**Space Weather Highlights**
**22 August - 28 August 2022**

**SWPC PRF 2452**
**29 August 2022**

Solar activity ranged from very low to low levels on 22-24 Aug with a majority of the flare activity originating from Region 3085 (S24, L=041, class/area Dko/280 on 25 Aug). Activity levels picked up on 25 Aug with weak M-class (R1-Minor) activity recorded from Regions 3088 (S27, L=300, class/area Dkc/650 on 27 Aug) and 3089 (S23, L=196, class/area Eki/320 on 27 Aug). A further increase in activity was observed on 26 Aug with moderate flaring (R2-Moderate) from Region 3089 in the form of an M7.2/1b flare at 26/1214 UTC.

27 Aug saw 4 M-class flares from Reg 3088, the largest an M4.8/Sf at 27/0240 UTC with associated Type II (657 km/s) and Type IV Sweeps and a 130 sfu 10cm Burst. R2-Moderate flare activity was then observed on 28 Aug in the form of an M6.7/Sf at 28/1619 UTC. Associated with this event was a Type IV Sweep and a 1800 sfu 10cm Burst. Throughout the later half of the highlight period, a variety of CMEs were seen lifting off the SW limb as observed in LASCO and STEREO coronagraph imagery. Initial analysis and model output all suggested weak glancing blow effects, if any, on 28-29 Aug.

The greater than 10 MeV at 10 pfu protons reached event levels (S1-Minor) this period as a result of a long duration M1.2/Sn flare from Rgn 3088 observed at 27/1138 UTC. The proton event started at 27/1155 UTC, peaked at 27/1220 UTC (27.5 pfu) and ended at 27/2145 UTC. Proton background levels remained elevated at the the end of the highlight period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 22-27 Aug with a maximum flux reading of 4,360 pfu at 23/1455 UTC. Normal to moderate levels were observed on 28 Aug.

Geomagnetic field activity was at quiet to unsettled levels through midday on 27 Aug under a nominal wind environment. Unsettled to active levels were observed from midday on the 27th through midday on the 28th due to an enhanced total field to 10 nT and increased wind speeds to about 500 km/s, all due to a weak negative polarity CH HSS.

**Space Weather Outlook**
**29 August - 24 September 2022**

Solar activity is expected to be at mostly very low to low levels, with a chance for (R1-R2, Minor-Moderate) flare activity, through 05 Sep after Rgn 3089 departs, and again from 11-24 Sep due to the return of old Rgns 3088 and 3089. Mostly very low to low flare activity is expected on 06-10 Sep.

The is a slight chance for a proton event on 29 Aug and from 11-24 Sep after the return of old Rgn 3088.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to

high levels on 31 Aug - 02 Sep, 05-12 Sep and 15-18 Sep due to CH HSS influence. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach (G1-Minor) storm conditions on 29 Aug due to potential CME influence and on 05 Sep due to positive polarity CH HSS influence. Unsettled to active periods are expected on 30-31 Aug, 04-10 Sep, 13-17 Sep and 24 Sep due to recurrent CH HSSs. Mostly quiet levels are expected for 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 |
| 22 August | 103 | 44 | 280 | B3.3 | 10 | 0 | 0 | 12 | 0 | 0 | 0 | 0 |
| 23 August | 101 | 52 | 380 | B2.0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 24 August | 108 | 46 | 400 | B2.4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 25 August | 118 | 94 | 840 | B5.7 | 16 | 2 | 0 | 12 | 3 | 0 | 0 | 0 |
| 26 August | 119 | 88 | 830 | C1.6 | 10 | 3 | 0 | 18 | 7 | 0 | 0 | 0 |
| 27 August | 128 | 84 | 1120 | C1.7 | 13 | 4 | 0 | 35 | 2 | 0 | 0 | 0 |
| 28 August | 252 | 79 | 660 | C2.5 | 9 | 3 | 0 | 15 | 1 | 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 |
| 22 August | 4.8e+04 | 2.9e+04 | 1.7e+08 |
| 23 August | 5.1e+04 | 3.0e+04 | 2.6e+08 |
| 24 August | 1.3e+05 | 3.0e+04 | 1.9e+08 |
| 25 August | 1.3e+05 | 2.9e+04 | 1.8e+08 |
| 26 August | 3.2e+05 | 3.1e+04 | 1.8e+08 |
| 27 August | 7.6e+07 | 6.7e+05 | 2.4e+07 |
| 28 August | 1.0e+08 | 2.0e+05 | 1.5e+06 |

