

Solar activity was very quiet throughout the reporting period. Region 2706 (N03, L=281, class/area Dao/130 on 22 Apr) produced the strongest event of the past week, a B1 flare on 01/2115 UTC. Activity on the farside of the Sun produced a halo CME signature first observed in LASCO C2 imagery at 03/1712 UTC; however, no Earth-directed CMEs were observed in available coronagraph imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit ranged from normal to moderate levels from 30 Apr to 05 May. Influence from a negative polarity CH HSS caused an increase to high levels on 06 May with a peak flux of 11,500 pfu observed at 06/2305 UTC.

Geomagnetic field activity was mostly quiet until 05 May, when enhancements in the solar wind from the onset of a negative polarity CH HSS increased geomagnetic activity to G1 (Minor) storm levels. A further increase to G2 (Moderate) geomagnetic storm levels were observed early on 06 May. Solar wind speeds peaked at just over 700 km/s and persisted just below 700 km/s through the end of the reporting period. Total field peaked during the CIR, with a maximum of 17 nT observed at 05/1340 UTC. The maximum southward value of Bz was -14 nT which was observed 05/1327 UTC.

### **Space Weather Outlook** **07 May - 02 June 2018**

Solar activity is expected to remain at very low levels over the next 27 days.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels from 07-26 May and 02 Jun. Normal to moderate levels are expected over 27 May - 01 Jun. All enhancements in electron flux are attributed to the anticipation of influence from multiple, recurrent CH HSSs.

Geomagnetic field activity is expected to range from quiet to G2 (moderate) geomagnetic storm levels. G2 (Moderate) storm levels are likely on 17 May; G1 (Minor) storm levels are likely on 07 May and 02 Jun; active conditions are likely on 08-09 May, 18 May and 01 Jun; unsettled levels are likely on 10 May and 19 May. The remainder of the outlook period is expected to be mostly quiet. All enhancements to geomagnetic activity are due to multiple, recurrent CH HSSs.



### *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
30 April	70	0	0	A2.5	0	0	0	0	0	0	0	0	0
01 May	68	0	0	A2.2	0	0	0	0	0	0	0	0	0
02 May	67	0	0	A1.7	0	0	0	0	0	0	0	0	0
03 May	67	0	0	A1.3	0	0	0	0	0	0	0	0	0
04 May	68	13	30	A1.5	0	0	0	0	0	0	0	0	0
05 May	68	14	10	A1.7	0	0	0	0	0	0	0	0	0
06 May	67	14	10	A2.2	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
30 April	6.8e+05	1.7e+04	3.5e+03		4.0e+07	
01 May	7.1e+05	1.7e+04	3.3e+03		3.3e+07	
02 May	7.0e+05	1.8e+04	3.7e+03		2.6e+07	
03 May	1.1e+06	1.8e+04	3.7e+03		2.7e+07	
04 May	1.1e+06	1.7e+04	3.7e+03		2.6e+07	
05 May	1.3e+06	1.8e+04	3.6e+03		7.4e+06	
06 May	3.4e+06	1.7e+04	3.3e+03		2.0e+08	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
30 April	10	2-2-1-2-3-2-4-1	3	3-1-0-1-0-1-0-0	6	3-2-1-1-2-2-2-1
01 May	3	0-1-1-1-2-0-1-1	1	1-1-0-0-0-0-0-1	3	0-1-1-0-1-0-1-1
02 May	5	1-2-1-2-2-1-2-0	2	1-1-1-2-0-0-0-0	4	1-2-1-1-1-1-1-0
03 May	3	0-0-0-1-2-1-1-2	0	0-0-0-0-0-0-0-1	4	1-1-1-1-1-1-1-2
04 May	4	0-1-1-1-2-2-2-1	1	0-1-0-1-0-0-0-0	4	1-1-1-1-1-1-1-1
05 May	12	1-1-1-3-3-3-3-4	27	1-1-0-2-5-6-5-4	20	1-1-0-3-3-5-4-5
06 May	24	5-4-3-3-3-3-4-4	29	4-5-4-5-5-3-2-3	80	6-4-3-3-3-3-4-5

