

Solar activity was very low. GONG and SDO imagery displayed a 17 degree long filament eruption between 30/0214-0603 UTC. The filament was centered near S56W09. Two subsequent CME signatures were observed in coronagraph imagery. Analysis and modeling suggested an Earth-directed component was present despite most of the ejecta moving south of the ecliptic plane. Arrival of the slow-moving transient is expected on 05 Dec.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal background levels throughout the reporting period.

Geomagnetic field activity ranged from quiet to active. Quiet conditions increased to unsettled on 01-02 Dec, with an isolated period of active observed at the end of 02 Dec, due to the onset of a positive polarity CH HSS. Enhancements from the CIR increased Bt to a maximum of 10 nT on 01 Dec and wind speeds peaked at 460 km/s on 02 Dec. Nominal solar wind produced quiet conditions over the remainder of the reporting period.

**Space Weather Outlook**  
**03 December - 29 December 2018**

Solar activity is expected to remain very low over the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to range from normal to high levels. High levels are expected on 03-04 Dec and 07-12 Dec; moderate levels are expected on 06 Dec and 14-16 Dec; normal background levels are expected on 05 Dec and 17-19 Dec. All enhancements in are anticipated in response to multiple, recurrent CH HSSs.

Geomagnetic field activity is expected to range from quiet to active levels. Active levels are expected on 03-05 Dec and 29 Dec; unsettled levels are expected on 06-09 Dec, 17-19 Dec and 28 Dec; quiet levels are expected over the remainder of the period. All enhancements in geomagnetic field activity are anticipated in response to multiple, recurrent, CH HSSs, with the exception of 05 Dec, when a slow-moving transient is likely to pass Earth.



### ***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
26 November	69	0	0	A1.1	0	0	0	0	0	0	0	0	0
27 November	68	0	0	A1.0	0	0	0	0	0	0	0	0	0
28 November	68	0	0	A0.0	0	0	0	0	0	0	0	0	0
29 November	68	0	0	A0.0	0	0	0	0	0	0	0	0	0
30 November	68	0	0	A0.0	0	0	0	0	0	0	0	0	0
01 December	69	0	0	A0.0	0	0	0	0	0	0	0	0	0
02 December	69	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
26 November		4.0e+05	1.7e+04	3.9e+03		2.0e+06
27 November		6.2e+05	1.8e+04	3.5e+03		1.6e+06
28 November		4.1e+05	1.7e+04	3.8e+03		4.6e+05
29 November		9.9e+05	1.7e+04	4.0e+03		8.0e+05
30 November		1.0e+06	1.7e+04	3.6e+03		9.5e+05
01 December		1.1e+06	1.7e+04	3.8e+03		6.0e+05
02 December		6.4e+05	1.6e+04	3.6e+03		3.4e+05

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

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
26 November	2	1-0-0-0-1-1-0-1	0	0-0-0-0-0-0-0-0	2	1-1-0-0-0-0-0-1
27 November	4	0-1-0-1-2-2-2-2	2	0-0-0-1-1-2-1-1	5	1-1-0-1-2-2-2-2
28 November	2	1-1-0-0-0-1-1-1	1	0-0-0-1-0-0-2-0	3	1-1-0-0-0-1-1-1
29 November	2	2-0-0-0-1-1-0-1	1	0-0-0-2-0-0-0-0	3	2-0-0-0-0-0-0-1
30 November	2	1-0-0-1-1-1-0-0	0	0-0-0-0-0-0-0-0	3	1-0-0-0-1-0-0-0
01 December	4	0-1-0-0-2-3-2-1	6	0-1-0-1-3-3-2-1	8	1-1-1-1-2-3-3-2
02 December	9	2-2-3-2-2-2-2-3	15	1-1-3-5-4-3-2-1	7	2-2-3-2-2-3-3-4

