

Solar activity ranged from very low to high levels during the period. Low levels were observed on 17 Jan with 3 C-class flares observed from Region 2930 (N21, L=324, class/area Dao/230 on 18 Jan). Activity increased to moderate levels (R1-Minor) radio blackouts as Region 2929 (N08, L=321, class/area Dki/310 on 16 Jan) produced an M1/Sf at 18/1744 UTC. Associated with this event were Type II (143 km/s shock velocity), Type IV and 10cm (150 sfu) radio events. This event generated a non Earth-directed CME. C-class activity was also observed from Region 2930. Low levels returned on 19 Jan with a C1 flare observed from Region 2929.

High levels were observed on 20 Jan as Region 2929 produced an M5/!f (R2-Moderate) radio blackouts at 20/0601 UTC. Associated with this event were Type II (329 km/s shock velocity), Type IV and 10cm (350 sfu) radio events, along with a Caselli U radio signature. This event also generated a non Earth-directed CME. Very low levels returned on 21-23 Jan. Of note was a long duration B4 event at 21/1016 UTC with an associated CME. During this timeframe, a disappearing filament was observed lifting off near Region 2934 (S24, L=172, class/area Hsx/140 on 21 Jan). This CME was analyzed to have a potential glancing blow at Earth late on 24 Jan. On 22 Jan, another CME was observed at 22/1036 UTC associated with a disappearing filament located near N28E18. This CME was also analyzed to have a potential glancing blow at Earth on 26 January.

An S1 (Minor) solar radiation storm 10 MeV proton event was observed at geosynchronous orbit on 20 Jan associated with the M5 flare mentioned earlier in this report. The event reached a maximum flux of 22.7 pfu at 20/1015 UTC. A 100 MeV proton event was also observed at geosynchronous orbit on 20 Jan associated with the M5 flare. This event reached a maximum flux of 1.1 pfu at 20/0850 UTC. No other proton events were observed during the period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels through the entire period with a maximum flux of 6,130 pfu observed at 23/1620 UTC.

Geomagnetic field activity was at quiet to unsettled levels on 17-20 Jan due to negative polarity CH HSS influence. Active to G1 (minor) storm levels were also observed on 18 Jan and active to G1-G2 (Minor-Moderate) storm levels were observed on 19 Jan due to possible embedded transients from CME activity on 14 and 15 Jan. Quiet to unsettled activity was observed on 21-23 Jan due to a sustained negative Bz component.

Space Weather Outlook

24 January - 19 February 2022

Solar activity is expected to be at very low to low levels on 24 Jan - 02 Feb and 17-19 Feb. Very low to low levels, with a slight chance for R1 (Minor) radio blackouts, is expected on 03-16 Feb due to the return of old active region 2929 (N08, L=321).

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 24-26 Jan and 12-19 Feb due to recurrent CH HSS influence. Normal to moderate levels are expected on 27-31 Jan and 01-11 Feb.

Geomagnetic field activity is expected to be at unsettled to active levels on 24-27 Jan due to positive polarity CH HSS coupled with possible transient passage from the 21 and 22 Jan CME activity. Unsettled to active levels are expected on 04-05 and 10-12 Feb due to negative polarity 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
17 January	114	99	580	B3.1	3	0	0	1	0	0	0	0
18 January	115	59	600	B2.5	2	1	0	2	0	0	0	0
19 January	105	57	570	B2.1	1	0	0	0	0	0	0	0
20 January	99	60	351	B2.1	2	1	0	0	1	0	0	0
21 January	97	23	200	B1.4	0	0	0	0	0	0	0	0
22 January	95	22	180	B1.2	0	0	0	0	0	0	0	0
23 January	94	22	190	A9.8	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	
	17 January	1.3e+05	4.4e+04	8.9e+07
18 January	7.3e+04	4.4e+04	1.5e+08	
19 January	5.9e+05	4.4e+04	1.2e+08	
20 January	1.3e+06	6.9e+05	1.3e+08	
21 January	2.3e+06	1.7e+05	1.4e+08	
22 January	3.6e+06	7.1e+04	1.3e+08	
23 January	1.1e+06	5.2e+04	2.4e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	17 January	6	3-0-1-2-2-2-1-2	13	3-1-1-3-4-4-2-2	9
18 January	12	4-3-2-2-2-3-2-2	24	4-2-5-4-4-4-3-3	18	5-3-3-2-3-3-3-3
19 January	15	5-3-4-2-2-2-1-1	25	5-5-3-4-5-1-2-2	23	6-5-4-3-3-2-2-2
20 January	5	4-0-0-0-1-1-2-1	2	2-1-1-0-0-1-1-0	5	3-1-1-0-1-1-1-1
21 January	5	0-0-0-1-2-2-2-3	4	1-0-0-2-1-2-2-2	8	1-0-1-1-2-2-3-3
22 January	7	2-3-2-1-2-1-1-2	13	1-3-2-4-4-3-1-2	10	3-3-2-2-2-2-2-3
23 January	7	2-3-2-2-1-2-2-1	0	2-2-2-0-0-0-0-0	12	3-3-2-2-2-1-1-1



