Space Weather Highlights **SWPC PRF 2403**
13 September - 19 September 2021 **20 September 2021**

Solar activity reached low levels. Region 2871 (S28, L=359, class/area=Dao/60 on 19 Sep) produced four C-class flares throughout the week, the largest of which was a C3 flare observed at 17/0420 UTC, and was the primary source of solar activity. A filament eruption which lifted off at around 13/0100-0200 UTC and centered near N35W15, produced an Earth-directed CME that arrived at Earth early on 17 Sep.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was normal to moderate throughout the period.

Geomagnetic field activity reached active and G1 (Minor) geomagnetic storm levels on 17 Sep, and active conditions early on 18 Sep, due to the arrival of the 13 Sep CME. Quiet to unsettled conditions were observed on 13 Sep, and quiet conditions were observed throughout the remainder of the period.

Space Weather Outlook
20 September - 16 October 2021

Solar activity is expected to be very low with a chance for C-class flare activity throughout the outlook period.

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 29 Sep-03 Oct and 05-08 Oct. Normal to moderate levels are expected to persist throughout the remainder of the outlook period.

Geomagnetic field activity is likely to reach G1 (Minor) geomagnetic storm levels on 28 Sep, with active conditions likely on 25, 29 Sep, and 05, 10 Oct, due to the anticipated influence of multiple, recurrent CH HSSs. Quiet to unsettled and mostly quiet conditions are expected to prevail throughout the remainder of the outlook period.

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
13 September	83	32	200	B2.1	0	0	0	0	0	0	0	0
14 September	78	13	60	B1.4	1	0	0	1	0	0	0	0
15 September	75	0	0	B1.0	0	0	0	0	0	0	0	0
16 September	73	0	0	A6.0	0	0	0	0	0	0	0	0
17 September	73	0	0	A5.2	1	0	0	0	0	0	0	0
18 September	74	11	30	A5.2	2	0	0	0	0	0	0	0
19 September	75	13	60	A3.8	1	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
13 September	6.3e+04	4.5e+04	1.8e+06
14 September	5.7e+04	4.7e+04	4.9e+06
15 September	5.5e+04	4.7e+04	1.1e+07
16 September	5.6e+04	4.7e+04	1.5e+07
17 September	2.3e+05	4.7e+04	2.9e+06
18 September	7.2e+04	4.9e+04	1.2e+06
19 September	6.4e+04	5.0e+04	1.2e+06