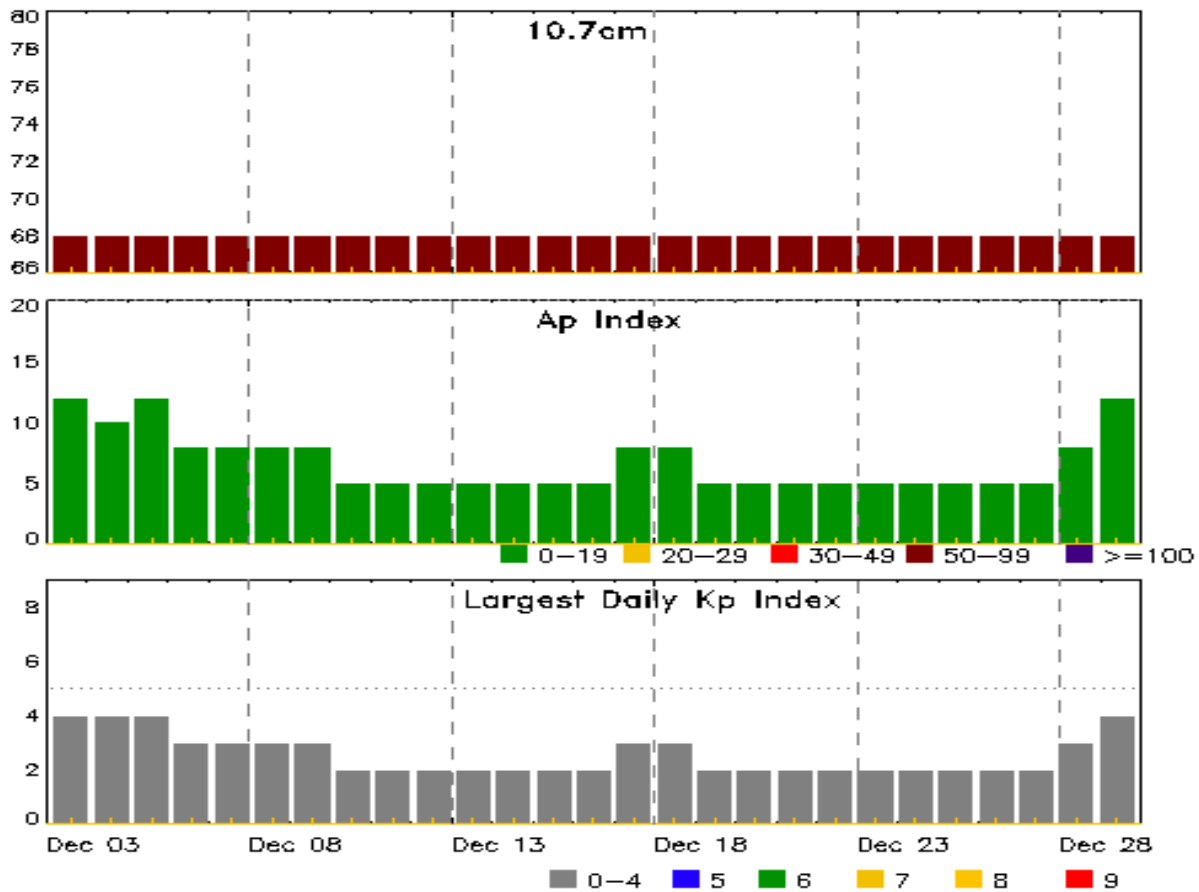


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
28 Nov 1818	WATCH: Geomagnetic Storm Category G1 predicted	
29 Nov 1438	WATCH: Geomagnetic Storm Category G1 predicted	
01 Dec 1725	WARNING: Geomagnetic K = 4	01/1725 - 02/0600
02 Dec 2351	WARNING: Geomagnetic K = 4	02/2350 - 2359
02 Dec 2359	ALERT: Geomagnetic K = 4	02/2359



## 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
03 Dec	68	12	4	17 Dec	68	8	3
04	68	10	4	18	68	8	3
05	68	12	4	19	68	5	2
06	68	8	3	20	68	5	2
07	68	8	3	21	68	5	2
08	68	8	3	22	68	5	2
09	68	8	3	23	68	5	2
10	68	5	2	24	68	5	2
11	68	5	2	25	68	5	2
12	68	5	2	26	68	5	2
13	68	5	2	27	68	5	2
14	68	5	2	28	68	8	3
15	68	5	2	29	68	12	4
16	68	5	2				

