

Solar activity ranged from low to high levels. Region 3006 (S30, L=235, class/area=Eai/180 on 10 May) produced the strongest event of the period, an impulsive X1/1b at 10/1355 UTC. Type II and Type IV radio sweeps occurred near the event but wasn't clear if it was associated with activity near the E limb, which also produced an associated CME around the same time. The region only produced C-class activity after that event and slowly decayed over the next several days. Region 3007 (S24, L=184, class/area=Ekc/350 on 12 May) produced an M1/1n flare on 11/1648 UTC. While being the most complex region on the visible disk, it also only produced C-class activity through the end of the reporting period. The remaining spotted regions on the visible disk were relatively simple and produced only low-level X-ray activity.

Other activity included several M-flare events that were produced from activity from around both the E and W limbs. An M2 flare at 11/1858 UTC from the vicinity of Region 3004 (S16, L=324, class/area=Dkc/500 on 05 May), which had around the W limb two days before, produced a Type II and Type IV radio sweep. Ejecta from the several CMEs observed during the period were determined to be off the Sun-Earth line, with only the periphery of some of the CMEs having the potential to cause minor enhancements near Earth.

No proton events above S1 (Minor) were observed at geosynchronous orbit. An enhancement below the S1 threshold was observed after the M2 flare from old Region 3004 around the W limb. The maximum >10 MeV proton flux was 5 pfu, observed early on 12 May.

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 conditions. Unsettled conditions that were observed on 09 May and 13 May were likely associated with weak enhancements from transient activity. Unsettled conditions on 14 May into active conditions on 15 May were associated with the onset CIR followed by influence from a positive polarity CH HSS. Solar wind speeds increased from the mid 300's km/s to ~570 km/s on 15 May. The remainder of the reporting period was at quiet levels.

## **Space Weather Outlook**

### **16 May - 11 June 2022**

Solar activity is expected to be low levels throughout most of the outlook period. With the exception of 21-22 May, regions associated with M-flare activity are expected to be present on the visible disk, carrying with them a slight chance for M-class activity.

No proton events are expected at geosynchronous orbit.

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



levels from 16-25 May and 05-11 Jun. High levels are expected on 26 May - 04 Jun and are associated with influence from anticipated CH HSS activity.

Geomagnetic field activity is expected to be at quiet to G1 (Minor) geomagnetic storm levels. G1 levels are likely on 24 May; active levels are likely on 16 May, 25-17 May, and 11 Jun; unsettled levels are likely on 17 May, 19-20 May, 28 May, and 10 Jun. All elevations in geomagnetic activity are anticipated in response to multiple, recurrent CH HSSs. The remainder of the outlook period is expected to be at mostly quiet levels.



### *Daily Solar Data*

| Date   | Radio<br>Flux<br>10.7cm | Sun<br>spot<br>No. | Sunspot<br>Area<br>(10 <sup>-6</sup> hemi.) | X-ray<br>Background<br>Flux | Flares |   |   |         |   |   |   |   |
|--------|-------------------------|--------------------|---|-----------------------------|--------|---|---|---------|---|---|---|---|
|        |                         |                    |   |                             | X-ray  |   |   | Optical |   |   |   |   |
|        |                         |                    |   |                             | C      | M | X | S       | 1 | 2 | 3 | 4 |
| 09 May | 117                     | 71                 | 450   | B5.8                        | 6      | 0 | 0 | 2       | 0 | 0 | 0 | 0 |
| 10 May | 116                     | 62                 | 420   | B7.6                        | 9      | 0 | 1 | 17      | 2 | 0 | 0 | 0 |
| 11 May | 133                     | 84                 | 450   | C1.1                        | 17     | 3 | 0 | 24      | 3 | 0 | 0 | 0 |
| 12 May | 133                     | 112                | 580   | C1.0                        | 9      | 1 | 0 | 11      | 0 | 0 | 0 | 0 |
| 13 May | 150                     | 120                | 610   | C1.2                        | 8      | 0 | 0 | 6       | 0 | 0 | 0 | 0 |
| 14 May | 153                     | 105                | 580   | C1.1                        | 10     | 1 | 0 | 10      | 0 | 0 | 0 | 0 |
| 15 May | 154                     | 129                | 720   | C1.0                        | 2      | 0 | 0 | 1       | 0 | 0 | 0 | 0 |

### *Daily Particle Data*

| Date   | Proton Fluence<br>(protons/cm <sup>2</sup> -day -sr) |         | Electron Fluence<br>(electrons/cm <sup>2</sup> -day -sr) |
|--------|--|---------|--|
|        | >1 MeV   | >10 MeV | >2MeV  |
|        | 09 May   | 5.7e+04 | 3.7e+04  |
| 10 May | 6.5e+04  | 3.7e+04 | 1.3e+06  |
| 11 May | 3.1e+05  | 6.3e+04 | 1.3e+06  |
| 12 May | 7.7e+06  | 2.0e+05 | 1.0e+06  |
| 13 May | 2.2e+06  | 5.6e+04 | 1.0e+06  |
| 14 May | 3.0e+05  | 4.0e+04 | 1.2e+06  |
| 15 May | 8.5e+04  | 3.8e+04 | 1.2e+06  |

