Space Weather Highlights **SWPC PRF 2462**
31 October - 06 November 2022 **07 November 2022**

Solar activity was at very low to high levels during the period. Low levels were observed on 31 Oct through 04 Nov with the majority of the low to mid-level C-class activity produced by Regions 3135 (N27, L=063, class/area Eao/190 on 31 Oct), 3131 (N23, L=111, class/area Cso/190 on 27 Oct), and 3141 (N15, L=319, class/area Eko/460 on 06 Nov). Region 3141 rotated onto the visible disk on 04 Nov as a large bipolar spot group, however the magnetic classification has been difficult to ascertain due to possible artifacts in the magnetogram imagery. Very low levels were observed on 05 Nov. By late on 06 Nov, an M5.2 flare occurred from Region 3141 reaching a peak at 07/0011 UTC. Associated with the flare was a Type II radio sweep (927 km/s), a 740 sfu Tenflare, and likely a CME off the SE as was evident by coronal darkening in GOES/SUVI 195 imagery beginning at 07/0008 UTC. Analysis of any associated CME is pending as imagery becomes available. Other CMEs preceding this event did not have an Earth-directed component.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels throughout the period due to CH HSS influences. The peak flux was 8,980 pfu observed at 06/1515 UTC.

Geomagnetic field activity ranged from quiet to G1 (Minor) storm levels due to multiple CH HSSs. Solar wind speed began the period near 500 km/s with total field near 5 nT. Solar wind speed slowly receded to near 410 km/s by late on 01 Nov. By midday on 02 Nov, total field and solar wind speed began to increase once again to near 10 nT and 560 km/s. Solar wind speed decreased to near 460 km/s on 03 Nov before increasing once again to near 580 km/s late on 03 Nov to early on 04 Nov. Solar wind speeds slowly decreased to background levels through 06 Nov. The geomagnetic field responded with quiet to unsettled levels on 31 Oct. Increased to quiet to active levels on 01-02 Nov and quiet to G1 (Minor) storm levels on 03 Nov. Quiet to active levels were observed on 04 Nov followed by quiet to unsettled conditions on 05 Nov and ended at quiet levels on 06 Nov.

Space Weather Outlook
07 November - 03 December 2022

Solar activity is expected to be at very low to low levels throughout the forecast period with a slight chance for further M-class flares (R1-R2, Minor-Moderate) on 07-16 Nov due primarily to the flare potential of Region 3141.

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 07-09 Nov and again on 26 Nov-03 Dec due to HSS influence.

Geomagnetic field activity is expected to be reach unsettled to active levels on 07-12 Nov, 18-20

Nov, and 23 Nov-03 Dec with G1 (Minor) storm levels likely on 18 Nov, 25 Nov, and 30 Nov 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
31 October	128	56	390	B5.4	3	0	0	0	0	0	0	0
01 November	128	63	360	B4.6	2	0	0	2	0	0	0	0
02 November	130	49	280	B4.5	3	0	0	4	0	0	0	0
03 November	125	65	340	B4.8	2	0	0	7	0	0	0	0
04 November	118	81	510	B5.6	5	0	0	3	0	0	0	0
05 November	131	82	480	B5.1	0	0	0	0	0	0	0	0
06 November	131	78	690	B5.7	6	1	0	1	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
31 October	1.7e+05	3.0e+04	1.6e+08
01 November	5.5e+04	3.1e+04	6.4e+07
02 November	8.4e+05	3.2e+04	1.1e+08
03 November	5.4e+05	3.2e+04	4.9e+07
04 November	1.1e+05	3.2e+04	2.1e+08
05 November	9.0e+04	3.3e+04	3.7e+08
06 November	5.3e+04	3.2e+04	5.0e+08