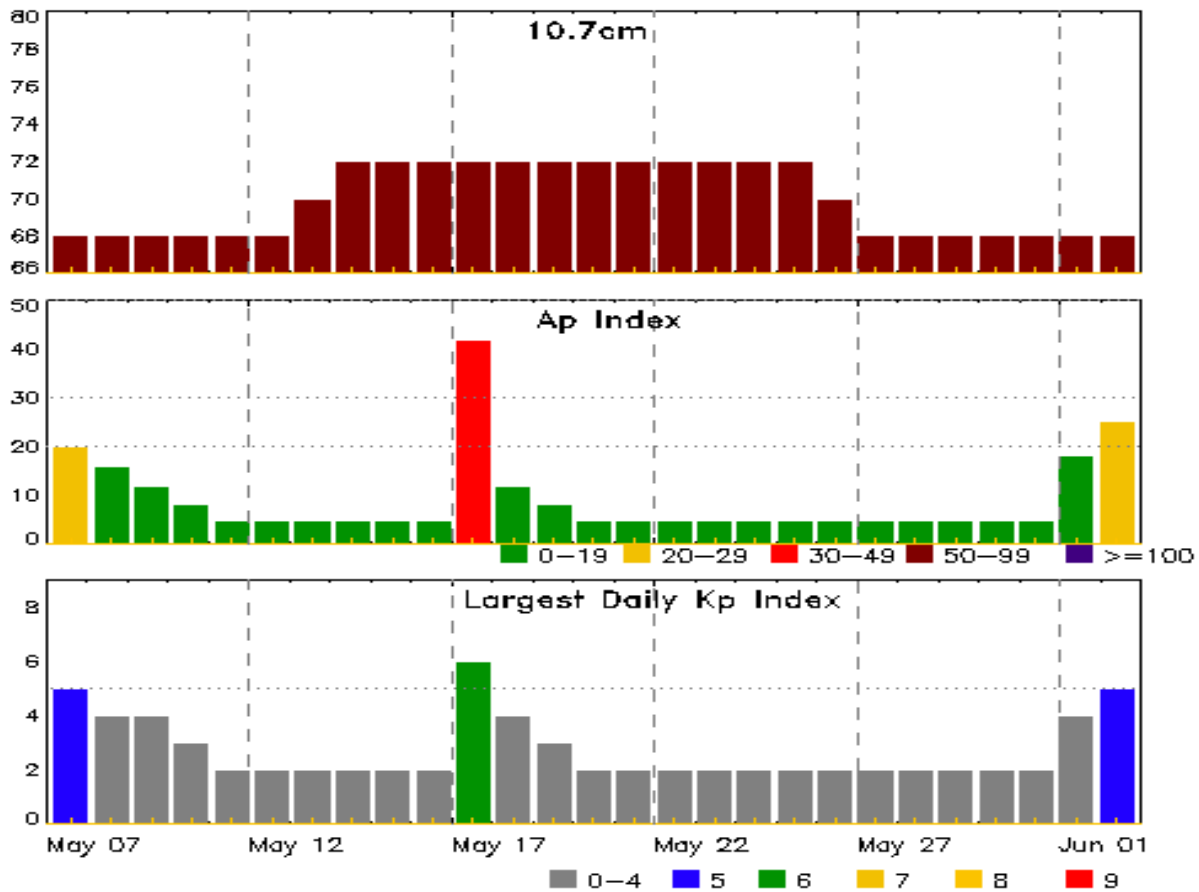


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
03 May 1458	WATCH: Geomagnetic Storm Category G1 predicted	
04 May 1607	WATCH: Geomagnetic Storm Category G1 predicted	
05 May 1351	WARNING: Geomagnetic K = 4	05/1350 - 1800
05 May 1552	ALERT: Geomagnetic K = 4	05/1552
05 May 1716	WARNING: Geomagnetic K = 5	05/1715 - 06/0300
05 May 1716	EXTENDED WARNING: Geomagnetic K = 4	05/1350 - 06/0900
05 May 1802	ALERT: Geomagnetic K = 5	05/1759
05 May 2253	ALERT: Geomagnetic K = 5	05/2252
06 May 0047	ALERT: Geomagnetic K = 5	06/0047
06 May 0121	EXTENDED WARNING: Geomagnetic K = 5	05/1715 - 06/0900
06 May 0121	WARNING: Geomagnetic K = 6	06/0117 - 0600
06 May 0218	ALERT: Geomagnetic K = 6	06/0218
06 May 0834	EXTENDED WARNING: Geomagnetic K = 4	05/1350 - 06/2100
06 May 1416	ALERT: Electron 2MeV Integral Flux $\geq 1000$ pfu	06/1400
06 May 2021	EXTENDED WARNING: Geomagnetic K = 4	05/1350 - 07/1200
06 May 2031	WARNING: Geomagnetic K = 5	06/2030 - 07/0600



## 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
07 May	68	20	5	21 May	72	5	2
08	68	16	4	22	72	5	2
09	68	12	4	23	72	5	2
10	68	8	3	24	72	5	2
11	68	5	2	25	72	5	2
12	68	5	2	26	70	5	2
13	70	5	2	27	68	5	2
14	72	5	2	28	68	5	2
15	72	5	2	29	68	5	2
16	72	5	2	30	68	5	2
17	72	42	6	31	68	5	2
18	72	12	4	01 Jun	68	18	4
19	72	8	3	02	68	25	5
20	72	5	2				

### ***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	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
30 Apr	1911	1914	1919	B1.1			2706
