

**Space Weather Highlights**  
**14 February - 20 February 2022**

**SWPC PRF 2425**  
**21 February 2022**

Solar activity ranged from very low to moderate. Region 2941 (N24, L=337, class/area=Eki/370 on 10 Feb) produced both M-class (R1-Minor) events during the period, an M1/Sf at 14/1731 UTC and an M1/Sf at 15/1815 UTC. The region was the most complex on the visible disk during the past week and all significant activity was produced as it was rotating around the NW limb. Following its exit from the visible disk, a Type II radio sweep was observed from CME produced from the vicinity of the region on 18 Feb. The remaining regions on the visible disk produced only isolated low-level C-class activity and were magnetically simple.

No proton events were observed at geosynchronous orbit. A very weak enhancement in the 10 MeV proton flux (well below the S1 threshold) was observed on 16 Feb and an additional one on 18 Feb. The weak enhancements were likely associated with activity on the far-side of the Sun.

The greater than 2 MeV electron flux at geosynchronous orbit ranged from normal to high levels. High levels were observed on 14-18 Feb. Elevated geomagnetic activity on 19-20 Feb decreased the flux to normal-moderate levels.

Geomagnetic field activity was at quiet to G1 (Minor) geomagnetic storm levels. During the onset of a positive polarity CH HSS, an isolated period of G1 was observed during the 20/0000-0300 UTC synoptic period. Total magnetic field strength reached a peak of 12 nT while the Bz component rotated as far south as -11 nT at 20/0115 UTC. Solar wind speeds increased to between 500-550 km/s and remained elevated through the end of the reporting period. Outside of that activity, unsettled conditions were only observed on 16 Feb and early on 19 Feb. The remainder of the summary period was quiet.

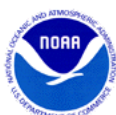
**Space Weather Outlook**  
**21 February - 19 March 2022**

Solar activity is likely to be at low levels, with a slight chance for R1 (Minor) events on 21-23 Feb, from 21 Feb to 06 Mar due to flare potential from regions of flux near and just beyond the E limb. Very low levels are expected from 07 Mar-19 Mar.

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 21-25 Feb, 04-10 Mar and 12-17 Mar. Elevated levels of electron flux are anticipated due to multiple, recurrent CH HSSs. The remainder of the outlook period is expected to be at normal to moderate levels.

Geomagnetic field activity is expected to range from quiet to G1 (Minor) geomagnetic storm levels. G1 conditions are likely on 03-04 Mar, 11 Mar and 19 Mar; active conditions are likely



on 21 Feb and 12 Mar; unsettled conditions are likely over 22-23 Feb, 05-06 Mar, 13 Mar and 18 Mar. All elevated levels of geomagnetic activity are anticipated due to multiple, recurrent CH HSSs. The remainder of the outlook period is expected to be quiet.



### *Daily Solar Data*

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
14 February	107	72	530	B3.5	1	1	0	3	0	0	0	0
15 February	114	73	420	B4.1	3	1	0	1	0	0	0	0
16 February	103	111	340	B3.0	1	0	0	0	0	0	0	0
17 February	97	103	190	B2.4	3	0	0	1	0	0	0	0
18 February	93	53	100	B1.9	0	0	0	1	0	0	0	0
19 February	96	51	80	B1.4	1	0	0	0	0	0	0	0
20 February	93	49	120	B1.9	1	0	0	0	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day -sr)		Electron Fluence (electrons/cm <sup>2</sup> -day -sr)	
	>1 MeV	>10 MeV	>2MeV	
	14 February	5.5e+04	4.3e+04	2.3e+08
15 February	5.0e+04	4.2e+04	3.7e+08	
16 February	9.4e+04	6.7e+04	2.8e+08	
17 February	1.2e+05	7.6e+04	3.9e+07	
18 February	9.3e+05	8.6e+04	1.1e+08	
19 February	1.4e+06	8.2e+04	1.6e+06	
20 February	6.4e+05	7.9e+04	2.1e+06	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	14 February	6	2-2-2-2-2-2-1-0	13	2-1-3-5-2-3-2-0	8
15 February	3	1-2-1-0-1-0-1-1	3	2-1-0-0-1-2-0-0	5	2-2-1-1-1-0-1-1
16 February	6	0-2-2-1-3-1-2-2	9	0-0-2-4-3-3-2-1	9	1-2-2-2-2-2-3-3
17 February	4	2-1-1-0-1-2-1-1	2	1-1-1-1-2-0-0-0	5	2-2-1-1-1-0-1-1
18 February	5	0-0-2-1-2-2-2-2	8	0-0-2-2-4-3-2-1	6	0-1-1-1-2-2-2-2
19 February	6	2-2-2-1-2-2-1-2	17	1-4-3-4-4-4-2-1	9	3-3-2-2-2-2-2-2
20 February	8	3-3-1-1-1-3-2-1	10	4-3-1-3-0-2-2-1	39	5-3-2-2-1-2-3-2