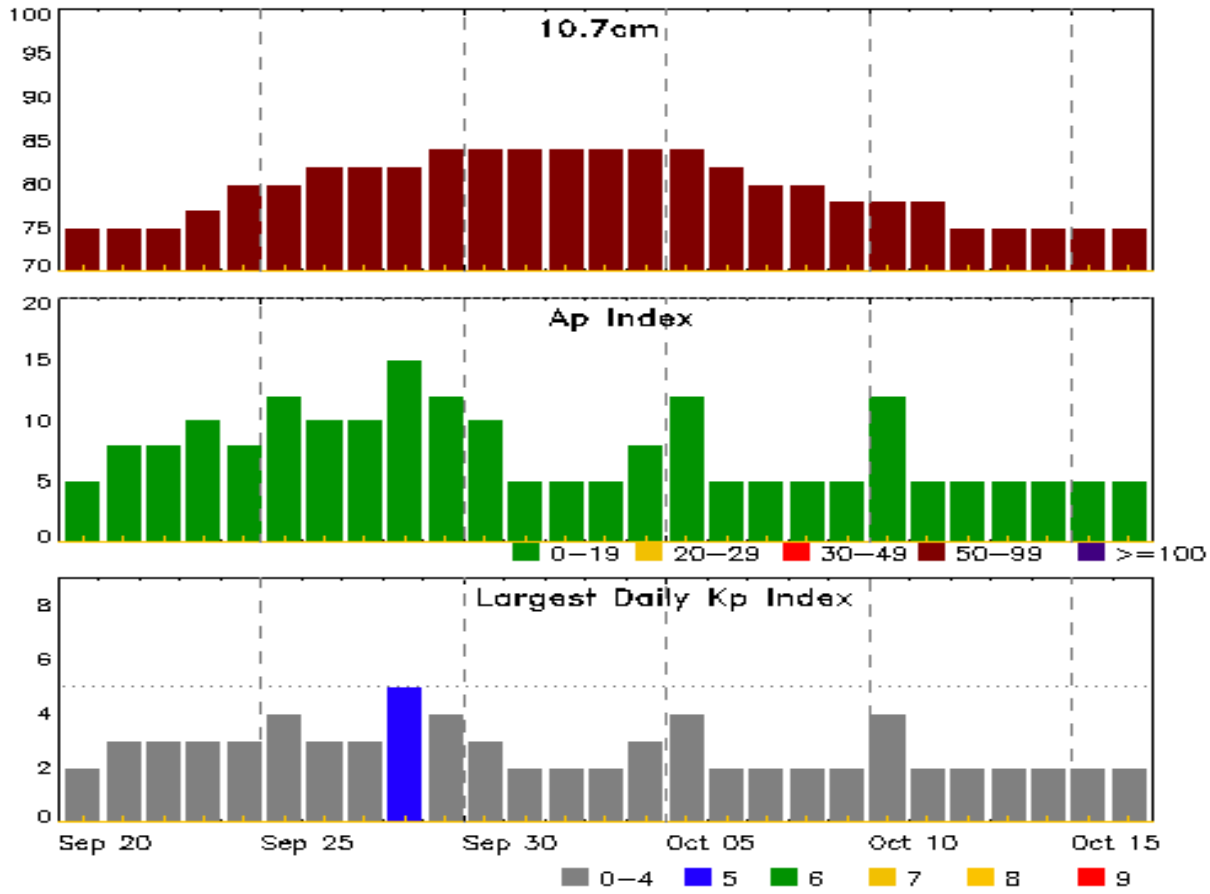
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
13 September	7	1-1-3-1-3-2-1-2	13	0-0-3-5-4-2-1-2	9	1-1-3-2-3-2-1-3
14 September	5	2-0-1-2-2-2-2-0	8	1-0-2-3-4-1-2-1	6	2-0-2-2-2-2-2-1
15 September	6	1-2-2-2-2-1-1-2	12	0-3-3-4-3-1-1-1	6	2-2-2-2-1-1-1-2
16 September	3	0-1-1-1-2-1-1-1	9	2-3-3-3-2-1-0-2	3	1-2-1-0-1-1-1-1
17 September	19	2-3-1-3-2-2-5-5	32	2-3-3-6-6-3-3-4	24	2-4-1-4-2-3-5-5
18 September	14	3-4-4-3-3-1-1-1	16	2-4-4-5-3-1-0-0	11	3-4-3-3-2-1-0-1
19 September	2	1-0-0-1-2-1-1-0	5	1-2-3-3-1-0-0-0	4	1-0-0-1-1-0-1-0

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
17 Sep 0420	WARNING: Geomagnetic K = 4	17/0419 - 1200
17 Sep 0455	ALERT: Type II Radio Emission	17/0417
17 Sep 0601	ALERT: Geomagnetic K = 4	17/0559
17 Sep 1155	EXTENDED WARNING: Geomagnetic K = 4	17/0419 - 2100
17 Sep 1945	EXTENDED WARNING: Geomagnetic K = 4	17/0419 - 18/1200
17 Sep 2010	WARNING: Geomagnetic K = 5	17/2010 - 18/0600
17 Sep 2015	ALERT: Geomagnetic K = 5	17/2014
17 Sep 2026	WARNING: Geomagnetic K = 6	17/2025 - 2359
17 Sep 2243	ALERT: Geomagnetic K = 5	17/2240
17 Sep 2345	EXTENDED WARNING: Geomagnetic K = 5	17/2010 - 18/0900
17 Sep 2345	EXTENDED WARNING: Geomagnetic K = 6	17/2025 - 18/0600
18 Sep 1155	EXTENDED WARNING: Geomagnetic K = 4	17/0419 - 18/1800

