

Solar activity was at low levels. Region 2733 (N05, Lo=261, class/area Dso/090 on 27 Jan) produced the strongest flare of the period, a C5 at 30/0611 UTC. The region produced several other weaker B and C-class flares before rotating around the limb on 30 Jan. 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 high levels. Flux levels decreased from high to normal to moderate levels on 31 Jan through most of 31 Feb due to geomagnetic activity associated with influence from a negative polarity CH HSS. Moderate to high levels were observed for the remainder of the reporting period.

Geomagnetic field activity was ranged from quiet to G1 (Minor) geomagnetic storm levels. Solar wind parameters became enhanced on 31 Jan due to the onset of influence from a negative polarity CH HSS. The passage of the CIR produced sustained southward Bz, with a maximum of -16 nT observed at 31/2026 UTC. The geomagnetic field responded with an isolated period of G1 (Minor) storm conditions late on 31 Jan. The wind speeds increased to between 550-625 km/s after 01/0920 UTC and persisted until the end of 03 Feb. An accompanying decrease in Bt to between 4-7 nT resulted in a geomagnetic response of quiet to active conditions over 01-03 Feb. The remainder of the reporting period was quiet under nominal solar wind conditions.

Space Weather Outlook
04 February - 02 March 2019

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 range from normal to high levels. High levels are expected on 04-10 Feb and 21 Feb - 02 Mar; moderate levels are expected on 11-13 Feb; mostly normal levels are expected on 14-20 Feb. All elevated levels of electron flux are anticipated due to influence from multiple, recurrent CH HSSs.

Geomagnetic field activity is expected to range from quiet to G1 (Minor) geomagnetic storm levels. G1 (Minor) conditions are expected on 20 Feb and 28 Feb - 01 Mar; active conditions are expected on 05 Feb, 19 Feb, 21 Feb and 27 Feb; unsettled conditions are expected on 04 Feb, 06 Feb, 22 Feb and 02 Mar. All enhancements in geomagnetic field conditions are anticipated due to multiple, recurrent CH HSSs. The remainder of the outlook period is expected to be mostly quiet under nominal solar wind conditions.



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
28 January	76	16	80	A3.8	0	0	0	1	0	0	0	0
29 January	73	15	90	A5.1	2	0	0	1	0	0	0	0
30 January	74	12	90	A5.5	2	0	0	0	0	0	0	0
31 January	72	0	0	A3.6	0	0	0	0	0	0	0	0
01 February	72	0	0	A1.2	0	0	0	0	0	0	0	0
02 February	71	0	0	A0.0	0	0	0	0	0	0	0	0
03 February	71	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
	28 January	1.6e+06	1.7e+04	3.7e+03	7.3e+07	
29 January	1.6e+06	1.6e+04	3.6e+03	5.6e+07		
30 January	2.7e+06	1.7e+04	4.0e+03	6.7e+07		
31 January	1.6e+06	1.7e+04	3.8e+03	1.1e+07		
01 February	2.0e+06	1.6e+04	3.6e+03	2.2e+07		
02 February	1.6e+06	1.6e+04	3.8e+03	2.6e+08		
03 February	1.0e+06	1.6e+04	3.8e+03	4.1e+08		

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	28 January	0	1-0-0-0-0-0-0-0	1	0-0-0-1-1-0-0-0	1
29 January	0	1-0-0-0-0-0-0-0	2	0-0-0-2-2-0-0-0	2	1-0-0-0-1-0-0-0
30 January	0	0-0-0-0-0-0-1-0	0	0-0-0-0-0-0-1-0	2	0-0-0-0-0-0-1-1
31 January	12	1-0-1-1-3-2-3-5	23	0-0-2-3-6-5-2-4	14	1-0-1-1-3-3-3-5
01 February	10	2-3-3-2-2-2-2-3	40	3-4-5-5-6-6-3-2	17	3-4-3-2-3-3-3-4
02 February	11	3-3-3-2-2-3-2-2	24	3-3-4-5-5-4-2-2	17	4-4-3-2-2-4-3-3
03 February	8	3-3-3-0-1-1-1-2	12	3-3-3-2-3-3-2-2	22	4-3-3-1-1-2-2-3