### ***Energetic Events***

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

**No Events Observed**

### ***Flare List***

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
26 Nov	1210	1211	1212	A1.1			



## *Region Summary*

Location		Sunspot Characteristics						Flares							
Date	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
		Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		<i>Region 2728</i>													
24 Nov	N06W03	339	20	3	Bxo	4	B								
25 Nov	N06W17	340	20	5	Bxo	5	B								
26 Nov	N06W32	342	plage												
27 Nov	N06W47	343	plage												
28 Nov	N06W62	345	plage												
29 Nov	N06W75	345	plage												
30 Nov	N06W88	345	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 339

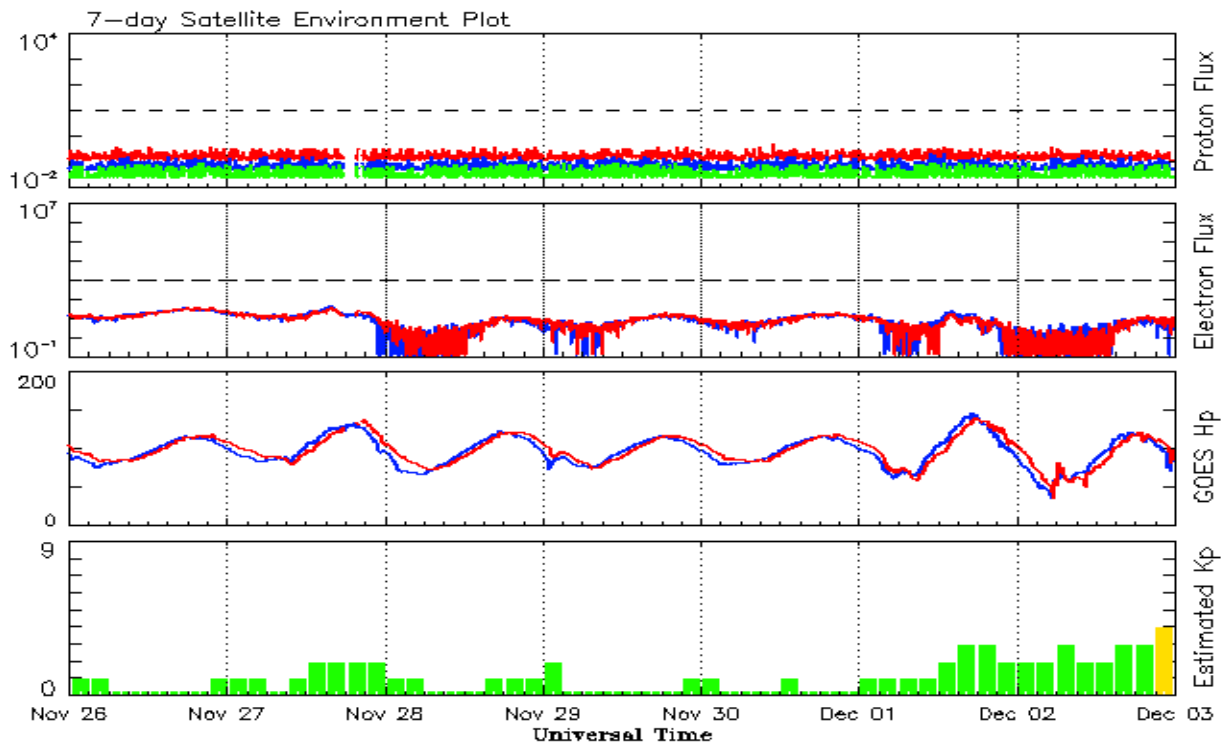


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>									
