

Space Weather Highlights
20 September - 26 September 2021

SWPC PRF 2404
27 September 2021

Solar activity was at very low to moderate levels. Region 2871 (S27, L=357, class/area=Dao/310 on 21 Sep) produced the largest flare of the period, an M2/1n flare at 23/0444 UTC. Associated with the flare was a Type II radio sweep (966 km/s) followed by a Type IV radio sweep. A subsequent CME signature was observed in SOHO/LASCO C2 coronagraph imagery. Analysis and modeling of the event suggested most of the ejecta was away from the Sun-Earth line but a glancing blow from the periphery of the CME may be possible on 27 Sep. An additional M1/1n flare was produced by the same region at 23/1528 UTC. A subsequent CME signature associated with the event was also analyzed with a similar potential for the periphery of the ejecta to influence Earth around 27 Sep.

Other activity included a Type II radio sweep (739 km/s) associated with an eruption around Region 2875 (S32, L=053, class/area Bxo/010 on 24 Sep). The associated CME signature was narrow and directed away from the Sun-Earth line. Most numbered active regions were in decay and they transited through the W hemisphere with most decaying to plage by the end of the period. The remaining numbered regions in the E hemisphere were relatively simple and quiet.

No proton events were observed at geosynchronous orbit.

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

Geomagnetic field activity ranged from quiet to active levels. Active levels were observed on 22 Sep in response to a SSBC followed by influence from positive polarity CH HSS. Unsettled conditions were observed on 21 Sep, and 23-25 Sep due to coronal hole activity. The remainder of the reporting period was quiet.

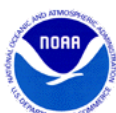
Space Weather Outlook
27 September - 23 October 2021

Solar activity is expected to range from very low to low levels. Low levels are likely on 27-29 Sep and very low levels are likely for the remainder of 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 moderate to high levels. High levels are likely on 29 Sep - 02 Oct, 05-08 Oct and 20-21 Oct due primarily to influence from multiple, recurrent CH HSSs. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to range from quiet to G2 (Moderate) geomagnetic storm conditions. G1-G2 (Minor-Moderate) conditions are likely on 27 Sep in response to combined effects of an anticipated positive polarity CH HSS and possible glancing blow from a CME that



left the Sun on 23 Sep. Active conditions associated with coronal hole activity are likely on 28-29 Sep, 05 Oct, 10 Oct and 19 Oct. Unsettled conditions are likely on 04 Oct, 18 Oct and 20-21 Oct. The remainder of the outlook period is expected to be at quiet levels.



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	
20 September	80	51	280	A6.3	0	0	0	0	0	0	0	0	0
21 September	85	50	430	B1.0	3	0	0	4	0	0	0	0	0
22 September	89	76	420	B1.1	1	0	0	2	0	0	0	0	0
23 September	90	75	350	B1.3	1	2	0	2	2	0	0	0	0
24 September	88	75	250	B1.2	1	0	0	1	0	0	0	0	0
25 September	88	38	200	B1.5	3	0	0	4	0	0	0	0	0
26 September	86	67	170	A9.8	2	0	0	1	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	
	20 September	6.6e+04	4.7e+04	1.4e+06
21 September	1.1e+05	4.7e+04	1.3e+06	
22 September	6.4e+04	4.6e+04	1.6e+06	
23 September	1.3e+05	4.6e+04	1.6e+07	
24 September	1.1e+05	4.4e+04	4.8e+06	
25 September	5.7e+04	4.3e+04	3.6e+06	
26 September	5.7e+04	4.3e+04	7.8e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 September	4	1-0-0-2-2-2-1-1	3	1-1-2-2-1-0-0-1	3
21 September	6	2-0-1-1-2-2-2-3	6	1-1-1-1-2-3-2-2	8	3-0-1-1-1-3-2-3
22 September	11	3-2-4-3-2-2-1-2	24	3-2-6-5-4-3-0-1	12	4-2-4-3-1-1-1-2
23 September	10	2-3-4-2-2-2-2-1	16	1-2-5-5-3-1-1-0	11	3-3-4-2-2-2-2-1
24 September	6	2-2-2-1-1-3-1-1	8	2-2-3-1-1-3-2-1	8	3-2-2-1-1-3-1-1
25 September	7	2-2-2-2-2-1-2-2	9	2-2-3-4-1-1-1-1	7	2-3-2-2-1-1-1-2
26 September	2	0-0-0-1-1-1-1-0	1	0-0-1-0-0-0-0-1	4	1-0-0-1-0-0-1-1

