Space Weather Highlights **SWPC PRF 2318**
27 January - 02 February 2020 **03 February 2020**

Solar activity was very low. Region 2757 (N05, L=089, class/area Cso/100 on 27 Jan) decayed to played before rotating around the W. limb. 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 was at normal to moderate throughout the reporting period.

Geomagnetic field activity range from quiet to active. Isolated active conditions were observed on 30 Jan while unsettled conditions were observed on 28-27 Jan, 31 Jan and 02 Feb. Solar wind measurements suggested all enhancements in geomagnetic activity were in response to intermittent influence from the Southern Crown coronal hole. The remainder of the reporting period was quiet.

Space Weather Outlook
03 February - 29 February 2020

Solar activity is expected to be very low throughout 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 07-13 Feb, in response to a negative polarity CH HSS. The remainder or the outlook period is expected to be at normal to moderate levels.

Geomagnetic field activity is expected to range from quiet to active levels. Active conditions are likely on 06 Feb and 26 Feb; unsettled conditions are likely on 07-09 Feb, 25 Feb and 27 Feb. Enhancements in geomagnetic activity are in response to influence from multiple, recurrent, coronal hole high speed streams. The remainder of the outlook period is expected to be at quiet levels.

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
27 January	73	12	100	A8.1	0	0	0	0	0	0	0	0
28 January	74	11	70	A8.1	0	0	0	0	0	0	0	0
29 January	74	11	60	A8.1	0	0	0	0	0	0	0	0
30 January	74	11	60	A8.2	0	0	0	0	0	0	0	0
31 January	74	11	20	A8.1	0	0	0	0	0	0	0	0
01 February	73	11	10	A7.9	0	0	0	0	0	0	0	0
02 February	72	0	0	A7.9	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
27 January	4.9e+05	2.2e+04	4.0e+03	2.2e+05		
28 January	5.5e+05	2.2e+04	4.0e+03	1.4e+05		
29 January	2.2e+05	2.2e+04	3.8e+03	7.3e+04		
30 January	4.8e+05	2.2e+04	3.8e+03	6.5e+05		
31 January	3.4e+05	2.0e+04	3.8e+03	1.5e+07		
01 February	4.4e+05	2.2e+04	4.1e+03	2.5e+07		
02 February	3.1e+05	2.1e+04	3.9e+03	1.5e+07		

