

Space Weather Highlights
02 March - 08 March 2020

SWPC PRF 2323
09 March 2020

Solar activity was very low. A new spot group emerged in the SE quadrant on 07 Mar and was numbered Region 2758 (S29, L=229, class/area Cro/020 on 08 Mar). No Earth-directed CMEs were observed during the reporting period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels with a peak flux of 923 pfu observed at 02/1455 UTC.

Geomagnetic field activity ranged from quiet to unsettled levels. Solar wind parameters were slightly enhanced midday on 02 Mar as solar wind speed reached a peak of 488 km/s at 02/1318 UTC, likely due to a connection with an extension off the southern crown, polar coronal hole high speed stream (CH HSS). Solar wind speed gradually diminished to nominal levels by 04 Mar. The geomagnetic field responded with mostly quiet conditions with an isolated unsettled period observed on 04 Mar.

Space Weather Outlook
09 March - 04 April 2020

Solar activity is expected to continue at very low levels.

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 19-21 Mar due to CH HSS influence.

Geomagnetic field activity is expected to be reach unsettled levels on 10-11, 18-20, 27-28 Mar and active levels on 19 and 27 Mar due to recurrent CH HSS effects. Mostly quiet levels are expected for the remainder of the outlook period.



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
02 March	69	0	0	A0.0	0	0	0	0	0	0	0	0
03 March	70	0	0	A0.0	0	0	0	0	0	0	0	0
04 March	70	0	0	A0.0	0	0	0	0	0	0	0	0
05 March	70	0	0	A0.0	0	0	0	0	0	0	0	0
06 March	70	0	0	A0.0	0	0	0	0	0	0	0	0
07 March	70	0	0	A0.0	0	0	0	0	0	0	0	0
08 March	70	13	20	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	>2MeV
	02 March	1.3e+05	4.5e+04
03 March	9.7e+04	4.6e+04	8.9e+06
04 March	1.0e+05	4.6e+04	7.2e+06
05 March	2.0e+05	4.5e+04	3.5e+06
06 March	1.3e+05	4.6e+04	1.9e+06
07 March	2.1e+05	4.6e+04	1.3e+06
08 March	1.5e+05	4.6e+04	1.5e+06

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	02 March	4	2-1-0-1-2-2-1-1	5	1-0-0-3-3-0-0-1	5
03 March	4	2-1-1-1-2-1-1-1	7	2-0-2-3-3-3-0-0	6	2-1-1-2-2-2-1-2
04 March	4	0-2-1-1-2-2-1-1	9	0-0-2-4-3-3-2-1	7	0-2-1-1-2-3-2-2
05 March	3	1-1-1-1-2-1-1-0	1	0-0-0-2-1-0-0-0	4	1-1-1-1-2-1-1-0
06 March	4	1-1-1-2-2-2-1-0	7	0-0-0-4-3-3-0-0	5	1-1-1-2-2-2-0-0
07 March	5	1-1-2-1-2-2-1-1	13	0-0-4-4-5-1-0-0	5	1-2-2-2-2-1-0-0
08 March	3	1-1-2-0-1-1-1-1	2	1-0-0-1-1-1-1-0	5	1-2-2-1-1-1-2-1