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
17 Jan 1028	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	16/1445
18 Jan 0034	WARNING: Geomagnetic K = 4	18/0035 - 0900
18 Jan 0043	WARNING: Geomagnetic K = 5	18/0043 - 0600
18 Jan 0046	ALERT: Geomagnetic K = 4	18/0040
18 Jan 0109	ALERT: Geomagnetic K = 5	18/0108
18 Jan 0855	EXTENDED WARNING: Geomagnetic K = 4	18/0035 - 1200
18 Jan 1011	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	16/1445
18 Jan 1803	ALERT: Type II Radio Emission	18/1731
18 Jan 1810	ALERT: Type IV Radio Emission	18/1741
19 Jan 0015	WARNING: Geomagnetic K = 4	19/0015 - 0600
19 Jan 0113	ALERT: Geomagnetic K = 4	19/0113
19 Jan 0131	WARNING: Geomagnetic K = 5	19/0130 - 0600
19 Jan 0154	ALERT: Geomagnetic K = 5	19/0152
19 Jan 0257	WARNING: Geomagnetic K = 6	19/0255 - 0600
19 Jan 0310	ALERT: Geomagnetic K = 6	19/0259
19 Jan 0405	ALERT: Geomagnetic K = 5	19/0404
19 Jan 0459	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	16/1445
19 Jan 0550	EXTENDED WARNING: Geomagnetic K = 4	19/0015 - 1500
19 Jan 0550	EXTENDED WARNING: Geomagnetic K = 5	19/0130 - 1300
19 Jan 1455	EXTENDED WARNING: Geomagnetic K = 5	19/0130 - 20/0300
19 Jan 1459	EXTENDED WARNING: Geomagnetic K = 4	19/0015 - 20/0300
19 Jan 1459	CANCELLATION: Geomagnetic K = 5	
20 Jan 0058	SUMMARY: 10cm Radio Burst	20/0013 - 0013
20 Jan 0459	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	16/1445
20 Jan 0601	ALERT: X-ray Flux exceeded M5	20/0559
20 Jan 0646	SUMMARY: 10cm Radio Burst	20/0558 - 0624

