Space Weather Highlights
26 February - 04 March 2018

SWPC PRF 2218
05 March 2018

Solar activity reached low levels on 02 Mar due to an isolated C1 flare from Region 2700 (N06, L=328, class/area=Cro/30 on 26 Feb), which was the only active region with sunspots this period. Solar activity was very low throughout the remainder of the period and no Earth-directed CMEs were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 26-27 Feb and 03 Mar and moderate levels were observed on 28 Feb and 01-02 Mar. Normal levels were observed on 04 Mar.

Geomagnetic field activity reached active and G1 (Minor) geomagnetic storm levels on 27 Feb due to the influence of a negative polarity CH HSS. Generally quiet and quiet to unsettled conditions were observed throughout the remainder of the period.

Space Weather Outlook
05 March - 31 March 2018

Solar activity is expected to be very low throughout the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 18-25 Mar and moderate levels are expected on 17, and 26-30 Mar. Normal flux levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach G1 (Minor) geomagnetic storm levels on 18, 22 and 26 Mar due to the influences of multiple recurrent, CH HSSs. Active levels are expected on 15-17 and 21 Mar with generally quiet and quiet to unsettled conditions likely through the remainder of the outlook period.

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
26 February	70	16	30	A2.3	0	0	0	1	0	0	0	0
27 February	68	15	10	A0.0	0	0	0	0	0	0	0	0
28 February	69	11	10	A0.0	0	0	0	1	0	0	0	0
01 March	67	0	0	A0.0	0	0	0	0	0	0	0	0
02 March	68	11	10	A0.0	1	0	0	1	0	0	0	0
03 March	68	0	0	A0.0	0	0	0	0	0	0	0	0
04 March	68	0	0	A0.0	0	0	0	0	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
26 February		6.0e+05	1.5e+04	3.3e+03	8.4e+07	
27 February		1.2e+06	1.6e+04	3.5e+03	1.7e+07	
28 February		5.5e+05	1.6e+04	3.6e+03	2.3e+07	
01 March		5.5e+05	1.6e+04	3.8e+03	3.4e+07	
02 March		5.6e+05	1.6e+04	3.4e+03	3.0e+07	
03 March		1.1e+06	1.7e+04	3.7e+03	2.8e+07	
04 March		3.0e+05	1.6e+04	3.6e+03	2.2e+06	