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
31 October	108	2-2-3-9-3-9-3-1	24	1-2-4-5-5-5-2-2	11	2-3-3-3-2-3-2-2
01 November	84	1-0-3-0-9-0-0-1	11	0-0-4-4-4-2-1-0	8	1-1-4-3-2-1-2-2
02 November	0	3-4-3-0-0-0-0-0	30	1-3-4-5-6-5-3-1	14	3-4-3-2-3-4-3-2
03 November	16	2-1-3-0-0-4-3-4	48	2-1-5-5-6-7-4-4	26	3-2-4-4-5-5-4-4
04 November	12	3-3-3-3-3-2-1-2	24	4-3-3-5-5-4-2-1	16	4-4-3-3-3-3-2-2
05 November	8	3-3-2-3-2-1-1-0	22	2-2-3-6-5-3-1-0	10	3-3-2-3-2-2-1-1
06 November	3	0-1-1-1-1-2-0-1	4	1-0-2-3-1-0-0-0	4	1-1-2-1-0-1-1-1

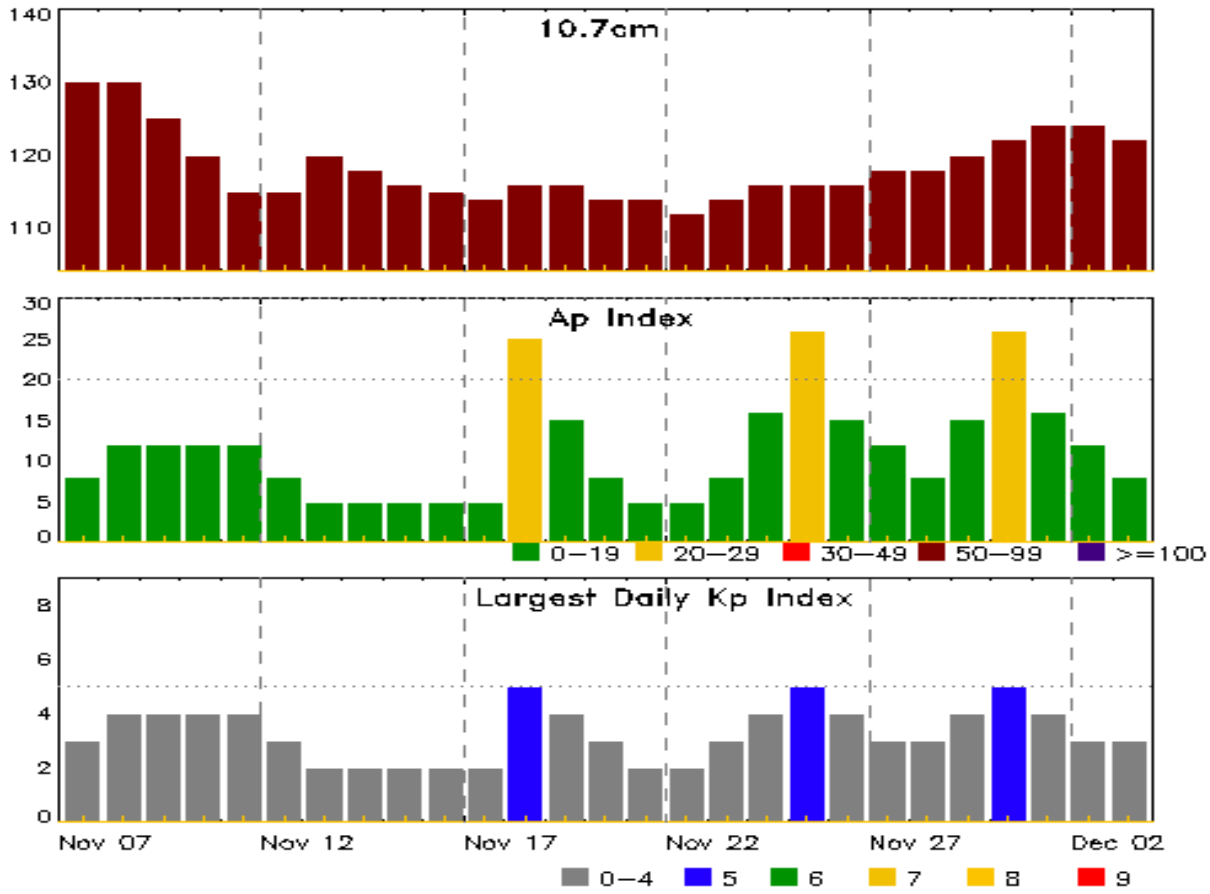
Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
31 Oct 0306	WARNING: Geomagnetic K = 4	31/0305 - 1500
31 Oct 0654	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220
31 Oct 1737	WARNING: Geomagnetic K = 4	31/1736 - 2359
01 Nov 0735	WARNING: Geomagnetic K = 4	01/0735 - 1200
01 Nov 0902	ALERT: Geomagnetic K = 4	01/0859
01 Nov 1151	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220
02 Nov 0543	WARNING: Geomagnetic K = 4	02/0543 - 0900
02 Nov 0602	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220
02 Nov 0602	ALERT: Geomagnetic K = 4	02/0559
02 Nov 1229	WARNING: Geomagnetic K = 4	02/1230 - 1800
02 Nov 1737	EXTENDED WARNING: Geomagnetic K = 4	02/1230 - 2359
