

Space Weather Highlights
29 October - 04 November 2018

SWPC PRF 2253
05 November 2018

Solar activity was at very low levels. The solar disk remained spotless through the reporting period. No Earth-directed CMEs were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels with a peak flux of 28 pfu observed at 30/2015 UTC.

Geomagnetic field activity ranged from quiet to G1 (Minor) storm levels during the period. The majority of the period was under nominal solar wind conditions with solar wind speeds between 285-365 km/s and total field at or below 6 nT. Total field began to increase at 04/0925 UTC and reached a maximum of 16 nT at 04/2225 UTC. The Bz component reached a maximum southward deflection of -12 nT at 04/2129 UTC. Solar wind speed began to increase at 04/1430 UTC to a maximum of 500 km/s at 04/2336 UTC as a positive polarity coronal hole high speed stream (CH HSS) became geoeffective. The geomagnetic field was quiet on 29 Oct - 03 Nov. G1 (Minor) storm levels were observed late on 04 Nov.

Space Weather Outlook
05 November - 01 December 2018

Solar activity is expected to be at very low levels through the forecast period (05 Nov - 01 Dec).

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 07-16 Nov due to CH HSS influence.

Geomagnetic field activity is expected to be at unsettled to active levels on 05-07 Nov, 10-11 Nov, and again on 01 Dec with G1 (Minor) geomagnetic storm levels expected on 05 Nov 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 ⁻⁶ hemi.)	Flux	C	M	X	S	1	2	3	4
29 October	69	0	0	A0.0	0	0	0	0	0	0	0	0
30 October	67	0	0	A0.0	0	0	0	0	0	0	0	0
31 October	68	0	0	A0.0	0	0	0	0	0	0	0	0
01 November	67	0	0	A0.0	0	0	0	0	0	0	0	0
02 November	68	0	0	A0.0	0	0	0	0	0	0	0	0
03 November	67	0	0	A0.0	0	0	0	0	0	0	0	0
04 November	67	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
29 October		5.2e+05	1.7e+04	3.7e+03	1.0e+06	
30 October		5.4e+05	1.6e+04	3.7e+03	8.1e+05	
31 October		5.6e+05	1.6e+04	3.8e+03	8.0e+05	
01 November		3.1e+05	1.7e+04	3.8e+03	2.3e+05	
02 November		3.3e+05	1.7e+04	3.7e+03	4.8e+05	
03 November		3.4e+05	1.7e+04	3.8e+03	5.7e+05	
04 November		1.0e+06	1.7e+04	3.6e+03	3.1e+05	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
29 October	1	0-0-0-0-1-1-0-0	0	0-0-0-0-0-0-0-0	3	1-1-1-1-1-1-1-0
30 October	4	2-2-0-0-1-2-1-1	0	0-0-0-0-0-0-0-0	4	2-2-1-1-0-1-1-1
31 October	3	1-0-0-1-2-1-1-1	2	0-0-0-0-2-2-1-0	4	1-0-0-1-1-1-1-2
01 November	5	1-1-2-2-1-1-2-1	7	0-0-3-4-2-1-0-0	5	1-1-2-2-1-1-1-1
02 November	3	2-1-0-1-1-1-1-0	3	0-0-2-3-1-0-0-0	4	2-1-1-2-1-1-1-0
03 November	3	2-2-0-0-1-0-0-1	0	0-0-0-0-0-0-0-0	4	2-2-1-0-0-0-0-1
04 November	7	1-1-1-1-2-2-3-3	12	0-0-0-1-3-4-4-4	4	1-1-1-1-1-3-5-5

