

Space Weather Highlights
15 March - 21 March 2021

SWPC PRF 2377
22 March 2021

Solar activity was very low throughout the reporting period. Region 2808 (N19, L=035, class/area, Cao/30 on 12 Mar), Region 2810 (N18, L=307, class/area, Hax/50 on 17 Mar), and Region 2811 (N21, L=248, class/area, Bxo/10 on 21 Mar) all produced low level B-class flare activity. The largest event was a B3 flare from Region 2808 at 16/2026 UTC. No Earth-directed CMEs were observed in available imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 15-19 and 21 Mar, with moderate levels observed on 20 Mar.

Geomagnetic field activity reached G2 (Moderate) geomagnetic storm levels on 20 Mar, with G1 (Minor) storm levels on 21 Mar due to recurrent, negative-polarity CH HSS activity. Unsettled conditions were observed on 15 and 19 Mar. Quiet levels were observed for the remainder of the reporting period (16-18 Mar).

Space Weather Outlook
22 March - 17 April 2021

Solar activity is expected to be very low, with a slight chance for C-class flare events, 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 reach high levels on 22-26, 30-31 Mar, and 01-13, 17 Apr. Moderate levels are expected during the remainder of the outlook period (27-29 Mar, 14-16 Apr).

Geomagnetic field activity is likely to reach G1 (Minor) geomagnetic storm levels on 22, 28-30 Mar and 10, 16-17 Apr, with active conditions likely on 23-24 Mar, 02, 08-09 Apr due to recurrent CH HSS activity. Quiet to unsettled levels are anticipated throughout 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	
15 March	75	24	20	A4.0	0	0	0	0	0	0	0	0	0
16 March	79	23	40	A4.3	0	0	0	0	0	0	0	0	0
17 March	78	12	50	A3.8	0	0	0	0	0	0	0	0	0
18 March	73	12	200	A3.3	0	0	0	0	0	0	0	0	0
19 March	74	14	30	A3.1	0	0	0	0	0	0	0	0	0
20 March	80	12	10	A3.4	0	0	0	0	0	0	0	0	0
21 March	77	12	10	A5.2	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
	15 March	5.7e+04	4.4e+04
16 March	7.7e+04	4.4e+04	1.8e+08
17 March	1.5e+05	4.4e+04	1.9e+08
18 March	9.4e+04	4.4e+04	5.5e+07
19 March	6.6e+04	4.5e+04	3.4e+07
20 March	5.4e+05	4.4e+04	3.7e+06
21 March	5.1e+05	4.3e+04	6.2e+07

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	15 March	5	3-2-1-2-1-1-0-0	10	2-1-3-5-1-2-0-0	7
16 March	2	0-1-0-1-1-1-0-1	1	0-0-0-0-0-0-1-1	4	1-2-0-1-1-1-1-1
17 March	2	1-0-0-0-1-2-1-1	5	2-1-0-0-1-3-2-1	5	2-1-0-0-1-2-1-1
18 March	4	2-2-1-2-1-1-0-1	2	1-1-2-1-0-0-0-0	4	2-2-1-2-0-0-0-1
19 March	6	2-2-2-2-1-1-1-2	6	0-2-3-3-2-0-0-0	6	2-3-2-2-1-0-1-2
20 March	20	2-3-5-4-3-3-3-3	40	1-2-7-6-3-5-3-3	29	2-3-6-5-4-4-3-4
21 March	17	4-3-1-2-4-3-4-3	45	3-3-2-2-7-7-4-2	32	4-4-1-2-4-5-5-3