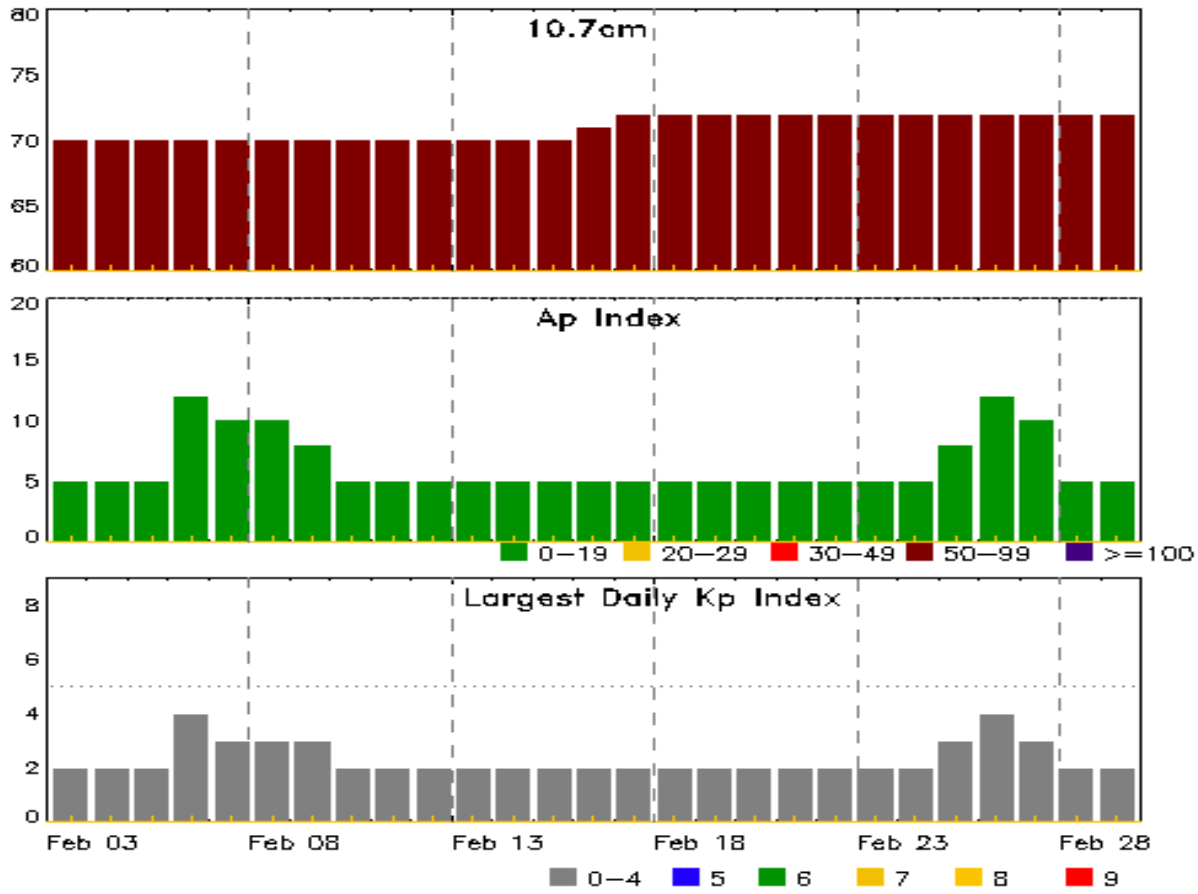
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
27 January	2	0-1-1-0-1-1-0-0	0	0-0-0-0-0-0-0-0	3	1-1-1-0-0-0-0-0
28 January	4	1-1-1-0-1-1-1-3	2	0-0-2-0-0-0-1-1	5	1-1-1-1-0-1-1-3
29 January	6	2-2-2-2-1-1-1-2	9	2-2-3-4-1-1-1-1	9	3-3-2-2-1-1-2-2
30 January	9	1-2-2-1-2-4-2-2	20	1-1-5-3-4-5-3-1	12	2-3-2-2-2-4-3-3
31 January	6	2-3-1-2-1-1-1-1	12	2-4-2-5-2-0-0-0	8	3-4-2-2-1-1-1-1
01 February	4	1-0-0-1-2-2-1-2	6	0-0-0-2-4-2-1-1	6	1-1-1-1-2-2-2-2
02 February	4	1-1-1-0-1-1-2-2	2	1-0-0-0-0-1-2-1	9	2-1-1-1-0-1-3-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
29 Jan 0234	WARNING: Geomagnetic K = 4	29/0233 - 0600
30 Jan 1649	WARNING: Geomagnetic K = 4	30/1650 - 2100
30 Jan 1811	ALERT: Geomagnetic K = 4	30/1759
30 Jan 2056	EXTENDED WARNING: Geomagnetic K = 4	30/1650 - 2359
30 Jan 2336	EXTENDED WARNING: Geomagnetic K = 4	30/1650 - 31/0600
31 Jan 0253	EXTENDED WARNING: Geomagnetic K = 4	30/1650 - 31/0600
31 Jan 0459	ALERT: Geomagnetic K = 4	31/0459
31 Jan 0502	EXTENDED WARNING: Geomagnetic K = 4	30/1650 - 31/0900

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 Feb	70	5	2	17 Feb	72	5	2
04	70	5	2	18	72	5	2
05	70	5	2	19	72	5	2
06	70	12	4	20	72	5	2
07	70	10	3	21	72	5	2
08	70	10	3	22	72	5	2
09	70	8	3	23	72	5	2
10	70	5	2	24	72	5	2
11	70	5	2	25	72	8	3
12	70	5	2	26	72	12	4
13	70	5	2	27	72	10	3
14	70	5	2	28	72	5	2
15	70	5	2	29	72	5	2
16	71	5	2				

Energetic Events

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

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
31 Jan	1447	1503	1523	A9.6			2757