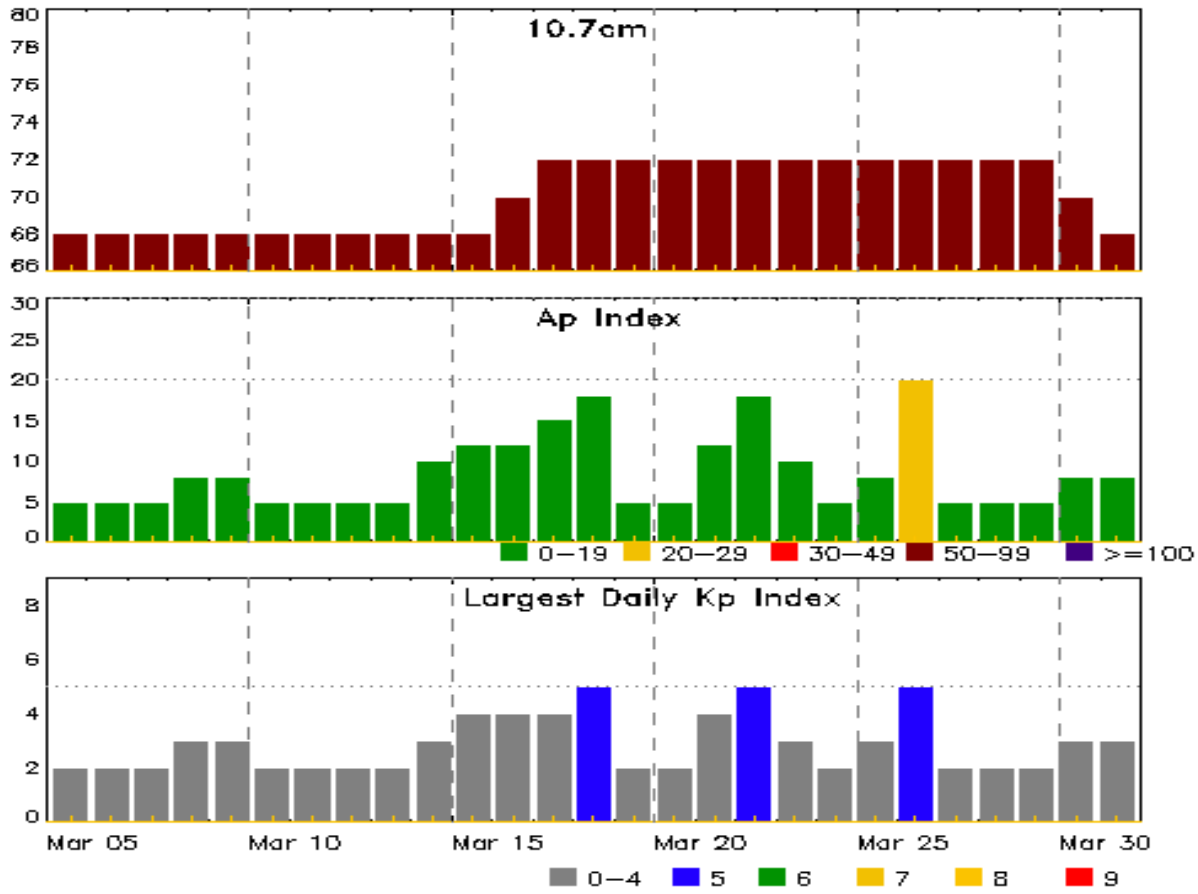
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
26 February	6	1-1-2-1-2-1-1-3	10	1-1-3-4-3-3-0-0	7	2-2-2-2-2-1-1-3
27 February	14	3-5-2-2-4-1-1-0	30	3-4-2-3-7-4-2-1	19	4-5-2-2-4-2-1-1
28 February	4	1-2-1-1-1-1-1-1	15	1-2-2-5-5-2-0-1	7	2-2-1-2-2-1-1-1
01 March	5	1-2-1-1-1-1-2-2	5	0-1-1-2-3-1-1-1	6	1-2-1-1-1-1-2-2
02 March	3	1-1-1-1-1-1-1-1	3	1-1-2-2-0-1-0-0	4	2-1-1-1-1-1-1-1
03 March	5	0-0-2-2-2-1-2-2	5	0-0-2-3-2-1-1-1	6	1-0-2-2-2-1-2-3
04 March	7	3-3-2-1-1-1-1-2	3	2-1-1-1-1-1-0-0	12	3-2-2-1-1-1-1-1

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
26 Feb 1527	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	18/1555
27 Feb 0017	WARNING: Geomagnetic K = 4	27/0017 - 0600
27 Feb 0115	ALERT: Geomagnetic K = 4	27/0114
27 Feb 0431	WARNING: Geomagnetic K = 5	27/0430 - 0900
27 Feb 0435	EXTENDED WARNING: Geomagnetic K = 4	27/0017 - 1200
27 Feb 0444	ALERT: Geomagnetic K = 5	27/0444
27 Feb 0502	WARNING: Geomagnetic K = 6	27/0501 - 0900
27 Feb 1155	EXTENDED WARNING: Geomagnetic K = 4	27/0017 - 1800
27 Feb 1318	WARNING: Geomagnetic K = 5	27/1317 - 1800
03 Mar 2025	ALERT: Electron 2MeV Integral Flux >= 1000pfu	03/2010

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
05 Mar	68	5	2	19 Mar	72	5	2
06	68	5	2	20	72	5	2
07	68	5	2	21	72	12	4
08	68	8	3	22	72	18	5
09	68	8	3	23	72	10	3
10	68	5	2	24	72	5	2
11	68	5	2	25	72	8	3
12	68	5	2	26	72	20	5
13	68	5	2	27	72	5	2
14	68	10	3	28	72	5	2
15	68	12	4	29	72	5	2
16	70	12	4	30	70	8	3
17	72	15	4	31	68	8	3
18	72	18	5				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
26 Feb	1158	1202	1204	B1.0			2700
26 Feb	1548	1551	1553	B3.3	SF	N06W07	2700
28 Feb	0604	0655	0730	A8.9			2700
28 Feb	1412	1427	1453	B2.3	SF	N08W37	2700
28 Feb	1523	1527	1530	B1.4			2700
28 Feb	1607	1610	1612	B1.5			2700
01 Mar	2203	2207	2213	B1.2			2700
02 Mar	0030	0052	0117	B6.8	SF	N06W55	2700
02 Mar	0514	0527	0534	B5.2			2700
02 Mar	0758	0803	0808	B1.3			2700
02 Mar	1056	1107	1113	C1.9			2700
03 Mar	0401	0407	0412	B4.9			2700
04 Mar	0255	0301	0307	B1.1			2700