01 May	2108	2115	2125	B1.6			2706
06 May	0255	0256	0257	A1.1			



## Region Summary

Date	Location	Sunspot Characteristics						Flares							
	Lat CMD	Helio	Area 10 <sup>-6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
Region 2706															
19 Apr	N04E68	281	20	2	Bxo	4	B								
20 Apr	N04E56	280	40	7	Cao	4	B				1				
21 Apr	N04E43	280	110	8	Dao	13	B				1				
22 Apr	N03E29	281	130	9	Dao	10	B								
23 Apr	N02E16	281	80	8	Cao	12	B								
24 Apr	N02E01	283	50	7	Cao	9	B				1				
25 Apr	N03W10	280	50	8	Cro	7	B								
26 Apr	N03W27	284	20	1	Hrx	4	A								
27 Apr	N03W40	284	10	1	Axx	1	A								
28 Apr	N03W53	284	plage												
29 Apr	N03W67	285	plage												
30 Apr	N03W82	286	plage												
								0	0	0	3	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 283

<b>Region 2707</b>															
21 Apr	S10E29	294	10		Axx	1	A								
22 Apr	S10E15	295	plage												
23 Apr	S10E01	296	plage												
24 Apr	S10W13	297	plage												
25 Apr	S10W27	297	plage												
26 Apr	S10W41	298	plage												
27 Apr	S10W54	298	plage												
28 Apr	S10W67	298	plage												
29 Apr	S10W81	299	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 296

<b>Region 2708</b>															
04 May	S09E53	204	30	3	Cro	3	B								
05 May	S08E39	99	10	5	Bxo	4	B								
06 May	S10E26	99	10	5	Bxo	4	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 99