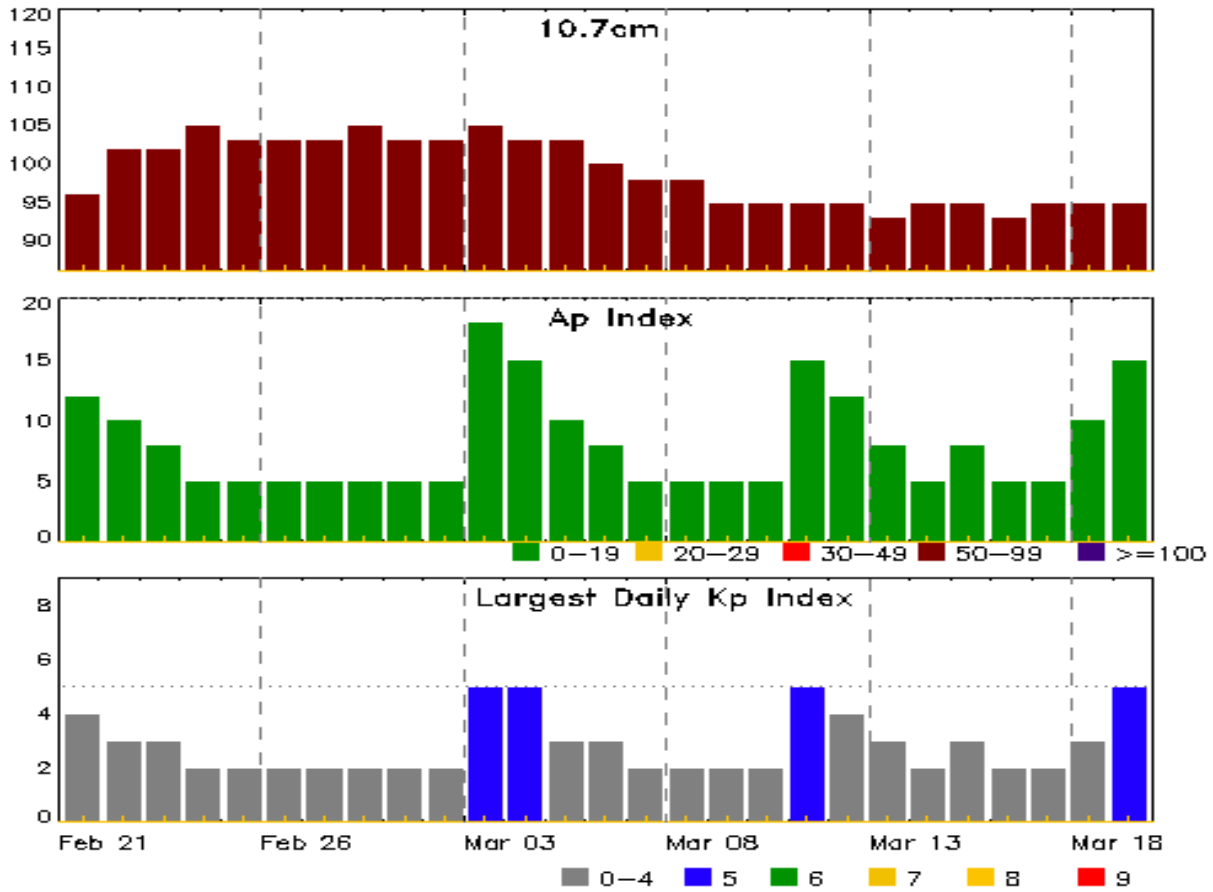


### *Alerts and Warnings Issued*

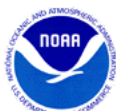
<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
14 Feb 0516	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	13/1300
15 Feb 0503	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	13/1300
16 Feb 0501	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	13/1300
17 Feb 1618	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	13/1300
17 Feb 2346	WATCH: Geomagnetic Storm Category G1 predicted	
18 Feb 1016	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	13/1300
18 Feb 2003	ALERT: Type II Radio Emission	18/1917
20 Feb 0117	WARNING: Geomagnetic K = 4	20/0115 - 1800
20 Feb 0130	ALERT: Geomagnetic K = 4	20/0129
20 Feb 0234	WARNING: Geomagnetic K = 5	20/0234 - 0900
20 Feb 0300	ALERT: Geomagnetic K = 5	20/0259