Region Summary

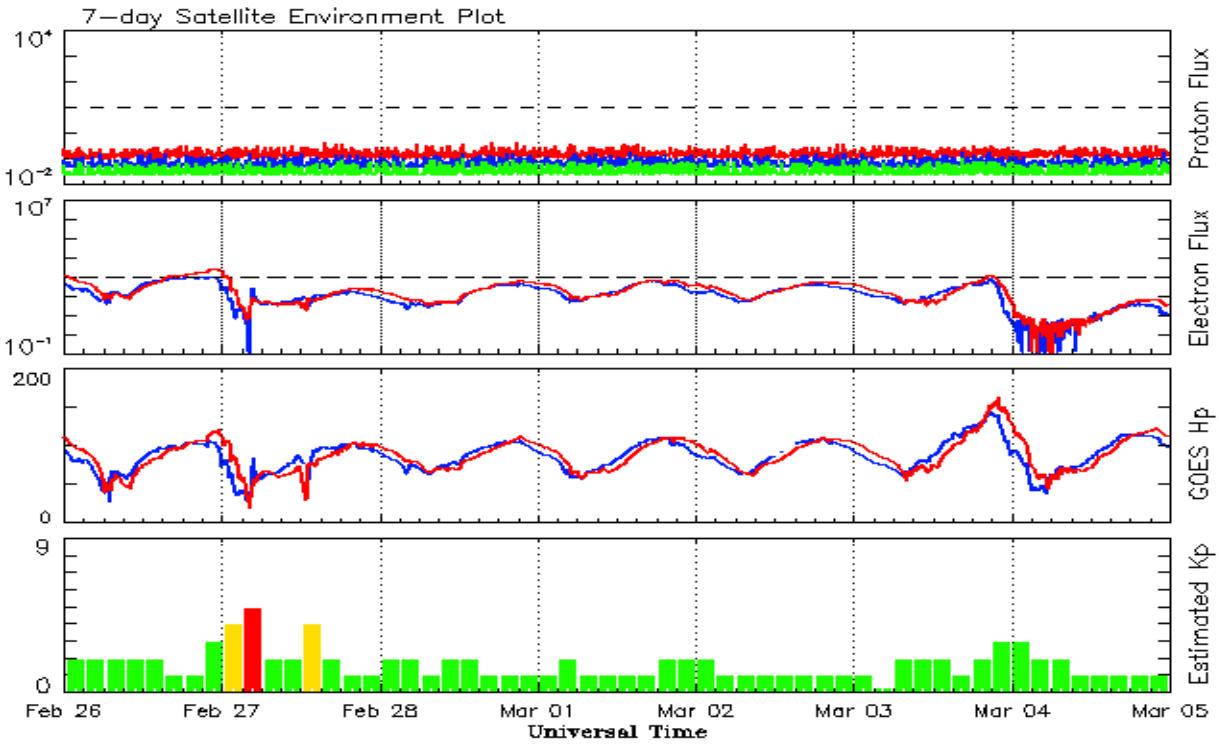
	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		Region 2700													
26 Feb	N06W13	328	30	4	Cro	6	B				1				
27 Feb	N06W28	330	10	5	Bxo	5	B								
28 Feb	N07W41	330	10	1	Axx	1	A				1				
01 Mar	N08W55	330	plage	1											
02 Mar	N07W68	330	10		Axx	1	A	1			1				
03 Mar	N07W82	331	plage												
								1	0	0	3	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 328

