Space Weather Highlights **SWPC PRF 2412**
15 November - 21 November 2021 **22 November 2021**

Solar activity was at very low levels with only B-class activity observed. No Earth-directed CMEs were observed in LASCO coronagraph imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 15 Nov due to CH HSS influences. Normal to moderate levels were observed on 16-21 Nov.

Geomagnetic field activity reached active levels on 15-17 Nov due to CH HSS influences. Quiet to unsettled levels were observed on 18-21 Nov.

Space Weather Outlook
22 November - 18 December 2021

Solar activity is expected to be at low levels on 30 Nov - 14 Dec due to the expected return of Regions 2894 (S27, L=85, class/area Dao/130 on 12 Nov) and 2895 (N24, L=73, class/area Dso/130 on 10 Nov). Very low levels are expected on 22-29 Nov, and 15-18 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 10-12 Dec due to recurrent CH HSS influences. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach unsettled to active levels on 27 Nov and 12-14 Dec due to recurrent CH HSS influences. Quiet to unsettled levels are expected for the rest 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 November	79	23	130	A6.8	0	0	0	0	0	0	0	0
16 November	80	35	330	A7.6	0	0	0	0	0	0	0	0
17 November	79	33	270	A3.5	0	0	0	1	0	0	0	0
18 November	82	22	40	A2.1	0	0	0	0	0	0	0	0
19 November	79	22	40	A1.6	0	0	0	0	0	0	0	0
20 November	80	22	40	A2.4	0	0	0	0	0	0	0	0
21 November	79	22	20	A2.0	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 November	9.3e+06	4.4e+04	3.7e+07
16 November	1.0e+06	4.3e+04	2.2e+06
17 November	5.5e+05	4.3e+04	6.6e+06
18 November	1.0e+05	4.3e+04	8.7e+06
19 November	2.9e+05	4.3e+04	1.9e+07
20 November	9.7e+05	4.2e+04	1.7e+07
21 November	2.5e+06	4.1e+04	1.5e+07