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	11.8	77.9	76.3	12	10.7
September	42.2	26.2	0.62	18.6	11.0	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	15.7	9.2	72.1	74.6	11	9.5
December	7.6	4.9	0.64	15.7	9.1	71.5	74.4	8	9.4
<b>2018</b>									
January	7.8	4.1	0.51	15.0	8.5	70.0	74.0	6	9.3
February	16.0	6.4	0.40	13.7	7.6	72.0	73.3	7	9.1
March	6.0	1.5	0.25	11.5	5.9	68.4	71.9	8	8.6
April	7.0	5.3	0.76	9.6	4.7	70.0	70.6	7	8.0
May	15.0	7.9	0.53	9.2	4.5	70.9	70.2	8	7.6
June	19.7	9.4	0.48			72.5		7	
July	1.3	1.0	0.77			69.7		6	
August	10.0	5.3	0.53			69.1		10	
September	5.7	2.0	0.35			68.3		9	
October	6.9	2.9	0.42			69.5		7	
November	7.3	3.5	0.48			68.9		6	

**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 November 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.

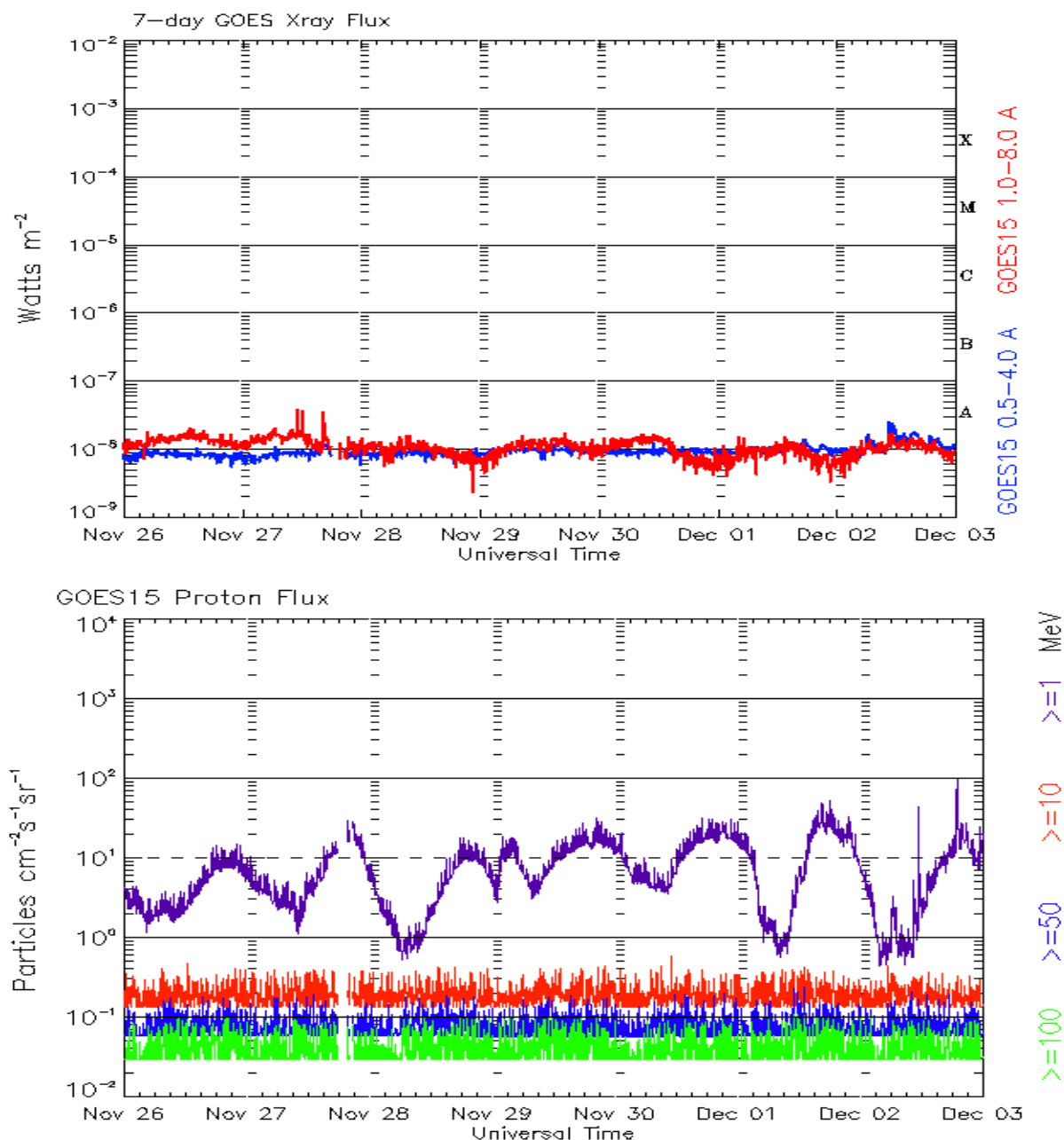
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 26 November 2018*