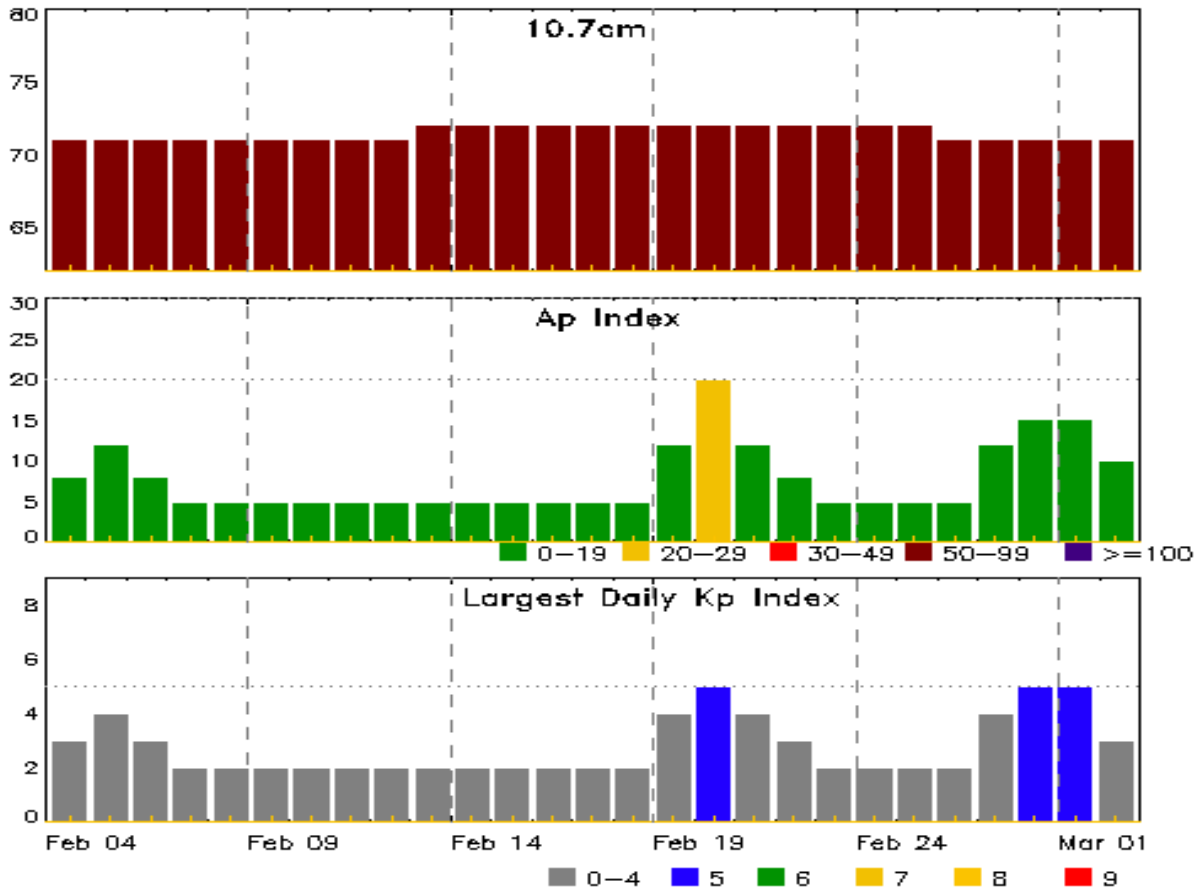


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
28 Jan 1413	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	25/1730
29 Jan 1943	WATCH: Geomagnetic Storm Category G1 predicted	
30 Jan 1617	WATCH: Geomagnetic Storm Category G1 predicted	
30 Jan 1626	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	30/1627
31 Jan 1317	WARNING: Geomagnetic K = 4	31/1318 - 2100
31 Jan 1346	WARNING: Geomagnetic K = 5	31/1347 - 1800
31 Jan 2029	EXTENDED WARNING: Geomagnetic K = 4	31/1318 - 01/0900
31 Jan 2156	ALERT: Geomagnetic K = 4	31/2149
31 Jan 2200	WARNING: Geomagnetic K = 5	31/2201 - 01/0300
31 Jan 2219	ALERT: Geomagnetic K = 5	31/2219
31 Jan 2246	WARNING: Geomagnetic K = 6	31/2247 - 01/0300
01 Feb 0251	EXTENDED WARNING: Geomagnetic K = 5	31/2201 - 01/0900
01 Feb 0256	EXTENDED WARNING: Geomagnetic K = 4	31/1318 - 01/1500
01 Feb 0854	EXTENDED WARNING: Geomagnetic K = 5	31/2201 - 01/1500
01 Feb 1456	EXTENDED WARNING: Geomagnetic K = 4	31/1318 - 01/2359
01 Feb 2220	EXTENDED WARNING: Geomagnetic K = 4	31/1318 - 02/1200
01 Feb 2234	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	01/2230
02 Feb 1424	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	01/2230
02 Feb 1629	WARNING: Geomagnetic K = 4	02/1635 - 2359
02 Feb 1803	ALERT: Geomagnetic K = 4	02/1759
03 Feb 0247	WARNING: Geomagnetic K = 4	03/0247 - 1500
03 Feb 0300	ALERT: Geomagnetic K = 4	03/0259
03 Feb 0859	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	01/2230



