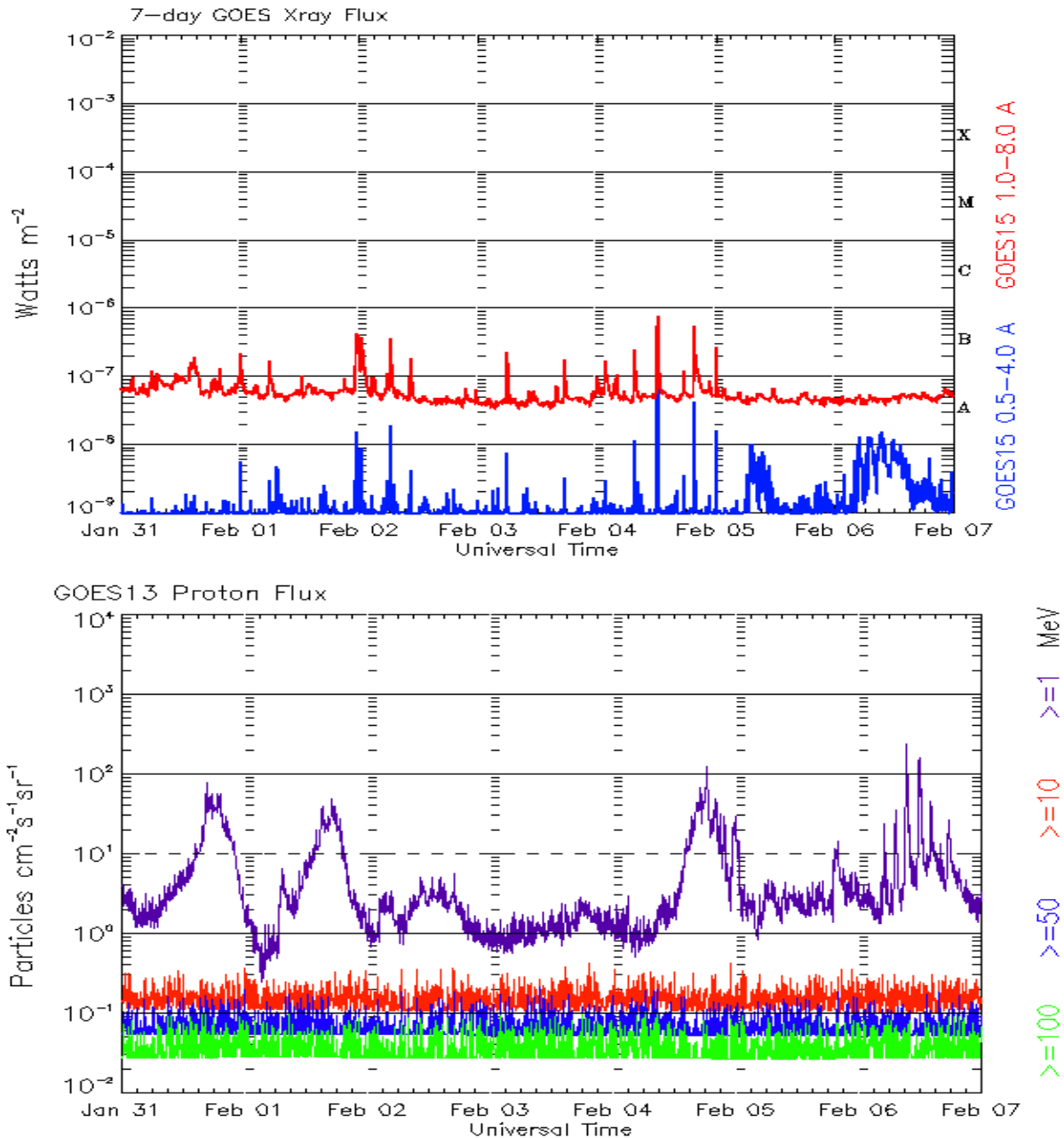
The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