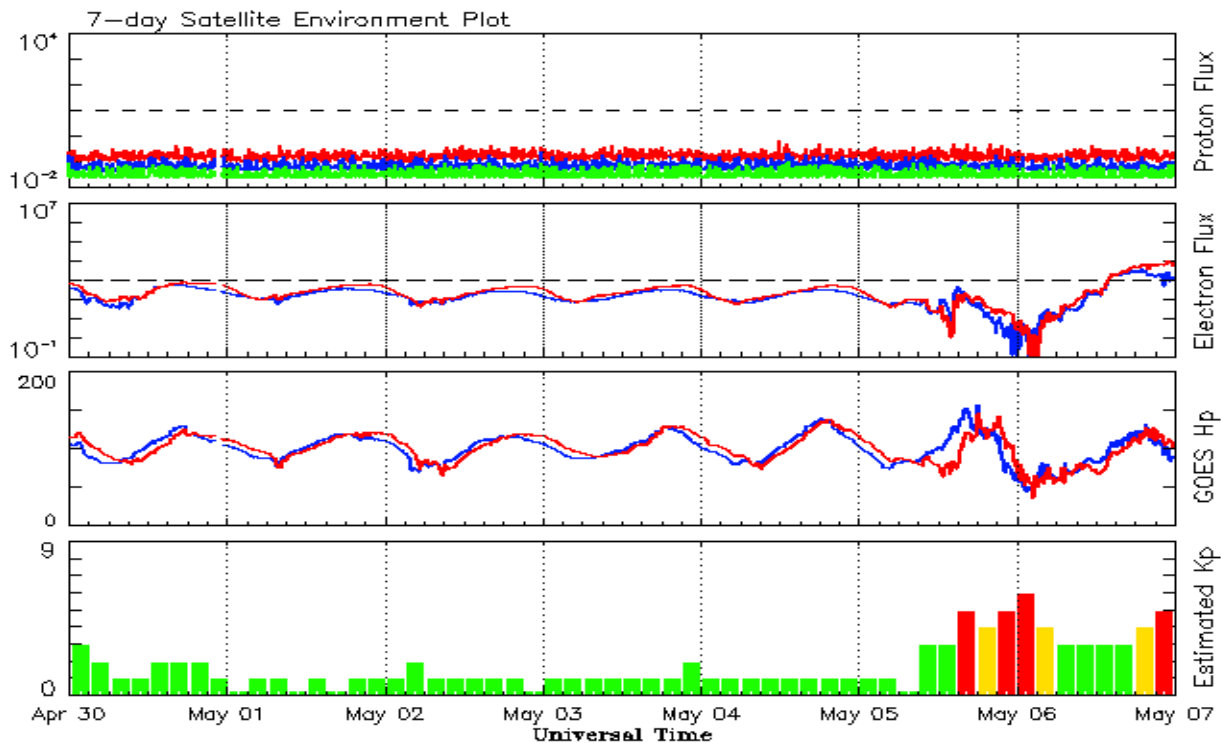


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>									
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	16.8	10.0	76.4	75.1	11	9.8
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	
April	7.0	5.3	0.76			70.0		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 30 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.