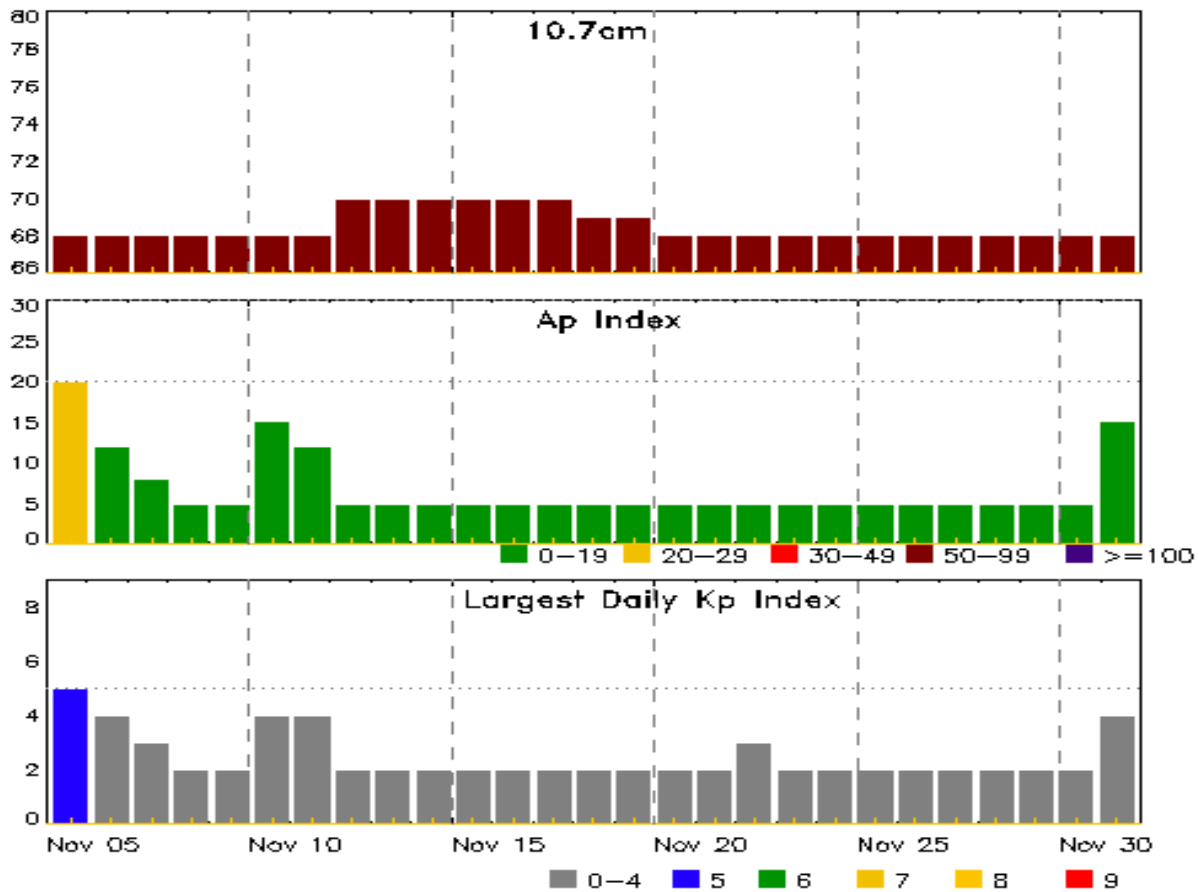


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
31 Oct 2122	WATCH: Geomagnetic Storm Category G1 predicted	
04 Nov 1906	WARNING: Geomagnetic K = 4	04/1906 - 05/0600
04 Nov 1936	ALERT: Geomagnetic K = 4	04/1934
04 Nov 2057	WARNING: Geomagnetic K = 5	04/2056 - 05/0600
04 Nov 2105	ALERT: Geomagnetic K = 5	04/2059
04 Nov 2128	ALERT: Geomagnetic K = 5	04/2127
04 Nov 2239	WARNING: Geomagnetic K = 6	04/2239 - 05/0300



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 Nov	68	20	5	19 Nov	69	5	2
06	68	12	4	20	68	5	2
07	68	8	3	21	68	5	2
08	68	5	2	22	68	5	3
09	68	5	2	23	68	5	2
10	68	15	4	24	68	5	2
11	68	12	4	25	68	5	2
12	70	5	2	26	68	5	2
13	70	5	2	27	68	5	2
14	70	5	2	28	68	5	2
15	70	5	2	29	68	5	2
16	70	5	2	30	68	5	2
17	70	5	2	01 Dec	68	15	4
18	69	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			X-ray	Optical		
	Begin	Max	End		Imp/	Location	Rgn
				Class	Brtns	Lat CMD	#
29 Oct	1828	1829	1830	A1.0			
01 Nov	0932	0937	0939	A2.0			



Region Summary

Location		Sunspot Characteristics					Flares							
Date	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical			
		Lon	10 ⁻⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3

