

**Space Weather Highlights**  
**02 April - 08 April 2018**

**SWPC PRF 2223**  
**09 April 2018**

Solar activity was at very low levels throughout the period with only a few low level B-class flare observed on 03 Apr from Region 2703 (S08, L=193, class/area Axx/010 on 31 Mar). No Earth-directed coronal mass ejections were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 02-04 Apr and at moderate levels on 05-08 Apr. The largest flux of the period was 2,150 pfu observed at 02/1915 UTC.

Geomagnetic field activity was mostly quiet with unsettled periods observed on 05 Apr. Solar wind speed began the period slightly enhanced near 470 km/s with total field around 4-5 nT. Solar wind speed declined to near 320 km/s by 04 April before increasing briefly to near 450 km/s by late on 05 Apr. Total field increased to a maximum of 9 nT at 05/2130 UTC. By 07 Apr, solar wind speed had decreased to 330-380 km/s while the total field decreased to 5 nT or less.

**Space Weather Outlook**  
**09 April - 05 May 2018**

Solar activity is expected to be at very 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 reach high levels on 12-30 Apr due to recurrent coronal hole high speed stream (CH HSS) influence.

Geomagnetic field activity is expected to be at unsettled to active levels on 10-16 Apr and again from 19-23 Apr with G1 (minor) storm levels likely on 10-11 Apr due to recurrent CH HSS effects.



### ***Daily Solar Data***

Date	Radio	Sun	Sunspot	X-ray		Flares							
	Flux	spot	Area	Background		X-ray			Optical				
	10.7cm	No.	(10 <sup>-6</sup> hemi.)	Flux		C	M	X	S	1	2	3	4
02 April	68	0	0	A0.0	0	0	0	0	0	0	0	0	0
03 April	68	0	0	A0.0	0	0	0	3	0	0	0	0	0
04 April	69	0	0	A0.0	0	0	0	0	0	0	0	0	0
05 April	66	0	0	A0.0	0	0	0	0	0	0	0	0	0
06 April	67	0	0	A0.0	0	0	0	0	0	0	0	0	0
07 April	67	0	0	A0.0	0	0	0	0	0	0	0	0	0
08 April	68	0	0	A0.0	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
02 April	5.0e+05	1.6e+04	3.3e+03		1.1e+08	
03 April	5.6e+05	1.6e+04	3.5e+03		8.5e+07	
04 April	8.8e+05	1.6e+04	3.5e+03		5.3e+07	
05 April	8.0e+05	1.6e+04	3.4e+03		1.5e+07	
06 April	4.5e+05	1.7e+04	3.5e+03		1.2e+07	
07 April	5.0e+05	1.7e+04	3.6e+03		1.5e+07	
08 April	6.4e+05	1.6e+04	3.6e+03		1.6e+07	

### ***Daily Geomagnetic Data***

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
02 April	4	1-1-1-0-2-2-1-1	2	1-1-0-2-1-1-0-0	5	2-1-1-1-2-2-1-1
03 April	3	1-2-2-1-0-1-1-0	2	1-1-2-0-0-0-0-0	4	2-2-2-0-0-0-0-0
04 April	4	0-0-1-2-2-2-1-2	6	0-0-0-4-3-1-0-0	5	0-1-1-2-2-2-1-2
05 April	8	2-2-1-1-2-3-3-2	4	2-1-1-1-1-2-2-0	9	3-2-1-1-1-3-3-2
06 April	3	1-1-0-1-1-2-1-1	2	1-0-0-1-1-1-0-0	4	1-1-1-1-1-2-1-1
07 April	4	0-1-1-1-2-1-1-2	2	1-1-1-1-1-0-0-0	5	1-1-1-1-1-1-0-2
08 April	5	1-2-1-1-1-1-2-2	2	1-1-0-1-0-1-0-1	5	1-2-0-1-1-2-2-2