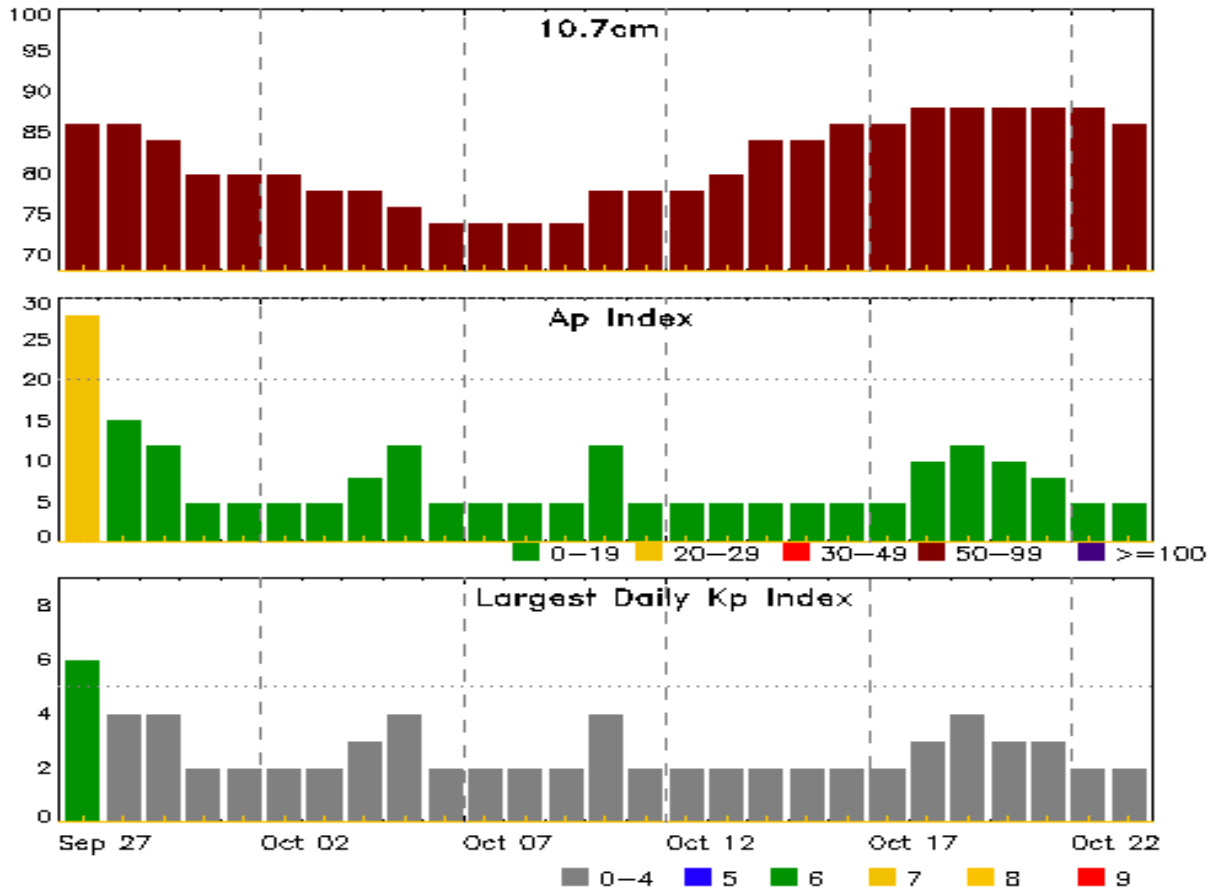


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
21 Sep 2224	WARNING: Geomagnetic K = 4	21/2223 - 22/0900
22 Sep 0259	ALERT: Geomagnetic K = 4	22/0259
22 Sep 0828	EXTENDED WARNING: Geomagnetic K = 4	21/2223 - 22/1500
22 Sep 0843	WARNING: Geomagnetic K = 5	22/0840 - 1200
23 Sep 0510	ALERT: Type II Radio Emission	23/0444
23 Sep 0521	ALERT: Type IV Radio Emission	23/0454
23 Sep 0810	WARNING: Geomagnetic K = 4	23/0805 - 1500
23 Sep 0812	ALERT: Geomagnetic K = 4	23/0812
23 Sep 1708	WATCH: Geomagnetic Storm Category G1 predicted	
25 Sep 0448	ALERT: Type II Radio Emission	25/0345
25 Sep 1610	WATCH: Geomagnetic Storm Category G2 predicted	