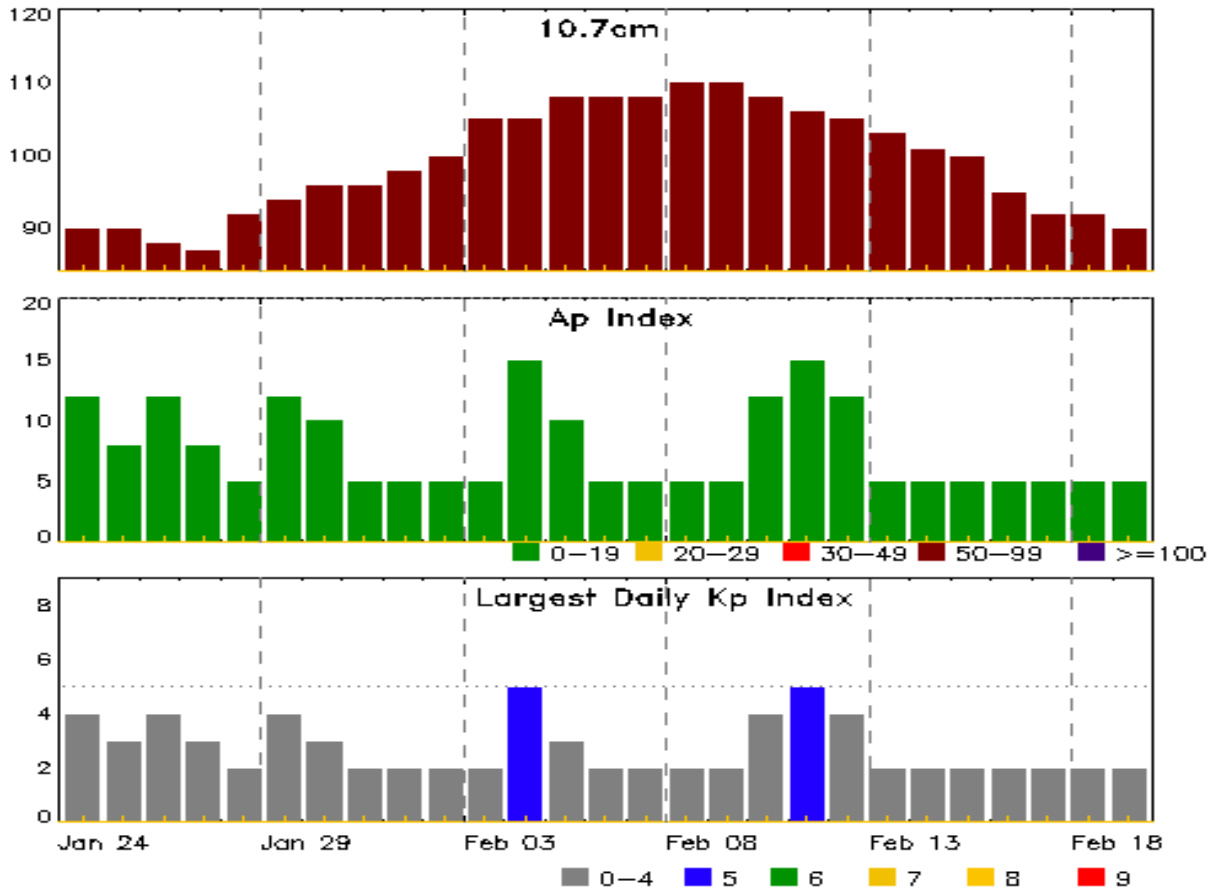


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
20 Jan 0708	ALERT: Type II Radio Emission	20/0557
20 Jan 0722	WARNING: Proton 100MeV Integral Flux > 1pfu	20/0730 - 2100
20 Jan 0723	ALERT: Type IV Radio Emission	20/0617
20 Jan 0732	WARNING: Proton 10MeV Integral Flux > 10pfu	20/0730 - 2100
20 Jan 0805	ALERT: Proton Event 100MeV Integral Flux > 1pfu	20/0745
20 Jan 0817	ALERT: Proton Event 10MeV Integral Flux >= 10pfu	20/0800
20 Jan 0947	SUMMARY: X-ray Event exceeded M5	20/0541 - 0612
20 Jan 1643	CANCELLATION: Proton Event 100MeV Integral Flux > 1pfu	
20 Jan 1932	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	20/0745 - 1110
20 Jan 2120	SUMMARY: Proton Event 10MeV Integral Flux >= 10pfu	20/0800 - 1555
21 Jan 0501	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	16/1445
21 Jan 2220	WARNING: Geomagnetic K = 4	21/2219 - 22/0900
22 Jan 0538	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	16/1445
23 Jan 0500	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	16/1445



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
24 Jan	90	12	4	07 Feb	108	5	2
25	90	8	3	08	110	5	2
26	88	12	4	09	110	5	2
27	87	8	3	10	108	12	4
28	92	5	2	11	106	15	5
29	94	12	4	12	105	12	4
30	96	10	3	13	103	5	2
31	96	5	2	14	101	5	2
01 Feb	98	5	2	15	100	5	2
02	100	5	2	16	95	5	2
03	105	5	2	17	92	5	2
04	105	15	5	18	92	5	2
05	108	10	3	19	90	5	2
06	108	5	2				

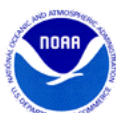


Energetic Events

Date	Time			X-ray	Optical Information				Peak		Sweep Freq	
	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	Intensity II	IV
18 Jan	1701	1744	1817	M1.5	0.034	SF	N09W54	2929	210	150	1	1
20 Jan	0541	0601	0612	M5.5	0.043	1F	N08W68	2929	10000	350	2	