No Active Regions

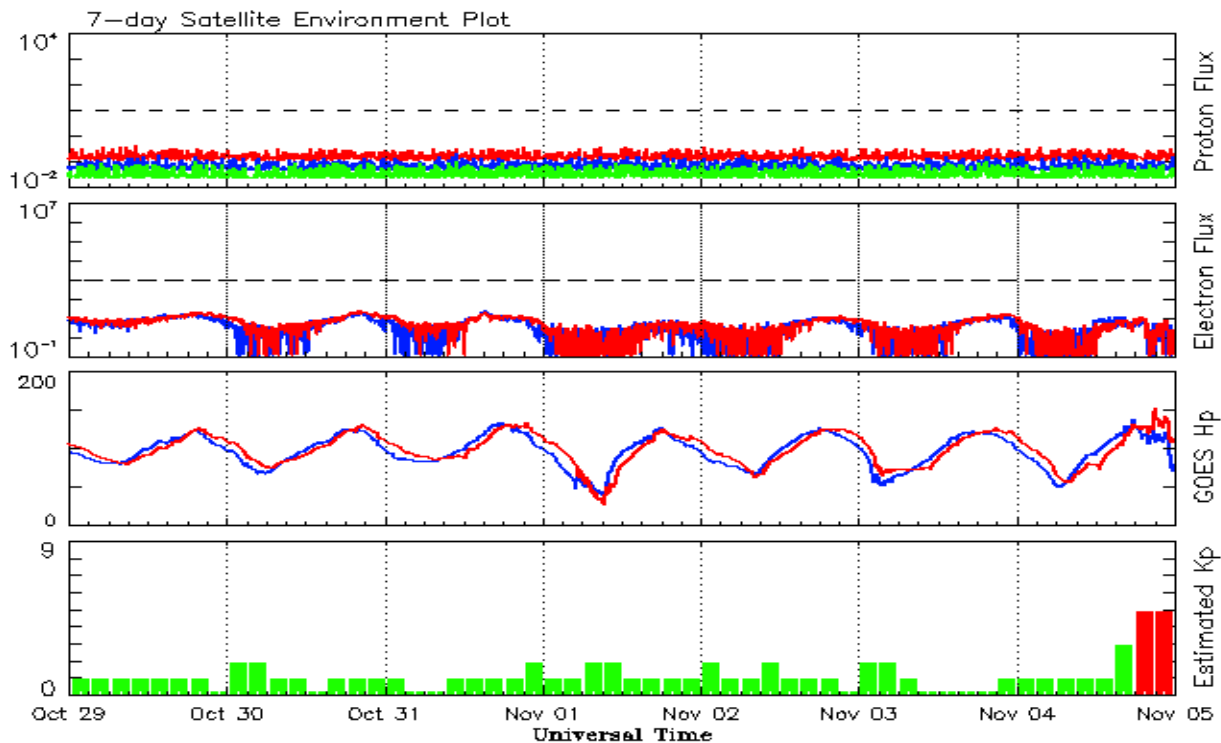


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2016									
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	11.8	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
2018									
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			70.9		8	
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	

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 29 October 2018*

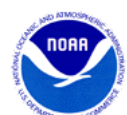
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