## 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
21 Feb	96	12	4	07 Mar	98	5	2
22	102	10	3	08	98	5	2
23	102	8	3	09	95	5	2
24	105	5	2	10	95	5	2
25	103	5	2	11	95	15	5
26	103	5	2	12	95	12	4
27	103	5	2	13	93	8	3
28	105	5	2	14	95	5	2
01 Mar	103	5	2	15	95	8	3
02	103	5	2	16	93	5	2
03	105	18	5	17	95	5	2
04	103	15	5	18	95	10	3
05	103	10	3	19	95	15	5
06	100	8	3				



### *Energetic Events*

Date	Time		Half Max	X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max		Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux 245 2695	Intensity II IV		
14 Feb	1702	1731	1751	M1.0	0.017	SF	N26W62	2941				
15 Feb	1754	1815	1831	M1.3	0.017	SF	N26W73	2941				

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
14 Feb	0910	0916	0920	B6.1			
14 Feb	0920	0929	0939	B7.3			
14 Feb	B1353	U1353	A1359	C5.0	SF	N25W60	2941
14 Feb	1432	1433	1436		SF	N25W55	2941
14 Feb	1702	1731	1751	M1.0	SF	N26W62	2941
14 Feb	2226	2234	2238	B5.0			
15 Feb	0512	0518	0522	C4.7			2943
15 Feb	0534	0540	0548	B6.9			2943
15 Feb	1211	1220	1226	B7.7			2943
15 Feb	1409	1413	1419	C1.0			2943
15 Feb	1419	1423	1427	C1.0			2943
15 Feb	1724	1739	1754	B9.5			2941
15 Feb	1754	1815	1831	M1.3	SF	N26W73	2941
15 Feb	2305	2313	2320	B6.8			2941
15 Feb	2341	2346	2352	B8.6			2941
16 Feb	0157	0201	0206	B6.4			2950
16 Feb	1214	1225	1233	B6.5			2939
16 Feb	1333	1341	1347	B5.0			2939
16 Feb	2130	2137	2148	B4.3			2950
16 Feb	2323	2331	2335	C1.1			2950
17 Feb	0218	0227	0234	B6.7	SF	S11W01	2946
17 Feb	0313	0324	0328	C1.0			
17 Feb	0556	0602	0606	C2.3			2941
17 Feb	0931	0936	0946	B3.4			2941
17 Feb	1111	1115	1122	B7.0			2941
17 Feb	1316	1326	1333	B6.3			2946
17 Feb	2040	2051	2110	C1.4			2950
17 Feb	2159	2207	2213	B8.9			
18 Feb	0355	0407	0417	B8.6	SF	N24E36	2950



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
18 Feb	1516	1523	1531	B2.8			2946
18 Feb	1605	1627	1641	B8.4			2950
18 Feb	1906	1922	2018	B4.8			
19 Feb	0447	0453	0507	B3.1			2946
19 Feb	1707	1712	1717	B4.7			
19 Feb	1844	1854	1907	B5.9			
19 Feb	1910	1930	1931	B7.9			
19 Feb	1931	1942	1949	C1.3			
19 Feb	1958	2003	2009	B9.2			2946
19 Feb	2113	2126	2131	B7.2			
20 Feb	0213	0220	0224	B8.7			
20 Feb	0336	0407	0424	C5.1			
20 Feb	1717	1737	1756	B4.0			
20 Feb	1756	1802	1806	B3.5			



## Region Summary

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

### Region 2652

20 Apr	N13E60	54	10	1	Hrx	1	A										
21 Apr	N13E45	56	10	1	Hrx	1	A										
22 Apr	N13E31	57	plage														
23 Apr	N14E17	57	10	3	Bxo	3	B										
24 Apr	N13E01	60	10	2	Bxo	3	B										
25 Apr	N13W13	61	10		Axx	1	A										
26 Apr	N14W26	61	10	1	Axx	3	A										
27 Apr	N14W40	62	plage														
28 Apr	N14W54	62	plage														
29 Apr	N14W68	63	plage														
30 Apr	N14W82	64	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 60

### Region 2941

03 Feb	N25E71	344	180	6	Cao	3	B										
04 Feb	N25E61	341	280	12	Eho	6	B	1									
05 Feb	N24E48	341	300	12	Eho	9	B	3			1						
06 Feb	N24E35	340	290	11	Eho	10	B										
07 Feb	N25E24	338	220	14	Eao	11	B	2									
08 Feb	N23E10	338	260	13	Eki	20	BG										
09 Feb	N24W05	340	370	15	Eki	24	B	1			3						
10 Feb	N24W15	337	370	15	Eki	28	B	1			1						
11 Feb	N24W28	338	280	17	Fki	12	B				1						
12 Feb	N24W40	336	310	17	Fki	8	BG										
13 Feb	N24W54	337	330	17	Fki	11	BG	5			1						
14 Feb	N23W68	338	320	13	Eki	10	BG	1	1		3						
15 Feb	N24W79	335	240	17	Fai	12	BG		1		1						
16 Feb	N25W83	326	150	1	Dao	1	B										
									14	2	0	11	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 340