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
04 Feb	71	8	3	18 Feb	72	5	2
05	71	12	4	19	72	12	4
06	71	8	3	20	72	20	5
07	71	5	2	21	72	12	4
08	71	5	2	22	72	8	3
09	71	5	2	23	72	5	2
10	71	5	2	24	72	5	2
11	71	5	2	25	72	5	2
12	71	5	2	26	71	5	2
13	72	5	2	27	71	12	4
14	72	5	2	28	71	15	5
15	72	5	2	01 Mar	71	15	5
16	72	5	2	02	71	10	3
17	72	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Optical Location Lat CMD	Optical Rgn #
	Begin	Max	End				
28 Jan	0100	0104	0108	B1.1	SF	N04W50	2733
28 Jan	1732	1737	1916	B1.2			2733
28 Jan	1948	1953	1958	B1.9			2733
29 Jan	0503	0507	0523	B2.4	SF	N03W67	2733
29 Jan	0636	0641	0645	B2.6			2733
29 Jan	0720	0736	0742	B8.4			2733
29 Jan	1021	1034	1040	C1.9			2733
29 Jan	1503	1522	1536	B3.5			2733
29 Jan	2118	2129	2148	C2.0			2733
30 Jan	0209	0214	0220	B1.7			2733
30 Jan	0433	0436	0440	B1.6			2733
30 Jan	0513	0527	0535	B3.6			2733
30 Jan	0556	0611	0619	C5.2			2733
30 Jan	0741	0744	0746	B3.2			2733
30 Jan	0828	0834	0843	B2.3			2733
30 Jan	1031	1038	1043	B8.5			2733
30 Jan	1116	1124	1132	C1.3			2733
30 Jan	1410	1415	1418	B1.7			2733
30 Jan	1522	1526	1529	B1.1			2733
30 Jan	1700	1705	1707	B9.7			2733
30 Jan	1920	1928	2000	B4.1			2733
30 Jan	2027	2034	2040	B5.3			2733
30 Jan	2228	2232	2235	B2.5			2733
31 Jan	0054	0058	0103	B7.2			2733
31 Jan	0221	0229	0240	B2.8			2733
31 Jan	1538	1543	1548	B1.2			2733
31 Jan	1642	1653	1716	B1.5			2733
01 Feb	0457	0518	0530	B1.5			2733
01 Feb	0837	0913	0944	B1.8			2733



Region Summary

Date	Location		Sunspot Characteristics				Flares													
	Lat CMD	Lon	Helio 10 ⁻⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical								
									C	M	X	S	1	2	3	4				
<i>Region 2733</i>																				
22 Jan	N06E22	257	20	4	Cro	8	B													
23 Jan	N06E08	258	30	5	Cro	9	B													
24 Jan	N06W07	259	30	8	Dro	9	B													
25 Jan	N06W20	259	50	9	Dri	17	B													
26 Jan	N06W34	260	80	10	Dsi	16	B	1				1								
27 Jan	N05W48	261	90	10	Dso	12	B					1								
28 Jan	N06W61	261	80	10	Cso	6	B					1								
29 Jan	N05W76	263	90	10	Cso	5	B	2				1								
30 Jan	N04W89	262	90	9	Cao	2	B	2												
								5	0	0	0	4	0	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 259