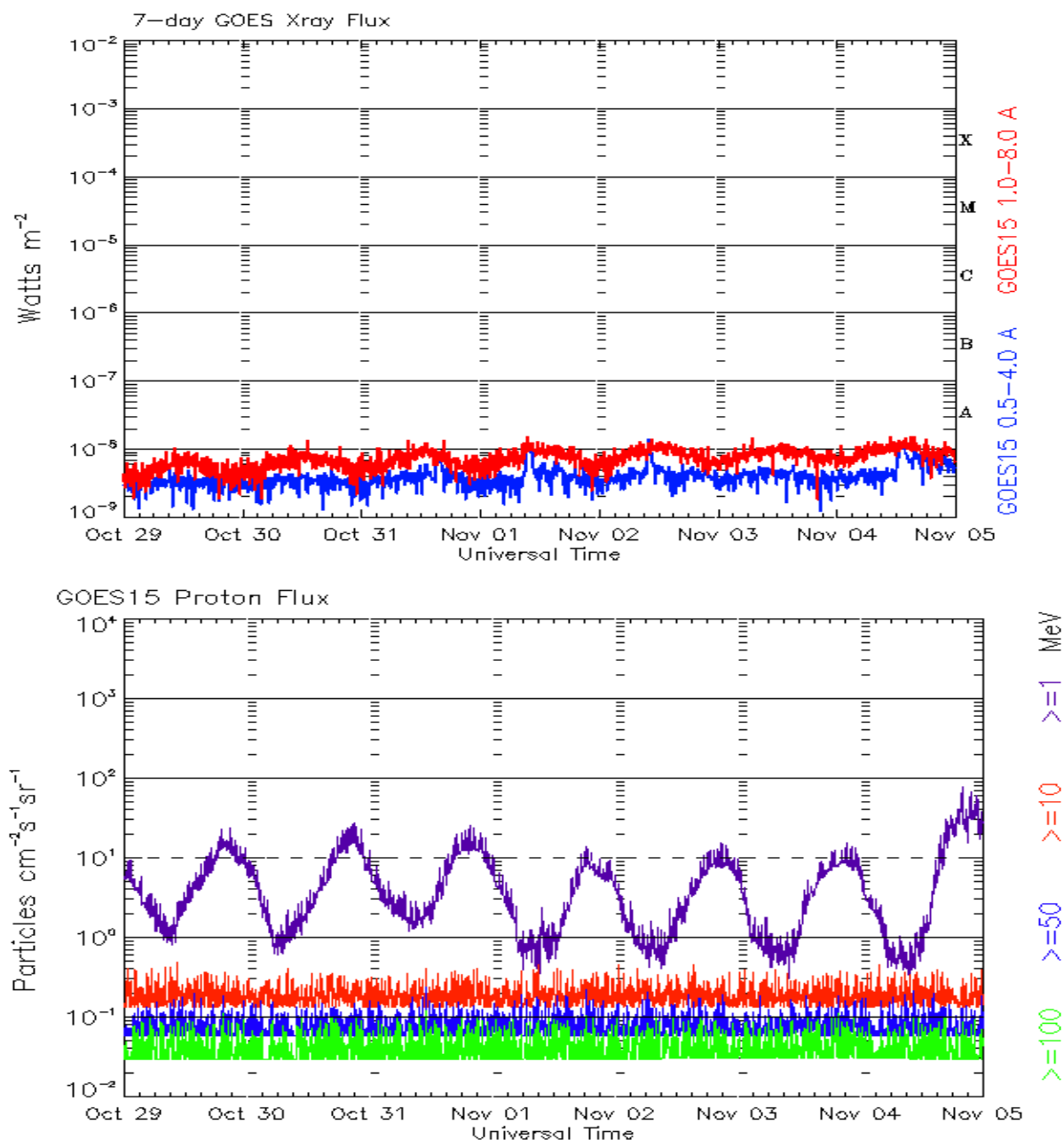
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 29 October 2018*

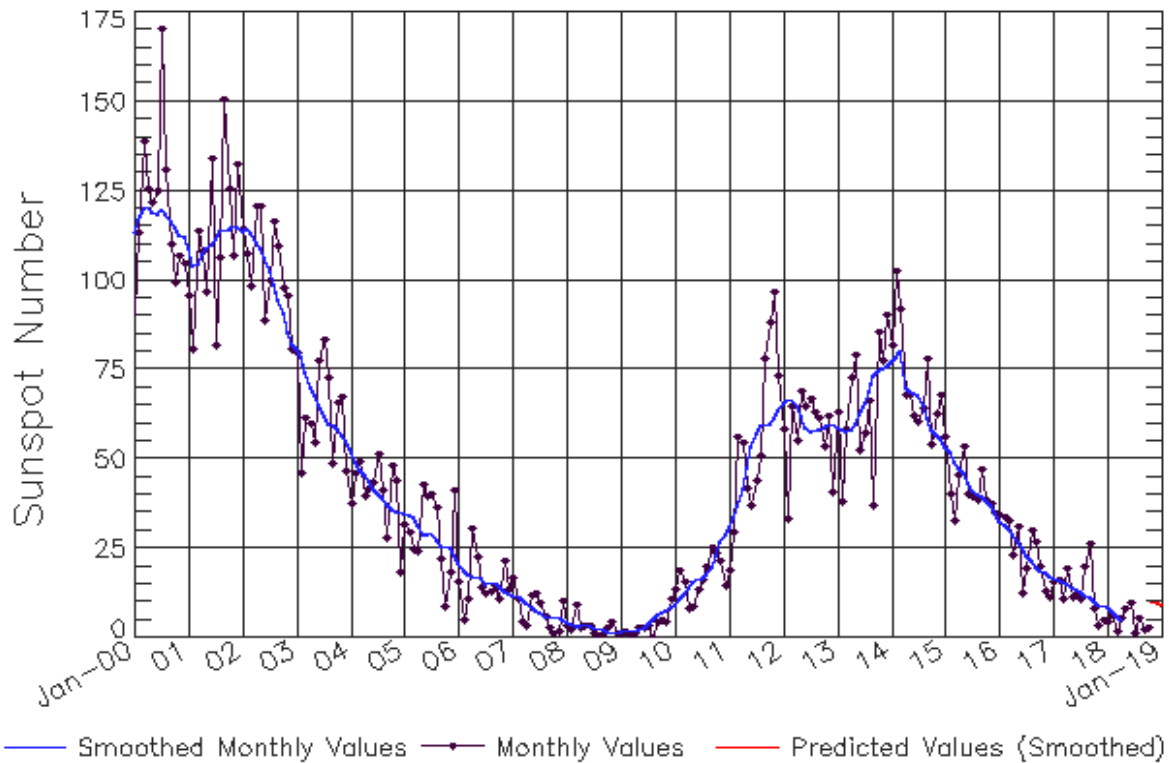
The x-ray plots contains five-minute averages x-ray flux (Watt/m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral 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.