02 Nov 1738	ALERT: Geomagnetic K = 4	02/1737
03 Nov 0725	WATCH: Geomagnetic Storm Category G1 predicted	
03 Nov 0804	WARNING: Geomagnetic K = 4	03/0804 - 1500
03 Nov 0902	ALERT: Geomagnetic K = 4	03/0859
03 Nov 1116	EXTENDED WARNING: Geomagnetic K = 4	03/0804 - 1800
03 Nov 1117	WARNING: Geomagnetic K = 5	03/1117 - 1500
03 Nov 1245	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220
03 Nov 1438	EXTENDED WARNING: Geomagnetic K = 4	03/0804 - 2359
03 Nov 1438	ALERT: Geomagnetic K = 5	03/1436
03 Nov 1438	EXTENDED WARNING: Geomagnetic K = 5	03/1117 - 2100
03 Nov 1636	WATCH: Geomagnetic Storm Category G1 predicted	
03 Nov 1646	ALERT: Geomagnetic K = 5	03/1636
03 Nov 2046	EXTENDED WARNING: Geomagnetic K = 4	03/0804 - 04/1200
03 Nov 2046	EXTENDED WARNING: Geomagnetic K = 5	03/1117 - 04/0600
04 Nov 0512	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
04 Nov 0708	EXTENDED WARNING: Geomagnetic K = 4	03/0804 - 04/1800
04 Nov 1650	EXTENDED WARNING: Geomagnetic K = 4	03/0804 - 05/2100
05 Nov 0501	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220
05 Nov 1758	CANCELLATION: Geomagnetic Storm Category G1 predicted	
06 Nov 0500	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	30/1220

