Space Weather Highlights **SWPC PRF 2466**
28 November - 04 December 2022 **05 December 2022**

Solar activity was at low to moderate (R1-Minor) levels this period. Region 3152 (N27, L=083, class/area Cao/120 on 26 Nov) produced an M1.0/1n at 01/0721 UTC. Region 3157 (N16, L=300, class/area Dso/210 on 04 Dec) produced an M1.2/Sn flare at 03/1741 UTC. A 456 km/s Type II Sweep signature was associated with this event. Numerous C-class activity was also assocated with both of these regions as well as C-class activity from Regions 3151 (S16, L=154, class/area Dao/060 on 24 Nov), 3153 (S17, L=327, class/area Fko/1080 on 04 Dec), 3155 (N23, L=026, class/area Dai/140 on 04 Dec) and 3156 (N25, L=319, class/area Dao/220 on 03 Dec). No Earth-directed CME signatures were detected during the period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels on 28 Nov and high levels on 29-30 Nov and 01-04 Dec. A peak flux of 17,351 pfu was observed at 03/1740 UTC.

Geomagnetic field activity generally ranged from unsettled to active levels throughout the period. Minor storm levels (G1-Minor) were observed on 28-30 Nov and 01 Dec. The field was under the influence of a pair of positive polarity CH HSSs.

Space Weather Outlook
05 December - 31 December 2022

Solar activity is expected to be at very low to low levels. M-class (R1-R2, Minor-Moderate) flares are possible on 05-13 Dec and 18-31 Dec due to current and returning M-class producing regions.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be reach high levels on 05-08 Dec and 24-31 Dec due to CH HSS influence.

Geomagnetic field activity is expected to be at unsettled to active levels on 07-09 Dec, 17-18 Dec and 22-31 Dec with G1 (Minor) storm levels expected on 22 Dec and 25-28 Dec 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
28 November	107	52	170	B3.8	0	0	0	4	0	0	0	0
29 November	108	25	100	B5.5	3	0	0	7	0	0	0	0
30 November	111	12	10	B7.4	8	0	0	1	0	0	1	0
01 December	119	49	330	B5.1	5	1	0	0	1	0	0	0
02 December	124	66	1010	B4.9	5	0	0	1	0	0	0	0
03 December	134	68	1170	B6.8	11	1	0	1	0	0	0	0
04 December	144	93	1620	B6.6	6	0	0	3	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
28 November	7.7e+04	2.9e+04	4.9e+06
29 November	1.2e+05	2.9e+04	5.4e+07
30 November	1.9e+06	2.9e+04	1.9e+08
01 December	1.1e+06	2.9e+04	1.1e+08
02 December	6.9e+05	3.2e+04	3.9e+08
03 December	7.9e+05	3.3e+04	5.7e+08
04 December	9.6e+05	3.2e+04	3.0e+08

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
28 November	18	4-4-3-3-2-2-4-3	25	4-5-4-4-2-2-4-4	24	5-5-3-3-1-1-4-4
29 November	20	4-3-4-3-4-4-3-2	43	3-2-6-6-6-5-4-2	25	4-3-4-4-4-5-4-3
30 November	17	3-3-2-4-4-2-4-2	54	2-3-2-7-7-3-6-4	24	3-3-3-4-4-3-5-3
01 December	18	2-4-4-3-3-4-3-2	51	3-4-6-7-6-4-4-3	28	3-5-4-4-4-4-4-4
02 December	11	3-3-3-2-3-2-2-2	31	3-4-5-6-4-4-3-2	16	3-4-3-3-3-3-3-3
03 December	7	2-3-2-2-1-2-1-1	24	1-4-4-6-3-4-2-1	10	3-3-2-3-2-3-2-1
04 December	10	1-1-1-2-3-3-3-3	26	1-1-2-4-5-6-4-3	7	2-2-1-2-3-4-4-4