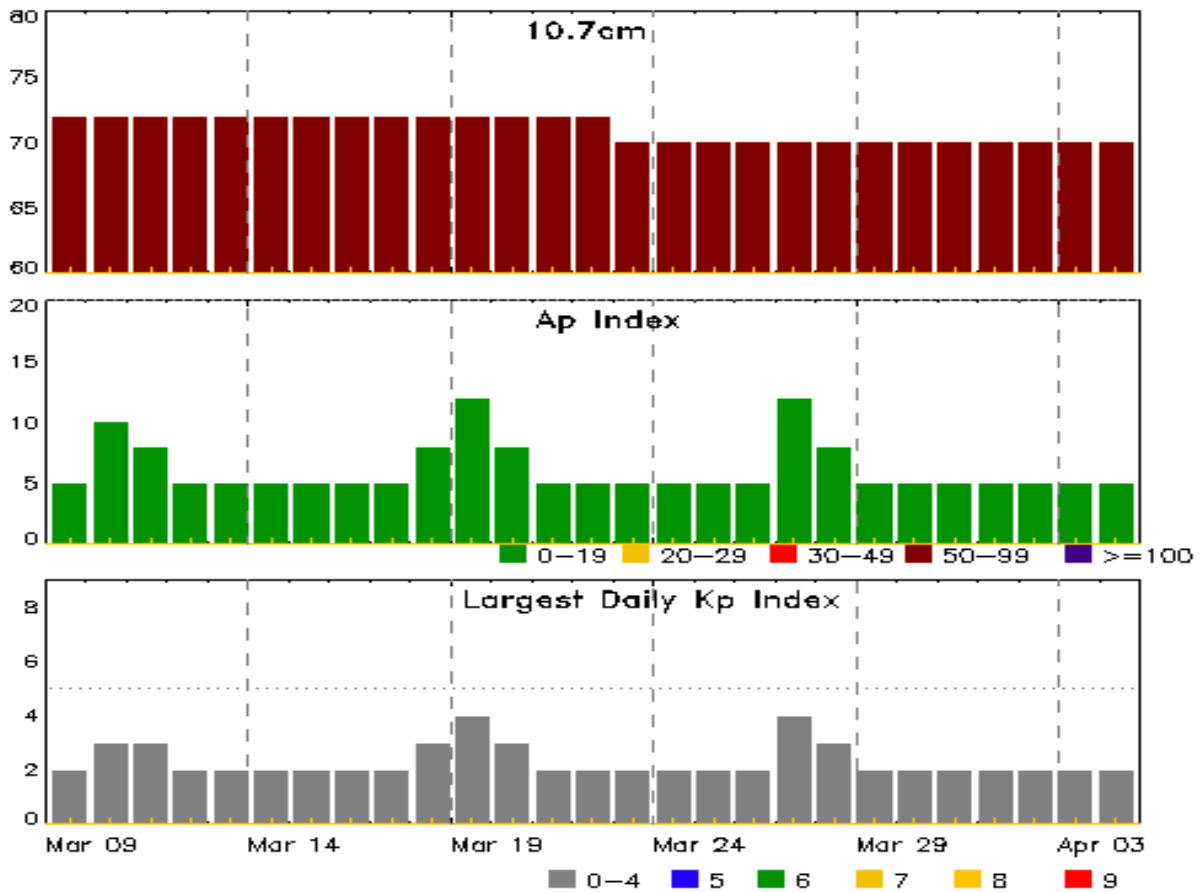


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
No Alerts or Warnings Issued		



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 Mar	72	5	2	23 Mar	70	5	2
10	72	10	3	24	70	5	2
11	72	8	3	25	70	5	2
12	72	5	2	26	70	5	2
13	72	5	2	27	70	12	4
14	72	5	2	28	70	8	3
15	72	5	2	29	70	5	2
16	72	5	2	30	70	5	2
17	72	5	2	31	70	5	2
18	72	8	3	01 Apr	70	5	2
19	72	12	4	02	70	5	2
20	72	8	3	03	70	5	2
21	72	5	2	04	70	5	2
22	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	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
04 Mar	1333	1334	1335	A8.1			



Region Summary

Date	Location		Sunspot Characteristics				Flares														
	Lat	CMD	Helio Lon	Area 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical									
									C	M	X	S	1	2	3	4					
<i>Region 2758</i>																					
08 Mar	S29E26		229	20	3	Cro	3	B	0	0	0	0	0	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 229