ISES Solar Cycle Sunspot Number Progression

Observed data through Oct 2018



Updated 2018 Nov 5

NOAA/SWPC Boulder, CO USA

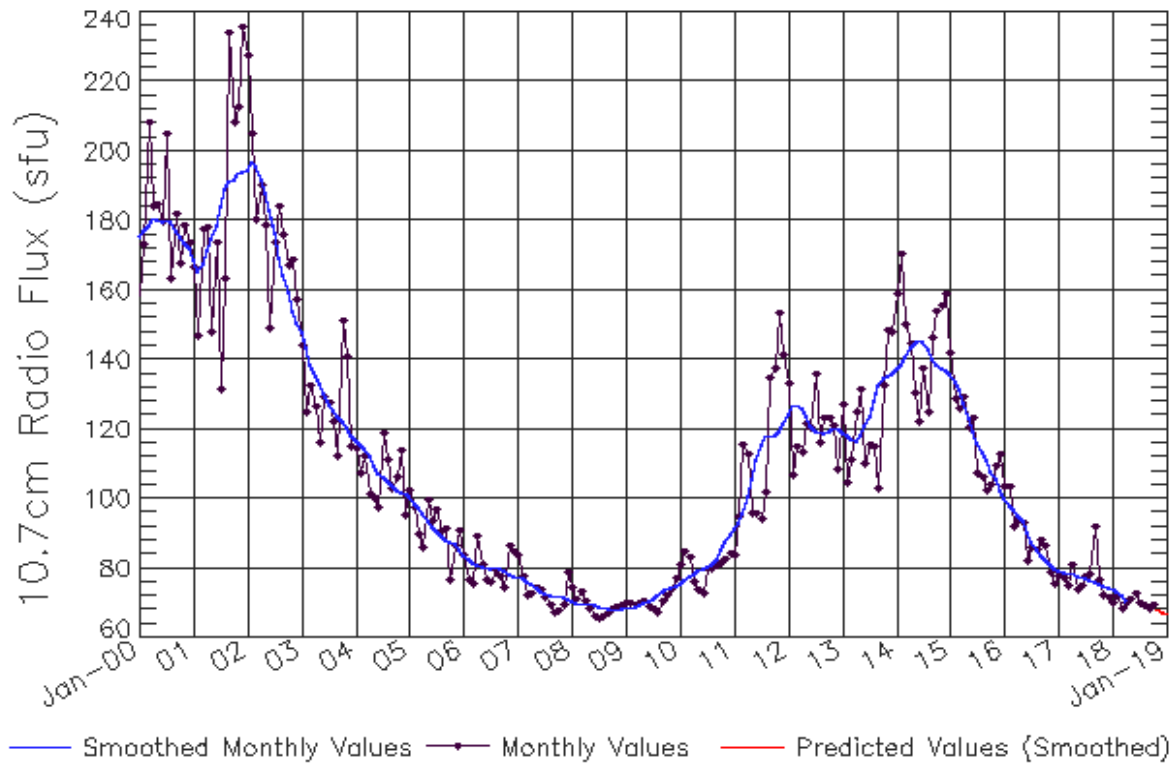
Smoothed Sunspot Number Prediction

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)	8 (10)	9 (10)	1 (10)	5 (10)	2 (10)	3 (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 Oct 2018