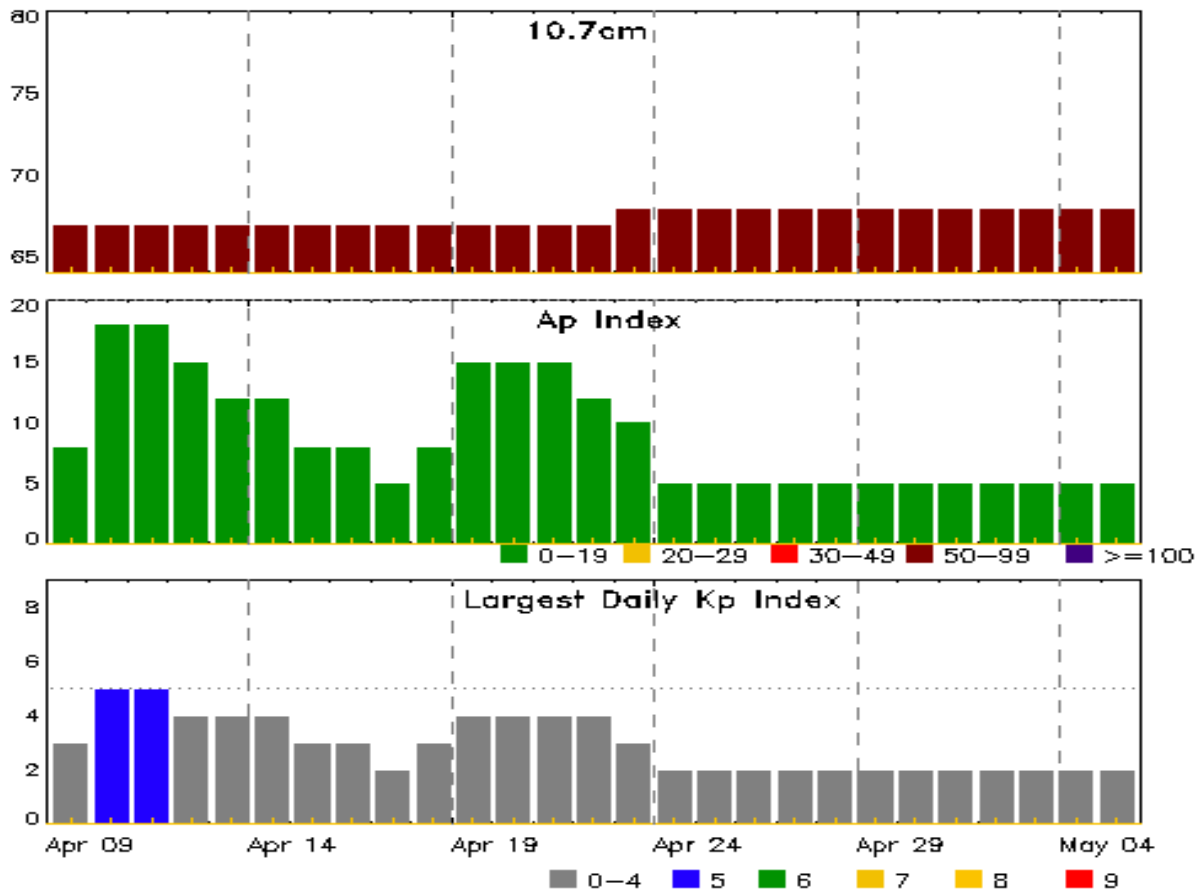


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
02 Apr 1226	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	16/0105
03 Apr 1457	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	16/0105
08 Apr 0504	WATCH: Geomagnetic Storm Category G1 predicted	
08 Apr 1634	WATCH: Geomagnetic Storm Category G1 predicted	



## 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 Apr	67	8	3	23 Apr	68	10	3
10	67	18	5	24	68	5	2
11	67	18	5	25	68	5	2
12	67	15	4	26	68	5	2
13	67	12	4	27	68	5	2
14	67	12	4	28	68	5	2
15	67	8	3	29	68	5	2
16	67	8	3	30	68	5	2
17	67	5	2	01 May	68	5	2
18	67	8	3	02	68	5	2
19	67	15	4	03	68	5	2
20	67	15	4	04	68	5	2
21	67	15	4	05	68	5	2
22	67	12	4				

### ***Energetic Events***

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

**No Events Observed**

### ***Flare List***

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
03 Apr	0356	0405	0415	B2.1	SF	S10E23		2703
03 Apr	1413	1417	1432	B1.2	SF	S09E17		2703
03 Apr	2030	2035	2038	B2.0	SF	S10E12		2703
06 Apr	1929	1930	1931	A1.1				