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
07 Nov	130	8	3	21 Nov	114	5	2
08	130	12	4	22	112	5	2
09	125	12	4	23	114	8	3
10	120	12	4	24	116	16	4
11	115	12	4	25	116	26	5
12	115	8	3	26	116	15	4
13	120	5	2	27	118	12	3
14	118	5	2	28	118	8	3
15	116	5	2	29	120	15	4
16	115	5	2	30	122	26	5
17	114	5	2	01 Dec	124	16	4
18	116	25	5	02	124	12	3
19	116	15	4	03	122	8	3
20	114	8	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
06 Nov	2359		0011	0016	M5.2	0.024		3141	740		2	

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
31 Oct	0205	0213	0220	C1.0			3133
31 Oct	1319	1331	1343	C1.3			3135
31 Oct	2032	2040	2049	C1.2			3135
01 Nov	0052	0059	0103	B7.0			
01 Nov	0615	0620	0624	C1.2			3137
01 Nov	1100	1108	1114	B7.5			
01 Nov	1345	1358	1402	C1.3			3137
01 Nov	2029	2030	2032		SF	S05E40	3136
01 Nov	2108	2109	2114		SF	N29E14	3135
02 Nov	0207	0214	0222	C2.2	SF	N28E19	3135
02 Nov	0628	0631	0634	B6.1			
02 Nov	0634	0638	0654	B9.4			
02 Nov	0635	0637	0642		SF	N29E78	
02 Nov	0804	0814	0822	B8.2	SF	N28E19	3135
02 Nov	2049	2103	2125	C1.0			3135
02 Nov	2303	2316	2339	C1.2	SF	N26E03	3135
03 Nov	0009	0024	0044	B9.2	SF	N24W46	3131
03 Nov	0217	0226	0233	C1.0	SF	S06E24	3136
03 Nov	0302	0307	0309		SF	N24W46	3131
03 Nov	0338	0340	0345		SF	N25W49	3131
03 Nov	0637	0644	0651	B9.0			3136
03 Nov	0657	0723	0752	C1.3	SF	S08E20	3136
03 Nov	0750	0753	0805		SF	N26W53	3131
03 Nov	1442	1447	1451	B8.1			3131
03 Nov	1643	1653	1703	B8.0			3139
03 Nov	1719	1727	1732	B9.7			3137
03 Nov	2250	2250	2252		SF	S08E12	3136
04 Nov	0633	0641	0649	C1.0			3141
04 Nov	0713	0744	0803	C5.6			3141
04 Nov	0852	0852	0856		SF	N24W64	3131

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
04 Nov	1049	1101	1114	B9.5			3141
04 Nov	1527	1538	1547	C1.0	SF	N26E02	3135
04 Nov	1847	1852	1857	C1.5	SF	N17E83	3141
04 Nov	2022	2028	2038	B9.6			3141
04 Nov	2213	2227	2241	C1.6			3141
05 Nov	0910	0917	0928	B9.3			3135
06 Nov	0057	0103	0110	B7.1			3141
06 Nov	0110	0113	0124	C1.2			3141
06 Nov	1158	1210	1215	C1.7			3141
06 Nov	1506	1524	1539	C1.3			3141
06 Nov	1710	1715	1741	C3.7	SF	N15E59	3141
06 Nov	2106	2125	2137	C1.6			3141
06 Nov	2139	2150	2202	C1.7			3141
06 Nov	2359	0011	0016	M5.2			3141

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 3130													
23 Oct	S24E09	185	20	4	Cro	5	B	3							
24 Oct	S24W03	184	20	7	Cro	7	B	1							
25 Oct	S25W17	185	20	7	Cro	6	B								
26 Oct	S24W30	184	60	7	Dso	12	B								
27 Oct	S25W44	185	90	6	Dao	9	B	2							
28 Oct	S25W58	186	80	6	Dai	10	B	1							
29 Oct	S24W71	186	70	6	Dai	8	B	2							
30 Oct	S24W84	186	40	5	Dao	3	B	1							
								10	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 184

		Region 3131													
24 Oct	N23E70	111	30	2	Hsx	1	A								
25 Oct	N23E58	110	130	6	Cso	5	B								
26 Oct	N23E44	109	170	8	Cao	7	B								
27 Oct	N23E29	111	190	8	Cso	4	B								
28 Oct	N22E16	112	150	6	Cso	3	B								
29 Oct	N23E06	112	150	7	Cso	8	B								
30 Oct	N23W09	111	160	6	Cso	5	B	1							
31 Oct	N23W19	108	180	5	Cso	4	B								
01 Nov	N22W33	111	160	4	Hsx	3	A								
02 Nov	N22W47	110	120	4	Hsx	2	A								
03 Nov	N22W61	110	140	3	Hsx	2	A				4				
04 Nov	N23W76	112	100	3	Hsx	1	A				1				
05 Nov	N24W90	113	50	2	Hsx	1	A								
								1	0	0	5	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 112