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
17 Jan	1126	1134	1135	B4.7			2925
17 Jan	1348	1415	1446	C2.8	SF	N24W39	2930
17 Jan	1446	1506	1509	C2.6			2930
17 Jan	1509	1516	1521	C2.7			2930
18 Jan	0223	0228	0239	B4.0			2933
18 Jan	0423	0431	0436	B4.6			2929
18 Jan	0436	0440	0444	B5.1			2929
18 Jan	0724	0739	0759	C1.2			2929
18 Jan	1209	1224	1231	B4.9			2929
18 Jan	1231	1237	1244	B5.5			2929
18 Jan	1701	1744	1817	M1.5	SF	N09W54	2929
18 Jan	1948	1951	1955	C5.7	SN	N25W54	2930
19 Jan	1422	1428	1434	B3.3			2930
19 Jan	1633	1643	1649	B5.7			2930
19 Jan	1809	1814	1818	B2.9			2929
19 Jan	1918	1924	1929	B3.3			2929
19 Jan	2350	0010	0018	C1.0			2929
20 Jan	0052	0100	0107	B4.4			2929
20 Jan	0123	0135	0144	B7.0			2929
20 Jan	0209	0214	0225	C1.1			2929
20 Jan	0231	0246	0302	C1.6			2929
20 Jan	0513	0524	0535	B5.3			2929
20 Jan	0541	0601	0612	M5.5	1F	N08W68	2929
20 Jan	2049	2103	2117	B4.1			2933
20 Jan	2349	0002	0009	B9.6			2929
21 Jan	0356	0403	0407	B2.7			2929
21 Jan	0609	0617	0624	B4.1			2929
21 Jan	0807	0822	0831	B5.5			2929
21 Jan	A0850	1016	1120	B4.8			



Flare List

Date	Time			Optical			Rgn #
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	
21 Jan	1423	1427	1431	B2.3			2929
22 Jan	0655	0708	0720	B6.4			2930
23 Jan	0816	0823	0829	B1.5			
23 Jan	1156	1205	1213	B1.7			
23 Jan	1213	1223	1238	B1.6			
23 Jan	2003	2009	2016	B1.5			



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 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										
17 Jan	S35W83		2	10	1	Axx	1	A										
									1	0	0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 5

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										
17 Jan	S20W39		318	30	1	Hsx	1	A										
18 Jan	S20W53		318	30	1	Hsx	1	A										
19 Jan	S20W66		318	30	1	Hsx	1	A										
20 Jan	S21W79		317	1	1	Axx	1	A										
21 Jan	S21W92		318	plage														
									0	0	0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 317



Region Summary - continued

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		
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														
17 Jan	S20W70	349	plage														
18 Jan	S20W84	349	plage														
								0	0	0	0	0	0	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 347

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					
17 Jan	N07W44	323	270	5	Dkc	8	BG										
18 Jan	N07W58	323	260	5	Dko	4	B	1	1			1					
19 Jan	N07W71	323	230	5	Dao	2	B	1									
20 Jan	N08W88	325	80	6	Dao	2	B	2	1				1				
								6	2	0	2	2	1	0	0	0	0

Crossed West Limb.
 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									
17 Jan	N21W45	324	170	7	Dac	8	B	3				1					
18 Jan	N21W59	324	230	7	Dao	6	B	1				1					
19 Jan	N21W72	324	210	7	Dao	4	B										
20 Jan	N22W87	326	100	7	Dao	2	B										
								5	0	0	2	0	0	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 326



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares							
	Lat CMD	Lon	Helio 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
								C	M	X	S	1	2	3

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										
17 Jan	N13W80	359	10	1	Axx	1	A										
								0	0	0	0	0	0	0	0	0	

Crossed West Limb.

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										
17 Jan	N32E34	245	10	1	Axx	2	A										
18 Jan	N32E20	245	plage														
19 Jan	N32E07	245	plage														
20 Jan	N32W07	246	plage														
21 Jan	N32W21	247	plage														
22 Jan	N32W35	248	plage														
23 Jan	N32W49	249	plage														
								5	0	0	0	0	0	0	1	0	

Still on Disk.

Absolute heliographic longitude: 245

Region 2933

16 Jan	S21E06	286	60	3	Cso	6	B										
17 Jan	S22W08	287	80	5	Dso	8	B										
18 Jan	S22W22	287	80	5	Cso	8	B										
19 Jan	S22W35	287	100	6	Cao	10	B										
20 Jan	S22W49	288	80	6	Cao	4	B										
21 Jan	S20W63	289	60	2	Hax	2	A										
22 Jan	S19W77	289	40	1	Hsx	1	A										
23 Jan	S20W88	287	50	2	Hsx	1	A										
								0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 286



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares														
	Lat CMD	Lon	Heli 10 ⁻⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical									
									C	M	X	S	1	2	3	4					
Region 2934																					
20 Jan	S24E69	170	90	2	Hsx	1	A														
21 Jan	S24E54	172	140	2	Hsx	1	A														
22 Jan	S25E41	172	140	2	Hsx	1	A														
23 Jan	S25E28	172	140	2	Hsx	1	A														

Still on Disk.

Absolute heliographic longitude: 172



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

The Weekly has been published continuously since 1951 and is available online since 1997.

<https://www.swpc.noaa.gov/products/weekly-highlights-and-27-day-forecast> --

Current

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