Space Weather Highlights
06 June - 12 June 2022

SWPC PRF 2441
13 June 2022

Solar activity ranged from very low to moderate levels. Very low levels were observed on 06-08 Jun. Low levels were observed on 09 and 11-12 Jun with the majority of the C-class flares from Regions 3029 (S17, L=204, class/area Dao/070 on 09 Jun) and 3030 (N20, L=113, class/area Eao/180 on 11 Jun). Region 3030 was also responsible for the moderate activity on 10 Jun due to an isolated M1/Sf flare at 10/1054 UTC. By 12 Jun, Region 3030 had rotated into view enough to determine it was two separate regions. The trailing spots were reclassified as Region 3032 (N21, L=106 class/area Dai/090 on 12 Jun). Just after the end of the period, an M3.4 flare was observed at 13/0407 UTC along with Type II and IV radio sweeps. The bulk of the flare activity was from Region 3032 with sympathetic flaring noted around the same time from Region 3030. No Earth-directed CMEs were observed, however we are waiting on further coronagraph imagery associated with the recent M3.4 flare to determine if there is an Earth-directed component.

No proton events were observed at geosynchronous orbit.

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

Geomagnetic field activity was at or near background levels on 06-11 Jun with solar wind below 400 km/s and total field ranging from 3-12 nT. By 12 Jun, total field increased to 12-15 nT while the solar wind speed increased to 440-485 km/s as a weak positive polarity CH HSS became geoeffective. The geomagnetic field responded with quiet to unsettled levels on 06-07 Jun and 11-12 Jun while quiet conditions were observed on 08-10 Jun.

Space Weather Outlook
13 June - 09 July 2022

Solar activity is expected to be very low to low with a chance for further M-class flares on 13-24 Jun due to potential flare activity from Regions 3030 and 3032.

There is a chance for a greater than 10 MeV proton event in the next 24 hours associated with the recent M3 flare.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 17-22 Jun and again on 26 Jun - 02 Jul due CH HSS influence.

Geomagnetic field activity is expected to reach unsettled levels on 13 Jun, 15-18 Jun, 23-26 Jun, 08-09 Jul with active levels on 13,16 and 24 Jun 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
06 June	96	45	140	B1.8	0	0	0	1	0	0	0	0
07 June	101	23	30	B2.3	0	0	0	1	0	0	0	0
08 June	100	0	0	B3.0	0	0	0	0	0	0	0	0
09 June	106	17	70	B4.4	4	0	0	1	0	0	0	0
10 June	111	33	170	B5.2	4	1	0	2	0	0	0	0
11 June	112	41	230	B4.9	2	0	0	0	0	0	0	0
12 June	121	63	190	B6.3	2	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
06 June	5.0e+04	3.4e+04	5.7e+06
07 June	5.0e+04	3.3e+04	2.1e+06
08 June	4.1e+04	3.5e+04	1.3e+06
09 June	4.4e+04	3.5e+04	1.6e+06
10 June	4.4e+04	3.7e+04	1.8e+06
11 June	5.9e+04	3.6e+04	1.6e+06
12 June	5.0e+04	3.7e+04	1.5e+06