Recent Solar Indices (preliminary)
Observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2016					
March	40.9	32.5	0.80	47.7	30.2	91.6	96.6	11	11.8
April	39.2	22.7	0.58	45.0	28.7	93.4	95.3	10	11.8
May	48.9	30.9	0.64	42.1	26.9	93.1	93.2	12	11.7
June	19.3	12.3	0.65	39.0	24.9	81.9	90.4	9	11.4
July	36.8	19.4	0.53	36.5	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
				2017					
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.4	74.6	78.6	15	11.5
April	30.4	19.4	0.64	24.3	14.9	80.9	78.4	13	11.5
May	18.1	11.3	0.62	23.1	14.0	73.5	77.7	9	11.3
June	18.0	11.5	0.64	22.0	13.3	74.8	77.3	7	11.3
July	18.8	10.7	0.59	20.8	12.6	77.7	76.8	9	11.0
August	25.0	19.6	0.80	19.7	11.7	77.9	76.3	12	10.7
September	42.2	26.2	0.62			92.0		19	
October	16.0	7.9	0.49			76.4		11	
November	7.7	3.4	0.44			72.1		11	
December	7.6	4.9	0.64			71.5		8	
				2018					
January	7.8	4.0	0.51			70.0		6	
February	16.0	6.4	0.40			72.0		7	

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 26 February 2018

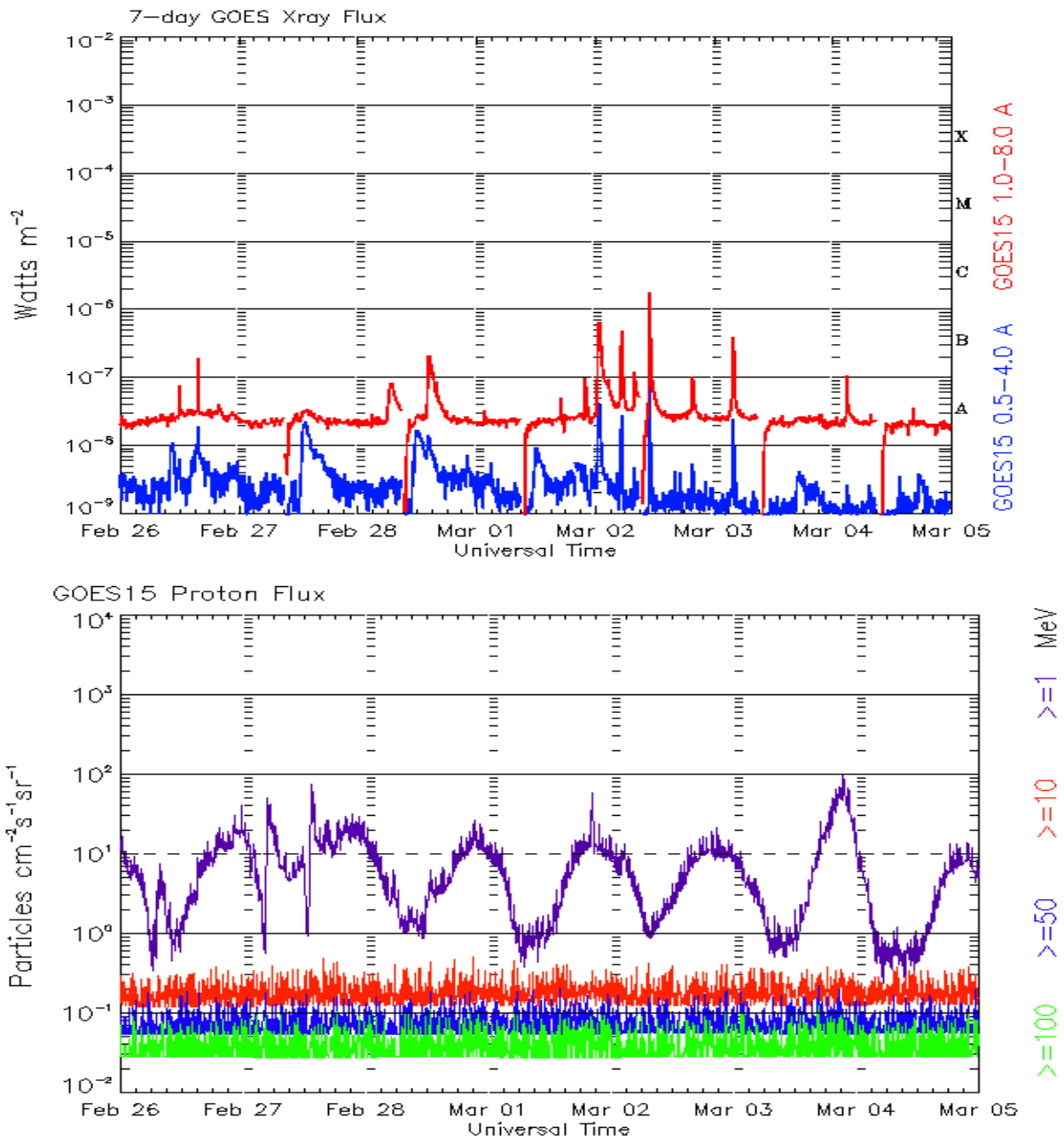
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm^2-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm^2-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.