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 3133												
25 Oct	N26E73	95	20	2	Cro	3	B	2			1				
26 Oct	N26E60	95	30	6	Cro	4	B	2			2				
27 Oct	N26E46	94	30	5	Cro	6	B	3							
28 Oct	N26E33	95	140	6	Dao	8	B								
29 Oct	N26E21	94	90	7	Dri	11	B								
30 Oct	N26E07	95	30	8	Bxo	11	B	1							
31 Oct	N26W03	92	10	5	Axx	2	A	1							
01 Nov	N23W20	95	plage												
02 Nov	N23W34	96	plage												
03 Nov	N23W48	97	plage												
04 Nov	N23W62	98	plage												
05 Nov	N23W76	99	plage												
06 Nov	N23W90	100	plage												
								9	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 92

			Region 3134												
28 Oct	N12E14	114	10	3	Bxo	2	B								
29 Oct	N12W01	116	10	2	Axx	3	A								
30 Oct	N12W15	117	plage												
31 Oct	N12W29	118	plage												
01 Nov	N12W44	119	plage												
02 Nov	N12W58	121	plage												
03 Nov	N12W72	121	plage												
04 Nov	N12W86	122	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 116

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 3135												
28 Oct	N27E65	63	20	6	Bxo	3	B	3							
29 Oct	N27E52	63	130	9	Dso	6	B	1							
30 Oct	N27E39	63	160	11	Eao	9	B								
31 Oct	N27E25	63	190	11	Eao	8	BG	2							
01 Nov	N26E12	63	160	9	Dso	5	B				1				
02 Nov	N26W00	61	110	11	Eso	3	B	3			3				
03 Nov	N26W12	60	120	10	Dso	4	B								
04 Nov	N26W26	62	90	9	Cso	2	B	1							
05 Nov	N26W40	63	80	4	Cso	3	B								
06 Nov	N26W54	64	100	1	Hsx	1	A								
								10	0	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 61

			Region 3136												
31 Oct	S06E51	37	10	2	Axx	2	A								
01 Nov	S08E37	38	10	3	Dso	3	B				1				
02 Nov	S07E23	38	30	4	Dso	3	B								
03 Nov	S08E09	38	30	5	Cso	4	B	2			3				
04 Nov	S07W05	41	10	1	Axx	1	A								
05 Nov	S08W19	42	10	1	Axx	1	A								
06 Nov	S08W34	44	10	1	Axx	1	A								
								2	0	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 41

			Region 3137												
01 Nov	N37E64	12	20	1	Hsx	1	A	2							
02 Nov	N37E50	12	20	1	Hsx	1	A								
03 Nov	N38E39	10	30	2	Hsx	1	A								
04 Nov	N38E21	15	30	9	Cro	3	B								
05 Nov	N37E09	14	30	3	Cro	2	B								
06 Nov	N37E01	9	10	1	Axx	1	A								
								2	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 9

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 3138												
01 Nov	S39E08	67	10	2	Dso	1	B								
02 Nov	S39W05	68	plage												
03 Nov	S39W18	67	plage												
04 Nov	S39W31	67	plage												
05 Nov	S39W44	67	plage												
06 Nov	S39W57	67	plage												
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 68															
			Region 3139												
03 Nov	N29E48	1	20	3	Cro	4	B								
04 Nov	N28E35	1	10	3	Bxo	2	B								
05 Nov	N28E23	1	10	1	Axx	1	A								
06 Nov	N28E10	1	plage												
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 1															
			Region 3140												
04 Nov	N26E66	330	120	3	Hsx	1	A								
05 Nov	N26E51	332	110	1	Hsx	1	A								
06 Nov	N27E38	332	100	1	Hsx	1	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 332															
			Region 3141												
04 Nov	N15E75	321	150	4	Hsx	1	A	4							
05 Nov	N14E63	320	190	8	Dao	3	B								
06 Nov	N15E51	319	460	12	Eko	9	B	6	1		1				
								10	1	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 319															

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 3142													
06 Nov	N26E21	349	10	6	Bxo	5	B	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 349

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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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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