Recent Solar Indices (preliminary)
Observed monthly mean values

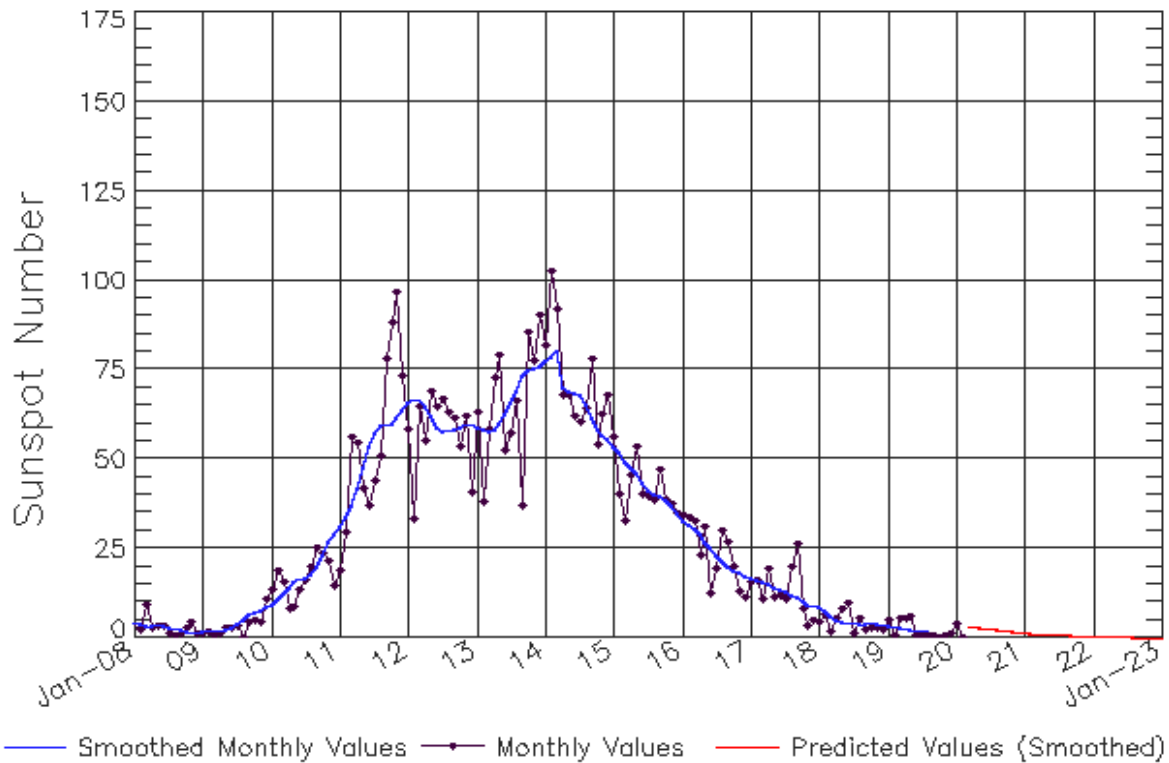
Month	Sunspot Numbers					Radio Flux		Geomagnetic		
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth	
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value	
2018										
March		6.0	1.5	0.25	11.5	5.9	68.4	71.9	8	8.6
April		7.0	5.3	0.76	9.6	4.7	70.0	70.6	7	8.0
May		15.0	7.9	0.53	9.2	4.5	70.9	70.2	8	7.6
June		19.7	9.4	0.48	9.1	4.3	72.5	70.0	7	7.4
July		1.3	1.0	0.77	9.4	4.2	69.7	70.0	6	7.3
August		10.0	5.2	0.53	9.0	4.0	69.1	70.0	10	7.3
September		5.7	2.0	0.35	8.7	3.9	68.3	70.1	9	7.3
October		6.9	2.9	0.42	9.2	4.1	69.5	70.3	7	7.1
November		7.3	2.9	0.48	9.5	4.0	68.9	70.4	6	7.0
December		5.6	1.9	0.34	9.3	3.6	70.0	70.3	7	6.9
2019										
January		16.0	4.6	0.29	9.0	3.2	71.6	70.0	6	6.8
February			0.5		8.7	3.0	70.6	69.8	7	6.7
March		14.8	5.6	0.39	8.3	2.8	71.5	69.7	6	6.6
April		11.5	5.5	0.48	7.9	2.6	72.4	69.6	6	6.7
May		18.1	5.9	0.34	7.4	2.3	71.3	69.6	7	6.7
June		11.6	0.7	0.06	7.3	2.2	68.1	69.6	5	6.5
July		1.6	0.5	0.31	7.0	2.1	67.1	69.7	6	6.3
August		2.5	0.3	0.16	7.0	2.1	67.0	69.8	7	6.2
September		2.6	0.7	0.27			68.1		10	
October		1.8	0.2	0.11			67.4		8	
November		1.1	0.3	0.27			70.2		4	
December		7.2	1.0	0.14			70.9		4	
2020										
January		9.2	3.8	0.41			72.3		5	
February		5.5	0.2	0.04			71.0		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.