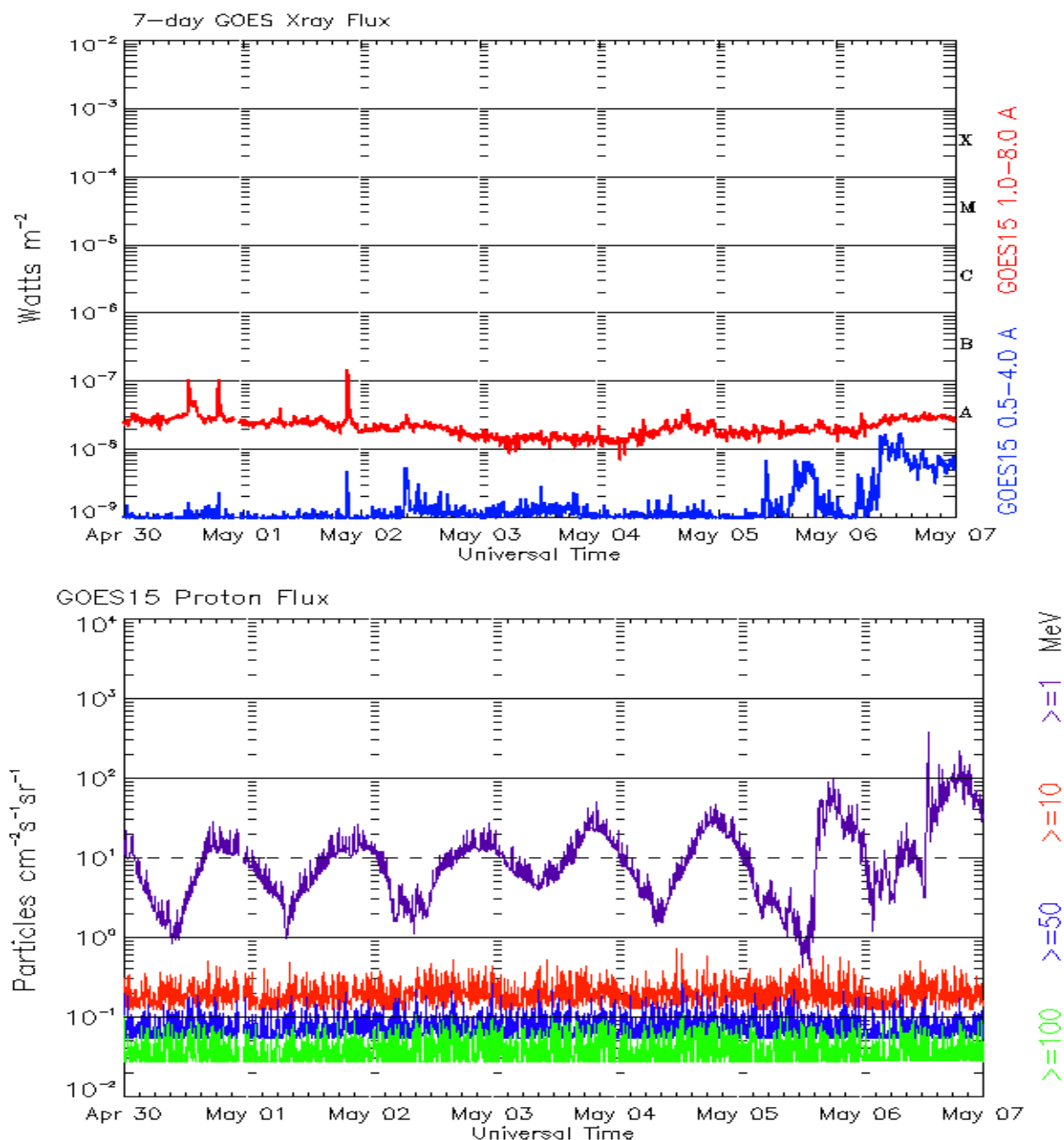
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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. Hp 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 30 April 2018*

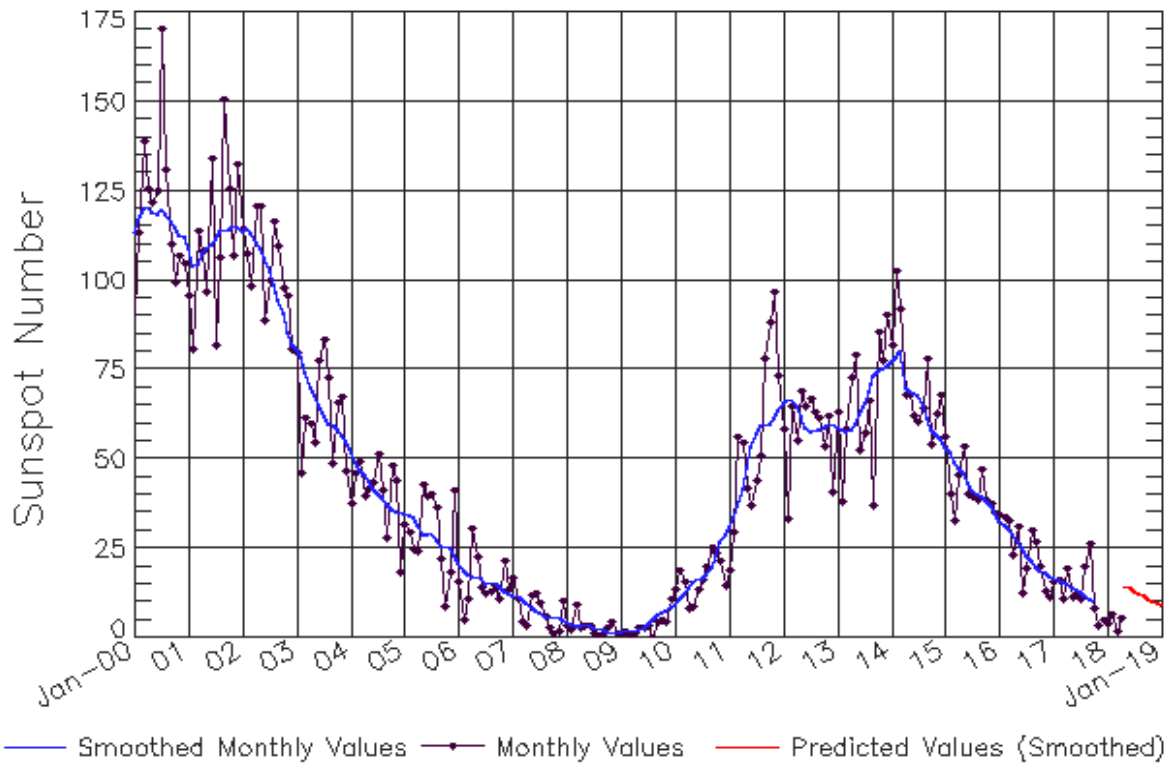
The x-ray plots contains five-minute averages x-ray flux ( $\text{Watt/m}^2$ ) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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