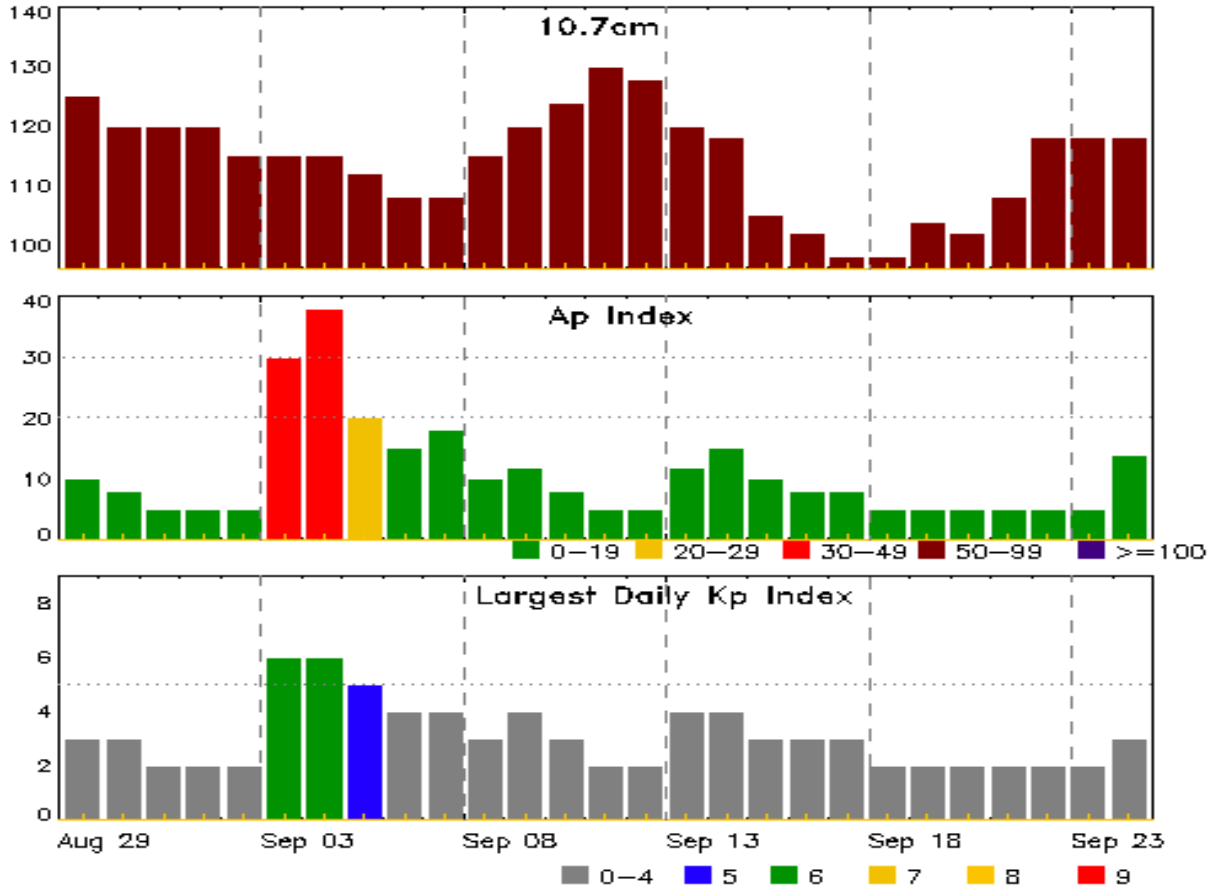
## *Daily Geomagnetic Data*

| Date | Middle Latitude Fredericksburg | | High Latitude College | | Estimated Planetary | |
|---|---|---|---|---|---|---|
| | A | K-indices | A | K-indices | A | K-indices |
| 22 August | 7 | 3-2-2-2-2-1-2-1 | 9 | 3-4-2-3-1-1-1-0 | 7 | 3-3-2-2-2-1-2-1 |
| 23 August | 3 | 0-1-0-1-2-0-1-2 | 2 | 1-1-0-1-1-0-1-1 | 4 | 1-1-1-1-1-0-0-2 |
| 24 August | 4 | 1-0-1-2-2-1-1-1 | 1 | 1-1-0-0-0-0-0-1 | 3 | 1-0-1-1-1-1-0-1 |
| 25 August | 5 | 1-1-1-2-2-1-1-2 | 2 | 1-1-0-0-2-0-0-1 | 5 | 1-1-2-2-2-1-1-2 |
| 26 August | 5 | 1-1-1-1-2-2-2-1 | 1 | 1-1-0-0-0-0-0-0 | 5 | 1-2-1-1-1-1-1-2 |
| 27 August | 11 | 1-1-1-3-4-2-3-3 | 15 | 1-1-1-4-5-3-3-2 | 14 | 2-1-2-4-4-3-3-3 |
| 28 August | 7 | 1-1-1-2-3-3-2-1 | 17 | 2-2-2-6-3-2-2-1 | 7 | 2-1-2-3-2-2-2-1 |