## ***Region Summary***

Location		Sunspot Characteristics						Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 2703															
30 Mar	S08E60	192	10	1	Axx	1	A	1			4				
31 Mar	S08E47	193	10	2	Axx	2	A				1				
01 Apr	S08E34	193	plage								1				
02 Apr	S08E20	194	plage												
03 Apr	S08E06	195	plage								3				
04 Apr	S08W08	196	plage												
05 Apr	S08W22	197	plage												
06 Apr	S08W36	197	plage												
07 Apr	S08W50	198	plage												
08 Apr	S08W64	199	plage												
								1	0	0	9	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 195

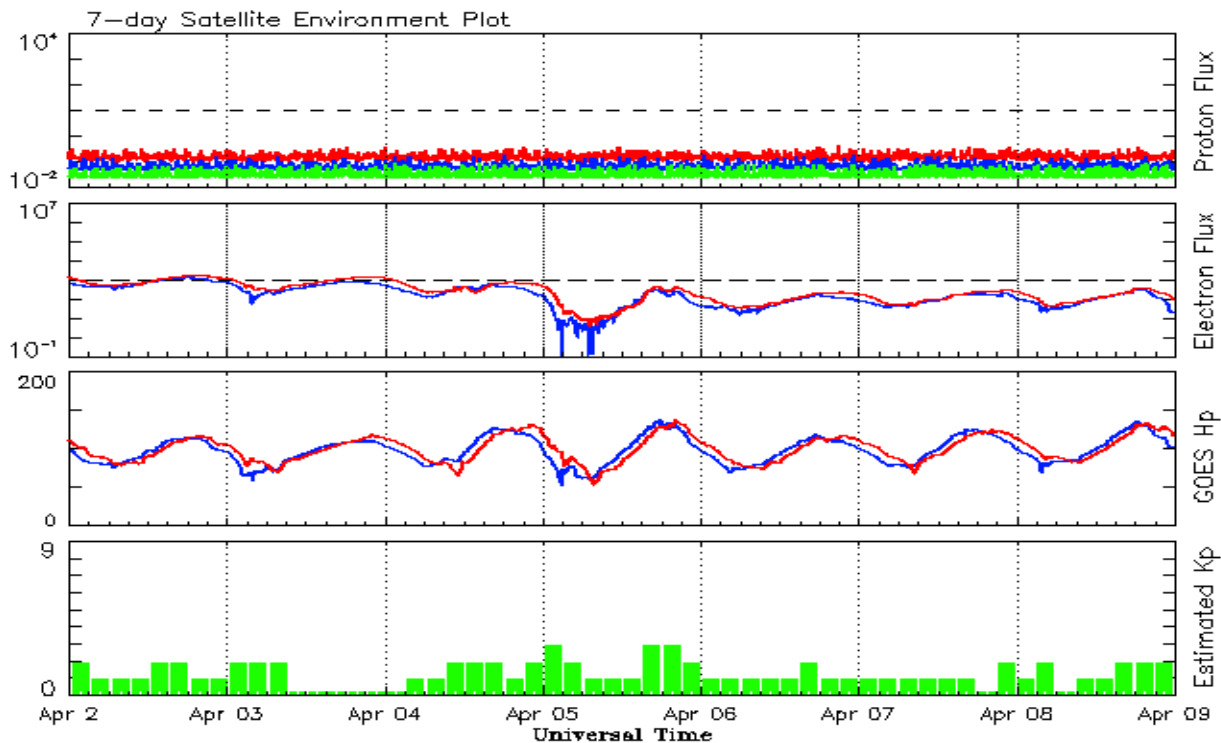


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2016</b>									
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
<b>2017</b>									
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	18.6	10.9	92.0	75.9	19	10.3
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	
<b>2018</b>									
January	7.8	4.0	0.51			70.0		6	
February	16.0	6.4	0.40			72.0		7	
March	6.0	1.5	0.25			68.4		8	

**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 02 April 2018*

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.