Updated 2018 Nov 5

NOAA/SWPC Boulder, CO USA

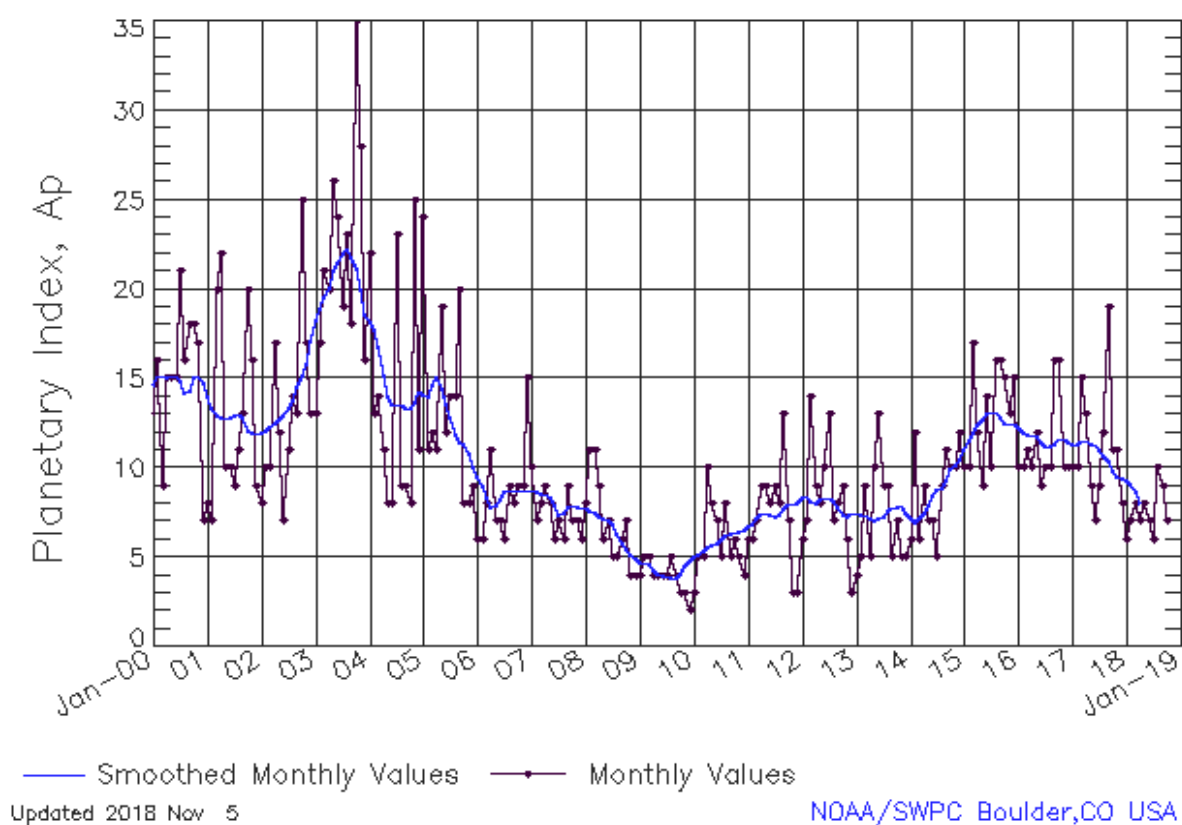
Smoothed F10.7cm Radio Flux Prediction

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 (1)	70 (1)	70 (2)	69 (3)	69 (4)	69 (4)	68 (5)	68 (6)
2019	67 (7)	67 (8)	66 (8)	66 (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 Oct 2018



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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<http://spaceweather.gov/ftpmenu/> -- Some content as ascii text

<http://spaceweather.gov/SolarCycle/> -- Solar Cycle Progression web site

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http://spaceweather.gov/weekly/Usr_guide.pdf -- User Guide