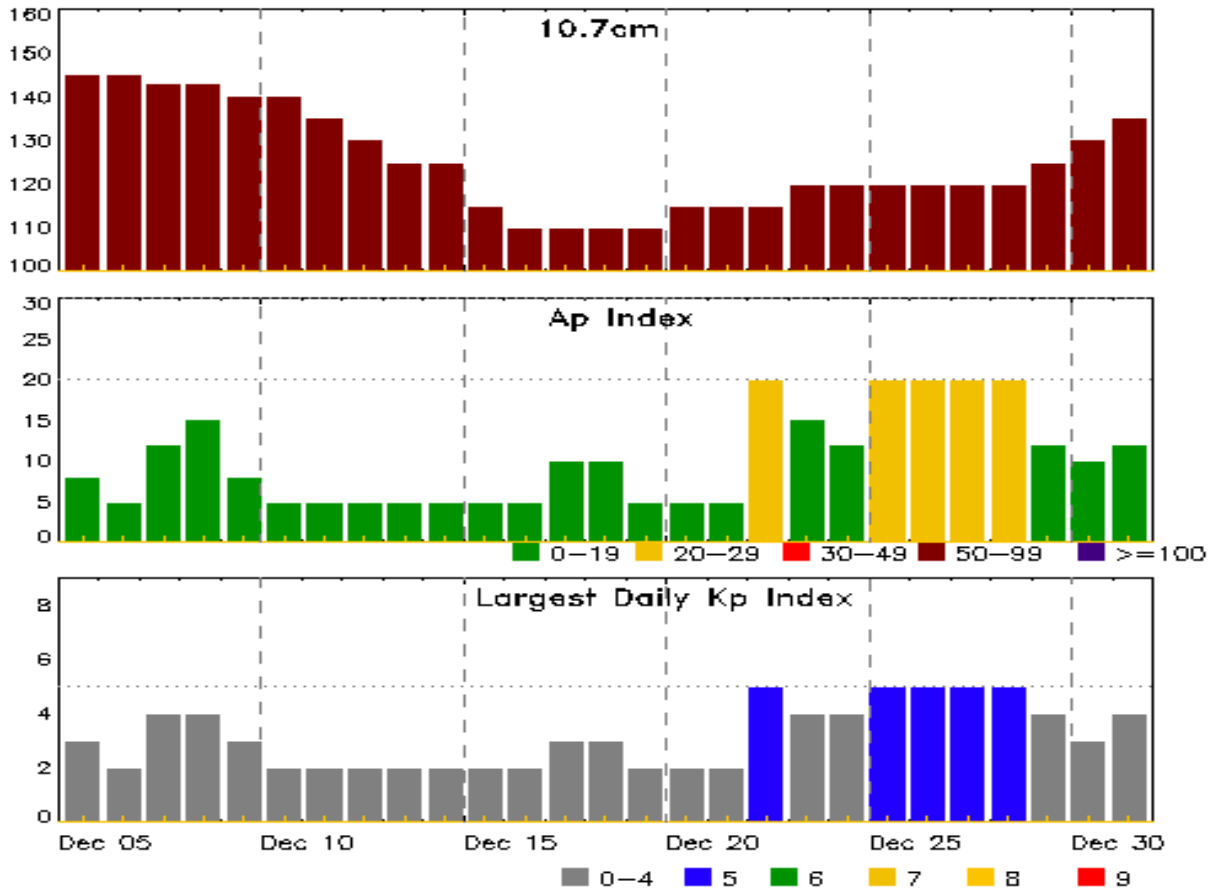
Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
28 Nov 0159	WARNING: Geomagnetic K = 5	28/0158 - 0900
28 Nov 0301	ALERT: Geomagnetic K = 5	28/0259
28 Nov 0526	ALERT: Geomagnetic K = 5	28/0525
28 Nov 0532	WARNING: Geomagnetic K = 6	28/0532 - 0900
28 Nov 0757	EXTENDED WARNING: Geomagnetic K = 4	25/1850 - 28/1500
28 Nov 1907	WARNING: Geomagnetic K = 4	28/1907 - 29/0600
28 Nov 1909	ALERT: Geomagnetic K = 4	28/1856
28 Nov 2145	WATCH: Geomagnetic Storm Category G1 predicted	
29 Nov 0119	WARNING: Geomagnetic K = 5	29/0118 - 0600
29 Nov 0527	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 29/1200
29 Nov 1149	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 29/1800
29 Nov 1531	ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1425
29 Nov 1646	WARNING: Geomagnetic K = 5	29/1645 - 30/0300
29 Nov 1651	ALERT: Geomagnetic K = 5	29/1647
29 Nov 1756	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 30/0900
29 Nov 1806	WARNING: Geomagnetic K = 5	29/1645 - 30/0300
29 Nov 2225	WATCH: Geomagnetic Storm Category G1 predicted	
30 Nov 0711	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1425
30 Nov 0836	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 30/1500
30 Nov 1155	WARNING: Geomagnetic K = 5	30/1155 - 1800
30 Nov 1155	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 30/2100
30 Nov 1855	WARNING: Geomagnetic K = 5	30/1855 - 2359
30 Nov 1859	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 01/0600
30 Nov 1918	ALERT: Geomagnetic K = 5	30/1918
30 Nov 2357	EXTENDED WARNING: Geomagnetic K = 5	30/1855 - 01/0600
01 Dec 0502	ALERT: Geomagnetic K = 5	01/0455
01 Dec 0534	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 01/2100
01 Dec 0536	EXTENDED WARNING: Geomagnetic K = 5	30/1855 - 01/1200