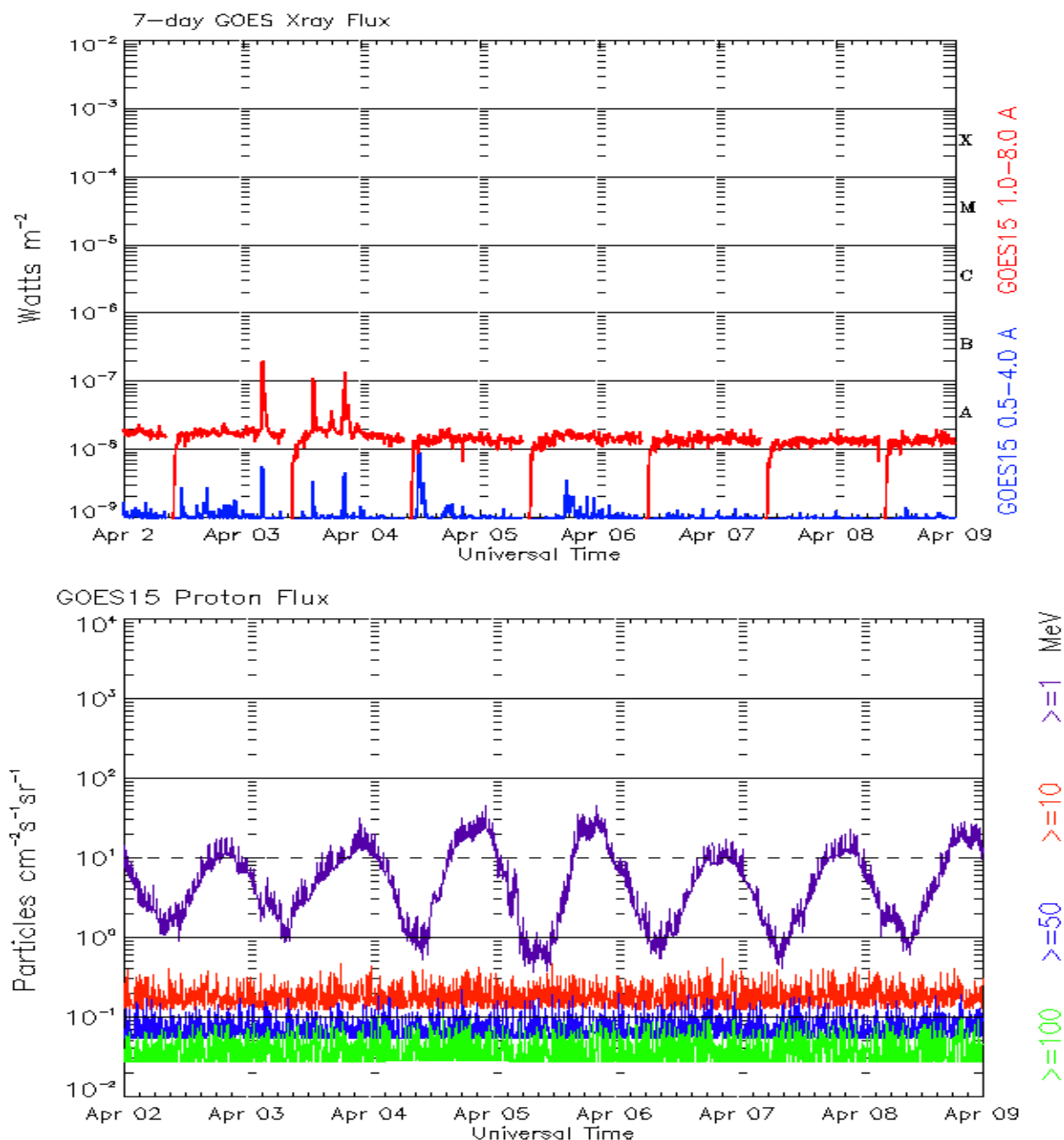
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 02 April 2018*

