Space Weather Highlights **SWPC PRF 2405**
27 September - 03 October 2021 **04 October 2021**

Solar activity was at very low to low levels. Low levels were reached on 28 Sep - 01 Oct and 02-03 Oct. Region 2877 (S18, L=327, Class/Area Dao/200 on 30 Sep) produced the strongest flare of the period, a C2/Sn at 29/2156 UTC. Other activity included a C1 flare at 28/0634 UTC. Associated with the flare was a Type II radio sweep (534 km/s) and an partial-halo CME signature first seen in SOHO/LASCO imagery around 28/0634 UTC. Analysis and modeling of the event suggested onset at Earth late on 30 Sep - 01 Oct. The region produced two more low-level, impulsive, C-class flares before rotating around the SW limb on 03 Oct. Associated with the final C-flare was a Tenflare of 100 sfu at 03/0523 UTC. The remaining numbered active regions on the visible disk were relatively quiet and stable.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels.

Geomagnetic field activity ranged from quiet to active conditions. Active conditions were observed 30 Sep and 01-02 Oct in response to the arrival of a CME that left the Sun on 28 Sep. Total field peaked at 14 nT around 30/1820 UTC. The onset of the magnetic cloud was observed after 01/1305 UTC and the Bz component was predominantly positive over the next 18 hours. Solar wind speeds began increasing from ~380 km/s midway through 30 Sep and peaked at ~560 km/s at 01/0120 UTC before gradually decreasing towards nominal levels over the next two days. Unsettled conditions were observed on 27-28 Sep due to influence from a positive polarity CH HSS. The remainder of the summary period was at quiet levels.

Space Weather Outlook
04 October - 30 October 2021

Solar activity is expected to be at very low levels with a chance for C-class flares over 04-10 Oct.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach moderate to high levels. High levels are likely on 20-21 Oct in response to recurrent coronal hole influence. The remainder of the outlook period is likely to be at normal to moderate levels.

Geomagnetic field activity is expected range from quiet to active levels. Active levels are likely 19 Oct and unsettled levels are likely on 05-06 Oct, 08-09 Oct, 18 Oct, 20-21 Oct, and 25 Oct. All increases in geomagnetic activity are in response to anticipated influence from 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^{-6} hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
27 September	85	30	90	B1.2	0	0	0	0	0	0	0	0
28 September	89	57	80	B1.5	1	0	0	4	0	0	0	0
29 September	102	74	540	B3.0	5	0	0	13	0	0	0	0
30 September	95	46	410	B2.2	1	0	0	9	0	0	0	0
01 October	91	28	460	B1.5	0	0	0	1	0	0	0	0
02 October	87	25	380	B1.3	1	0	0	0	0	0	0	0
03 October	86	38	440	B1.2	1	0	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
27 September	1.8e+05	4.2e+04	7.9e+06
28 September	4.1e+05	4.9e+04	4.5e+06
29 September	5.3e+05	4.6e+04	1.0e+07
30 September	7.7e+05	4.4e+04	8.6e+06
01 October	7.7e+04	4.2e+04	1.5e+06
02 October	5.5e+04	4.2e+04	1.6e+06
03 October	6.9e+04	4.3e+04	1.3e+06