## *Alerts and Warnings Issued*

| Date & Time of Issue UTC | Type of Alert or Warning | Date & Time of Event UTC |
|---|---|---|
| 22 Aug 0506 | CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu | 19/1300 |
| 23 Aug 0459 | CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu | 19/1300 |
| 24 Aug 0459 | CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu | 19/1300 |
| 25 Aug 0459 | CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu | 19/1300 |
| 26 Aug 0459 | CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu | 19/1300 |
| 26 Aug 1218 | ALERT: X-ray Flux exceeded M5 | 26/1213 |
| 26 Aug 1534 | SUMMARY: X-ray Event exceeded M5 | 26/1208 - 1526 |
| 27 Aug 0239 | ALERT: Type II Radio Emission | 27/0212 |
| 27 Aug 0353 | SUMMARY: 10cm Radio Burst | 27/0237 - 0242 |
| 27 Aug 0450 | ALERT: Type IV Radio Emission | 27/0212 |
| 27 Aug 0912 | WATCH: Geomagnetic Storm Category G1 predicted | |
| 27 Aug 1151 | WARNING: Geomagnetic K = 4 | 27/1150 - 1800 |
| 27 Aug 1201 | ALERT: Geomagnetic K = 4 | 27/1159 |
| 27 Aug 1202 | WARNING: Proton 10MeV Integral Flux > 10pfu | 27/1201 - 1800 |
| 27 Aug 1214 | ALERT: Proton Event 10MeV Integral Flux >= 10pfu | 27/1200 |
| 27 Aug 1245 | CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu | 19/1300 |
| 27 Aug 1739 | EXTENDED WARNING: Geomagnetic K = 4 | 27/1150 - 2359 |
| 27 Aug 1740 | EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu | 27/1201 - 2359 |
| 27 Aug 2354 | EXTENDED WARNING: Geomagnetic K = 4 | 27/1150 - 28/1200 |
| 28 Aug 0126 | SUMMARY: Proton Event 10MeV Integral Flux >= 10pfu | 27/1155 - 2145 |
| 28 Aug 1105 | EXTENDED WARNING: Geomagnetic K = 4 | 27/1150 - 28/2100 |
| 28 Aug 1612 | ALERT: X-ray Flux exceeded M5 | 28/1609 |
| 28 Aug 1635 | ALERT: Type IV Radio Emission | 28/1607 |
| 28 Aug 1702 | SUMMARY: X-ray Event exceeded M5 | 28/1548 - 1646 |
| 28 Aug 2027 | SUMMARY: 10cm Radio Burst | 28/1720 - 2001 |

## *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 |
|---|---|---|---|---|---|---|---|
| 29 Aug | 125 | 10 | 3 | 12 Sep | 128 | 5 | 2 |
| 30 | 120 | 8 | 3 | 13 | 120 | 12 | 4 |
| 31 | 120 | 5 | 2 | 14 | 118 | 15 | 4 |
| 01 Sep | 120 | 5 | 2 | 15 | 105 | 10 | 3 |
| 02 | 115 | 5 | 2 | 16 | 102 | 8 | 3 |
| 03 | 115 | 30 | 6 | 17 | 98 | 8 | 3 |
| 04 | 115 | 38 | 6 | 18 | 98 | 5 | 2 |
| 05 | 112 | 20 | 5 | 19 | 104 | 5 | 2 |
| 06 | 108 | 15 | 4 | 20 | 102 | 5 | 2 |
| 07 | 108 | 18 | 4 | 21 | 108 | 5 | 2 |
| 08 | 115 | 10 | 3 | 22 | 118 | 5 | 2 |
| 09 | 120 | 12 | 4 | 23 | 118 | 5 | 2 |
| 10 | 124 | 8 | 3 | 24 | 118 | 14 | 3 |
| 11 | 130 | 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 |
| 25 Aug | 1939 | 1951 | 2002 | M1.8 | 0.015 | | | 3088 | | | | |
| 25 Aug | 2321 | 2327 | 2332 | M1.0 | 0.007 | 1N | S20E61 | 3089 | | | | |
| 26 Aug | 1041 | 1055 | 1105 | M2.1 | 0.016 | 1N | S22E52 | 3089 | | | | |
| 26 Aug | 1208 | 1214 | 1221 | M7.2 | 0.031 | 1B | S22E51 | 3089 | | | | |
| 26 Aug | 1224 | 1231 | 1238 | M5.3 | 0.040 | | | 3089 | | | | |
| 27 Aug | 0152 | 0240 | 0305 | M4.8 | 0.130 | SF | S19W58 | 3088 | 340 | 130 | 1 | 1 |
| 27 Aug | 1129 | 1138 | 1143 | M1.2 | 0.006 | SN | S28W66 | 3088 | | | | |
| 27 Aug | 1513 | 1525 | 1530 | M1.1 | 0.008 | SF | S28W71 | 3088 | | | | |
| 27 Aug | 1545 | 1558 | 1621 | M1.8 | 0.027 | | | 3088 | | | | |
| 28 Aug | 0047 | 0134 | 0138 | M1.4 | 0.028 | | | 3088 | | | | |
| 28 Aug | 1548 | 1619 | 1646 | M6.7 | 0.140 | SF | S28W80 | 3088 | 100 | | | 1 |
| 28 Aug | 1820 | 1832 | 1850 | M4.6 | 0.063 | | | 3088 | | | | |

## *Flare List*

| | Time | | | Optical | | | |
|---|---|---|---|---|---|---|---|
| Date | Begin | Max | End | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
| 22 Aug | 0014 | 0022 | 0026 | B4.8 | | | 3078 |
| 22 Aug | 0059 | 0105 | 0119 | B5.2 | | | |
| 22 Aug | 0212 | 0222 | 0236 | B8.0 | | | |
| 22 Aug | 0314 | 0321 | 0325 | B4.7 | | | |
| 22 Aug | 0416 | 0422 | 0430 | B4.0 | SF | N09W68 | 3081 |
| 22 Aug | 0626 | 0636 | 0643 | C1.5 | | | 3085 |
| 22 Aug | 0655 | 0700 | 0705 | C1.7 | | | 3085 |
| 22 Aug | 0725 | 0731 | 0738 | C1.1 | SF | N31E13 | 3085 |
| 22 Aug | 0826 | 0832 | 0837 | B5.0 | | | |
| 22 Aug | 0840 | 0846 | 0851 | B5.9 | | | |
| 22 Aug | 0919 | 0929 | 0944 | C1.2 | | | 3085 |
| 22 Aug | 1015 | 1017 | 1019 | | SF | N09W71 | 3081 |
| 22 Aug | 1023 | 1035 | 1043 | | SF | N31E13 | 3085 |
| 22 Aug | 1045 | 1057 | 1104 | B7.3 | | | |
| 22 Aug | 1158 | 1203 | 1208 | C1.4 | SF | N31E10 | 3085 |
| 22 Aug | 1221 | 1224 | 1226 | | SF | N31E10 | 3085 |
| 22 Aug | 1258 | 1305 | 1318 | B5.0 | | | |
| 22 Aug | B1315 | 1408 | 1523 | | SF | N31E06 | 3085 |
| 22 Aug | 1344 | 1349 | 1351 | B8.1 | SF | N31E09 | 3085 |