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
01 Dec 1432	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1425
01 Dec 1436	WARNING: Geomagnetic K = 5	01/1435 - 1800
01 Dec 1751	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 02/0600
01 Dec 1751	EXTENDED WARNING: Geomagnetic K = 5	01/1435 - 2359
02 Dec 0459	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1425
02 Dec 0548	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 02/1200
02 Dec 1159	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 02/1800
02 Dec 1754	EXTENDED WARNING: Geomagnetic K = 4	28/1907 - 03/0600
03 Dec 0500	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1425
03 Dec 1816	ALERT: Type II Radio Emission	03/1745
04 Dec 0459	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	29/1425
04 Dec 1704	WARNING: Geomagnetic K = 4	04/1705 - 2359
04 Dec 1707	ALERT: Geomagnetic K = 4	04/1707
04 Dec 2336	EXTENDED WARNING: Geomagnetic K = 4	04/1705 - 05/0600

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
05 Dec	145	8	3	19 Dec	110	5	2
06	145	5	2	20	115	5	2
07	143	12	4	21	115	5	2
08	143	15	4	22	115	20	5
09	140	8	3	23	120	15	4
10	140	5	2	24	120	12	4
11	135	5	2	25	120	20	5
12	130	5	2	26	120	20	5
13	125	5	2	27	120	20	5
14	125	5	2	28	120	20	5
15	115	5	2	29	125	12	4
16	110	5	2	30	130	10	3
17	110	10	3	31	135	12	4
18	110	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
01 Dec	0704	0721	0736	M1.0	0.011	1N	N28	W34	3152				
03 Dec	1736	1741	1745	M1.2	0.003	SN	N18	E83	3157	200		2	

Flare List

	Time				Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #	
28 Nov	0233	0240	0245	B6.6			3151	
28 Nov	0710	0719	0725	B9.2			3151	
28 Nov	0737	0738	0742		SF	S16W65	3151	
28 Nov	1216	1217	1229		SF	S15W68	3151	
28 Nov	1249	1254	1258	B8.9	SF	S15W67	3151	
28 Nov	B1351	U1351	A1409		SF	S15W67	3151	
28 Nov	2006	2012	2021	B9.5				
28 Nov	2110	2119	2125	B9.8			3151	
29 Nov	0216	0220	0224	C1.0			3152	
29 Nov	0524	0531	0535	B9.3				
29 Nov	0629	0637	0655	C1.1			3151	
29 Nov	0935	0942	0951	B9.0				
29 Nov	1312	1358	1437	C4.2			3151	
29 Nov	1651	1652	1656		SF	S16W83	3151	
29 Nov	2122	2123	2125		SF	S17W82	3151	
29 Nov	2126	2127	2130		SF	S17W82	3151	
29 Nov	2131	2133	2138		SF	S17W82	3151	
29 Nov	2152	2153	2155		SF	S17W82	3151	
29 Nov	2235	2239	2245		SN	S17W82	3151	
29 Nov	2246	2247	2248		SF	S17W82	3151	
30 Nov	0001	0116	0117		3F	S18W79	3151	
30 Nov	0323	0324	0326		SF	N28W13	3152	
30 Nov	0534	0542	0549	C1.3			3151	
30 Nov	0617	0623	0629	C2.1			3151	
30 Nov	1106	1113	1118	C1.6			3151	
30 Nov	1222	1231	1235	C1.2				
30 Nov	1400	1410	1419	C1.1				
30 Nov	1610	1617	1624	C3.0			3151	
30 Nov	1701	1709	1714	C2.8				