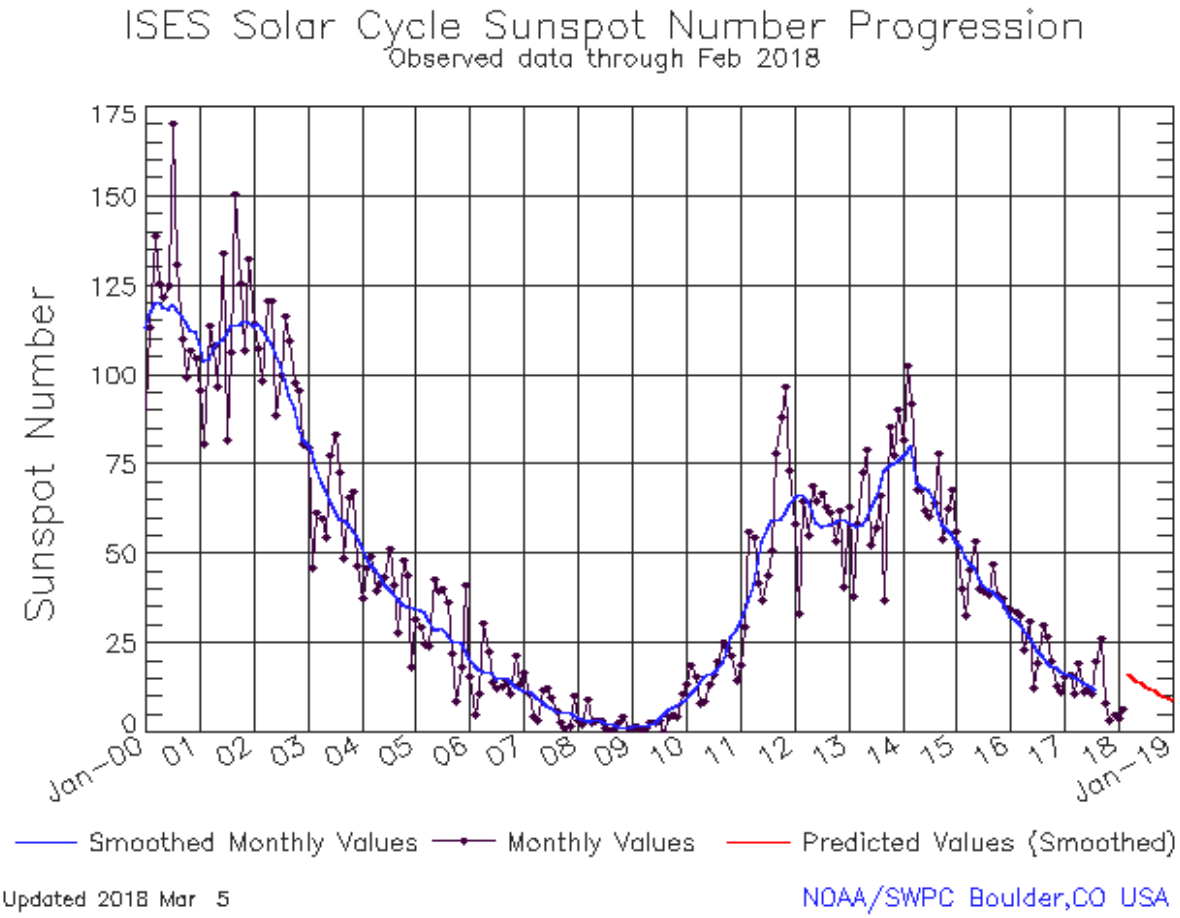
The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are 'global' parameters that are applicable to a first 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 26 February 2018