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
27 Sep	86	28	6	11 Oct	78	5	2
28	86	15	4	12	78	5	2
29	84	12	4	13	80	5	2
30	80	5	2	14	84	5	2
01 Oct	80	5	2	15	84	5	2
02	80	5	2	16	86	5	2
03	78	5	2	17	86	5	2
04	78	8	3	18	88	10	3
05	76	12	4	19	88	12	4
06	74	5	2	20	88	10	3
07	74	5	2	21	88	8	3
08	74	5	2	22	88	5	2
09	74	5	2	23	86	5	2
10	78	12	4				



Energetic Events

Date	Time			X-ray	Optical Information			Peak		Sweep Freq		
	Begin	Max	Half	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
			Max						245	2695	II	IV
23 Sep	0435	0442	0450	M2.8	0.018	1N	S27E21	2871				2
23 Sep	1523	1528	1539	M1.8	0.012	1N	S30E15	2871	120			

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
20 Sep	0556	0615	0621	B1.1			2871
20 Sep	0625	0629	0634	B1.1			2871
20 Sep	0753	0802	0806	B2.2			2871
20 Sep	0823	0830	0834	B1.0			2871
20 Sep	0900	0915	0920	B2.4			2871
20 Sep	0924	0936	0943	B8.1			2871
20 Sep	1038	1043	1048	B6.3			2871
20 Sep	1252	1258	1302	B1.4			
20 Sep	1339	1348	1354	B2.3			
20 Sep	1405	1411	1416	B1.3			
20 Sep	1711	1716	1720	B1.0			
20 Sep	1818	1826	1833	B1.5			
20 Sep	1901	1909	1916	B2.4			
20 Sep	1917	1925	1929	B4.0			
20 Sep	1938	1941	1945	B2.1			
20 Sep	2040	2044	2049	B1.6			
20 Sep	2055	2100	2104	B2.5			2871
20 Sep	2137	2142	2146	B3.3			2871
20 Sep	2304	2311	2321	B2.6			2871
21 Sep	0333	0340	0346	B2.6			2871
21 Sep	0426	0429	0439	B2.1			2871
21 Sep	0457	0509	0513	B4.1			2871
21 Sep	0520	0529	0536	B3.1			2871
21 Sep	0644	0649	0654	B2.3			2873
21 Sep	0820	0826	0832	B2.0			
21 Sep	0853	0903	0916	C1.1	SF	N26W08	2873
21 Sep	0942	0948	0950	B2.3			2871
21 Sep	0950	0955	0959	B2.9			2871
21 Sep	1006	1016	1021	B8.7	SF	N26W12	2873



Flare List

Date	Time			Optical			Rgn #
	Begin	Max	End	X-ray Class	Imp/Brtns	Location Lat CMD	
21 Sep	1107	1111	1116	B5.0	SF	N26W15	2873
21 Sep	1143	1153	1157	C1.8	SF	N26W15	2873
21 Sep	1223	1229	1231	B1.7			2871
21 Sep	1231	1238	1244	B3.2			2871
21 Sep	1419	1429	1435	B1.6			2873
21 Sep	1657	1703	1707	B1.5			2871
21 Sep	1805	1816	1818	B2.1			2871
21 Sep	1808	1811	1818	B1.7			2871
21 Sep	1818	1828	1835	C1.1			2871
21 Sep	1907	1915	1923	B1.6			2871
21 Sep	2015	2025	2030	B5.1			2871
21 Sep	2351	2355	2359	B4.1			2872
22 Sep	0152	0158	0202	B1.8			2871
22 Sep	0315	0326	0341	B3.1			2871
22 Sep	0417	0421	0426	B2.3			2871
22 Sep	0522	0529	0533	B2.4			2871
22 Sep	0615	0621	0630	B1.6			2871
22 Sep	0756	0805	0811	B2.1	SF	N17E29	2871
22 Sep	0853	0904	0916	B3.0			2871
22 Sep	0957	1007	1016	B3.2			2871
22 Sep	1117	1125	1130	B3.2			2872
22 Sep	1158	1204	1211	B1.6			
22 Sep	1228	1231	1242	B1.6			
22 Sep	1307	1316	1321	B2.5			
22 Sep	1332	1342	1348	B1.7			
22 Sep	1349	1352	1356	B2.2			
22 Sep	1418	1422	1429	B1.5			
22 Sep	1511	1518	1530	B1.5			
22 Sep	1805	1812	1820	B1.6			
22 Sep	1820	1823	1827	B1.6			
22 Sep	1940	1950	1955	B2.8			
22 Sep	2004	2014	2020	C1.1	SF	S26E28	2871
22 Sep	2148	2151	2201	B1.8			
22 Sep	2221	2227	2231	B3.0			
22 Sep	2351	2358	0007	B1.9			
23 Sep	0139	0145	0157	B2.9			2871
23 Sep	0204	0213	0220	B2.4			2875
23 Sep	0256	0305	0314	B2.0			2871