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 31 January 2011*

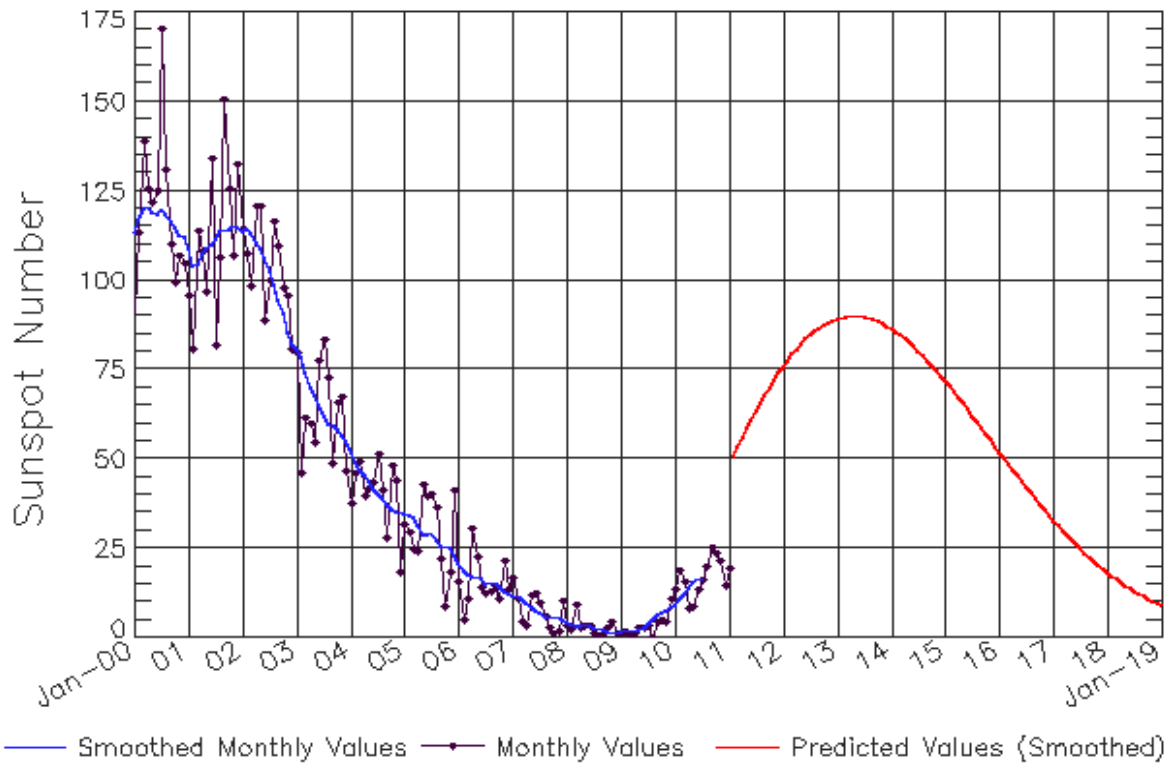
The x-ray plots contains five-minute averages x-ray flux (Watt/m<sup>2</sup>) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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.