## *Flare List*

| Date | Time | | | Optical | | | |
|---|---|---|---|---|---|---|---|
| | Begin | Max | End | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
| 22 Aug | 1401 | 1409 | 1414 | C5.0 | | | 3085 |
| 22 Aug | 1625 | 1628 | 1634 | | SF | S16W68 | |
| 22 Aug | 1728 | 1736 | 1744 | C1.2 | SF | S11W26 | 3084 |
| 22 Aug | 1808 | 1820 | 1840 | C1.2 | SF | N30E05 | 3085 |
| 22 Aug | 1931 | 1938 | 1945 | C3.4 | | | 3085 |
| 22 Aug | 2043 | 2055 | 2108 | C2.9 | SF | N30E05 | 3085 |
| 22 Aug | 2134 | 2137 | 2141 | B9.1 | | | 3085 |
| 22 Aug | 2147 | 2155 | 2159 | B8.7 | | | 3085 |
| 22 Aug | 2205 | 2211 | 2216 | B6.4 | | | 3085 |
| 22 Aug | 2331 | 2341 | 2347 | B5.2 | | | 3081 |
| 22 Aug | 2353 | 0000 | 0004 | B5.6 | | | |
| 23 Aug | 0039 | 0047 | 0052 | B5.0 | | | 3085 |
| 23 Aug | 0200 | 0211 | 0217 | C1.3 | | | 3086 |
| 23 Aug | 0515 | 0524 | 0534 | B4.5 | SF | S23E54 | 3086 |
| 23 Aug | 0854 | 0902 | 0906 | B7.7 | | | 3081 |
| 23 Aug | 1348 | 1354 | 1401 | B3.0 | | | |
| 23 Aug | 1532 | 1540 | 1549 | B5.8 | | | |
| 23 Aug | 1821 | 1828 | 1842 | B3.8 | | | |
| 23 Aug | 1932 | 1940 | 1946 | B5.2 | | | |
| 24 Aug | 0144 | 0151 | 0158 | B3.0 | | | 3085 |
| 24 Aug | 0716 | 0721 | 0732 | B3.0 | | | |
| 24 Aug | 1034 | 1037 | 1042 | B5.1 | | | |
| 24 Aug | 1323 | 1330 | 1334 | B7.5 | | | |
| 24 Aug | 1357 | 1358 | 1402 | | SF | S28W26 | |
| 24 Aug | 1824 | 1835 | 1853 | B6.4 | | | |
| 25 Aug | 0020 | 0029 | 0039 | B7.5 | | | |
| 25 Aug | 0041 | 0046 | 0057 | | SF | S25W34 | |
| 25 Aug | 0354 | 0404 | 0412 | C1.3 | SF | S22E70 | 3089 |
| 25 Aug | 0554 | 0608 | 0617 | C2.0 | SF | S22E70 | 3089 |
| 25 Aug | 0659 | 0704 | 0713 | C1.3 | | | 3088 |
| 25 Aug | 0804 | 0808 | 0812 | B8.2 | | | 3085 |
| 25 Aug | 0932 | 0936 | 0942 | C1.8 | | | 3088 |
| 25 Aug | 0953 | 1001 | 1005 | C3.6 | | | 3089 |
| 25 Aug | 1108 | 1119 | 1124 | C2.0 | SF | S23E68 | 3089 |
| 25 Aug | 1129 | 1134 | 1141 | | SF | S28W39 | 3088 |
| 25 Aug | 1144 | 1152 | 1214 | C1.4 | SF | S28W39 | 3088 |
| 25 Aug | 1229 | 1232 | 1245 | | SF | S28W39 | 3088 |
| 25 Aug | 1248 | 1256 | 1311 | B9.0 | | | |