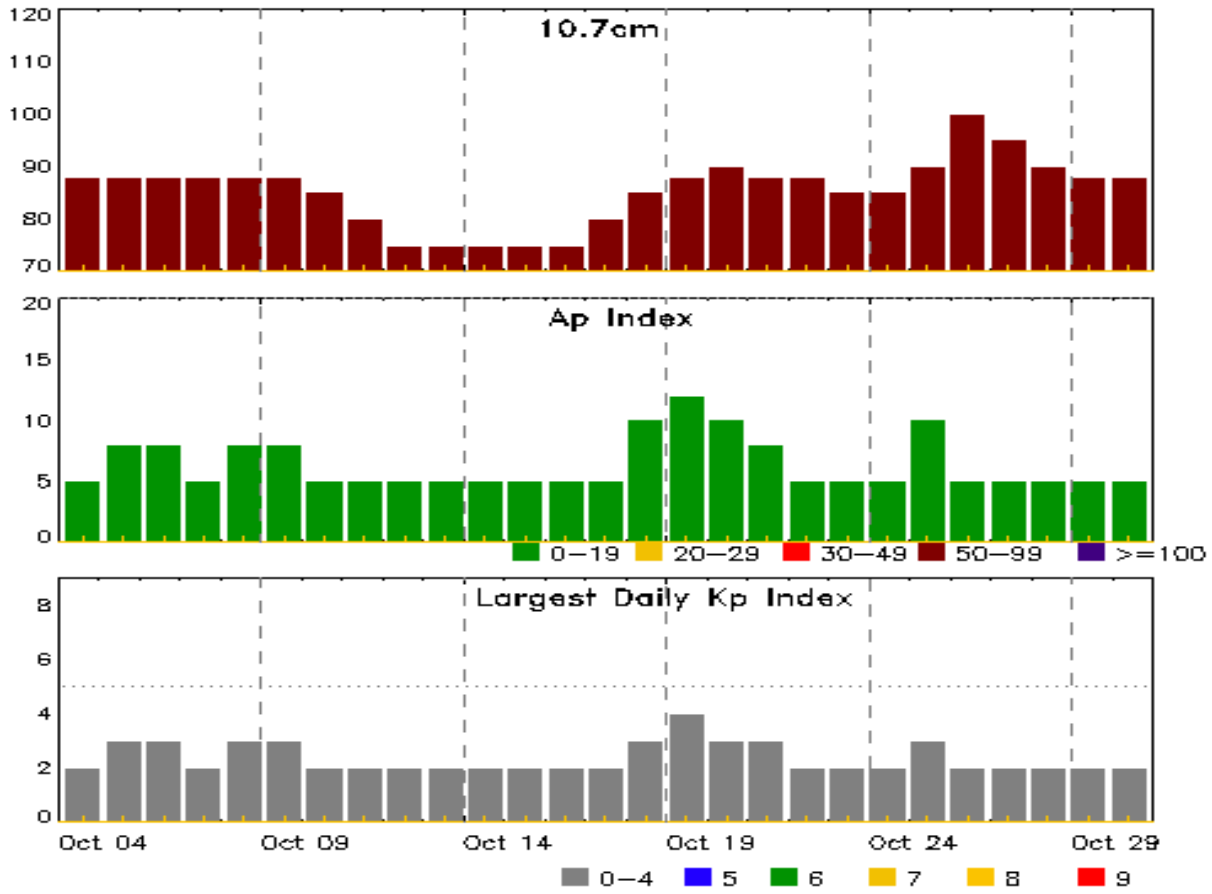
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
27 September	6	2-2-1-1-2-2-1-2	5	2-1-0-3-1-0-1-2	7	3-2-2-1-1-2-1-3
28 September	9	1-2-2-2-2-2-3-3	12	1-1-2-5-2-3-2-1	10	2-2-2-3-2-2-3-3
29 September	4	0-0-1-2-2-1-2-2	7	0-0-0-3-4-2-1-1	5	1-0-1-2-2-1-2-1
30 September	6	1-1-1-2-1-2-3-2	6	2-0-1-1-1-2-3-2	9	2-1-1-1-1-2-4-3
01 October	13	2-3-4-3-4-2-2-0	30	2-2-6-6-5-3-1-0	15	3-3-4-4-4-2-2-0
02 October	6	0-0-2-4-2-2-0-0	31	0-0-2-7-6-3-1-1	8	0-0-2-4-3-2-1-0
03 October	6	1-2-1-2-2-2-1-2	10	1-2-1-4-4-1-1-2	3	1-2-1-2-2-2-1-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
27 Sep 0241	WATCH: Geomagnetic Storm Category G2 predicted	
27 Sep 2035	WATCH: Geomagnetic Storm Category G2 predicted	
27 Sep 2040	WATCH: Geomagnetic Storm Category G1 predicted	
28 Sep 0649	ALERT: Type II Radio Emission	28/0620
28 Sep 1824	CANCELLATION: Geomagnetic Storm Category G2 predicted	
28 Sep 1826	CANCELLATION: Geomagnetic Storm Category G1 predicted	
28 Sep 1844	WATCH: Geomagnetic Storm Category G1 predicted	
30 Sep 1822	WARNING: Geomagnetic K = 4	30/1830 - 01/0300
30 Sep 2025	ALERT: Geomagnetic K = 4	30/2022
01 Oct 0234	EXTENDED WARNING: Geomagnetic K = 4	30/1830 - 01/1200
01 Oct 1113	EXTENDED WARNING: Geomagnetic K = 4	30/1830 - 01/2359
01 Oct 2331	EXTENDED WARNING: Geomagnetic K = 4	30/1830 - 02/0900
02 Oct 1012	WARNING: Geomagnetic K = 4	02/1011 - 1500
02 Oct 1031	ALERT: Geomagnetic K = 4	02/1030
03 Oct 0552	SUMMARY: 10cm Radio Burst	03/0523 - 0523