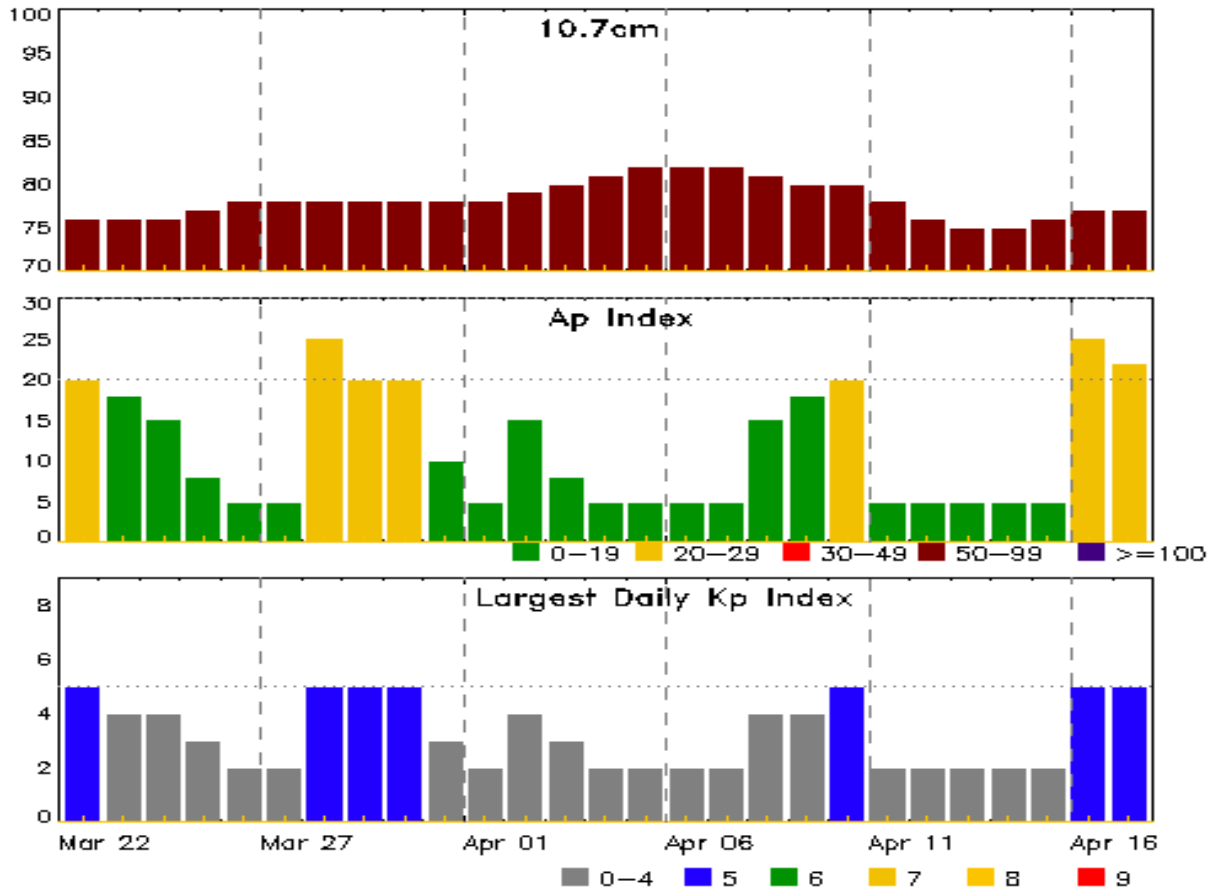


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
15 Mar 0651	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	14/1520
16 Mar 0506	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	14/1520
17 Mar 0506	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	14/1520
17 Mar 2033	WATCH: Geomagnetic Storm Category G1 predicted	
18 Mar 1317	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	14/1520
18 Mar 1917	WATCH: Geomagnetic Storm Category G1 predicted	
19 Mar 1527	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	14/1520
19 Mar 1706	WATCH: Geomagnetic Storm Category G1 predicted	
20 Mar 0250	WARNING: Geomagnetic K = 4	20/0250 - 1500
20 Mar 0646	ALERT: Geomagnetic K = 4	20/0645
20 Mar 0647	WARNING: Geomagnetic K = 5	20/0645 - 1500
20 Mar 0712	ALERT: Geomagnetic K = 5	20/0710
20 Mar 0721	WARNING: Geomagnetic K = 6	20/0720 - 1200
20 Mar 0803	ALERT: Geomagnetic K = 6	20/0800
20 Mar 1104	ALERT: Geomagnetic K = 5	20/1104
20 Mar 1455	EXTENDED WARNING: Geomagnetic K = 4	20/0250 - 21/0600
21 Mar 0543	EXTENDED WARNING: Geomagnetic K = 4	20/0250 - 21/1300
21 Mar 1314	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1255
21 Mar 1418	WARNING: Geomagnetic K = 4	21/1415 - 22/0600
21 Mar 1423	ALERT: Geomagnetic K = 4	21/1423
21 Mar 1633	WARNING: Geomagnetic K = 5	21/1630 - 2359
21 Mar 1801	ALERT: Geomagnetic K = 5	21/1759
21 Mar 2102	ALERT: Geomagnetic K = 5	21/2059