## *Flare List*

| Date | Time | | | Optical | | | |
|---|---|---|---|---|---|---|---|
| | Begin | Max | End | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
| 25 Aug | 1341 | 1946 | 2105 | | 1N | S28W42 | 3088 |
| 25 Aug | 1344 | 1356 | 1403 | C1.7 | 1N | S20E63 | 3089 |
| 25 Aug | 1419 | 1426 | 1431 | C1.5 | | | 3088 |
| 25 Aug | 1507 | 1516 | 1524 | C1.7 | | | 3088 |
| 25 Aug | 1540 | 1548 | 1554 | C2.4 | | | 3089 |
| 25 Aug | 1630 | 1640 | 1650 | C3.2 | | | 3089 |
| 25 Aug | 1716 | 1721 | 1727 | C1.9 | | | 3089 |
| 25 Aug | 1749 | 1758 | 1813 | C7.3 | | | 3089 |
| 25 Aug | 1903 | 1909 | 1914 | C8.0 | | | 3088 |
| 25 Aug | 1939 | 1951 | 2002 | M1.8 | | | 3088 |
| 25 Aug | 2057 | 2057 | 2102 | | SF | S20E63 | 3089 |
| 25 Aug | 2111 | 2114 | 2128 | | SF | S20E63 | 3089 |
| 25 Aug | 2206 | 2207 | 2209 | | SF | S28W45 | 3088 |
| 25 Aug | 2207 | 2208 | 2209 | | SF | S20E63 | 3089 |
| 25 Aug | 2211 | 2318 | A2359 | | 1N | S20E61 | 3089 |
| 25 Aug | 2309 | 2319 | 2321 | C9.1 | | | 3088 |
| 25 Aug | 2321 | 2327 | 2332 | M1.0 | | | 3089 |
| 25 Aug | 2322 | 2336 | 2340 | | SN | S28W45 | 3088 |
| 26 Aug | B0000 | 2318 | 0026 | | 1F | S20E61 | 3089 |
| 26 Aug | 0030 | 0031 | 0035 | | SF | S28W45 | 3088 |
| 26 Aug | 0119 | 0126 | 0130 | C2.7 | | | 3088 |
| 26 Aug | 0213 | 0235 | 0242 | C2.4 | | | 3089 |
| 26 Aug | 0236 | 0518 | A1000 | | 1N | S25W45 | 3088 |
| 26 Aug | 0300 | 0301 | 0307 | | SF | S23E59 | 3089 |
| 26 Aug | 0400 | 0410 | 0417 | C2.3 | | | 3089 |
| 26 Aug | 0419 | 0420 | 0422 | | SF | S23E59 | 3089 |
| 26 Aug | 0458 | 0459 | 0501 | | SF | S23E59 | 3089 |
| 26 Aug | 0511 | 0519 | 0523 | C4.7 | | | 3088 |
| 26 Aug | 0536 | 0536 | 0541 | | SF | S23E59 | 3089 |
| 26 Aug | 0607 | 0628 | 0645 | C7.2 | 1N | S29W58 | 3088 |
| 26 Aug | 0724 | 0730 | 0734 | C3.4 | SF | S21E57 | 3089 |
| 26 Aug | 0831 | 0849 | 0911 | C5.2 | SF | S21E55 | 3089 |
| 26 Aug | 0906 | 0907 | 0910 | | SF | S23E59 | 3089 |
| 26 Aug | 0927 | 0936 | 0945 | | SF | S23E59 | 3089 |
| 26 Aug | 0932 | 0936 | 0942 | | SF | S21E55 | 3089 |
| 26 Aug | 1033 | 1039 | 1041 | C2.1 | | | 3089 |
| 26 Aug | 1041 | 1055 | 1105 | M2.1 | 1N | S22E52 | 3089 |
| 26 Aug | 1208 | 1214 | 1221 | M7.2 | 1B | S22E51 | 3089 |

## *Flare List*

| Date | Time | | | Optical | | | |
|---|---|---|---|---|---|---|---|
| | Begin | Max | End | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
| 26 Aug | 1224 | 1231 | 1238 | M5.3 | | | 3089 |
| 26 Aug | 1332 | 1521 | 1803 | | 1F | S27W56 | 3088 |
| 26 Aug | 1533 | 1535 | 1542 | | SF | N29W44 | 3085 |
| 26 Aug | 1547 | 1711 | 1745 | | 1F | S22E49 | 3089 |
| 26 Aug | 1548 | 1550 | 1552 | | SF | S21E51 | 3089 |
| 26 Aug | 1809 | 1818 | 1826 | C4.9 | SF | S27W56 | 3088 |
| 26 Aug | 1921 | 2109 | 2138 | | SF | S22E49 | 3089 |
| 26 Aug | 2128 | 2129 | 2139 | | SF | N31W47 | 3085 |
| 26 Aug | 2153 | 2156 | 2157 | | SF | S22E47 | 3089 |
| 26 Aug | 2232 | 2235 | 2240 | C3.4 | SF | S23E45 | 3089 |
| 26 Aug | 2255 | 2255 | 2342 | | SF | S24E46 | 3089 |
| 27 Aug | 0041 | 0052 | 0057 | C3.4 | | | 3088 |
| 27 Aug | 0047 | 0049 | 0056 | | SF | S19W58 | 3088 |
| 27 Aug | 0057 | 0105 | 0114 | C5.0 | | | 3088 |
| 27 Aug | 0100 | 0104 | 0111 | | SF | S19W58 | 3088 |
| 27 Aug | 0128 | 0133 | 0136 | | SF | S23E47 | 3089 |
| 27 Aug | 0152 | 0240 | 0305 | M4.8 | SF | S19W58 | 3088 |
| 27 Aug | B0504 | U0508 | 0540 | | SF | N30W50 | 3085 |
| 27 Aug | B0505 | U0514 | 0644 | | SF | S29W63 | 3088 |
| 27 Aug | 0512 | 0513 | 0517 | | SF | S19W58 | 3088 |
| 27 Aug | 0553 | 0554 | 0557 | | SF | S23E45 | 3089 |
| 27 Aug | 0606 | 0610 | 0614 | C5.4 | | | 3088 |
| 27 Aug | 0653 | 0702 | 0706 | C8.8 | SF | S30W66 | 3088 |
| 27 Aug | 0701 | 0701 | 0707 | | SF | S19W58 | 3088 |
| 27 Aug | 0727 | 0727 | 0730 | | SF | S30W66 | 3088 |
| 27 Aug | 0747 | 0751 | 0755 | C5.6 | SF | S29W64 | 3086 |
| 27 Aug | 0749 | 0750 | 0754 | | SF | S19W58 | 3088 |
| 27 Aug | 0828 | 0832 | 0836 | | SF | S30W66 | 3088 |
| 27 Aug | 0852 | 0900 | 0903 | | SF | S30W66 | 3088 |
| 27 Aug | 0859 | 0900 | 0902 | | SF | S19W58 | 3088 |
| 27 Aug | 0907 | 0907 | 0910 | | SF | S29W67 | 3088 |
| 27 Aug | 0911 | 0916 | 0921 | C4.4 | SF | S32W73 | 3088 |
| 27 Aug | 0952 | 0953 | 0955 | | SF | S28W67 | 3088 |
| 27 Aug | 1007 | 1007 | 1009 | | SF | S31W74 | 3088 |
| 27 Aug | 1038 | 1041 | 1044 | | SF | S29W65 | 3088 |
| 27 Aug | 1049 | 1050 | 1053 | | SF | S28W64 | 3088 |
| 27 Aug | 1056 | 1104 | 1112 | | SF | S28W66 | 3088 |
| 27 Aug | 1129 | 1138 | 1143 | M1.2 | SN | S28W66 | 3088 |