Updated 2018 May 7

NOAA/SWPC Boulder, CO USA

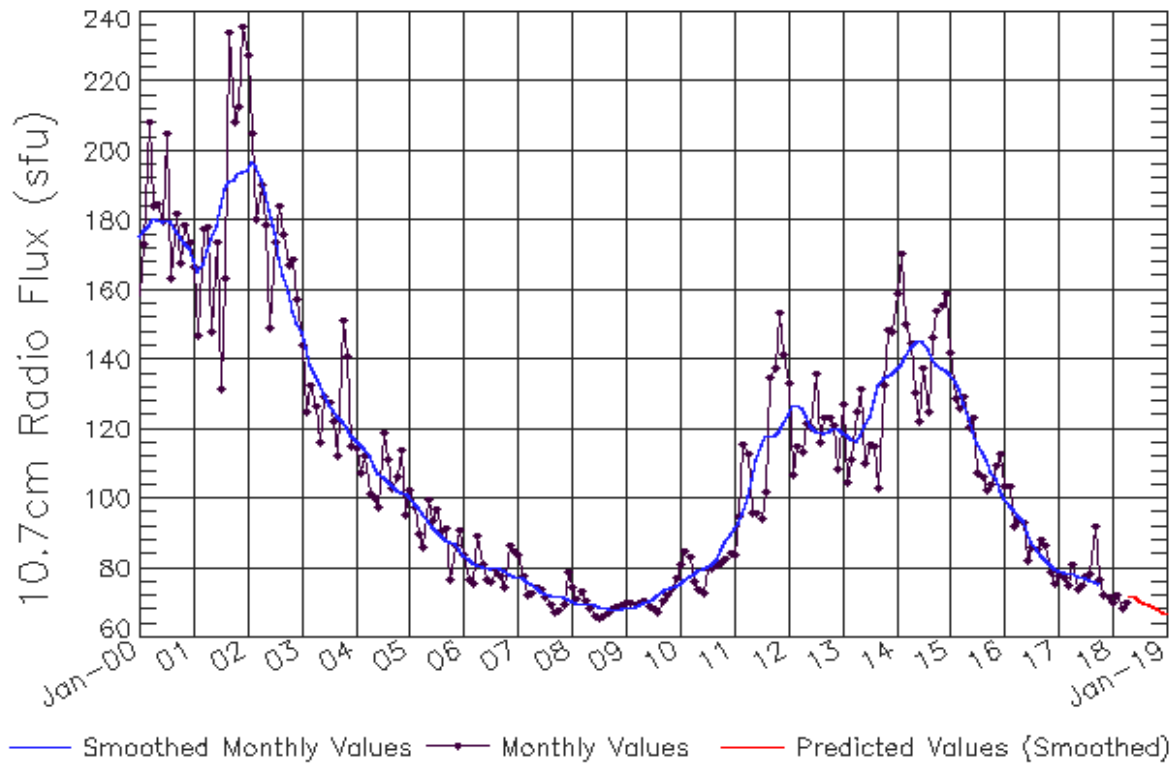
## Smoothed Sunspot Number Prediction

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)	5 (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 Apr 2018