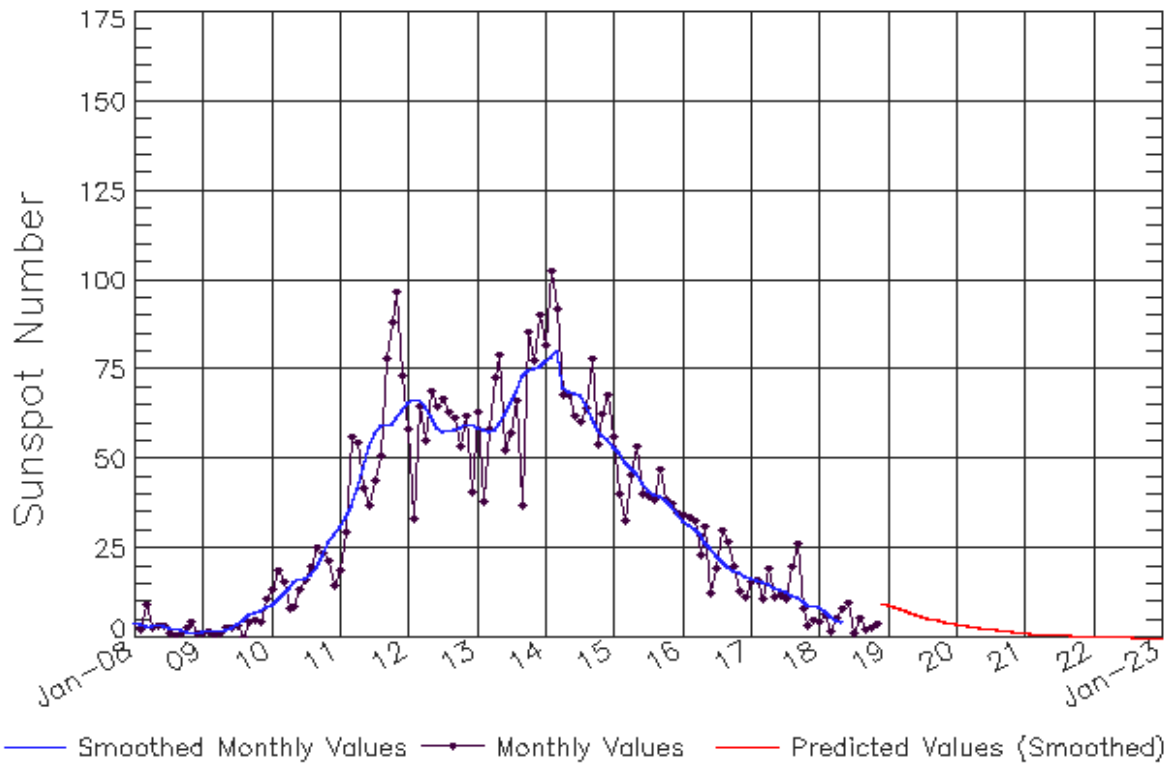
The x-ray plots contains five-minute averages x-ray flux (Watt/m<sup>2</sup>) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral 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 Nov 2018