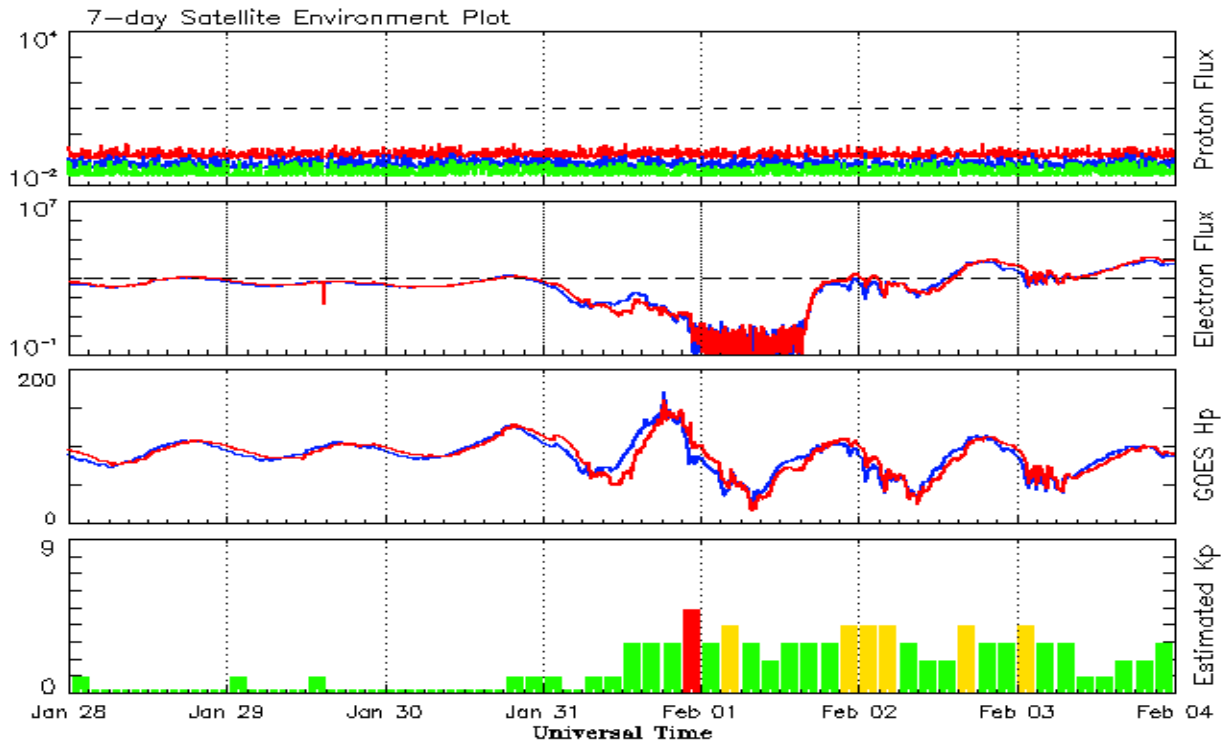


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2017									
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	9.2	4.5	70.9	70.2	8	7.6
June	19.7	9.4	0.48	9.1	4.4	72.5	70.0	7	7.4
July	1.3	1.0	0.77	9.4	4.3	69.7	70.0	6	7.3
August	10.0	5.2	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	
December	5.6	1.9	0.34			70.0		7	
2019									
January	16.0	4.7	0.29			71.6		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 28 January 2019*

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.

