Space Weather Highlights **SWPC PRF 2465**
21 November - 27 November 2022 **28 November 2022**

Solar activity was at very low levels on 24, 26, and 27 Nov. Low levels were reached on 21-23 and 25 Nov. Regions 3149 (N21, L=163, class/area Dsi/170 on 22 Nov) and 3151 (S16, L=153, class/area Cao/080 on 26 Nov) produced the majority of the C-class flares. The largest was a C7/Sf at 22/0727 UTC from Region 3151. Associated with the C7 flare was a CME first observed in SOHO LASCO C2 imagery at 22/0800 UTC with the majority of the ejecta moving south of the ecliptic with a possible glancing blow on 27 Nov. However, no definitive signature could be seen in solar wind data.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal-moderate levels on 21-26 Nov. High levels occurred on 27 Nov, with a peak flux of 2,400 pfu 27/1730 UTC, due to CH HSS influence.

Geomagnetic field activity ranged from quiet to active levels. Solar wind parameters began under the influence of a weak negative polarity CH HSS. Solar wind speed ranged from 400-460 km/s on 21 Nov followed by a decrease to nominal levels through late on 24 Nov. Total field was initially around 11 nT, but decreased to under 5 nT by late on 21 Nov. The geomagnetic field responded with quiet to active levels on 21 Nov and quiet levels on 22-23 Nov. Around 24/1800 UTC, total field and solar wind speed began to increase again as a positive polarity CH HSS moved into geoeffective position. Total field increased to a maximum of 15 nT at 24/2320 UTC while solar wind speed increased to a maximum of 624 km/s at 26/1845 UTC. Positive polarity CH HSS influence continued through the end of the period. The geomagnetic field responded with quiet to unsettled on 24 Nov and quiet to active levels on 25-27 Nov.

Space Weather Outlook
28 November - 24 December 2022

Solar activity is expected to be at very low to low levels. M-class (R1-R2, Minor-Moderate) flares are possible on 29 Nov-12 Dec with the return of old Regions 3140 (N25, L=326) and 3141 (N14, L=318).

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be is expected to reach high levels on 28 Nov-07 Dec and again on 24 Dec due to CH HSS influence.

Geomagnetic field activity is expected to be at unsettled to active levels on 28 Nov-03 Dec, 08-09 Dec, 17-18 Dec, and 22-24 Dec with G1 (Minor) storm levels expected on 28 Nov due to recurrent CH HSS effects.

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
21 November	117	83	410	B4.8	5	0	0	5	0	0	0	0
22 November	116	61	410	B5.2	10	0	0	5	0	0	0	0
23 November	113	68	440	B2.6	3	0	0	3	0	0	0	0
24 November	110	61	410	B3.7	0	0	0	6	0	0	0	0
25 November	109	55	210	B3.0	1	0	0	2	0	0	0	0
26 November	107	60	350	B3.0	0	0	0	0	0	0	0	0
27 November	107	56	150	B3.3	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
21 November	2.2e+05	2.9e+04	1.5e+06
22 November	2.1e+05	2.9e+04	1.5e+06
23 November	3.6e+05	2.9e+04	1.7e+06
24 November	3.1e+05	2.9e+04	1.3e+06
25 November	1.5e+05	3.0e+04	1.2e+06
26 November	7.4e+04	2.9e+04	4.7e+06
27 November	1.0e+05	3.0e+04	4.3e+07