ISES Solar Cycle Sunspot Number Progression

Observed data through Feb 2020

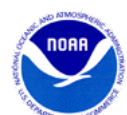


Updated 2020 Mar 9

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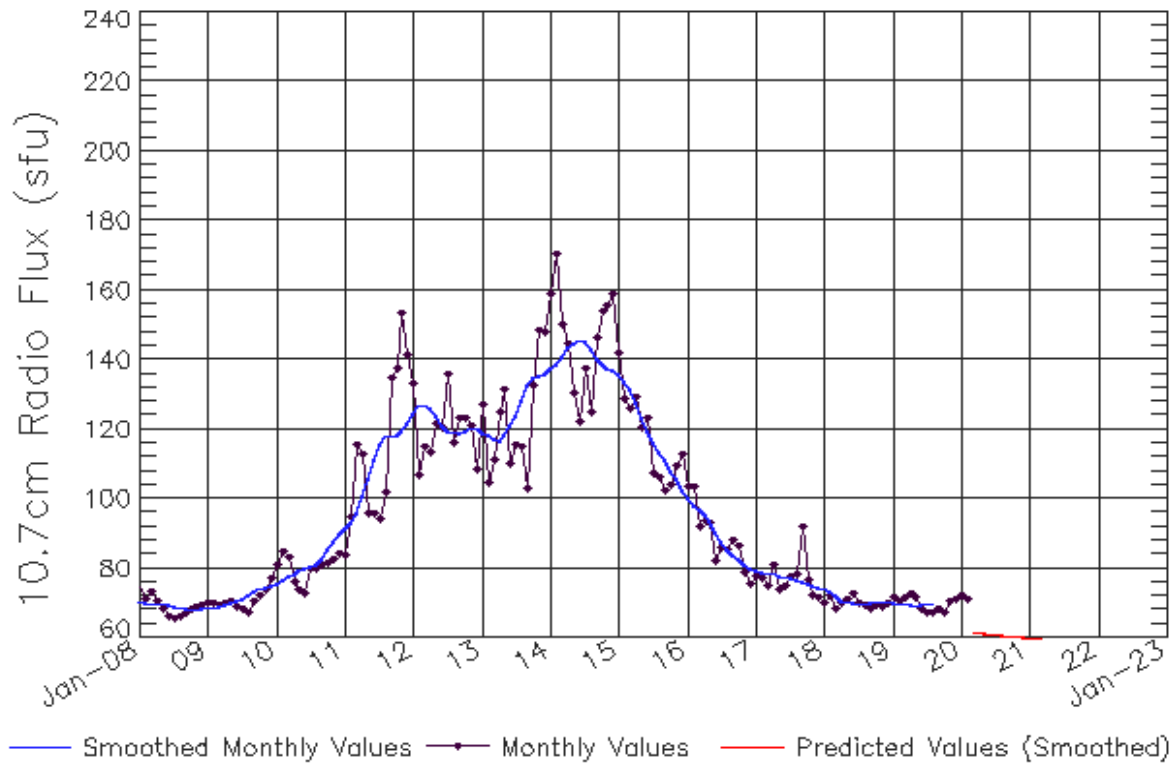
Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	33	32	30	29	27	25	23	22	20	19	18	17
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2017	17	16	15	15	14	13	13	12	11	10	9	9
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2018	9	8	6	5	5	4	4	4	4	4	4	4
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2019	3	3	3	3	2	2	2	2	2	2	2	2
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(2)	(3)	(5)
2020	2	2	2	2	2	2	2	2	2	2	2	2
	(5)	(6)	(7)	(7)	(8)	(9)	(9)	(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)



ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Feb 2020



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NOAA/SWPC Boulder, CO USA

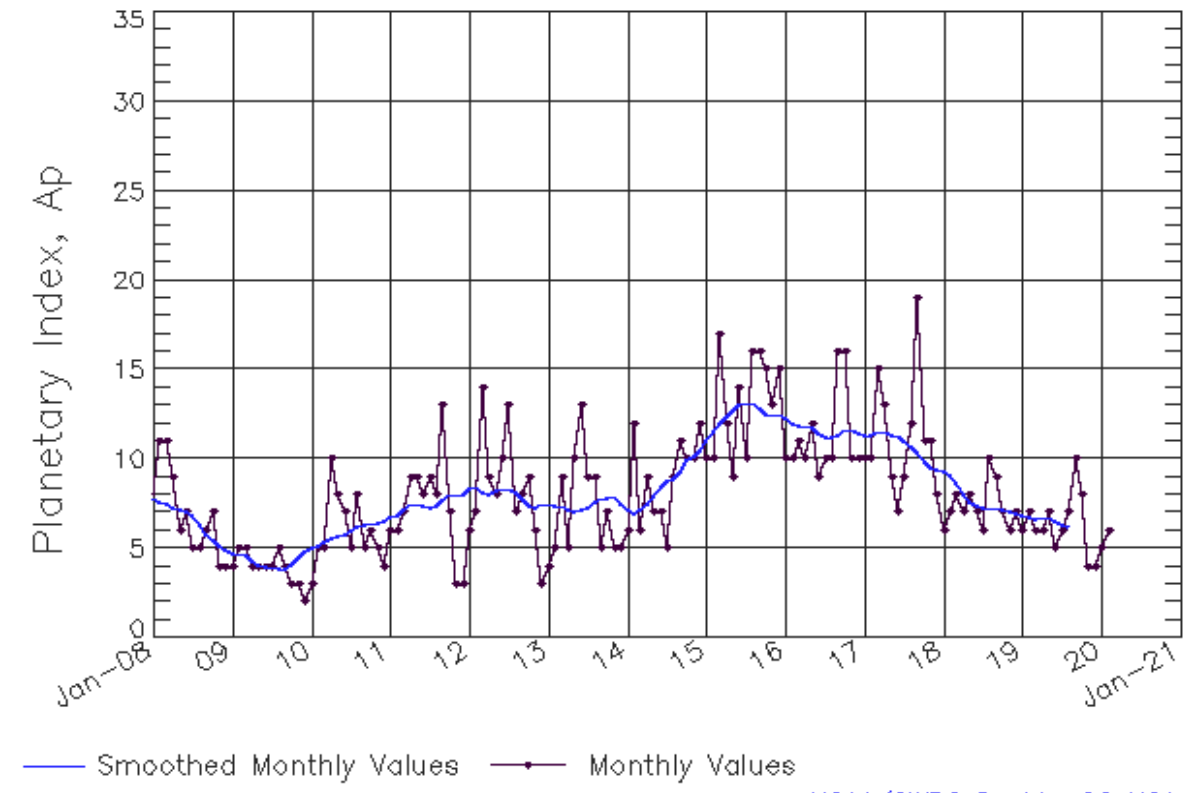
Smoothed F10.7cm Radio Flux Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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	70	70	70	70
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2019	70	70	70	70	70	70	70	70	69	69	68	67
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(1)	(2)	(3)
2020	66	66	65	65	64	63	62	61	61	60	60	60
	(4)	(4)	(5)	(6)	(7)	(8)	(8)	(9)	(9)	(9)	(9)	(9)
2021	60	60	60	60	60	60	60	59	59	59	59	59
	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)
2022	59	59	59	59	59	59	59	59	59	59	59	59
	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)



ISES Solar Cycle Ap Progression

Observed data through Feb 2020



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Solar Cycle Comparison charts are temporarily unavailable.



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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

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