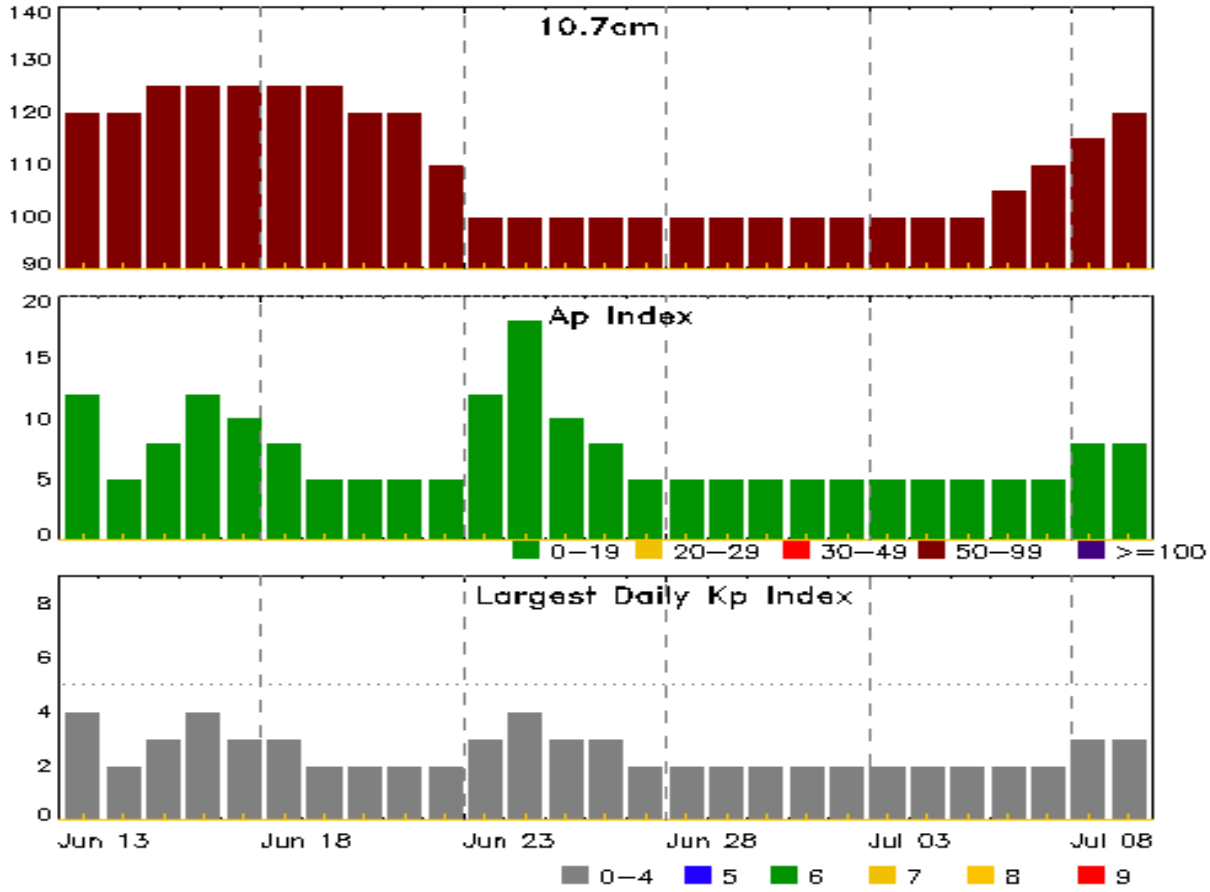
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
06 June	10	2-2-2-2-3-2-3-3	13	1-1-2-5-4-2-2-1	10	2-2-2-3-3-2-3-3
07 June	11	2-3-2-3-3-1-2-3	14	2-4-2-4-2-4-1-1	8	2-2-2-3-2-2-1-2
08 June	5	2-0-1-2-2-1-1-2	3	2-0-0-2-0-0-2-1	5	2-1-1-2-1-0-2-2
09 June	6	1-3-1-1-2-1-2-2	10	1-2-1-4-4-2-0-1	5	1-2-1-1-2-1-1-2
10 June	6	2-1-1-2-3-1-2-1	5	2-1-1-1-3-1-0-1	5	2-1-1-2-2-0-1-1
11 June	10	2-2-3-1-3-2-3-2	6	1-2-3-2-1-1-1-1	8	2-2-3-1-2-2-1-2
12 June	12	2-3-2-3-3-3-3-2	11	1-2-2-3-4-3-2-2	6	2-2-2-2-2-3-3-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
06 Jun 0941	WARNING: Geomagnetic Sudden Impulse expected	06/1030 - 1100
06 Jun 1059	SUMMARY: Geomagnetic Sudden Impulse	06/1041
06 Jun 1936	WARNING: Geomagnetic K = 4	06/1935 - 2359
12 Jun 1652	WARNING: Geomagnetic K = 4	12/1653 - 2100

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
13 Jun	120	12	4	27 Jun	100	5	2
14	120	5	2	28	100	5	2
15	125	8	3	29	100	5	2
16	125	12	4	30	100	5	2
17	125	10	3	01 Jul	100	5	2
18	125	8	3	02	100	5	2
19	125	5	2	03	100	5	2
20	120	5	2	04	100	5	2
21	120	5	2	05	100	5	2
22	110	5	2	06	105	5	2
23	100	12	3	07	110	5	2
24	100	18	4	08	115	8	3
25	100	10	3	09	120	8	3
26	100	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
10 Jun	1011	1054	1114	M1.2		0.034	SF	N18E78	3030			

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
06 Jun	2332	2332	2338	B5.5	SF	S13W85	3023
07 Jun	0204	0210	0215	B4.1			3023
07 Jun	0310	0314	0317	B4.4	SF	S12W85	3023
07 Jun	0319	0328	0337	B5.7			3023
07 Jun	0400	0408	0416	B5.4			3023
07 Jun	1736	1742	1757	B3.9			
09 Jun	0331	0339	0344	C1.3			3029
09 Jun	0553	0600	0611	B6.8			3029
09 Jun	0611	0618	0623	B6.0			3029
09 Jun	B0717	U0717	A0722		SF	S17W03	
09 Jun	0833	0841	0853	B6.2			3029
09 Jun	0853	0859	0904	C1.7			3029
09 Jun	1003	1018	1037	C1.9			3030
09 Jun	2203	2315	2343	C2.6			3030
10 Jun	0234	0242	0248	B8.3			3030
10 Jun	0248	0321	0335	C1.1			3030
10 Jun	0534	0546	0602	C3.7	SF	N21E75	3030
10 Jun	0817	0832	0911	C4.1			3030
10 Jun	1011	1054	1114	M1.2	SF	N18E78	3030
10 Jun	1410	1432	1501	C2.3			3030
10 Jun	2105	2112	2117	B8.6			3031
11 Jun	0604	0610	0617	B8.2			3030
11 Jun	1401	1410	1419	C1.2			3030
11 Jun	2156	2227	2245	C1.3			3030
12 Jun	0531	0842	0930	C1.8			3032
12 Jun	2129	2140	2157	C2.0			3033

