Space Weather Highlights **SWPC PRF 2420**
10 January - 16 January 2022 **17 January 2022**

Solar activity ranged from very low to isolated moderate levels. Very low to low levels were observed on 10-13 Jan with weak C-class events observed from beyond the NE limb. An isolated R1 (Minor) radio blackout event was observed from beyond the NE limb at 14/0203 UTC that peaked at M1. Additional weak C-class activity was observed from this same unnumbered region on 14 Jan. Region 2925 (S34, L=008, class/area Dso/240 on 05 Jan) produced a C4/1f at 14/1334 UTC. An associated CME was observed off the SW limb with a potential glancing blow expected at Earth on 17 Jan. Low level activity was observed on 15 Jan from Region 2924 (S31, L=038, class/area Ehi/430 on 08 Jan) and Region 2932 (N31, L=245, class/area Cro/020 on 15 Jan). 16 Jan witnessed additional C-class activity from Region 2930 (N20, L=320, class/area Dso/100 on 16 Jan) and an LDE C2/Sf from Region 2929. No additional Earth-directed CMEs were observed.

No proton events were observed at geosynchronous orbit. However, there was a weak enhancement to 1.7 pfu observed at 15/2115 UTC, possibly associated with shock passage from the 14 Jan CME.

The greater than 2 MeV electron flux at geosynchronous orbit was was at moderate levels on 10-15 Jan and at high levels on 16 Jan with a maximum flux of 2,280 pfu observed at 16/1910 UTC.

Geomagnetic field activity was at mostly quiet levels on 10 Jan through midday on 14 Jan. By midday to late on 14 Jan, activity increased to unsettled to G2 (Moderate) geomagnetic storm levels due to a CIR in advance of a negative polarity CH HSS. Imbedded in this activity was a possibly transient from an earlier, undetected CME. Activity levels remained enhanced to G1 (Minor) storm levels on 15-16 Jan due to continued negative polarity CH HSS effects.

Space Weather Outlook
17 January - 12 February 2022

Solar activity is expected to be at very low to low levels, with a slight chance for R1 (Minor) radio blackouts, on 17-21 Jan due to the complexity of Region 2929. Very low to low levels are expected on 22 Jan - 02 Feb. Very low to low levels, with a slight chance for R1 (Minor) radio blackouts, is expected on 03-12 Feb with the potential return of old Region 2929.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 17-23 Jan and again on 12 Feb due to recurrent CH HSS influence. Normal to moderate levels are expected on 24 Jan - 11 Feb.

Geomagnetic field activity is expected to be at unsettled levels on 18, 24-26, 28-30 Jan, 05, 10

and 12 Feb, with active levels expected on 17 Jan, 04, and 11 Feb, all due to recurrent CH HSS activity.

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
10 January	102	38	530	B2.6	0	0	0	0	0	0	0	0
11 January	100	51	560	B1.9	1	0	0	1	0	0	0	0
12 January	103	68	590	B2.7	0	0	0	0	0	0	0	0
13 January	106	111	680	B3.1	3	0	0	1	0	0	0	0
14 January	110	112	580	B3.6	4	1	0	1	1	0	0	0
15 January	116	120	830	B4.1	5	0	0	0	0	0	1	0
16 January	116	103	660	B3.3	4	0	0	2	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
10 January	6.8e+04	4.3e+04	1.4e+06
11 January	9.2e+04	4.4e+04	1.3e+06
12 January	2.0e+05	4.4e+04	2.0e+06
13 January	8.5e+04	4.5e+04	1.4e+06
14 January	2.3e+06	4.5e+04	1.6e+06
15 January	1.2e+07	5.3e+04	1.8e+06
16 January	7.7e+05	4.5e+04	4.8e+07