Region Summary

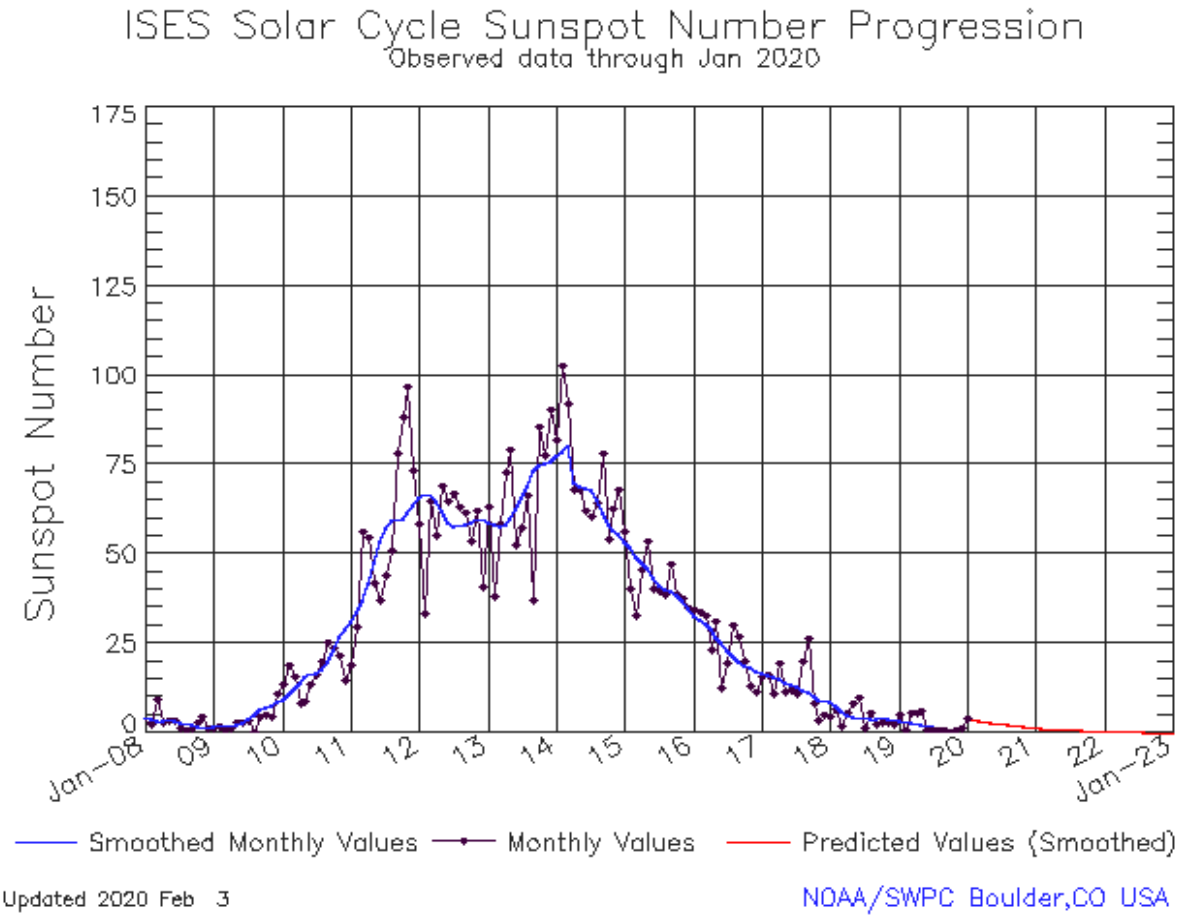
	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		Region 2757													
24 Jan	N04E30	85	10	3	Bxo	2	B								
25 Jan	N03E14	87	20	3	Bxo	4	B				1				
26 Jan	N04W01	89	60	5	Cao	8	B				1				
27 Jan	N05W14	89	100	5	Cso	2	B								
28 Jan	N04W28	90	70	5	Hsx	1	A								
29 Jan	N04W42	91	60	3	Hsx	1	A								
30 Jan	N04W56	92	60	3	Hsx	1	A								
31 Jan	N04W70	93	20	1	Hrx	1	A								
01 Feb	N03W84	94	10	1	Axx	1	A								
02 Feb	N03W98	94	plage												
								0	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 89