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 3023													
24 May	S12E76	328	plage					1							
25 May	S13E65	325	120	3	Hsx	2	A								
26 May	S14E50	327	180	3	Hax	2	A								
27 May	S14E38	326	120	3	Hax	2	A	1							
28 May	S13E25	325	110	3	Hax	2	A								
29 May	S12E12	325	110	3	Hax	3	A								
30 May	S13W01	324	130	3	Hax	2	A				1				
31 May	S13W14	324	110	2	Hax	2	A								
01 Jun	S14W27	324	120	2	Hax	2	A								
02 Jun	S14W41	325	110	2	Hsx	2	A								
03 Jun	S13W54	325	110	2	Hsx	2	A								
04 Jun	S14W67	325	110	3	Hsx	2	A								
05 Jun	S14W80	324	80	3	Hsx	2	A								
06 Jun	S14W93	324	60	2	Hsx	1	A				1				
								2	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 324

		Region 3024													
25 May	S33E68	322	50	1	Hsx	1	A								
26 May	S33E54	323	80	2	Hsx	1	A								
27 May	S33E43	321	60	2	Hsx	1	A	2			2				
28 May	S33E31	320	70	2	Hsx	1	A								
29 May	S33E18	319	60	1	Hsx	1	A								
30 May	S33E05	318	40	1	Hsx	1	A				1				
31 May	S33W07	317	40	1	Hsx	1	A								
01 Jun	S33W19	316	70	1	Hsx	1	A								
02 Jun	S33W31	316	60	1	Hsx	1	A								
03 Jun	S33W44	315	70	3	Cso	4	B								
04 Jun	S35W57	315	60	3	Cso	4	B								
05 Jun	S35W68	313	60	2	Hsx	1	A								
06 Jun	S34W82	313	40	1	Hsx	1	A								
								2	0	0	3	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 318

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 3026												
01 Jun	N16W36	333	100	5	Dsi	11	B				8				
02 Jun	N15W49	333	190	7	Dao	13	B				7				
03 Jun	N16W63	334	190	7	Cso	4	B								
04 Jun	N16W80	337	160	7	Cso	4	B								
05 Jun	N15W93	338	80	6	Hsx	1	A								
								0	0	0	15	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 333

			Region 3027												
01 Jun	S17E03	294	40	4	Dso	5	B								
02 Jun	S17W10	294	70	5	Dso	3	B								
03 Jun	S16W23	294	60	5	Dao	2	B								
04 Jun	S17W39	297	70	5	Dao	3	B								
05 Jun	S17W50	295	30	4	Cro	2	B								
06 Jun	S17W66	297	30	4	Cro	2	B								
07 Jun	S17W78	296	20	3	Bxo	2	B								
08 Jun	S17W92	297	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 294

			Region 3028												
04 Jun	N14E52	206	10	1	Axx	1	A								
05 Jun	N14E38	207	plage												
06 Jun	N14E24	208	plage												
07 Jun	N14E10	208	plage												
08 Jun	N14W04	209	plage												
09 Jun	N14W18	210	plage												
10 Jun	N14W32	211	plage												
11 Jun	N14W46	211	plage												
12 Jun	N14W60	212	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 209

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 3029												
04 Jun	S18E59	199	10	1	Axx	1	A								
05 Jun	S17E48	197	10	1	Axx	1	A	2							
06 Jun	S17E34	197	10	1	Axx	1	A								
07 Jun	S18E20	198	10	1	Axx	1	A								
08 Jun	S18E06	199	plage												
09 Jun	S17W12	204	70	4	Dao	7	B	2							
10 Jun	S17W26	205	30	4	Bxo	8	B								
11 Jun	S17W39	204	20	2	Bxo	2	B								
12 Jun	S17W53	205	plage												
								4	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 199

			Region 3030												
09 Jun	N20E74	118	plage					2							
10 Jun	N20E65	114	140	15	Eao	5	B	4	1		1				
11 Jun	N20E52	113	180	15	Eao	7	B	2							
12 Jun	N20E35	117	40	9	Dao	9	B								
								8	1	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 117

			Region 3031												
11 Jun	S27E36	129	30	3	Cro	2	B								
12 Jun	S27E23	129	30	8	Cro	5	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 129

			Region 3032												
12 Jun	N21E46	106	90	4	Dai	5	B	1							
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 106

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 3033													
12 Jun	N17E64	88	30	3	Bxo	4	B	1							
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 88

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

The Weekly has been published continuously since 1951 and is available online since 1997.

https://www.swpc.noaa.gov/products/weekly-highlights-and-27-day-forecast -- Current
ftp://ftp.swpc.noaa.gov/pub/warehouse -- Online archive from 1997
https://www.ngdc.noaa.gov/stp/satellite/goes-r.html -- NCEI GOES data textarchive
https://www.swpc.noaa.gov/products/solar-cycle-progression -- Solar Cycle Progression web site
https://www.swpc.noaa.gov/content/contact-us -- Contact and Copyright information
https://www.swpc.noaa.gov/sites/default/files/images/u2/Usr_guide.pdf -- User Guide