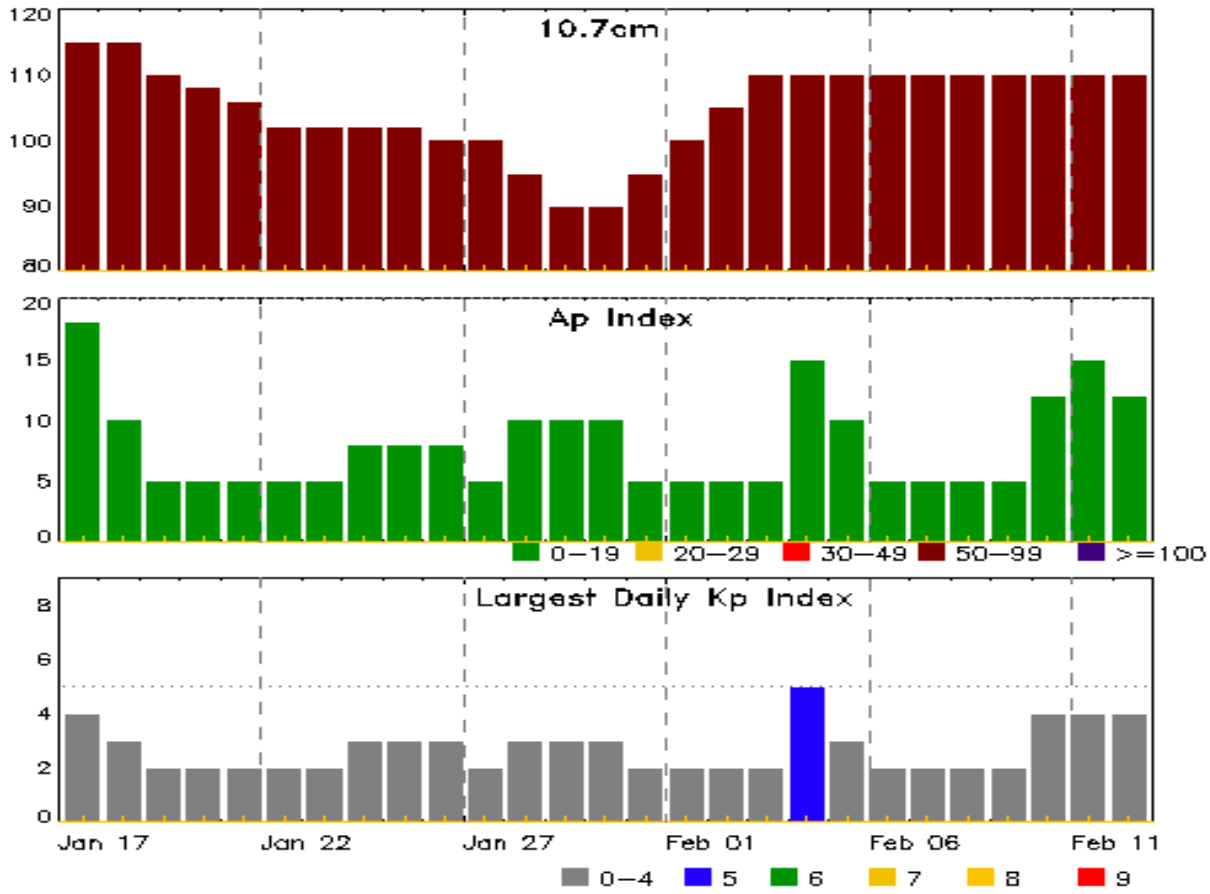
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
10 January	4	3-2-0-0-1-1-1-1	2	1-1-0-0-2-0-1-1	6	3-2-1-0-1-2-2-2
11 January	3	1-1-1-1-1-2-1-0	3	0-1-2-0-2-2-1-0	5	1-2-1-1-2-2-1-0
12 January	3	0-1-0-0-2-2-2-1	0	0-0-0-0-0-0-0-0	4	1-1-1-0-1-1-1-1
13 January	3	0-0-0-1-1-2-2-1	0	0-0-0-0-0-0-0-0	3	1-0-0-1-0-0-1-1
14 January	10	0-0-1-1-2-3-2-5	8	0-0-1-0-2-3-4-3	15	0-0-1-1-1-3-4-6
15 January	17	4-4-2-1-3-3-3-4	36	4-3-2-4-6-6-4-4	22	5-3-3-2-3-3-4-5
16 January	16	4-4-2-1-3-3-3-3	35	4-3-2-4-6-6-4-3	39	5-3-3-2-3-3-4-3