## *Flare List*

| Date | Time | | | Optical | | | |
|---|---|---|---|---|---|---|---|
| | Begin | Max | End | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
| 27 Aug | 1200 | 1206 | 1210 | C4.4 | SF | S28W64 | 3088 |
| 27 Aug | 1216 | 1219 | 1222 | | SF | S28W64 | 3088 |
| 27 Aug | 1226 | 1230 | 1239 | | SF | S29W66 | 3088 |
| 27 Aug | 1241 | 1248 | 1252 | C8.8 | SF | S29W66 | 3088 |
| 27 Aug | 1306 | 1313 | 1317 | C9.6 | | | 3088 |
| 27 Aug | B1413 | U1417 | A1419 | | SF | S29W66 | 3088 |
| 27 Aug | B1433 | U1445 | A1502 | | SF | S22W03 | 3086 |
| 27 Aug | 1454 | 1459 | 1503 | C5.2 | 1N | S28W70 | 3088 |
| 27 Aug | 1504 | 1506 | 1508 | | SF | S28W66 | 3088 |
| 27 Aug | 1513 | 1525 | 1530 | M1.1 | SF | S28W71 | 3088 |
| 27 Aug | 1545 | 1558 | 1621 | M1.8 | | | 3088 |
| 27 Aug | 1942 | 1949 | 2221 | | SF | S22E36 | 3089 |
| 27 Aug | 1949 | 1950 | 2222 | | 1F | S28W70 | 3088 |
| 27 Aug | 2038 | 2045 | 2051 | C4.4 | | | 3088 |
| 27 Aug | 2111 | 2115 | 2119 | C3.0 | | | 3088 |
| 27 Aug | 2136 | 2139 | 2144 | C5.1 | | | 3088 |
| 27 Aug | 2247 | 2310 | 2311 | | SF | S22E34 | 3089 |
| 27 Aug | 2324 | 2325 | 2330 | | SF | S27W72 | 3088 |
| 28 Aug | 0010 | 0019 | 0022 | | SF | S27W72 | 3088 |
| 28 Aug | 0047 | 0134 | 0138 | M1.4 | | | 3088 |
| 28 Aug | 0147 | 0147 | 0152 | | SF | S19W70 | 3088 |
| 28 Aug | 0232 | 0241 | 0250 | C7.4 | | | 3088 |
| 28 Aug | 0331 | 0339 | 0401 | C4.5 | | | 3088 |
| 28 Aug | 0434 | 0435 | 0437 | | SF | S19W70 | 3088 |
| 28 Aug | 0445 | 0446 | 0448 | | SF | S19W70 | 3088 |
| 28 Aug | 0544 | 0552 | 0559 | C3.0 | 1N | S28W77 | 3088 |
| 28 Aug | 0650 | 0653 | 0659 | C3.3 | | | 3089 |
| 28 Aug | 0659 | 0707 | 0711 | C5.3 | SF | S28W77 | 3088 |
| 28 Aug | 0724 | 0748 | 0809 | C9.9 | SF | S29W84 | 3088 |
| 28 Aug | 0812 | 0813 | 0816 | | SF | S19W74 | 3088 |
| 28 Aug | 0818 | 0821 | 0831 | | SF | S19W74 | 3088 |
| 28 Aug | 0913 | 0917 | 0920 | | SF | S29W83 | 3088 |
| 28 Aug | 0929 | 0930 | 0936 | | SF | S28W79 | 3088 |
| 28 Aug | 0930 | 0930 | 0932 | | SF | S19W74 | 3088 |
| 28 Aug | B1022 | U1033 | A1056 | | SF | S29W83 | 3088 |
| 28 Aug | 1117 | 1125 | 1138 | C3.1 | | | 3088 |
| 28 Aug | 1322 | 1341 | 1353 | C5.3 | SF | S21E28 | 3088 |
| 28 Aug | 1322 | 1522 | 1526 | | SF | S28W83 | 3088 |