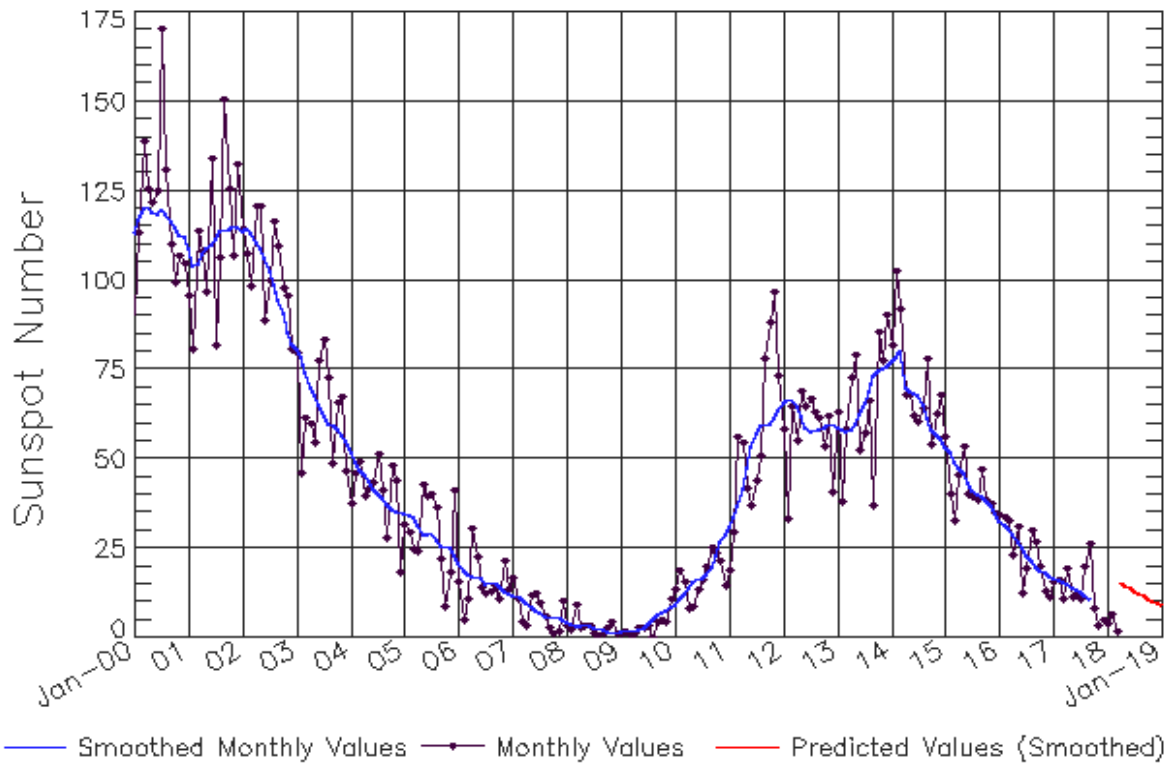
The x-ray plots contains five-minute averages x-ray flux ( $\text{Watt/m}^2$ ) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral flux units ( $\text{pfu} = \text{protons/cm}^2\text{-sec -sr}$ ) 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 Mar 2018