### *Region Summary - continued*

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

#### ***Region 2943***

08 Feb	S19E48	300	20	4	Bxo	2	B										
09 Feb	S18E33	302	10	4	Axx	2	A										
10 Feb	S18E21	300	plage														
11 Feb	S18E07	303	plage														
12 Feb	S18W07	303	plage														
13 Feb	S18W21	304	plage														
14 Feb	S23W23	293	30	2	Cro	4	B										
15 Feb	S20W37	296	40	3	Cso	2	B	3									
16 Feb	S19W52	295	20	5	Cro	8	B										
17 Feb	S21W66	297	20	7	Bxo	5	B										
18 Feb	S21W80	297	plage														
								3	0	0	0	0	0	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 303

#### ***Region 2945***

11 Feb	S21W35	345	30	4	Cro	6	B										
12 Feb	S20W47	343	30	6	Cro	10	B										
13 Feb	S21W62	345	20	4	Bxo	4	B										
14 Feb	S21W76	346	plage														
15 Feb	S21W90	347	plage														
								0	0	0	0	0	0	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 345

#### ***Region 2946***

11 Feb	S09E66	244	90	4	Dso	2	B										
12 Feb	S08E54	242	110	5	Dso	6	B				1						
13 Feb	S08E39	244	90	4	Cso	8	B										
14 Feb	S07E24	244	60	1	Hsx	2	A										
15 Feb	S09E11	245	50	2	Hsx	3	A										
16 Feb	S09W02	245	30	2	Cro	5	B										
17 Feb	S10W15	246	10	2	Bxo	3	B				1						
18 Feb	S10W29	246	10	3	Bxo	3	B										
19 Feb	S08W42	246	10	1	Axx	1	A										
20 Feb	S08W56	247	plage														
								0	0	0	2	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 245



**Region Summary - continued**

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

**Region 2947**

14 Feb	N12W57	327	40	2	Bxo	3	B										
15 Feb	N15W71	327	50	9	Hsx	3	A										
16 Feb	N15W78	323	10	1	Axx	1	A										
								0	0	0	0	0	0	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 327

**Region 2948**

14 Feb	S27E56	214	80	5	Dso	3	B										
15 Feb	S27E51	217	40	5	Cso	3	B										
16 Feb	S27E29	214	80	7	Dao	8	BG										
17 Feb	S27E15	216	100	8	Cao	13	B										
18 Feb	S28E01	215	70	8	Cao	8	B										
19 Feb	S27W12	216	50	8	Cso	6	B										
20 Feb	S27W24	215	30	6	Cso	4	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 215

**Region 2949**

16 Feb	N25W18	261	20	4	Cro	5	B										
17 Feb	N24W32	263	10	5	Bxo	6	B										
18 Feb	N24W45	262	plage														
19 Feb	N24W59	263	plage														
20 Feb	N24W73	264	plage														
								0	0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 261

**Region 2950**

16 Feb	N19E46	196	20		Hrx	1	A	1									
17 Feb	N21E33	198	20	1	Hrx	1	A	1									
18 Feb	N22E19	198	10	1	Axx	1	A				1						
19 Feb	N22E05	199	plage														
20 Feb	N22W09	200	plage														
								2	0	0	1	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 199



**Region Summary - continued**

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

**Region 2951**

16 Feb	S24W02	245	10	2	Cro	2	B										
17 Feb	S24W15	246	10	5	Bxo	4	B										
18 Feb	S25W27	244	plage														
19 Feb	S25W41	245	plage														
20 Feb	S25W55	246	plage														
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 245

**Region 2952**

17 Feb	S24E67	164	20	1	Hrx	1	A										
18 Feb	S24E55	162	10	1	Axx	1	A										
19 Feb	S24E42	162	10	1	Axx	1	A										
20 Feb	S24E29	162	10	1	Axx	1	A										
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 162

**Region 2953**

19 Feb	N18E37	167	10	5	Bxo	3	B										
20 Feb	N17E22	169	20	6	Bxo	3	B										
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 169

**Region 2954**

20 Feb	N18E72	119	60	2	Hsx	1	A										
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 119



## ***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> --

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