Recent Solar Indices (preliminary)
Observed monthly mean values

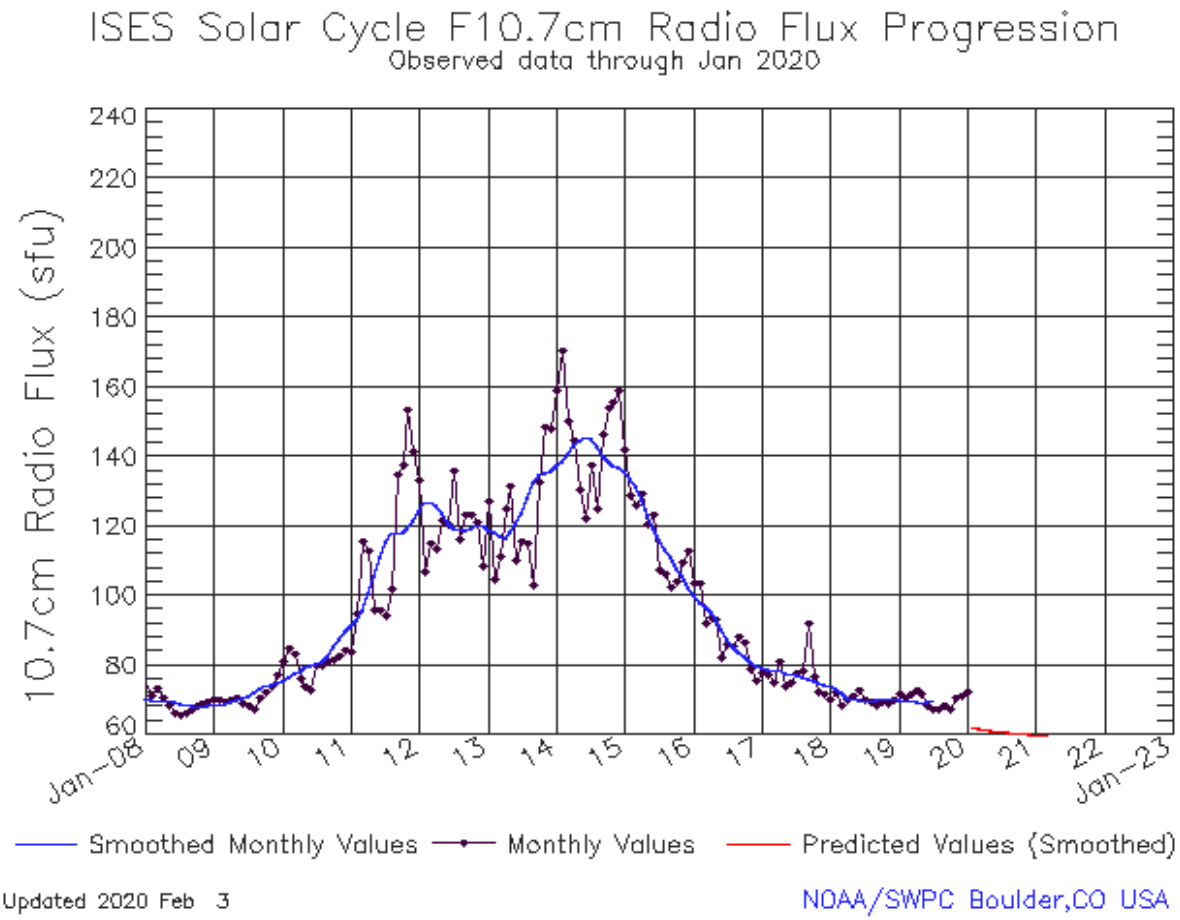
	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2018					
February	16.0	6.4	0.40	13.7	7.6	72.0	73.3	7	9.1
March	6.0	1.5	0.25	11.5	5.9	68.4	71.9	8	8.6
April	7.0	5.3	0.76	9.6	4.7	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	4.3	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			67.0		7	
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	

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.