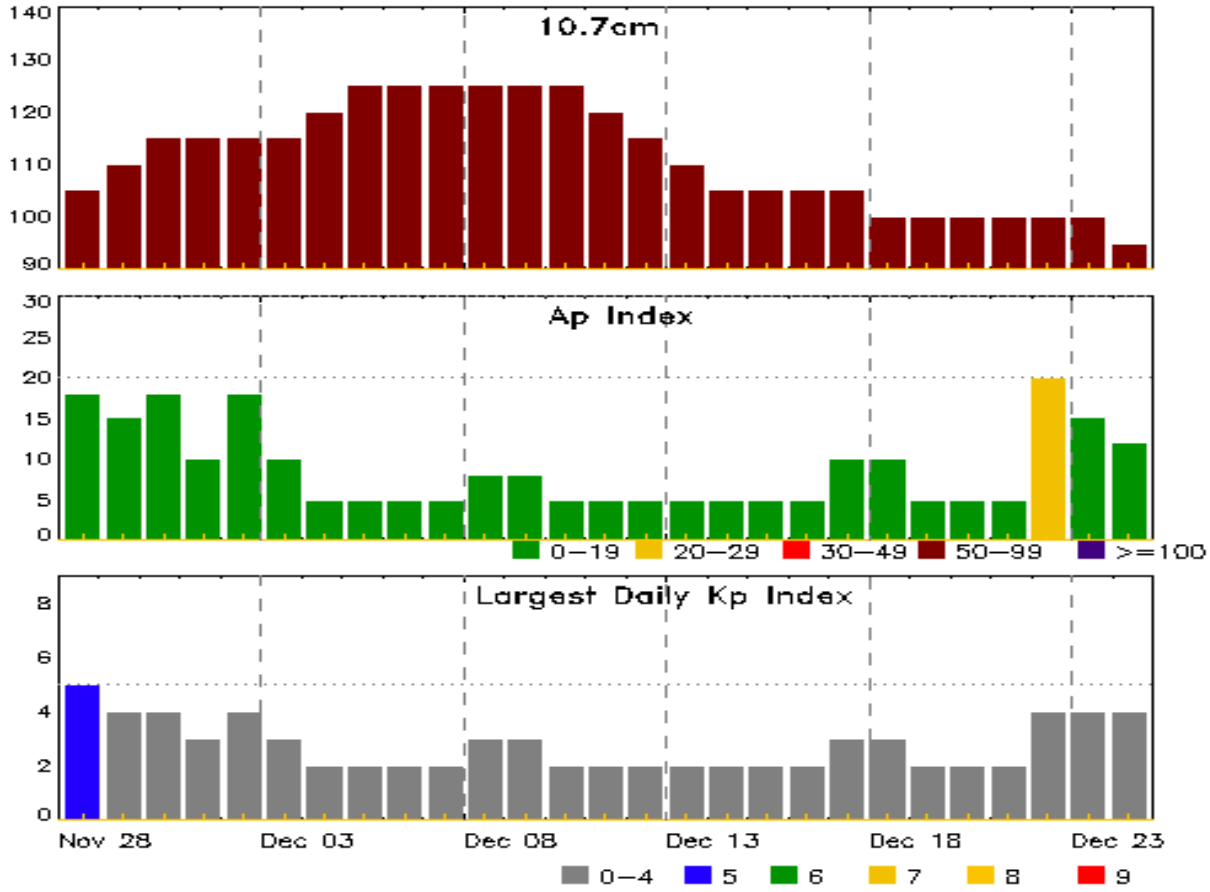
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
21 November	8	3-3-2-2-2-1-1-1	11	2-3-3-4-3-2-1-0	10	4-4-2-2-2-2-1-1
22 November	2	0-0-1-0-1-2-0-0	1	0-0-0-1-1-0-1-0	3	1-1-1-1-1-1-1-0
23 November	1	0-0-0-0-1-1-1-0	1	0-0-0-1-1-0-0-0	3	0-0-1-0-1-1-1-1
24 November	6	1-2-2-1-2-2-1-2	3	1-0-1-2-2-0-1-1	6	2-2-2-1-2-1-2-3
25 November	15	1-3-4-3-3-2-2-4	43	1-4-7-5-5-5-3-3	20	2-4-4-3-3-3-3-4
26 November	12	3-2-3-2-2-3-3-3	27	3-2-5-5-5-4-3-2	16	4-3-4-2-3-3-3-3
27 November	10	2-3-1-2-3-2-3-2	27	2-2-3-5-6-4-4-2	15	3-3-2-2-3-3-4-3