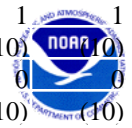
Updated 2018 Dec 3

NOAA/SWPC Boulder, CO USA

## Smoothed Sunspot Number Prediction

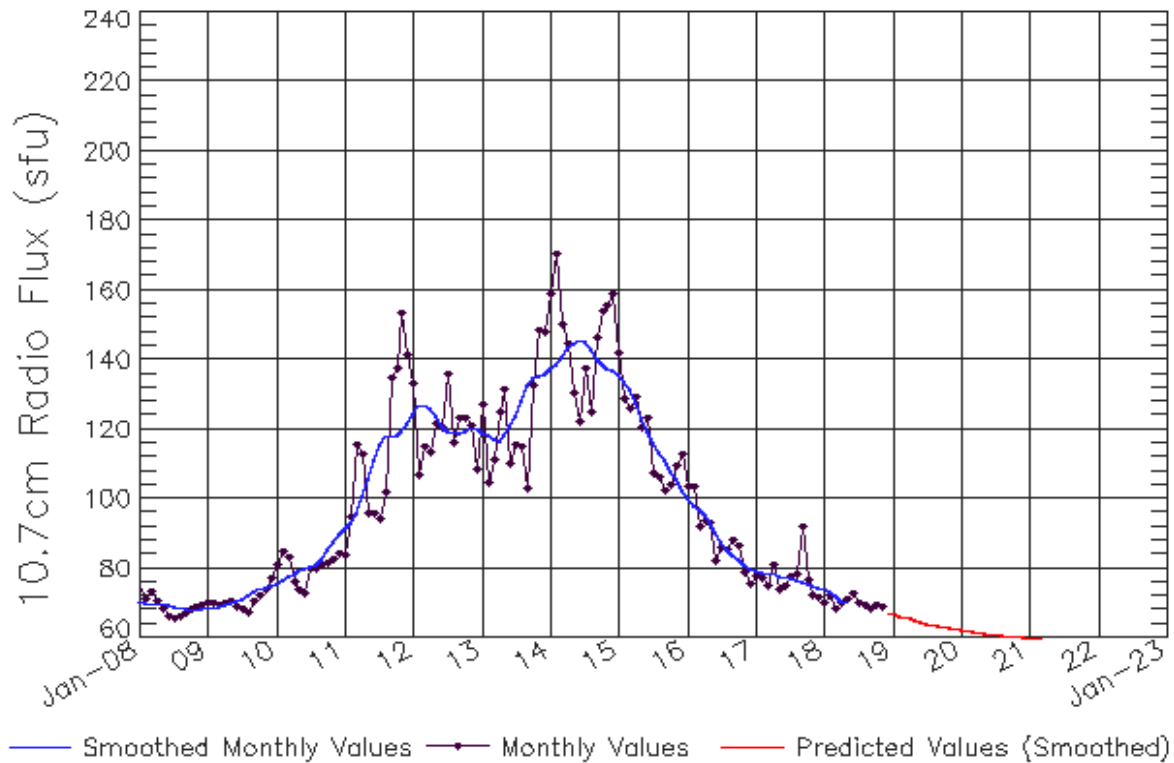
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	7	9	11	13	14	16	17	17	20	23	27	29
	(1)	(2)	(3)	(5)	(5)	(6)	(7)	(7)	(8)	(9)	(9)	(10)
2011	19	30	56	54	42	37	44	51	78	88	97	73
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2012	58	33	64	55	69	65	67	63	61	53	62	41
	(10)	(10)	(10)	(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	2	5	8	9	1	5	2	3	4	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)
2020	4	4	3	3	3	3	2	2	2	2	2	2
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2021	2	1	1	1	1	1	1	1	1	1	1	1
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2022	1	0	0	0	0	0	0	0	0	0	0	0
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