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
20 Sep	75	5	2	04 Oct	84	8	3
21	75	8	3	05	84	12	4
22	75	8	3	06	82	5	2
23	77	10	3	07	80	5	2
24	80	8	3	08	80	5	2
25	80	12	4	09	78	5	2
26	82	10	3	10	78	12	4
27	82	10	3	11	78	5	2
28	82	15	5	12	75	5	2
29	84	12	4	13	75	5	2
30	84	10	3	14	75	5	2
01 Oct	84	5	2	15	75	5	2
02	84	5	2	16	75	5	2
03	84	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 #
13 Sep	0251	0258	0302	B8.0			
13 Sep	1231	1239	1245	B5.8			2868
13 Sep	1730	1744	1748	B3.3			
13 Sep	1748	1755	1759	B5.9			2868
14 Sep	0134	0141	0145	B3.0			2866
14 Sep	0324	0330	0337	B4.3			2868
14 Sep	0337	0346	0352	B8.5			2868
14 Sep	0414	0421	0425	B2.4			2869
14 Sep	0425	0429	0434	B3.7			2869
14 Sep	0444	0451	0458	B4.9			2868
14 Sep	0532	0540	0547	B2.8			2869
14 Sep	0640	0649	0653	C1.1	SF	S22W78	2868
14 Sep	1404	1412	1417	B2.6			2868
14 Sep	1558	1605	1612	B2.0			2868
14 Sep	1800	1809	1822	B3.6			2868
14 Sep	1909	1919	1932	B2.3			2866
15 Sep	0100	0115	0123	B4.1			2869
15 Sep	0200	0209	0220	B1.8			2869
15 Sep	0501	0511	0526	B2.2			2869
15 Sep	0942	0951	0958	B2.4			2869
15 Sep	1049	1057	1103	B2.0			2869
17 Sep	0409	0420	0448	C3.5			2871
18 Sep	0022	0030	0037	B1.4			2871
18 Sep	0037	0046	0054	B2.0			2871
18 Sep	0103	0111	0119	B1.7			2871
18 Sep	0502	0514	0524	B1.6			2871
18 Sep	0747	0827	0833	C2.6			2871
18 Sep	0748	0815	2348	C1.6			2871
18 Sep	2348	0000	0006	B1.9			2871
19 Sep	0104	0115	0122	C1.6			2871
19 Sep	0130	0135	0139	B6.0			2871

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
19 Sep	0551	0559	0603	B1.2			2871
19 Sep	0652	0700	0705	B1.3			2871
19 Sep	0929	0946	0950	B1.5			2871
19 Sep	1802	1810	1814	B1.5			2871
19 Sep	1932	1940	1944	B2.7			2871

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 2865												
04 Sep	N22E25	233	10	4	Bxo	3	B								
05 Sep	N23E13	232	plage												
06 Sep	N23W00	232	plage												
07 Sep	N23W14	233	plage												
08 Sep	N23W28	234	plage												
09 Sep	N23W42	235	plage												
10 Sep	N23W56	235	plage												
11 Sep	N23W70	236	plage												
12 Sep	N23W84	237	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 232

			Region 2866												
04 Sep	S18E63	195	40	2	Bxo	2	B				1				
05 Sep	S17E48	197	80	6	Dai	8	B				7				
06 Sep	S18E32	200	220	7	Dai	15	B				1				
07 Sep	S18E21	197	430	8	Dkc	23	B				2				
08 Sep	S18E07	197	500	8	Dkc	15	B	2			6	1			
09 Sep	S18W06	199	500	8	Dkc	29	B	1			3				
10 Sep	S18W19	198	460	7	Dkc	17	B								
11 Sep	S18W33	199	400	6	Dkc	17	B				1				
12 Sep	S19W46	199	180	5	Dai	10	B								
13 Sep	S19W60	199	100	4	Dao	7	B								
14 Sep	S18W71	197	60	4	Hsx	3	A								
15 Sep	S18W85	198	plage												
								3	0	0	21	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 199

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 2868												
05 Sep	S21E33	212	60	7	Dso	6	B								
06 Sep	S22E19	212	220	7	Dso	11	B				2				
07 Sep	S21E05	213	240	10	Dso	10	B				1				
08 Sep	S21W08	213	300	10	Dhi	17	B	2			3				
09 Sep	S21W19	212	260	8	Dhi	18	B								
10 Sep	S22W34	213	250	8	Dki	20	B	1			2				
11 Sep	S19W49	215	260	8	Dki	21	B	1							
12 Sep	S20W62	215	200	7	Dao	6	B				1				
13 Sep	S20W77	216	100	6	Cao	5	B								
14 Sep	S22W90	213	plage					1			1				
								5	0	0	10	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 213

			Region 2869												
08 Sep	S35E12	194	10	3	Bxo	3	B								
09 Sep	S34W01	194	70	6	Cao	10	B								
10 Sep	S34W14	193	60	7	Cao	9	B								
11 Sep	S35W28	192	40	6	Cao	3	B								
12 Sep	S34W42	195	10		Axx	1	A								
13 Sep	S19W59	198	plage												
14 Sep	S19W73	200	plage												
15 Sep	S19W87	200	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 194

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 2870												
09 Sep	S31E56	136	10		Axx	1	A								
10 Sep	S31E45	134	plage												
11 Sep	S31E31	135	plage												
12 Sep	S31E17	136	plage												
13 Sep	S31E03	137	plage												
14 Sep	S31W11	138	plage												
15 Sep	S31W25	138	plage												
16 Sep	S31W39	139	plage												
17 Sep	S31W53	140	plage												
18 Sep	S31W67	141	plage												
19 Sep	S31W81	142	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 137

			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							
								4	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 359

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

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