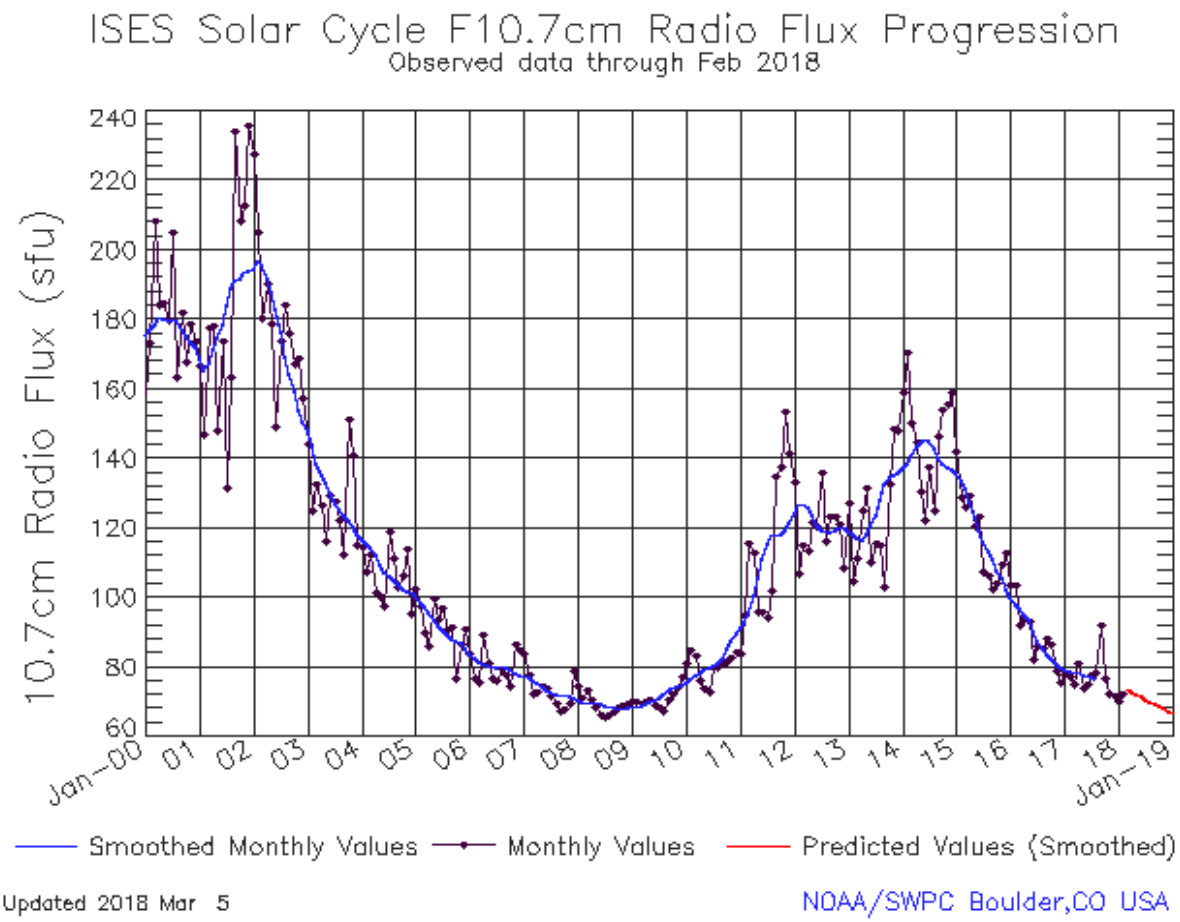
The x-ray plots contains five-minute averages x-ray flux (Watt/m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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.