Updated 2018 Apr 9

NOAA/SWPC Boulder, CO USA

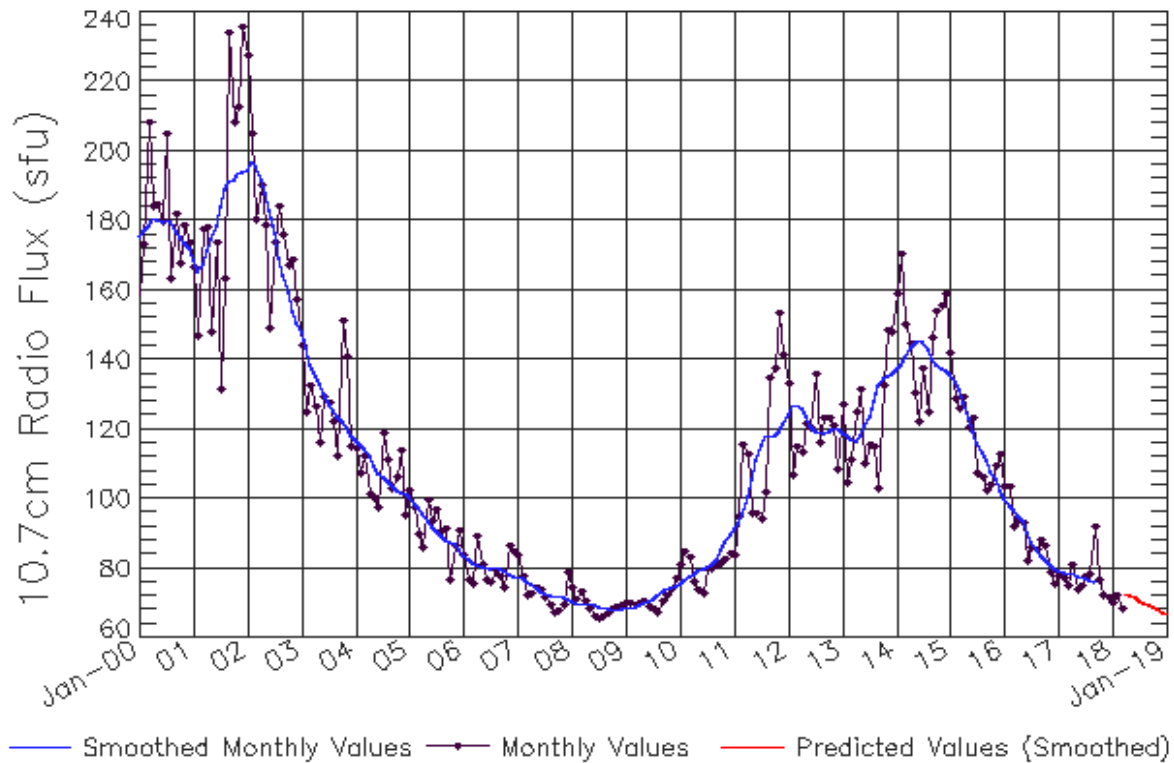
## Smoothed Sunspot Number Prediction

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



Updated 2018 Apr 9

NOAA/SWPC Boulder, CO USA

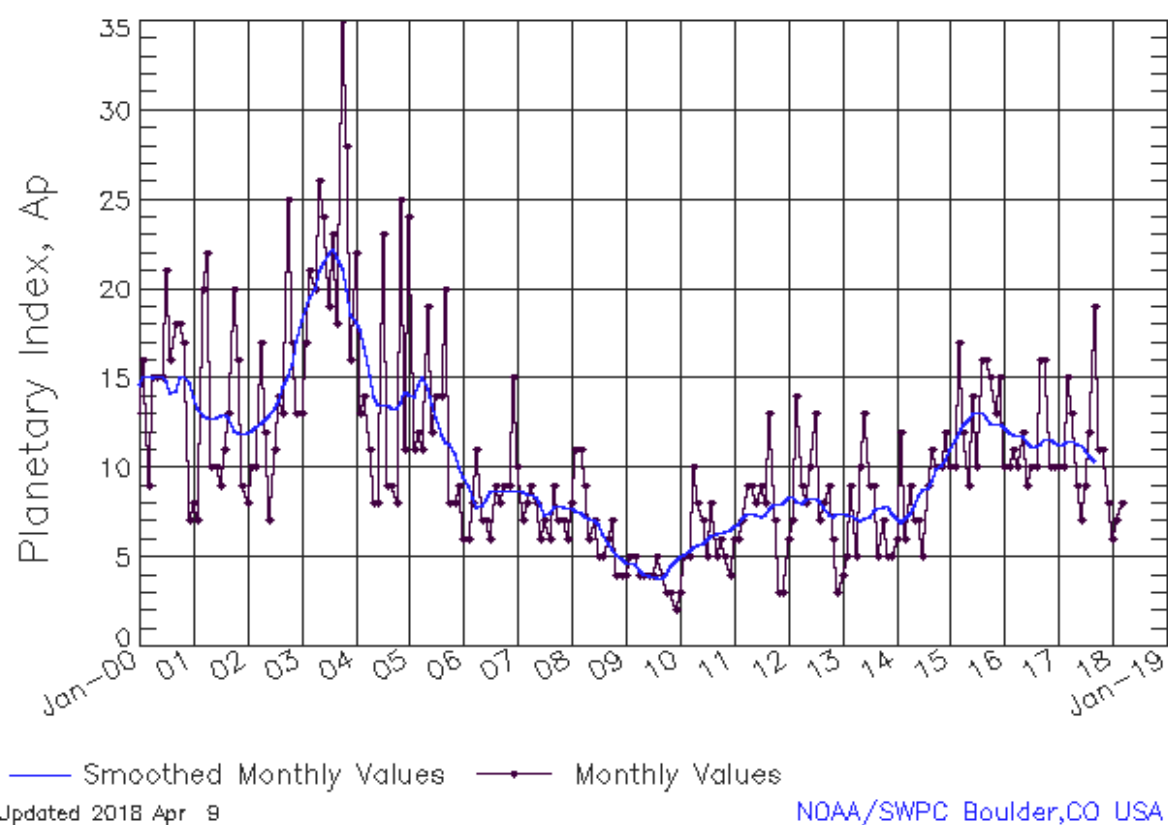
## Smoothed F10.7cm Radio Flux Prediction

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 (***)	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 (***)	75 (1)	75 (1)	75 (2)
2018	74 (3)	74 (4)	72 (4)	71 (5)	71 (6)	70 (7)	70 (8)	70 (8)	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 Mar 2018



*Solar Cycle Comparison charts are temporarily unavailable.*

## ***Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)***

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U.S. Department of Commerce  
NOAA / National Weather Service  
Space Weather Prediction Center  
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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](mailto: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