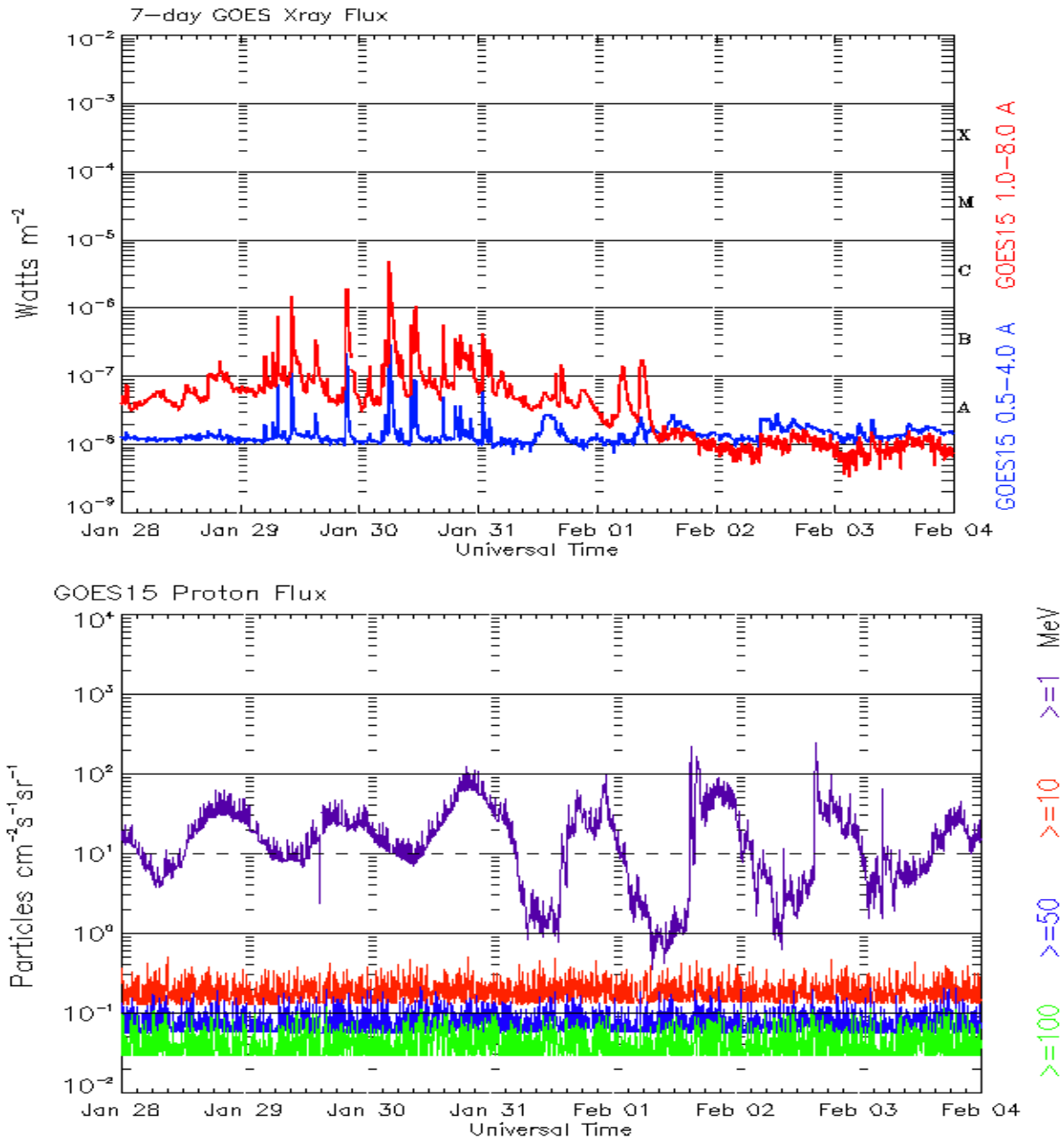
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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.