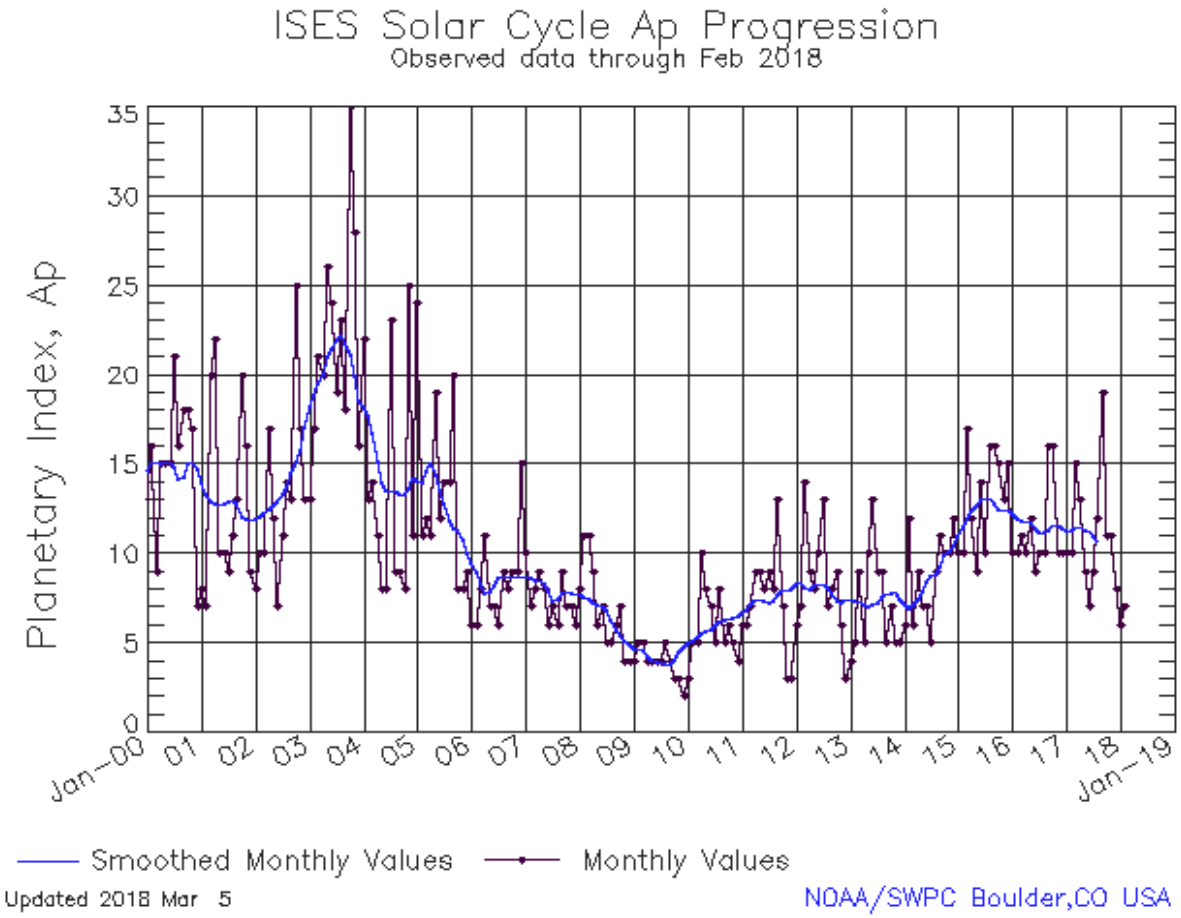
Smoothed Sunspot Number Prediction

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	38	37	35
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2016	34	34	33	23	31	12	19	30	27	20	13	11
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2017	16	16	11	19	11	12	11	20	26	8	3	5
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2018	4	6	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)



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	111	108	105	103
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2016	100	98	97	95	93	90	88	86	84	83	81	80
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2017	79	79	79	78	78	77	77	76	76	76	75	75
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(1)	(2)	(3)
2018	75	74	73	72	71	71	70	70	69	69	68	67
	(4)	(4)	(5)	(6)	(7)	(8)	(8)	(9)	(9)	(9)	(9)	(9)
2019	67	66	66	65	65	65	64	64	63	63	63	63
	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)



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.

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