# ISES Solar Cycle Sunspot Number Progression

Observed data through Jan 2011



Updated 2011 Feb 8

NOAA/SWPC Boulder, CO USA

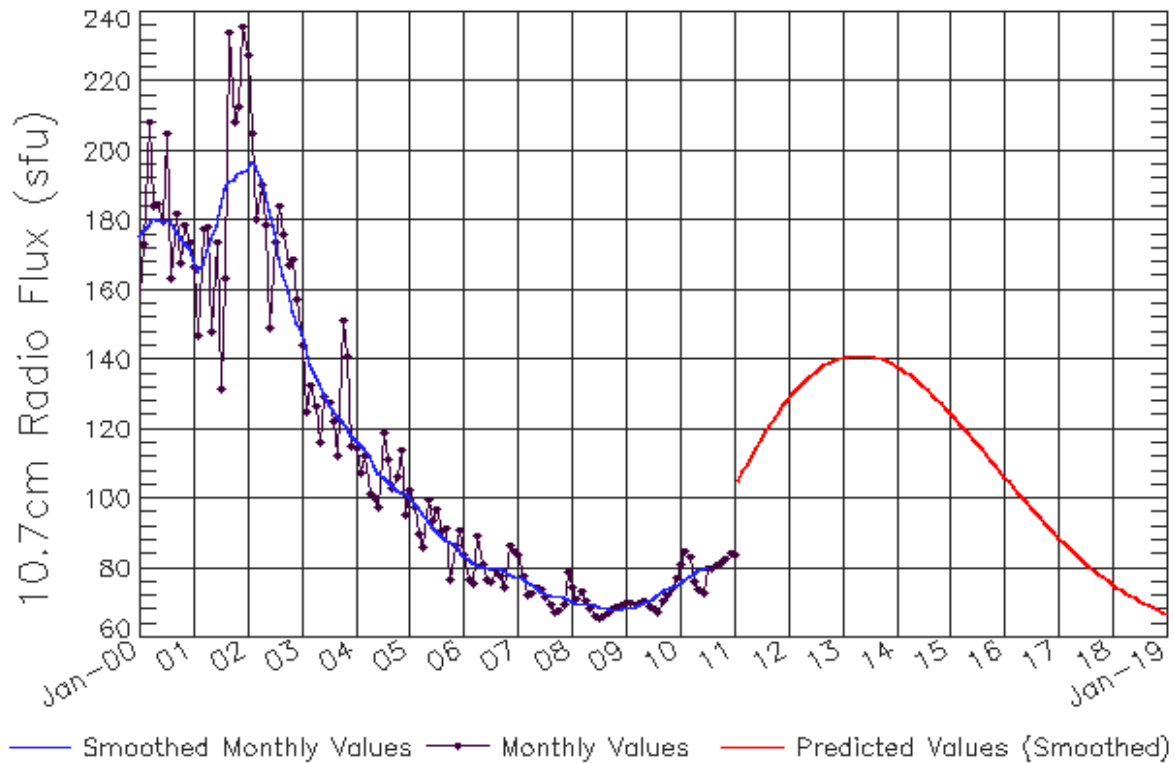
## Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	9 (***)	11 (***)	12 (***)	14 (***)	16 (***)	16 (***)	17 (***)	18 (1)	21 (2)	25 (3)	29 (5)	33 (5)
2011	37 (6)	41 (7)	45 (7)	48 (8)	52 (9)	57 (9)	62 (10)	66 (10)	68 (10)	70 (10)	72 (10)	74 (10)
2012	76 (10)	78 (10)	79 (10)	81 (10)	82 (10)	84 (10)	85 (10)	86 (10)	87 (10)	88 (10)	88 (10)	89 (10)
2013	89 (10)	90 (10)	90 (10)	90 (10)	90 (10)	90 (10)	90 (10)	89 (10)	89 (10)	89 (10)	88 (10)	87 (10)
2014	86 (10)	86 (10)	85 (10)	84 (10)	83 (10)	81 (10)	80 (10)	79 (10)	78 (10)	76 (10)	75 (10)	73 (10)
2015	72 (10)	70 (10)	69 (10)	67 (10)	65 (10)	64 (10)	62 (10)	60 (10)	59 (10)	57 (10)	55 (10)	54 (10)
2016	52 (10)	50 (10)	49 (10)	47 (10)	45 (10)	44 (10)	42 (10)	40 (10)	39 (10)	37 (10)	36 (10)	34 (10)
2017	33 (10)	31 (10)	30 (10)	29 (10)	27 (10)	26 (10)	25 (10)	24 (10)	23 (10)	21 (10)	20 (10)	19 (10)
2018	18 (10)	17 (10)	16 (10)	15 (10)	15 (10)	14 (10)	13 (10)	12 (10)	12 (10)	11 (10)	10 (10)	10 (10)
2019	9 (10)	8 (10)	8 (10)	7 (10)	7 (10)	6 (10)	6 (10)	6 (10)	5 (10)	5 (10)	4 (10)	4 (10)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Jan 2011