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
10 Jan 0043	ALERT: Type IV Radio Emission	09/2221
10 Jan 0043	ALERT: Type II Radio Emission	09/2252
12 Jan 0508	ALERT: Type II Radio Emission	12/0426
12 Jan 1626	WATCH: Geomagnetic Storm Category G1 predicted	
13 Jan 1438	WATCH: Geomagnetic Storm Category G1 predicted	
14 Jan 2031	WARNING: Geomagnetic K = 4	14/2030 - 15/1200
14 Jan 2039	ALERT: Geomagnetic K = 4	14/2038
14 Jan 2228	WARNING: Geomagnetic K = 5	14/2229 - 15/0600
14 Jan 2246	ALERT: Geomagnetic K = 5	14/2246
14 Jan 2303	WARNING: Geomagnetic K = 6	14/2300 - 15/0600
15 Jan 0001	ALERT: Geomagnetic K = 6	14/2358
15 Jan 0303	ALERT: Geomagnetic K = 5	15/0259
15 Jan 1920	WARNING: Geomagnetic K = 4	15/1920 - 16/1200
15 Jan 1926	ALERT: Geomagnetic K = 4	15/1924
15 Jan 2206	WARNING: Geomagnetic K = 5	15/2206 - 16/0900
15 Jan 2235	ALERT: Geomagnetic K = 5	15/2235
16 Jan 1156	EXTENDED WARNING: Geomagnetic K = 4	15/1920 - 16/1800
16 Jan 1535	ALERT: Electron 2MeV Integral Flux >= 1000pfu	16/1445
16 Jan 2019	WARNING: Geomagnetic K = 4	16/2219 - 17/1200
16 Jan 2028	ALERT: Geomagnetic K = 4	16/2023

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
17 Jan	115	18	4	31 Jan	95	5	2
18	115	10	3	01 Feb	100	5	2
19	110	5	2	02	105	5	2
20	108	5	2	03	110	5	2
21	106	5	2	04	110	15	5
22	102	5	2	05	110	10	3
23	102	5	2	06	110	5	2
24	102	8	3	07	110	5	2
25	102	8	3	08	110	5	2
26	100	8	3	09	110	5	2
27	100	5	2	10	110	12	4
28	95	10	3	11	110	15	4
29	90	10	3	12	110	12	4
30	90	10	3				

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
14 Jan		0147	0203	0214		M1.8	0.014					

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
11 Jan	0531	0539	0551	B3.7			2927
11 Jan	0636	0643	0649	B4.3	SF	N22W19	2926
11 Jan	0818	0838	0859	C1.0			
11 Jan	0914	0920	0924	B7.1			2926
11 Jan	1132	1147	1154	B4.6			2927
11 Jan	1237	1240	1244	B3.3			2926
12 Jan	0413	0423	0427	B7.2			
12 Jan	0436	0506	0508	B8.2			
12 Jan	1645	1649	1654	B4.9			2924
13 Jan	0151	0212	0236	C1.8			
13 Jan	0758	0806	0810	B5.2			
13 Jan	1118	1142	1153	C2.9			
13 Jan	1323	1330	1336	B5.3			2926
13 Jan	1400	1403	1407	B7.4	SF	S26W64	2924
13 Jan	1709	1713	1717	B7.5			2924
13 Jan	2024	2033	2038	C1.3			
13 Jan	2354	0006	0012	B7.0			
14 Jan	0147	0203	0214	M1.8			
14 Jan	0459	0508	0515	B7.8			
14 Jan	1144	1154	1203	C2.1			
14 Jan	1307	1334	1416	C4.3	1F	S37W35	2925
14 Jan	1416	1423	1428	C3.5			2924
14 Jan	1925	1939	1946	C2.5	SF	N31E83	2932
15 Jan	0134	0142	0146	B6.1			2932
15 Jan	0650	0707	0753	C1.3			2932
15 Jan	0753	0802	0815	B9.7			2932
15 Jan	0833	0854	0913	C4.2			2932
15 Jan	1154	1200	1205	B8.0			2930
15 Jan	1344	1352	1403	B6.4			2932
15 Jan	1403	1415	1424	B6.6			2929

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
15 Jan	1424	1431	1436	B6.8			
15 Jan	1831	1837	1841	C1.3			2924
15 Jan	2219	2229	2233	B6.7			2932
15 Jan	2233	2242	2252	B9.0			2932
15 Jan	2252	2304	2310	C1.1			2932
15 Jan	2303	2329	2332	C1.6	3F	N22W86	2932
16 Jan	0456	0511	0548	C1.2			2930
16 Jan	1007	1016	1026	B6.4			
16 Jan	1133	1142	1158	B7.1			
16 Jan	1450	1459	1506	B7.1			
16 Jan	1650	1652	1652		SF	S27E58	
16 Jan	1742	1748	1758	C1.1			
16 Jan	1921	2021	2132	C2.6	SF	N08W29	2929
16 Jan	1953	2000	2004	C2.4			2929