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
21 Nov 0248	WARNING: Geomagnetic K = 4	21/0248 - 0900
21 Nov 0304	ALERT: Geomagnetic K = 4	21/0259
25 Nov 0506	WARNING: Geomagnetic K = 4	25/0505 - 1800
25 Nov 0602	ALERT: Geomagnetic K = 4	25/0559
25 Nov 0849	WARNING: Geomagnetic K = 5	25/0849 - 1500
25 Nov 1851	WARNING: Geomagnetic K = 4	25/1850 - 26/0900
25 Nov 2328	ALERT: Geomagnetic K = 4	25/2327
26 Nov 0855	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 26/1800
26 Nov 1728	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 27/0600
27 Nov 0556	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 27/1500
27 Nov 1400	ALERT: Electron 2MeV Integral Flux >= 1000pfu	27/1345
27 Nov 1428	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 27/2100
27 Nov 2054	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 27/2359
27 Nov 2354	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 28/0900

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
28 Nov	105	18	5	12 Dec	115	5	2
29	110	15	4	13	110	5	2
30	115	18	4	14	105	5	2
01 Dec	115	10	3	15	105	5	2
02	115	18	4	16	105	5	2
03	115	10	3	17	105	10	3
04	120	5	2	18	100	10	3
05	125	5	2	19	100	5	2
06	125	5	2	20	100	5	2
07	125	5	2	21	100	5	2
08	125	8	3	22	100	20	4
09	125	8	3	23	100	15	4
10	125	5	2	24	95	12	4
11	120	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 #
21 Nov	0158	0202	0207	B8.0			3149
21 Nov	0210	0217	0223	C1.1			3149
21 Nov	0330	0342	0356	C2.9	SF	N24E22	3149
21 Nov	0632	0647	0657	C1.1			3149
21 Nov	0657	0702	0707	C1.1	SF	N24E20	3149
21 Nov	0713	0715	0723		SF	N24E22	3149
21 Nov	0947	0955	1018		SF	S31E07	3148
21 Nov	2258	2308	2317	C1.4	SF	N21E14	3149
22 Nov	0659	0727	0742	C7.0	SF	S15E22	3151
22 Nov	1027	1047	1052	C1.2			
22 Nov	1052	1104	1127	C1.9			3151
22 Nov	1214	1224	1229	C2.6			3151
22 Nov	1247	1253	1258	C1.6			3151
22 Nov	1304	1327	1347	C1.7			
22 Nov	1347	1354	1358	C2.7			3151
22 Nov	1503	1512	1515		SF	S13E09	3151
22 Nov	1701	1701	1708		SF	S13E13	3151
22 Nov	1714	1718	1719		SF	S13E12	3151
22 Nov	1849	1908	1916	C4.8	SF	S13E12	3151
22 Nov	2001	2027	2102	C1.7			3151
22 Nov	2102	2118	2124	C1.7			3151
23 Nov	0102	0114	0126	C1.5			3151
23 Nov	1640	1655	1700	B7.5	SF	S13W01	3151
23 Nov	1839	1853	1907	C1.4	SF	S32W29	3148
23 Nov	2044	2053	2059	C1.1	SF	S14W09	3151
24 Nov	0146	0148	0159		SF	S14W06	3151
24 Nov	0616	0623	0627	B8.9			3151
24 Nov	0813	0840	0853		SF	N27E61	3152
24 Nov	0833	0834	0842		SF	S16W12	3151
24 Nov	0856	0925	0942		SF	N27E61	3152
24 Nov	1506	1610	1631		SF	N28E56	3152

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
24 Nov	1711	1711	1714		SF	S13W21	3151
25 Nov	0703	0722	0735	C1.1	SF	N21W29	3149
25 Nov	0919	0922	0926	B5.1	SF	S15W30	3151
25 Nov	1520	1533	1542	B6.5			3148
25 Nov	1913	1926	1942	B7.8			3152
26 Nov	0025	0033	0054	B5.6			3151
26 Nov	0203	0214	0227	B9.0			3148
26 Nov	0430	0434	0443	B6.4			3152
26 Nov	0630	0636	0640	B6.0			3152
26 Nov	0821	0831	0856	B5.0			3152
26 Nov	0856	0907	0912	B4.3			3148
26 Nov	1040	1049	1056	B6.9			3149