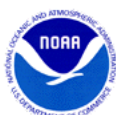




*Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 28 January 2019*

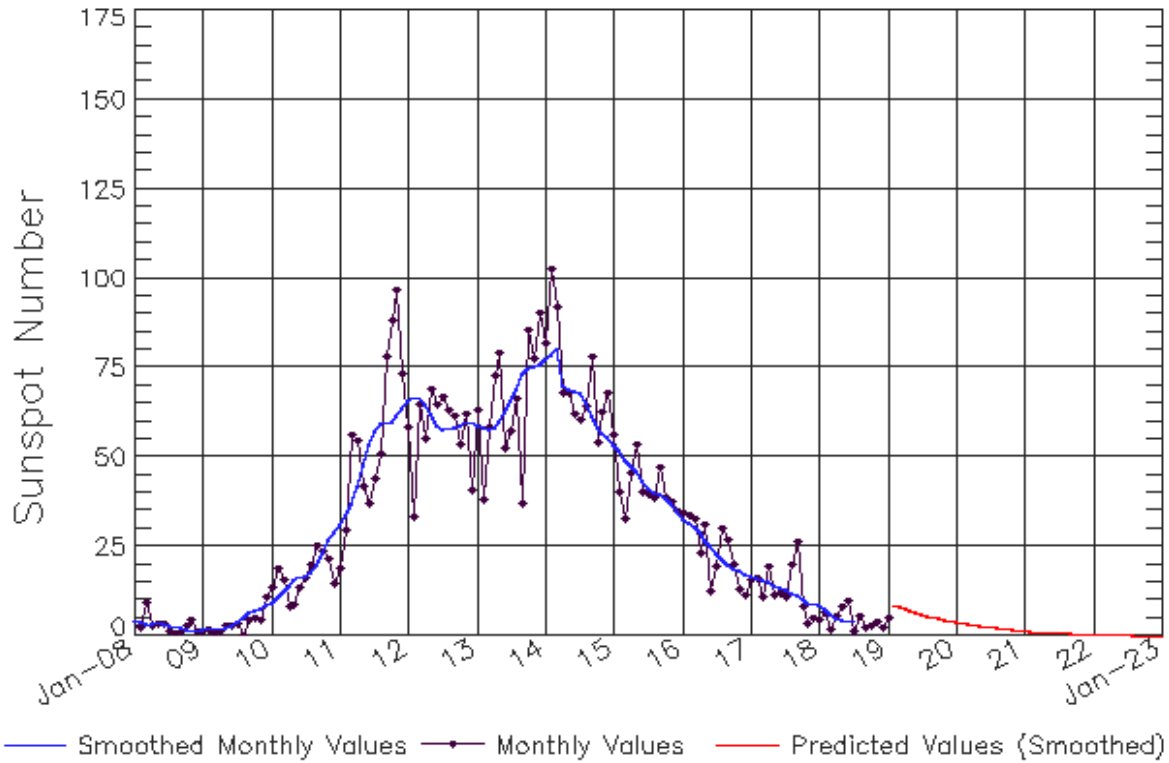
The x-ray plots contains five-minute averages x-ray flux (Watt/m²) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/cm² -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 Jan 2019



Updated 2019 Feb 4

NOAA/SWPC Boulder, CO USA

Smoothed Sunspot Number Prediction

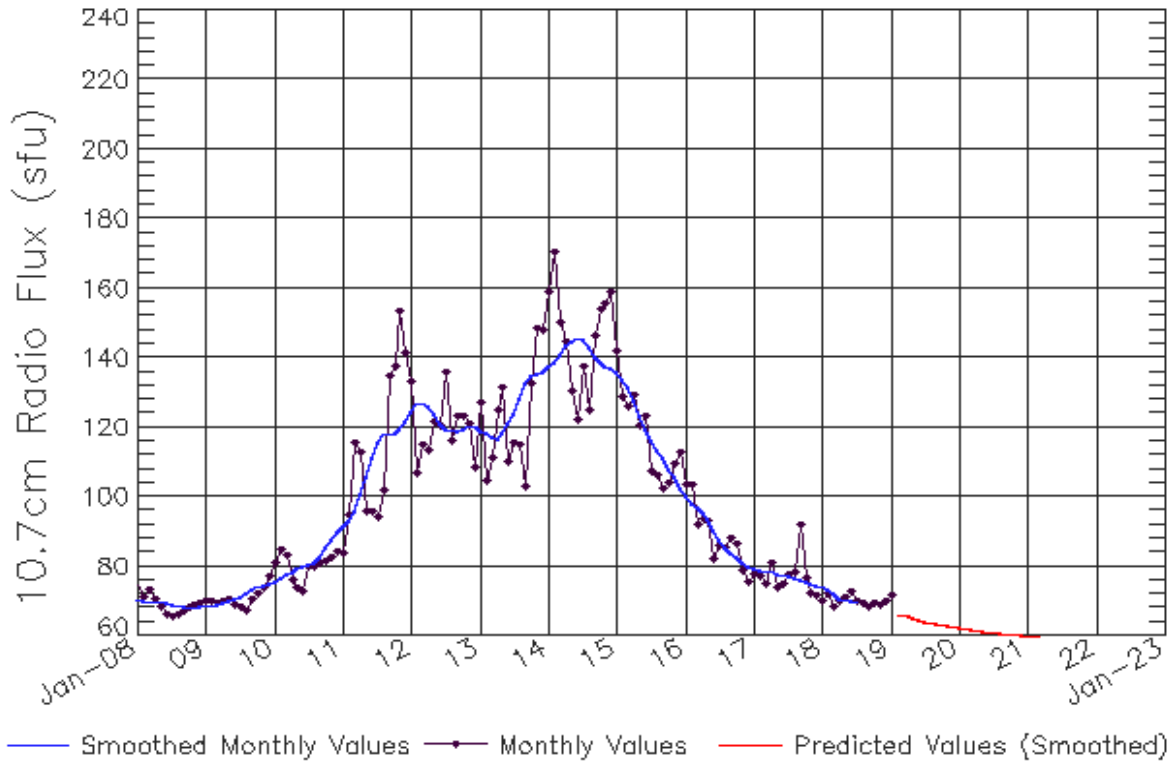
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	7	9	11	13	14	16	17	17	20	23	27	29
	(1)	(2)	(3)	(5)	(5)	(6)	(7)	(7)	(8)	(9)	(9)	(10)
2011	19	30	56	54	42	37	44	51	78	88	97	73
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2012	58	33	64	55	69	65	67	63	61	53	62	41
	(10)	(10)	(10)	(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	2
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2019	5	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 2266 04 February 2019



ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Jan 2019



Updated 2019 Feb 4

NOAA/SWPC Boulder, CO USA

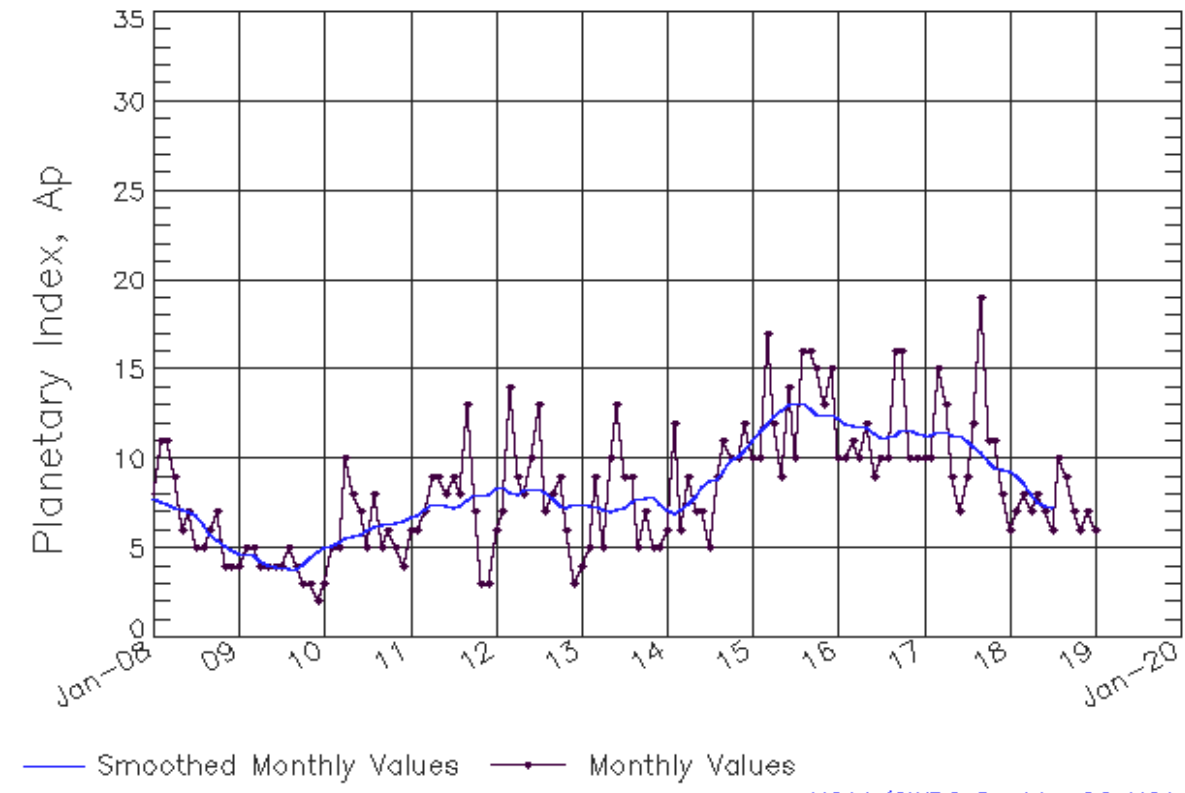
Smoothed F10.7cm Radio Flux Prediction

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 (***)	70 (***)	70 (1)	70 (1)	69 (2)	69 (3)	68 (4)
2019	68 (4)	67 (5)	67 (6)	66 (7)	66 (8)	65 (8)	65 (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 Jan 2019



Updated 2019 Feb 4

NOAA/SWPC Boulder, CO USA

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/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 -- User Guide