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
04 Oct	88	5	2	18 Oct	85	10	3
05	88	8	3	19	88	12	4
06	88	8	3	20	90	10	3
07	88	5	2	21	88	8	3
08	88	8	3	22	88	5	2
09	88	8	3	23	85	5	2
10	85	5	2	24	85	5	2
11	80	5	2	25	90	10	3
12	75	5	2	26	100	5	2
13	75	5	2	27	95	5	2
14	75	5	2	28	90	5	2
15	75	5	2	29	88	5	2
16	75	5	2	30	88	5	2
17	80	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 #
27 Sep	0858	0923	0930	B2.6			2871
27 Sep	1140	1146	1150	B4.5			
27 Sep	1311	1322	1338	B4.2			
27 Sep	1938	1945	1950	B3.5			
27 Sep	2346	2353	0011	B2.4			
28 Sep	0137	0147	0156	B3.5			2871
28 Sep	0249	0259	0305	B2.9			2871
28 Sep	0430	0438	0445	B3.1			2871
28 Sep	0524	0540	0554	B6.9			2871
28 Sep	0532	0540	2309	B6.7			
28 Sep	0554	0634	0654	C1.6			
28 Sep	B0657	U0730	0752		SF	S27W41	2871
28 Sep	1955	1958	2006		SF	N30E60	2880
28 Sep	2021	2021	2035		SF	N29E60	2880
28 Sep	2038	2045	2053		SF	N29E59	2880
28 Sep	2309	2316	2321	B2.8			2871
29 Sep	0013	0018	0024	B4.1			2880
29 Sep	0125	0132	0143	B3.9			2880
29 Sep	0208	0218	0223	C1.3			2880
29 Sep	0621	0625	0641		SF	S17W32	2877
29 Sep	0851	0852	0853		SF	S17W34	2877
29 Sep	1111	1120	1125	B8.4			2877
29 Sep	1157	1158	1159		SF	S17W35	2877
29 Sep	1351	1403	1413	B5.4	SF	S17W36	2877
29 Sep	1415	1421	1425	C1.0			2877
29 Sep	1622	1629	1635	B7.3	SF	S17W36	2877
29 Sep	1821	1821	1842		SF	S17W36	2877
29 Sep	1850	1851	1931	B7.1	SF	S18W38	2877
29 Sep	2016	2023	2024		SF	S18W38	2877
29 Sep	2041	2042	2043		SF	S18W38	2877
29 Sep	2105	2105	2107		SF	N30E43	2880

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
29 Sep	2146	2156	2202	C2.8	SN	S17W40	2877
29 Sep	2210	2213	2217	C1.4			2877
29 Sep	2218	2218	2219		SF	N29E43	2880
29 Sep	2234	2245	2250	C1.6	SF	S18W41	2877
29 Sep	2304	2309	2320	B6.8			2877
30 Sep	0542	0549	0555	B9.5			2877
30 Sep	0559	0704	A0748		SF	S18W46	2877
30 Sep	B0748	U0748	A0804	B4.9	SF	S18W46	2877
30 Sep	0831	0839	0845	B8.3	SF	S18W47	2877
30 Sep	1009	1009	1014		SF	S18W48	2877
30 Sep	1018	1023	1028	B4.8			2880
30 Sep	1146	1149	1153	B6.5	SF	S18W49	2877
30 Sep	1209	1214	1218	B3.0	SF	S18W50	2877
30 Sep	1219	1224	1230	B5.4	SF	S18W50	2877
30 Sep	1243	1249	1255	C1.2			2877
30 Sep	1439	1439	1443		SF	S18W51	2877
30 Sep	1454	1503	1524	B2.9	SF	S18W51	2877
30 Sep	1728	1732	1737	B2.8			2877
30 Sep	1817	1825	1833	B3.2			2877
01 Oct	1038	1055	1120	B4.7	SF	S21W63	2877
01 Oct	1833	1847	1900	B2.8			2877
01 Oct	2130	2139	2147	B3.1			2880
02 Oct	0839	0847	0851	B2.7			2880
02 Oct	1305	1312	1317	B2.5			
02 Oct	1754	1807	1816	B2.5			2877
02 Oct	2223	2240	2257	C1.6			2877
03 Oct	0408	0416	0430	B4.8			2877
03 Oct	0707	0722	0746	C1.8	SF	S17W79	2877
03 Oct	1018	1028	1034	B2.2			2880
03 Oct	1353	1401	1405	B1.8			2877
03 Oct	1620	1630	1634	B3.0			2880
03 Oct	2124	2134	2149	B2.2			2877