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 3146												
13 Nov	N31E30	248	30	3	Dro	5	B								
14 Nov	N32E17	247	30	6	Cro	6	B								
15 Nov	N33E03	248	20	6	Cro	3	B								
16 Nov	N32W08	246	10	6	Bxo	2	B								
17 Nov	N32W21	246	10	1	Axx	1	A								
18 Nov	N32W35	247	plage												
19 Nov	N32W49	247	plage												
20 Nov	N32W63	248	plage												
21 Nov	N32W77	249	plage												
								0	0	0	0	0	0	0	0

Died on Disk.
Absolute heliographic longitude: 248

			Region 3147												
16 Nov	S11E71	167	120	5	Hsx	1	A								
17 Nov	S11E57	168	300	3	Hkx	3	A	1			3				
18 Nov	S11E45	167	280	3	Hkx	3	A	1			1				
19 Nov	S12E32	166	230	4	Dao	4	B								
20 Nov	S12E18	167	240	5	Dao	5	B								
21 Nov	S11E04	168	190	4	Cso	5	B								
22 Nov	S12W10	169	210	7	Cao	7	B								
23 Nov	S12W24	170	250	5	Hkx	7	A								
24 Nov	S12W37	170	220	4	Hax	3	A								
25 Nov	S12W50	169	110	3	Hsx	2	A								
26 Nov	S11W63	169	70	2	Hsx	2	A								
27 Nov	S11W77	170	30	1	Hsx	1	A								
								2	0	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 168

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 3148												
16 Nov	S32E60	178	10	5	Bxo	2	B								
17 Nov	S32E46	179	10	1	Bxo	1	B				2				
18 Nov	S33E32	180	20	1	Hrx	1	A	2			2				
19 Nov	S32E21	177	40	4	Dro	4	B	2			3				
20 Nov	S33E09	176	30	4	Cro	4	B								
21 Nov	S33W05	177	10	1	Axx	3	A				1				
22 Nov	S33W19	178	plage												
23 Nov	S33W33	179	plage					1			1				
24 Nov	S33W47	180	plage												
25 Nov	S33W61	180	plage												
26 Nov	S33W75	181	plage												
27 Nov	S33W89	182	plage												
								5	0	0	9	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 177

			Region 3149												
17 Nov	N22E64	161	10	1	Bxo	6	B	2			2				
18 Nov	N22E51	161	30	2	Cro	3	B								
19 Nov	N23E38	160	30	3	Cro	5	B				1				
20 Nov	N23E24	161	130	6	Dai	16	B				10				
21 Nov	N22E10	162	150	8	Dai	15	BD	5			4				
22 Nov	N21W04	163	170	9	Dsi	15	B								
23 Nov	N21W18	164	150	11	Eao	11	B								
24 Nov	N21W30	163	120	9	Dao	8	B								
25 Nov	N22W45	164	60	2	Hsx	2	A	1			1				
26 Nov	N22W57	163	80	5	Cso	2	B								
27 Nov	N22W70	163	20	2	Hsx	1	A								
								8	0	0	18	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 163

			Region 3150												
18 Nov	N21W42	254	80	6	Dri	8	B	3							
19 Nov	N22W55	253	140	8	Dso	6	B	4	1		5				
20 Nov	N21W70	255	120	10	Dao	7	B	1							
21 Nov	N21W84	256	50	9	Dao	3	B								
								8	1	0	5	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 254

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 3151												
21 Nov	S14E19	153	10	6	Bxo	7	B								
22 Nov	S19E05	154	30	5	Cri	9	B	8			5				
23 Nov	S16W09	155	30	8	Dro	7	B	2			2				
24 Nov	S16W21	154	60	9	Dao	7	B				3				
25 Nov	S15W34	153	20	9	Cro	4	B				1				
26 Nov	S16W47	153	80	7	Cao	6	B								
27 Nov	S15W59	152	50	6	Cso	6	B								
								10	0	0	11	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 154

			Region 3152												
23 Nov	S26E57	89	10	2	Axx	3	A								
24 Nov	N26E45	88	10	4	Bxo	3	B				3				
25 Nov	N27E36	83	20	6	Cro	7	B								
26 Nov	N27E23	83	120	7	Cao	10	B								
27 Nov	N26E10	83	50	7	Cso	8	B								
								0	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 83

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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