Updated 2018 May 7

NOAA/SWPC Boulder, CO USA

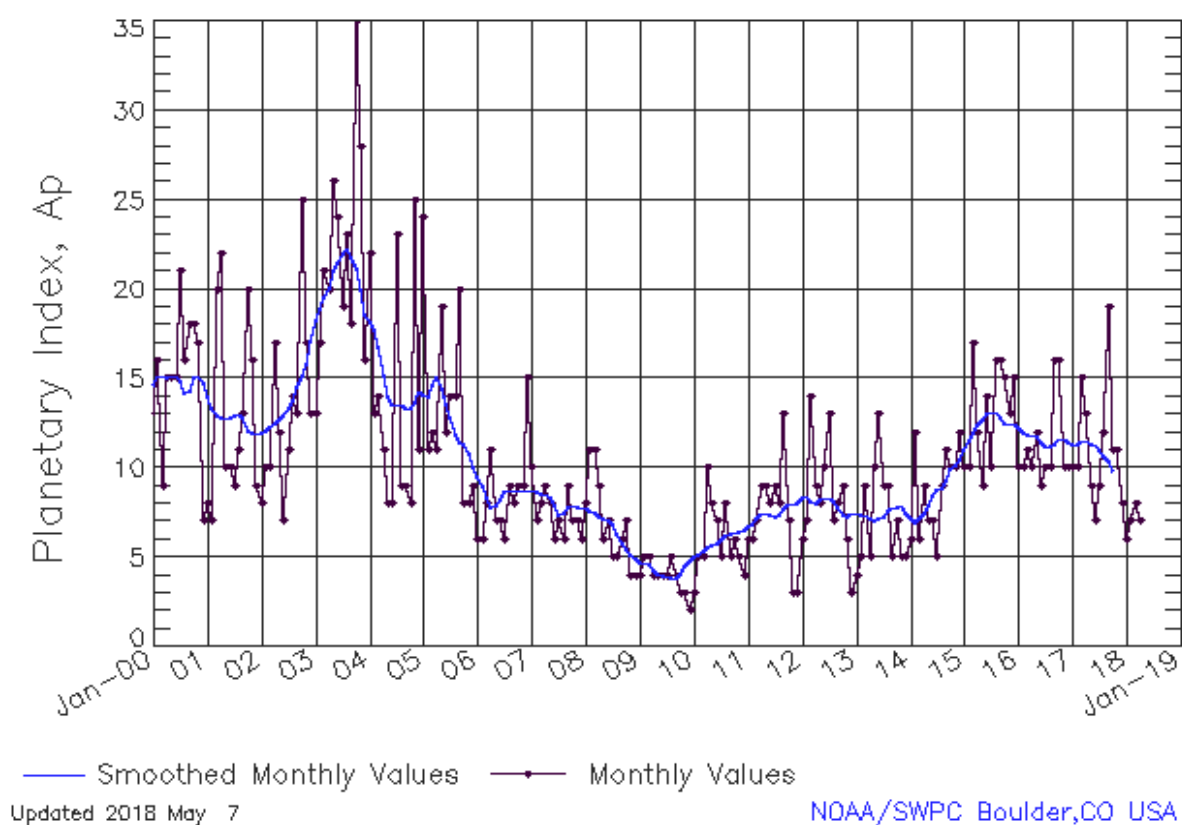
## Smoothed F10.7cm Radio Flux Prediction

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 (***)	75 (1)	74 (1)
2018	74 (2)	73 (3)	72 (4)	71 (4)	70 (5)	70 (6)	70 (7)	69 (8)	69 (8)	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 Apr 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  
325 Broadway, Boulder CO 80305

**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