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
22 Mar	76	20	5	05 Apr	82	5	2
23	76	18	4	06	82	5	2
24	76	15	4	07	82	5	2
25	77	8	3	08	81	15	4
26	78	5	2	09	80	18	4
27	78	5	2	10	80	20	5
28	78	25	5	11	78	5	2
29	78	20	5	12	76	5	2
30	78	20	5	13	75	5	2
31	78	10	3	14	75	5	2
01 Apr	78	5	2	15	76	5	2
02	79	15	4	16	77	25	5
03	80	8	3	17	77	22	5
04	81	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			Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #	
15 Mar	0955	1005	1009	B3.0			2808	
16 Mar	2009	2026	2040	B3.2			2808	
20 Mar	1429	1436	1447	B1.0			2811	
20 Mar	1531	1550	1610	B2.1			2811	
20 Mar	2322	2339	2351	B1.5			2811	
21 Mar	1530	1538	1543	B1.3				
21 Mar	1609	1618	1627	B1.2			2811	
21 Mar	1805	1818	1831	B1.6				
21 Mar	1851	1901	1914	B1.3			2810	
21 Mar	2137	2146	2155	B1.2			2811	



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							
Region 2808																							
09 Mar	N19E68		37	20	1	Hsx	1	A	1														
10 Mar	N19E55		37	20	1	Hsx	1	A															
11 Mar	N19E42		36	50	2	Hsx	1	A															
12 Mar	N19E32		33	30	8	Cao	5	B															
13 Mar	N19E18		34	10	6	Hax	2	A															
14 Mar	N19E04		35	10	1	Axx	1	A															
15 Mar	N19W04		34	10	3	Axx	1	A															
16 Mar	N19W19		31	10	2	Axx	1	A															
17 Mar	N19W32		31	plage																			
18 Mar	N19W46		32	plage																			
19 Mar	N19W60		33	plage																			
20 Mar	N19W74		34	plage																			
21 Mar	N19W88		35	plage																			
									1	0	0	0	0	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 35

Region 2809																							
11 Mar	S21E13		65	10	3	Bxo	2	B															
12 Mar	S21W01		66	plage																			
13 Mar	S21W15		67	plage																			
14 Mar	S22W26		65	20	3	Cso	3	B															
15 Mar	S22W39		64	10	4	Bxo	3	B															
16 Mar	S22W53		65	plage																			
17 Mar	S22W67		66	plage																			
18 Mar	S22W81		67	plage																			
									0	0	0	0	0	0	0	0	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 66

Region 2810																							
16 Mar	N17E64		308	30	1	Hrx	2	A															
17 Mar	N18E52		307	50	2	Hax	2	A															
18 Mar	N17E38		307	200	3	Hax	2	A															
19 Mar	N18E26		307	30	2	Hrx	4	A															
20 Mar	N18E13		307	10	2	Axx	2	A															
21 Mar	N18W01		307	plage																			
									0	0	0	0	0	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 307



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares									
	Lat CMD	Lon	Heli 10 ⁻⁶	Area hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
									C	M	X	S	1	2	3	4
<i>Region 2811</i>																
21 Mar	N21E58	248	10	1	Bxo	2	B	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 248



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

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