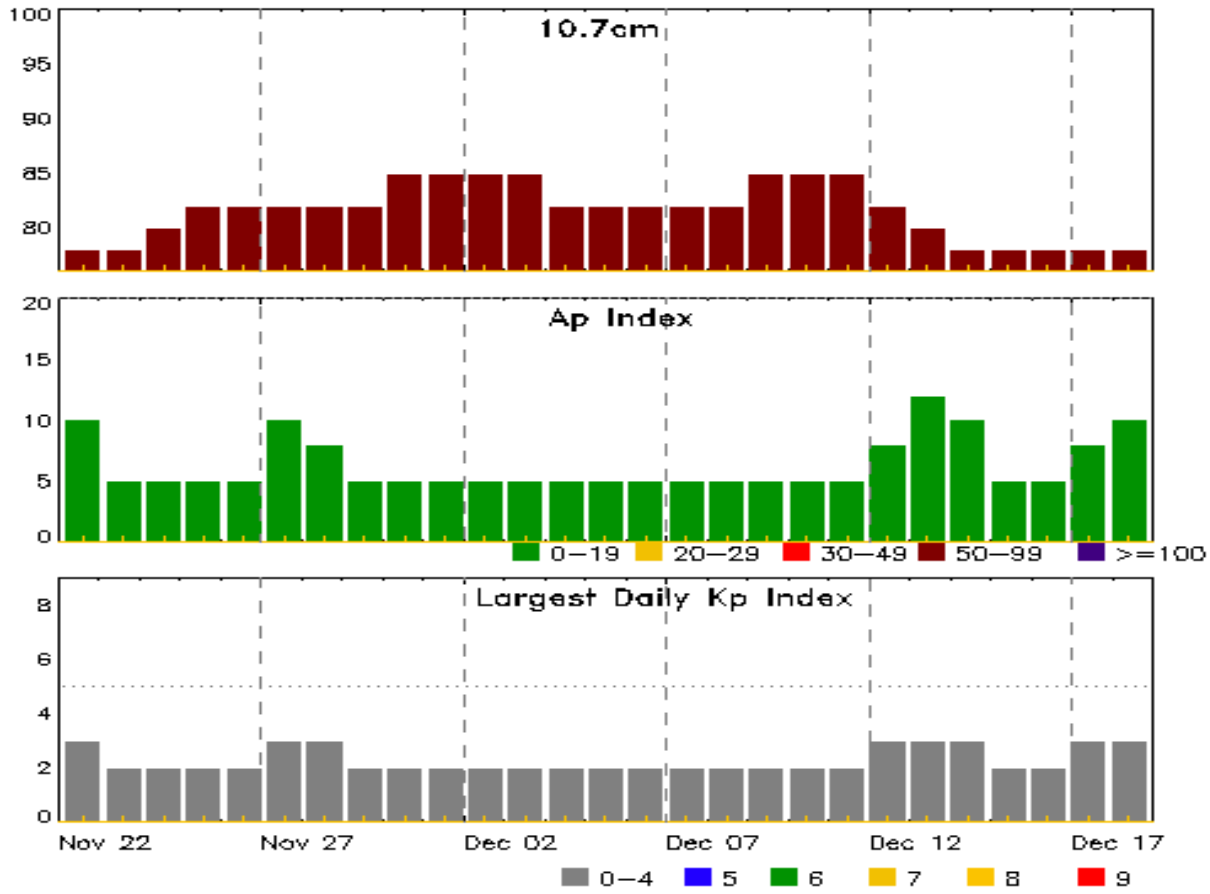
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
15 November	6	0-0-0-0-2-2-3-3	6	0-0-0-0-3-2-2-3	9	0-1-1-1-1-2-4-4
16 November	11	4-3-2-2-1-2-2-3	18	2-4-2-5-4-3-2-1	13	4-4-3-2-2-2-2-2
17 November	9	3-2-3-3-1-2-1-2	18	2-2-3-6-3-2-2-1	12	4-2-3-3-2-2-2-3
18 November	3	1-2-1-1-1-1-0-1	2	1-1-1-2-0-0-0-0	5	2-2-1-1-1-1-1-1
19 November	3	1-0-1-0-2-1-1-1	2	0-0-1-0-2-1-0-1	5	1-1-1-1-2-1-2-2
20 November	7	1-1-2-2-2-3-2-2	14	2-1-2-4-4-4-2-2	10	2-1-2-2-2-3-2-3
21 November	8	3-2-1-2-2-2-2-2	18	3-3-3-5-4-3-2-1	18	3-2-2-3-3-3-2-3

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
15 Nov 1413	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	13/2025
15 Nov 2102	WARNING: Geomagnetic K = 4	15/2059 - 16/0600
15 Nov 2104	ALERT: Geomagnetic K = 4	15/2100
16 Nov 0550	EXTENDED WARNING: Geomagnetic K = 4	15/2059 - 16/1200
17 Nov 0236	WARNING: Geomagnetic K = 4	17/0236 - 0900
17 Nov 0247	ALERT: Geomagnetic K = 4	17/0245
17 Nov 1111	WARNING: Geomagnetic K = 4	17/1111 - 1500
20 Nov 1728	WARNING: Geomagnetic K = 4	20/1727 - 21/0900