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
30 Nov	1803	1821	1826	C1.8			
30 Nov	2223	2226	2230	B9.1			
01 Dec	0110	0114	0118	C1.1			3153
01 Dec	0400	0409	0423	B8.9			
01 Dec	0511	0516	0521	B7.2			3153
01 Dec	0704	0721	0736	M1.0	1N	N28W34	3152
01 Dec	1408	1420	1435	C1.3			3153
01 Dec	1522	1527	1534	B9.2			3153
01 Dec	1657	1707	1718	C1.3			3153
01 Dec	1727	1731	1736	C1.0			3152
01 Dec	1855	1910	1923	C2.9			3153
02 Dec	0157	0207	0216	C3.7			3153
02 Dec	0331	0335	0339	C1.0			3153
02 Dec	0626	0635	0649	B9.7			3153
02 Dec	0909	0920	0926	C8.1	SF	N15E80	3156
02 Dec	1555	1600	1609	B6.9			
02 Dec	1813	1821	1833	C1.5			3156
02 Dec	2347	2356	0001	C1.8			3157
03 Dec	0146	0152	0157	C1.1			3153
03 Dec	0217	0226	0249	C1.2			3157
03 Dec	0556	0559	0603	C1.1			3156
03 Dec	0610	0623	0632	C3.1			3157
03 Dec	0756	0803	0807	C1.5			3153
03 Dec	0932	0942	0955	C1.0			3157
03 Dec	1056	1110	1122	C2.3			3157
03 Dec	1122	1134	1142	C2.4			3156
03 Dec	1420	1427	1437	C1.2			3155
03 Dec	1524	1529	1533	C1.0			3157
03 Dec	1736	1741	1745	M1.2	SN	N18E83	3157
03 Dec	1848	1851	1855	C1.1			3155
04 Dec	0208	0218	0244	C1.3			3156
04 Dec	0656	0701	0719		SF	S17E44	3153
04 Dec	0907	0919	0925	B8.1			
04 Dec	0925	0933	0938	B9.1			
04 Dec	B1037	U1038	A1050		SF	S15E45	3153
04 Dec	1230	1240	1302	C2.0	SF	S19E42	3153
04 Dec	1614	1624	1637	C1.4			3155
04 Dec	1808	1816	1824	C1.5			3155

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
04 Dec	1824	1827	1833	C1.7			3155
04 Dec	2150	2159	2204	C1.6			3155

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 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								
28 Nov	S11W93	172	10	2	Hrx	1	A								
								2	0	0	4	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 168

			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

Crossed West Limb.
Absolute heliographic longitude: 177

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 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								
28 Nov	N21W83	162	30	2	Hsx	1	A								
								8	0	0	18	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 163

		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								
28 Nov	S16W73	152	120	8	Cso	4	B				4				
29 Nov	S16W88	154	70	1	Hax	2	A	2			7				
								12	0	0	22	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 154

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 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								
28 Nov	N27W05	84	10	7	Bxo	6	B								
29 Nov	N27W14	80	30	4	Cro	3	B	1							
30 Nov	N27W26	78	10	7	Bxo	2	B				1				
01 Dec	N28W38	78	10	1	Axx	1	A	1	1			1			
02 Dec	N28W51	78	10	1	Axx	1	A								
03 Dec	N28W65	79	plage												
04 Dec	N28W79	80	plage												
								2	1	0	4	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 84

			Region 3153												
01 Dec	S19E70	329	270	4	Dko	2	B	4							
02 Dec	S17E59	328	750	12	Eko	6	BD	2							
03 Dec	S17E48	326	750	12	Eko	8	BG	2							
04 Dec	S17E33	327	1080	16	Fko	13	B	1			3				
								9	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 327

			Region 3154												
01 Dec	S38W07	47	40	3	Dao	3	B								
02 Dec	S38W19	46	30	4	Cro	3	B								
03 Dec	S38W32	46	20	3	Bxo	2	B								
04 Dec	S38W46	47	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 47

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 3155												
01 Dec	N22E17	23	10	4	Bxo	3	B								
02 Dec	N21E02	25	40	5	Dro	5	B								
03 Dec	N22W11	25	60	6	Dro	5	B	2							
04 Dec	N23W25	26	140	7	Dai	14	B	4							
								6	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 25

			Region 3156												
02 Dec	N25E63	324	180	3	Hax	1	A	2							
03 Dec	N25E55	319	220	6	Dao	2	B	2							
04 Dec	N25E39	320	170	6	Cso	4	B	1							
								5	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 320

			Region 3157												
02 Dec	N16E89	299	plage					1							
03 Dec	N16E75	299	120	2	Hax	1	A	5	1						
04 Dec	N16E61	300	210	8	Dso	6	B								
								6	1	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 300

			Region 3158												
04 Dec	N24E06	355	20	6	Cro	6	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 355

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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