SWPC PRF 257 03 December 2018



# ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Nov 2018



Updated 2018 Dec 3

NOAA/SWPC Boulder, CO USA

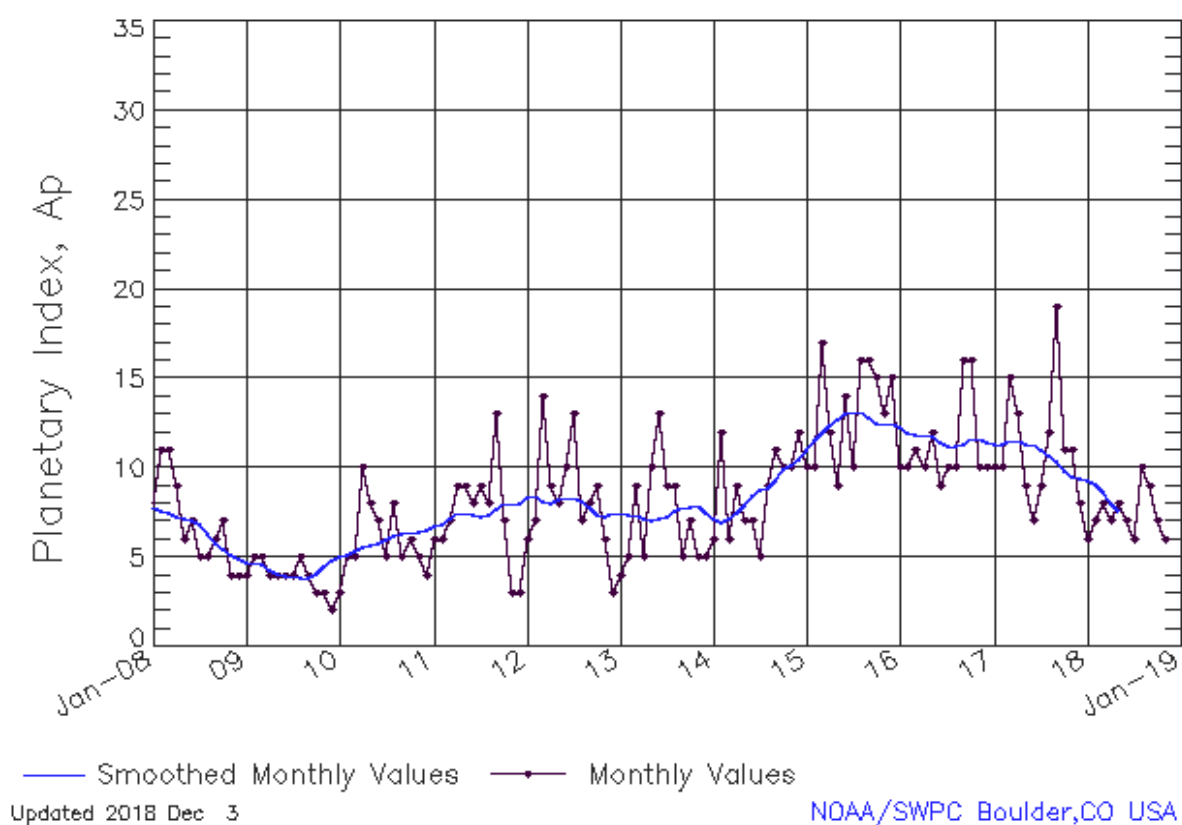
## Smoothed F10.7cm Radio Flux Prediction

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 (***)	74 (***)
2018	74 (***)	73 (***)	72 (***)	71 (***)	70 (***)	70 (1)	70 (1)	69 (2)	69 (3)	69 (4)	68 (4)	68 (5)
2019	67 (6)	67 (7)	66 (8)	66 (8)	65 (9)	65 (9)	64 (9)	64 (9)	63 (9)	63 (9)	63 (9)	63 (9)
2020	62 (9)	62 (9)	62 (9)	62 (9)	61 (9)	61 (9)	61 (9)	61 (9)	61 (9)	60 (9)	60 (9)	60 (9)
2021	60 (9)	60 (9)	60 (9)	60 (9)	60 (9)	60 (9)	60 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)
2022	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)	59 (9)



# ISES Solar Cycle Ap Progression

Observed data through Nov 2018



*Solar Cycle Comparison charts are temporarily unavailable.*

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

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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

The Weekly has been published continuously since 1951 and is available online since 1997.

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<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