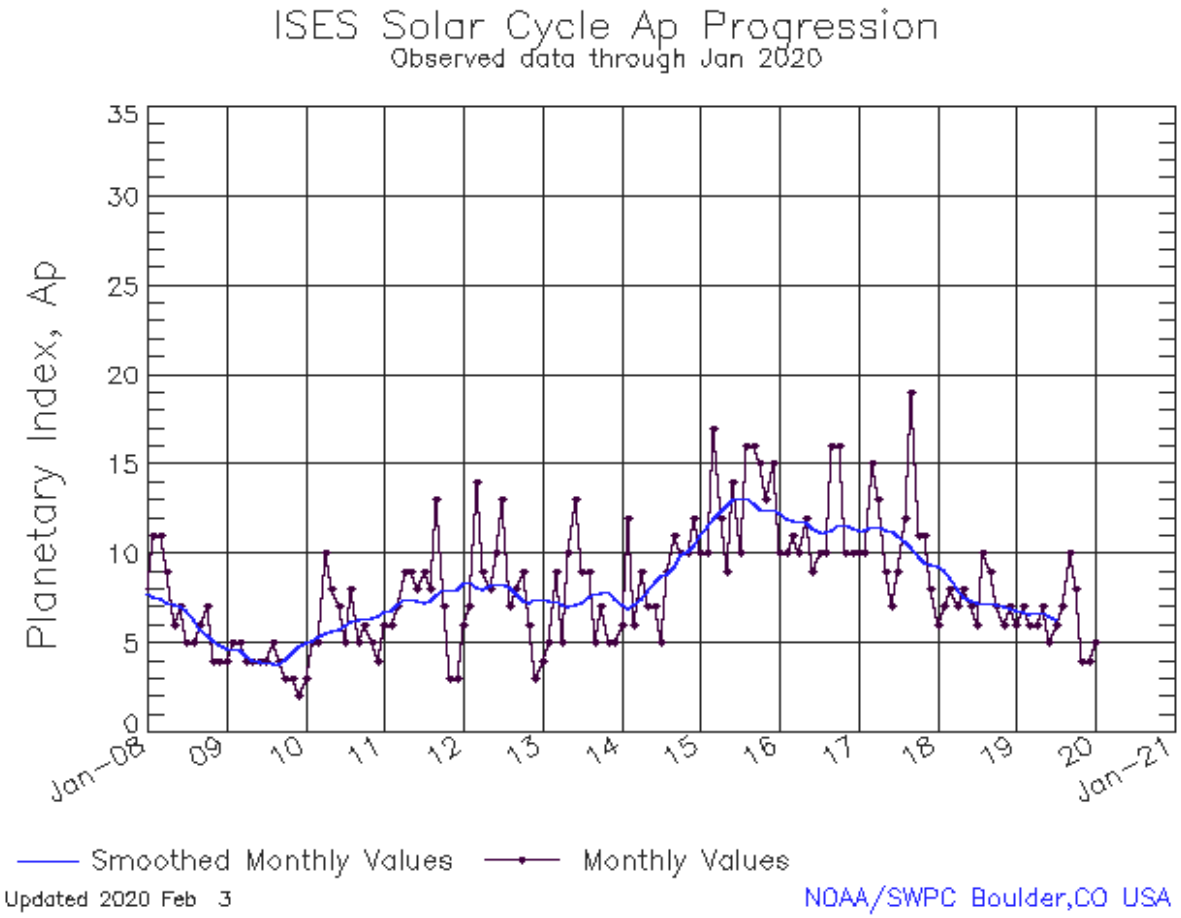
Smoothed Sunspot Number Prediction

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	3	2
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2019	5	1	6	6	6	1	1	0	1	0	0	1
	(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)



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	70	70	70	70
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2019	70	70	70	70	70	70	70	69	69	68	67	66
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(1)	(2)	(3)	(4)
2020	66	65	65	64	63	62	61	61	61	60	60	60
	(4)	(5)	(6)	(7)	(8)	(8)	(9)	(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)



Solar Cycle Comparison charts are temporarily unavailable.

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

Published every Monday by the Space Weather Prediction Center.

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

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