Updated 2011 Feb 8

NOAA/SWPC Boulder, CO USA

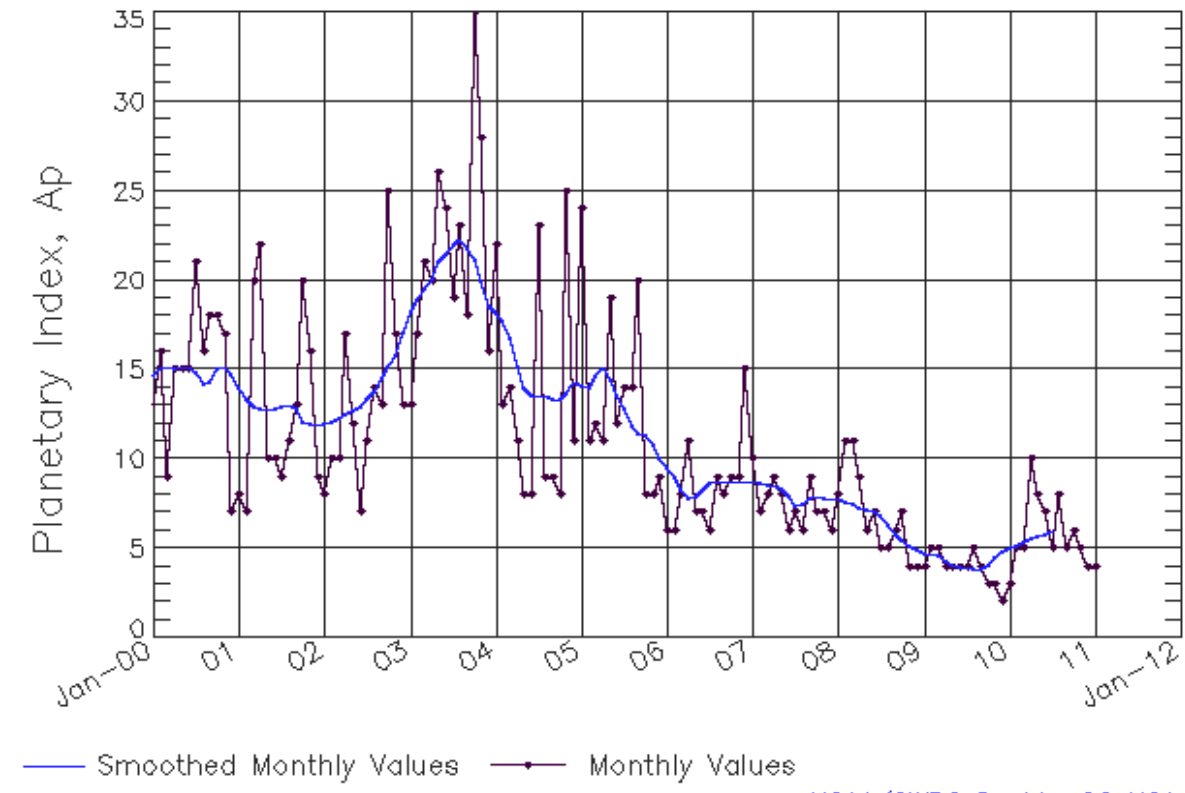
## Smoothed F10.7cm Radio Flux Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	76 (***)	77 (***)	78 (***)	78 (***)	79 (***)	80 (***)	80 (***)	81 (1)	83 (1)	85 (2)	89 (3)	92 (4)
2011	95 (4)	98 (5)	102 (6)	105 (7)	109 (8)	112 (8)	116 (9)	119 (9)	121 (9)	123 (9)	125 (9)	127 (9)
2012	128 (9)	130 (9)	132 (9)	133 (9)	134 (9)	135 (9)	136 (9)	137 (9)	138 (9)	139 (9)	140 (9)	140 (9)
2013	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	140 (9)	140 (9)	139 (9)	139 (9)
2014	138 (9)	137 (9)	136 (9)	136 (9)	135 (9)	134 (9)	132 (9)	131 (9)	130 (9)	129 (9)	127 (9)	126 (9)
2015	125 (9)	123 (9)	122 (9)	120 (9)	119 (9)	117 (9)	116 (9)	114 (9)	113 (9)	111 (9)	110 (9)	108 (9)
2016	106 (9)	105 (9)	103 (9)	102 (9)	100 (9)	99 (9)	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 2011



Updated 2011 Feb 8

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

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