Flare List

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
23 Sep	0343	0355	0402	B3.1			2871
23 Sep	0427	0444	0527	M2.8	1N	S27E21	2871
23 Sep	0800	0807	0812	B4.2			2871
23 Sep	1235	1245	1250	B7.1			
23 Sep	1343	1355	1403	B6.0	SF	S27E18	2871
23 Sep	1523	1528	1539	M1.8	1N	S30E15	2871
23 Sep	1917	1924	1928	B3.1			
23 Sep	2023	2028	2032	B1.8			
23 Sep	2034	2041	2046	C1.0	SF	S27E15	2871
23 Sep	2056	2100	2104	B3.1			
24 Sep	0246	0252	0256	B1.8			2871
24 Sep	0300	0307	0312	B1.9			2871
24 Sep	0633	0642	0651	B2.4			2871
24 Sep	0656	0701	0705	C2.9			2871
24 Sep	0957	1008	1013	B2.9			2871
24 Sep	1557	1605	1609	B1.8			2872
24 Sep	1758	1812	1822	B5.3			2871
24 Sep	1822	1833	1841	B4.4			2871
24 Sep	B1836	1836	1844		SF	S26E01	2871
24 Sep	2019	2023	2027	B2.4			2875
24 Sep	2111	2116	2120	B2.5			2871
24 Sep	2125	2130	2134	B3.4			2871
24 Sep	2250	2255	2259	B3.2			2871
24 Sep	2334	2338	2342	B2.0			2872
25 Sep	0026	0033	0038	B2.5			2871
25 Sep	0117	0131	0136	B9.9			2871
25 Sep	0306	0312	0318	B1.9			2871
25 Sep	0327	0354	0404	C1.4			2871
25 Sep	0534	0555	0611	B3.4			2871
25 Sep	0746	0757	0809	B5.4	SF	S31W06	2871
25 Sep	0812	0816	0828		SF	S27W04	2871
25 Sep	0845	0901	0928	B3.0			
25 Sep	1110	1130	1137	C1.0	SF	S27W06	2871
25 Sep	1159	1204	1208	B7.2			2871
25 Sep	1241	1246	1308		SF	S27W07	2871
25 Sep	1412	1419	1440	B1.9			2871
25 Sep	1604	1611	1616	B2.1			2871
25 Sep	1732	1739	1746	B2.3			2871



Flare List

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
25 Sep	1911	1917	1921	C1.7				2871
25 Sep	2301	2310	2318	B5.0				2871
26 Sep	0015	0023	0031	B1.6				2871
26 Sep	0031	0039	0047	B6.3				2871
26 Sep	0415	0422	0428	B2.1				2871
26 Sep	0524	0535	0541	B2.8				2877
26 Sep	0625	0631	0638	C1.0				2873
26 Sep	0913	0917	0921	B1.8				2871
26 Sep	1058	1106	1110	B2.4				2877
26 Sep	1120	1124	1128	C1.6	SF	S28W20		2871
26 Sep	1538	1547	1610	B3.7				2872
26 Sep	2244	2300	2317	B2.4				



Region Summary

Date	Location		Sunspot Characteristics				Flares								
	Lat	CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
									C	M	X	S	1	2	3

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	0

Crossed West Limb.

Absolute heliographic longitude: 137

Region 2871

17 Sep	S28E87	1	plage															
18 Sep	S28E73	1	30	1	Hsx	1	A											
19 Sep	S28E61	359	60	3	Dao	3	B											
20 Sep	S29E50	357	240	5	Dao	6	B											
21 Sep	S27E36	357	310	6	Dko	8	BD											
22 Sep	S28E25	355	250	6	Dko	7	BD					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						
										12	2	0	10	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 353



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
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										
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 5

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	0	0

Still on Disk.

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	0	0

Still on Disk.

Absolute heliographic longitude: 46



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares								
	Lat	CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical			
			Lon	10 ⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3

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	0	0

Still on Disk.

Absolute heliographic longitude: 55

Region 2876

24 Sep	S22E04	350	10	2	Bxo	3	B										
25 Sep	S22W10	351	plage														
26 Sep	S22W24	352	plage					0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 350

Region 2877

26 Sep	S17W00	328	10	4	Bxo	4	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 328

Region 2878

26 Sep	S23E34	294	30	6	Cro	6	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 294



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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<https://www.swpc.noaa.gov/products/weekly-highlights-and-27-day-forecast> --

Current

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