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
22 Nov	78	10	3	06 Dec	82	5	2
23	78	5	2	07	82	5	2
24	80	5	2	08	82	5	2
25	82	5	2	09	85	5	2
26	82	5	2	10	85	5	2
27	82	10	3	11	85	5	2
28	82	8	3	12	82	8	3
29	82	5	2	13	80	12	3
30	85	5	2	14	78	10	3
01 Dec	85	5	2	15	78	5	2
02	85	5	2	16	78	5	2
03	85	5	2	17	78	8	3
04	82	5	2	18	78	10	3
05	82	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 #
15 Nov	0710	0713	0717	B1.2			2895
15 Nov	0955	1005	1012	B2.6			2895
16 Nov	0707	0714	0716	B1.9			2894
16 Nov	1045	1054	1059	B1.4			
16 Nov	1207	1218	1223	B1.4			
16 Nov	1450	1503	1507	B1.7			
16 Nov	1526	1533	1538	B1.3			
16 Nov	1630	1637	1642	B1.7			
16 Nov	1720	1727	1737	B1.1			
16 Nov	1740	1746	1756	B2.3			
16 Nov	1847	1902	1922	B2.4			
16 Nov	2115	2124	2132	B1.8			
17 Nov	0336	0352	0406	B1.4			
17 Nov	0449	0453	0501	B2.6	SF	N16E57	2897
17 Nov	0607	0613	0628	B1.0			
17 Nov	0850	0857	0903	B1.7			
17 Nov	1005	1013	1017	B1.2			
17 Nov	1501	1505	1509	B2.5			2895
18 Nov	1535	1547	1604	B1.5			
21 Nov	1225	1235	1239	B1.3			

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 2													
15 Jun	S24W08	57	0		Axx	1	A								
16 Jun	S24W21	57	plage												
17 Jun	S24W34	57	plage												
18 Jun	S24W47	57	plage												
19 Jun	S24W60	57	plage												
20 Jun	S24W73	57	plage												
21 Jun	S24W86	57	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 57

		Region 2894													
04 Nov	S27E80	95	plage					2							
05 Nov	S27E66	95	100	2	Hsx	1	A	1							
06 Nov	S27E55	92	180	7	Cso	6	B	2			1				
07 Nov	S27E42	91	120	9	Cso	4	B								
08 Nov	S26E28	92	150	6	Cso	4	B								
09 Nov	S30E14	93	150	2	Hsx	2	A								
10 Nov	S26E01	93	150	1	Hsx	1	A								
11 Nov	S27W09	91	160	2	Hax	3	A								
12 Nov	S27W17	85	130	9	Dao	5	BG								
13 Nov	S28W33	87	100	8	Cso	3	B	1			1				
14 Nov	S28W50	91	110	2	Hsx	2	A								
15 Nov	S28W62	91	70	2	Hsx	2	A								
16 Nov	S27W75	91	160	2	Hsx	2	A								
17 Nov	S28W89	91	100	1	Hsx	1	A								
								6	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 93

Region Summary - continued

	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 2895												
08 Nov	N26E50	70	50	6	Dao	6	B	2			2				
09 Nov	N24E36	71	130	5	Dso	7	B				1				
10 Nov	N24E21	73	130	4	Dso	5	B								
11 Nov	N22E08	72	30	6	Cro	5	B								
12 Nov	N23W06	74	20	4	Bxo	3	B								
13 Nov	N22W20	74	10	1	Axx	1	A								
14 Nov	N22W34	76	plage												
15 Nov	N22W48	77	plage												
16 Nov	N22W62	78	plage												
17 Nov	N22W76	78	plage												
18 Nov	N22W90	79	plage												
								2	0	0	3	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 74

			Region 2896												
14 Nov	S18E72	329	60	1	Hsx	1	A								
15 Nov	S18E58	331	60	1	Hsx	1	A								
16 Nov	S18E44	332	90	2	Hsx	1	A								
17 Nov	S18E32	330	90	1	Hsx	1	A								
18 Nov	S18E18	331	20	1	Hsx	1	A								
19 Nov	S17E05	331	20	1	Hsx	1	A								
20 Nov	S17W08	331	20	1	Hsx	1	A								
21 Nov	S18W22	331	10	1	Hrx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 331

			Region 2897												
16 Nov	N15E62	314	80	1	Hsx	2	A								
17 Nov	N16E48	314	80	1	Hsx	1	A				1				
18 Nov	N17E31	318	20	1	Hsx	1	A								
19 Nov	N16E17	319	20	1	Hsx	1	A								
20 Nov	N17E04	318	20	1	Hsx	1	A								
21 Nov	N15W09	318	10	1	Hsx	1	A								
								0	0	0	1	0	0	0	0

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Absolute heliographic longitude: 318

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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