## *Flare List*

| | Time | | | Optical | | | |
|---|---|---|---|---|---|---|---|
| Date | Begin | Max | End | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
| 28 Aug | 1548 | 1619 | 1646 | M6.7 | SF | S28W80 | 3088 |
| 28 Aug | 1820 | 1832 | 1850 | M4.6 | | | 3088 |
| 28 Aug | 2333 | 2336 | 2340 | C7.5 | | | 3088 |

## *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 3078*** | | | | | | | | | | | | |
| 10 Aug | S22E58 | 33 | 50 | 1 | Hax | 1 | A | | | | | | | | |
| 11 Aug | S27E45 | 33 | 80 | 1 | Hsx | 1 | A | | | | | | | | |
| 12 Aug | S25E32 | 33 | 30 | 1 | Cao | 3 | B | | | | | | | | |
| 13 Aug | S25E20 | 31 | 20 | 3 | Hax | 2 | A | 1 | | | | | | | |
| 14 Aug | S25E06 | 32 | 60 | 3 | Cao | 5 | B | 4 | | | 5 | | | | |
| 15 Aug | S24W05 | 30 | 230 | 4 | Dac | 12 | BGD | 6 | 2 | | 4 | 2 | | | |
| 16 Aug | S23W18 | 30 | 270 | 5 | Dao | 10 | BGD | 12 | 2 | | 4 | 1 | | | |
| 17 Aug | S20W34 | 33 | 190 | 5 | Dac | 10 | BGD | 8 | 2 | | 6 | 1 | | | |
| 18 Aug | S24W47 | 33 | 210 | 6 | Dac | 14 | BGD | 15 | 3 | | 10 | 3 | | | |
| 19 Aug | S24W62 | 34 | 210 | 6 | Dac | 14 | BGD | 10 | 1 | | 2 | 4 | | | |
| 20 Aug | S24W74 | 33 | 30 | 3 | Dai | 6 | BG | | | | 1 | | | | |
| 21 Aug | S24W88 | 34 | plage | | | | | 1 | | | 1 | | | | |
| | | | | | | | | 57 | 10 | 0 | 33 | 11 | 0 | 0 | 0 |

Crossed West Limb.
Absolute heliographic longitude: 30

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Region 3081*** | | | | | | | | | | | | |
| 13 Aug | N10E44 | 7 | 240 | 4 | Dai | 9 | B | | | | 2 | | | | |
| 14 Aug | N10E31 | 7 | 160 | 7 | Dai | 13 | B | 2 | | | 3 | | | | |
| 15 Aug | N12E18 | 6 | 220 | 8 | Dao | 16 | BG | 1 | | | 1 | | | | |
| 16 Aug | N12E04 | 8 | 120 | 9 | Dao | 10 | BG | | | | | | | | |
| 17 Aug | N11W08 | 6 | 150 | 9 | Cao | 9 | B | | | | | | | | |
| 18 Aug | N11W23 | 9 | 120 | 7 | Cao | 9 | B | 4 | | | 3 | | | | |
| 19 Aug | N16W38 | 10 | 110 | 4 | Cao | 4 | B | 2 | | | 1 | | | | |
| 20 Aug | N11W52 | 10 | 90 | 3 | Hax | 4 | A | | | | | | | | |
| 21 Aug | N11W66 | 12 | 90 | 2 | Hax | 5 | A | 1 | | | 2 | | | | |
| 22 Aug | N13W79 | 11 | 120 | 2 | Hax | 2 | A | | | | 2 | | | | |
| | | | | | | | | 10 | 0 | 0 | 14 | 0 | 0 | 0 | 0 |

Crossed West Limb.
Absolute heliographic longitude: 8

## *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 3082*** | | | | | | | | | | | | |
| 16 Aug | N27E49 | 323 | 10 | 4 | Bxo | 3 | B | | | | | | | | |
| 17 Aug | N23E37 | 321 | 80 | 6 | Dao | 7 | B | 7 | | | 15 | | | | |
| 18 Aug | N27E22 | 324 | 50 | 7 | Dao | 4 | B | | | | | | | | |
| 19 Aug | N23E15 | 321 | 40 | 8 | Cao | 2 | B | | | | | | | | |
| 20 Aug | N28E02 | 317 | 10 | 8 | Cro | 2 | B | | | | | | | | |
| 21 Aug | N28W11 | 317 | 10 | 9 | Cro | 2 | B | | | | | | | | |
| 22 Aug | N29W24 | 316 | 10 | 1 | Axx | 1 | A | | | | | | | | |
| 23 Aug | N29W37 | 316 | plage | | | | | | | | | | | | |
| 24 Aug | N29W51 | 317 | plage | | | | | | | | | | | | |
| 25 Aug | N29W65 | 318 | plage | | | | | | | | | | | | |
| 26 Aug | N29W79 | 319 | plage | | | | | | | | | | | | |
| | | | | | | | | 7 | 0 | 0 | 15 | 0 | 0 | 0 | 0 |