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 2871												
17 Sep	S28E87	1	plage					1							
18 Sep	S28E73	1	30	1	Hsx	1	A	2							
19 Sep	S28E61	359	60	3	Dao	3	B	1							
20 Sep	S29E50	357	240	5	Dao	6	B								
21 Sep	S27E36	357	310	6	Dko	8	BD	1							
22 Sep	S28E25	355	250	6	Dko	7	BD	1			2				
23 Sep	S28E11	356	210	5	Dao	11	BGD	1	2		2	2			
24 Sep	S28E01	353	140	6	Dao	8	B	1			1				
25 Sep	S28W13	354	140	4	Dac	9	B	3			4				
26 Sep	S28W27	355	90	5	Dai	10	BG	1			1				
27 Sep	S27W40	355	70	5	Cso	6	BG								
28 Sep	S28W53	354	30	2	Hrx	1	A				1				
29 Sep	S28W65	353	10		Axx	1	A								
30 Sep	S28W79	354	plage												
								12	2	0	11	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 353

			Region 2872												
20 Sep	N17E42	4	30	4	Cro	7	B								
21 Sep	N17E27	6	10	3	Bxo	4	B								
22 Sep	N17E15	5	70	7	Cai	9	B								
23 Sep	N17E02	5	120	6	Cai	15	B								
24 Sep	N17W12	5	80	6	Cao	10	B								
25 Sep	N18W24	5	60	7	Cro	9	B								
26 Sep	N17W38	6	40	8	Cro	7	B								
27 Sep	N16W53	6	plage												
28 Sep	N16W67	9	plage												
29 Sep	N16W81	10	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 5

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 2873												
20 Sep	N26W07	54	10	4	Bxi	8	B								
21 Sep	N26W22	56	110	7	Dao	8	B	2			4				
22 Sep	N24W35	55	80	9	Dao	5	B								
23 Sep	N26W48	55	10	9	Bxo	6	B								
24 Sep	N25W59	53	10	4	Bxo	2	B								
25 Sep	N25W73	54	plage												
26 Sep	N25W87	55	plage					1							
								3	0	0	4	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 54

			Region 2874												
22 Sep	S25W26	46	10	2	Hrx	2	A								
23 Sep	S25W40	47	plage												
24 Sep	S25W54	48	plage												
25 Sep	S25W68	49	plage												
26 Sep	S25W82	50	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 46

			Region 2875												
22 Sep	S32W34	55	10	3	Bxo	3	B								
23 Sep	S32W47	55	10	4	Bxo	3	B								
24 Sep	S33W59	53	10	2	Bxo	2	B								
25 Sep	S33W73	54	plage												
26 Sep	S33W87	55	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 55

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 2876												
24 Sep	S22E04	350	10	2	Bxo	3	B								
25 Sep	S22W10	351	plage												
26 Sep	S22W24	352	plage												
27 Sep	S22W38	353	plage												
28 Sep	S22W52	354	plage												
29 Sep	S22W66	355	plage												
30 Sep	S22W80	355	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 350

			Region 2877												
26 Sep	S17W00	328	10	4	Bxo	4	B								
27 Sep	S18W13	328	20	2	Cro	4	B								
28 Sep	S18W27	329	30	4	Cro	10	B								
29 Sep	S16W40	327	130	7	Dai	14	BG	4			11				
30 Sep	S18W52	327	200	9	Dao	13	BG	1			9				
01 Oct	S20W67	329	200	9	Dao	4	BG				1				
02 Oct	S20W78	327	150	10	Dao	2	B	1							
03 Oct	S21W93	328	30	2	Hsx	1	A	1			1				
								7	0	0	22	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 328

			Region 2878												
26 Sep	S23E34	294	30	6	Cro	6	B								
27 Sep	S22E21	293	plage												
28 Sep	S22E07	295	plage												
29 Sep	S23W03	292	plage												
30 Sep	S23W17	292	plage												
01 Oct	S23W31	293	plage												
02 Oct	S23W45	294	plage												
03 Oct	S23W59	295	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 292

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 2879												
27 Sep	N13W31	346	plage												
28 Sep	N13W45	347	plage												
29 Sep	N13W59	348	plage												
30 Sep	N13W73	348	plage												
01 Oct	N13W87	349	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 346

			Region 2880												
28 Sep	N30E54	246	10	4	Cro	5	B				3				
29 Sep	N29E43	244	390	9	Dkc	18	BG	1			2				
30 Sep	N32E30	245	210	8	Dao	13	B								
01 Oct	N30E15	247	260	8	Dho	4	B								
02 Oct	N32E04	245	230	11	Eso	3	B								
03 Oct	N31W07	243	230	10	Dso	6	B								
								1	0	0	5	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 245

			Region 2881												
28 Sep	N16W20	321	10		Axx	1	A								
29 Sep	N16W33	321	10		Axx	1	A								
30 Sep	N16W47	322	plage												
01 Oct	N16W61	323	plage												
02 Oct	N16W75	324	plage												
03 Oct	N16W89	325	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 321

			Region 2882												
03 Oct	N14E77	158	180	1	Hax	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 158

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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