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 2924												
04 Jan	S32E48	42	30	1	Cro	2	B								
05 Jan	S31E34	43	30	4	Cao	1	B								
06 Jan	S31E20	40	190	5	Dai	12	B	1			6				
07 Jan	S31E06	39	430	11	Ehi	14	B	2			3				
08 Jan	S31W01	38	430	12	Ehi	8	B				1				
09 Jan	S31W14	38	380	13	Eho	4	B								
10 Jan	S31W27	38	350	13	Eho	5	B								
11 Jan	S31W40	38	350	13	Eho	5	BG								
12 Jan	S31W53	38	370	13	Eho	9	BG								
13 Jan	S31W67	38	390	15	Eho	11	BG				1				
14 Jan	S29W79	37	220	14	Eso	4	B	1							
15 Jan	S31W93	38	180	14	Eso	2	B	1							
								5	0	0	11	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 38

			Region 2925												
05 Jan	S34E69	8	240	3	Dso	3	B								
06 Jan	S34E55	9	80	3	Dso	3	B								
07 Jan	S34E41	9	100	3	Cso	4	B								
08 Jan	S32E31	6	100	2	Hsx	3	A								
09 Jan	S33E19	5	80	2	Hsx	1	A								
10 Jan	S33E06	5	80	2	Hsx	2	A								
11 Jan	S33W07	5	80	2	Hsx	2	A								
12 Jan	S33W20	5	80	2	Hsx	1	A								
13 Jan	S33W34	5	80	2	Hsx	1	A								
14 Jan	S33W45	2	50	2	Hsx	1	A	1				1			
15 Jan	S34W57	2	50	2	Hsx	1	A								
16 Jan	S34W71	2	40	1	Hsx	1	A								
								1	0	0	0	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 5

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 2926												
09 Jan	N21W09	33	plage												
10 Jan	N21W22	33	plage												
11 Jan	N20W35	33	50	2	Cso	3	B				1				
12 Jan	N22W48	33	30	2	Cro	4	B								
13 Jan	N22W62	33	30	2	Cro	6	B								
14 Jan	N19W79	37	20	1	Hsx	1	A								
15 Jan	N19W93	38	10	1	Axx	1	A								
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 33

			Region 2927												
09 Jan	S20E66	318	80	2	Hsx	1	A								
10 Jan	S20E53	318	100	2	Hsx	1	A								
11 Jan	S20E40	318	80	2	Hsx	1	A								
12 Jan	S20E27	318	80	2	Hsx	1	A								
13 Jan	S20E13	318	80	2	Hsx	1	A								
14 Jan	S20E01	317	50	2	Hsx	1	A								
15 Jan	S21W13	318	50	9	Cso	2	B								
16 Jan	S20W25	316	50	1	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 317

			Region 2928												
12 Jan	S19W02	347	30	3	Dso	3	B								
13 Jan	S19W16	347	70	4	Dso	3	B								
14 Jan	S21W28	345	20	4	Bxo	4	B								
15 Jan	S20W42	347	plage												
16 Jan	S20W56	348	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 347

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 2929												
13 Jan	N08E09	322	10	3	Bxo	2	B								
14 Jan	N08W05	322	100	4	Dso	7	B								
15 Jan	N08W20	324	300	5	Dhi	14	B								
16 Jan	N08W30	321	310	5	Dki	11	B	2			1				
								2	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 322

			Region 2930												
13 Jan	N21E05	326	10	2	Bxo	4	B								
14 Jan	N21W07	325	20	4	Bxo	5	B								
15 Jan	N21W19	323	100	4	Dao	7	B								
16 Jan	N20W28	320	100	5	Dso	5	B	1							
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 326

			Region 2931												
13 Jan	N13W27	358	10	2	Bxo	3	B								
14 Jan	N13W43	360	100	4	Dso	9	B								
15 Jan	N13W54	359	120	4	Dao	5	B								
16 Jan	N13W68	359	90	5	Cso	5	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 358

			Region 2932												
14 Jan	N32E74	245	plage					1							
15 Jan	N32E60	245	20	3	Cro	8	B	4						1	
16 Jan	N31E49	242	10	3	Bxo	4	B								
								5	0	0	0	0	0	1	0

Still on Disk.
Absolute heliographic longitude: 242

			Region 2933												
16 Jan	S21E06	286	60	3	Cso	6	B								
								0	0	0	0	0	0	0	0

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Absolute heliographic longitude: 286

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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