Crossed West Limb.
Absolute heliographic longitude: 317

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Region 3084*** | | | | | | | | | | | | |
| 18 Aug | S09E18 | 328 | 20 | 3 | Bxo | 3 | B | | | | | | | | |
| 19 Aug | S11E01 | 331 | 20 | 3 | Bxo | 2 | B | | | | | | | | |
| 20 Aug | S09W12 | 331 | 10 | 4 | Bxo | 4 | B | | | | 1 | | | | |
| 21 Aug | S11W19 | 325 | 10 | 8 | Bxo | 3 | B | | | | | | | | |
| 22 Aug | S07W33 | 324 | plage | | | | | 1 | | | 1 | | | | |
| 23 Aug | S07W48 | 327 | plage | | | | | | | | | | | | |
| 24 Aug | S07W63 | 329 | plage | | | | | | | | | | | | |
| 25 Aug | S07W78 | 331 | plage | | | | | | | | | | | | |
| | | | | | | | | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

Crossed West Limb.
Absolute heliographic longitude: 331

## *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 3085*** | | | | | | | | | | | | |
| 21 Aug | N29E16 | 290 | 50 | 5 | Dao | 6 | B | 2 | | | 1 | | | | |
| 22 Aug | N30E01 | 291 | 150 | 7 | Dso | 11 | B | 9 | | | 8 | | | | |
| 23 Aug | N25W08 | 287 | 250 | 8 | Dki | 15 | B | | | | | | | | |
| 24 Aug | N30W21 | 287 | 260 | 8 | Dko | 10 | B | | | | | | | | |
| 25 Aug | N32W35 | 287 | 280 | 9 | Dko | 10 | B | | | | | | | | |
| 26 Aug | N30W49 | 289 | 140 | 8 | Dso | 4 | B | | | | 2 | | | | |
| 27 Aug | N30W62 | 289 | 100 | 8 | Cso | 2 | B | | | | 1 | | | | |
| 28 Aug | N30W76 | 290 | 80 | 5 | Hsx | 1 | A | | | | | | | | |
| | | | | | | | | 11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 291

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Region 3086*** | | | | | | | | | | | | |
| 23 Aug | S21E44 | 235 | 90 | 4 | Cao | 6 | B | 1 | | | | | | | |
| 24 Aug | S24E28 | 238 | 100 | 6 | Dso | 5 | B | | | | | | | | |
| 25 Aug | S24E14 | 238 | 120 | 8 | Dso | 3 | B | | | | | | | | |
| 26 Aug | S22E01 | 239 | 50 | 8 | Dao | 6 | B | | | | | | | | |
| 27 Aug | S22W12 | 239 | 70 | 5 | Cai | 8 | B | 1 | | | 2 | | | | |
| 28 Aug | S23W25 | 239 | 30 | 6 | Cro | 6 | B | | | | | | | | |
| | | | | | | | | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 239

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Region 3087*** | | | | | | | | | | | | |
| 23 Aug | S15E65 | 214 | 40 | 2 | Hax | 1 | A | | | | | | | | |
| 24 Aug | S17E53 | 213 | 40 | 1 | Hax | 1 | A | | | | | | | | |
| 25 Aug | S16E38 | 213 | 40 | 1 | Hax | 1 | A | | | | | | | | |
| 26 Aug | S13E26 | 214 | 30 | 1 | Hrx | 1 | A | | | | | | | | |
| 27 Aug | S14E13 | 214 | 20 | 1 | Hrx | 1 | A | | | | | | | | |
| 28 Aug | S14W01 | 215 | 10 | 1 | Axx | 1 | A | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 215

## *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 3088*** | | | | | | | | | | | | |
| 25 Aug | S26W45 | 298 | 240 | 6 | Dai | 10 | B | 7 | 1 | | 5 | 1 | | | |
| 26 Aug | S28W58 | 298 | 420 | 7 | Dkc | 15 | B | 4 | | | 2 | 3 | | | |
| 27 Aug | S27W73 | 300 | 650 | 7 | Dkc | 9 | BG | 12 | 4 | | 28 | 2 | | | |
| 28 Aug | S27W87 | 301 | 220 | 6 | Dkc | 4 | BG | 8 | 3 | | 15 | 1 | | | |
| | | | | | | | | 31 | 8 | 0 | 50 | 7 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 298

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Region 3089*** | | | | | | | | | | | | |
| 25 Aug | S24E56 | 196 | 150 | 6 | Dsi | 9 | B | 9 | 1 | | 4 | 2 | | | |
| 26 Aug | S21E44 | 196 | 190 | 8 | Dai | 12 | BG | 6 | 3 | | 14 | 4 | | | |
| 27 Aug | S22E31 | 196 | 280 | 7 | Dki | 14 | B | | | | 4 | | | | |
| 28 Aug | S23E18 | 196 | 320 | 11 | Eki | 17 | BD | 1 | | | | | | | |
| | | | | | | | | 16 | 4 | 0 | 22 | 6 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 196

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Region 3090*** | | | | | | | | | | | | |
| 25 Aug | N14E60 | 191 | 10 | | Axx | 1 | A | | | | | | | | |
| 26 Aug | N16E48 | 192 | plage | | | | | | | | | | | | |
| 27 Aug | N16E34 | 193 | plage | | | | | | | | | | | | |
| 28 Aug | N16E20 | 194 | plage | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 194

## *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