### *Daily Geomagnetic Data*

| Date   | Middle Latitude<br>Fredericksburg |                 | High Latitude<br>College |                 | Estimated<br>Planetary |                 |
|--------|-----------------------------------|-----------------|--------------------------|-----------------|------------------------|-----------------|
|        | A                                 | K-indices       | A                        | K-indices       | A                      | K-indices       |
|        | 09 May                            | 8               | 2-4-2-2-2-1-1-1          | 11              | 2-4-4-2-3-1-1-0        | 8               |
| 10 May | 2                                 | 0-0-0-1-2-1-1-1 | 1                        | 0-1-0-0-1-1-0-0 | 3                      | 0-1-0-1-2-1-1-1 |
| 11 May | 5                                 | 1-1-1-1-2-2-2-2 | 4                        | 0-1-1-2-1-2-1-2 | 6                      | 1-1-1-1-2-2-2-2 |
| 12 May | 8                                 | 2-2-1-1-3-2-3-2 | 13                       | 2-4-3-1-4-3-2-1 | 8                      | 2-2-2-1-2-2-2-2 |
| 13 May | 7                                 | 2-1-1-1-3-1-2-3 | 6                        | 1-2-1-3-2-1-1-1 | 7                      | 2-1-2-2-2-1-2-3 |
| 14 May | 9                                 | 2-1-2-2-2-3-3-2 | 6                        | 2-2-2-2-1-2-2-1 | 7                      | 2-1-2-2-1-3-2-2 |
| 15 May | 10                                | 3-3-2-2-3-2-2-2 | 18                       | 4-4-4-4-3-2-2-1 | 22                     | 4-4-3-2-3-3-2-1 |

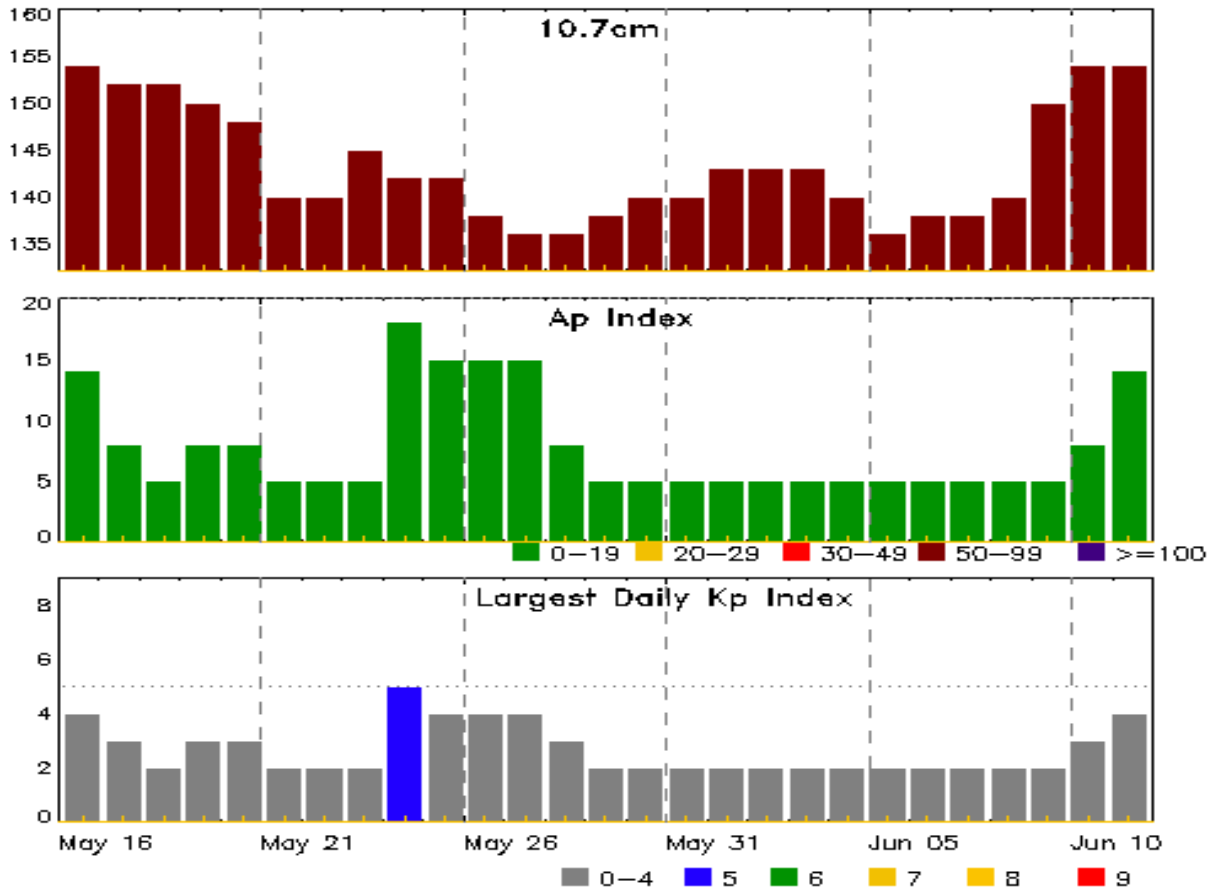


### *Alerts and Warnings Issued*

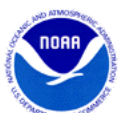
| <b>Date &amp; Time<br/>of Issue UTC</b> | <b>Type of Alert or Warning</b>  | <b>Date &amp; Time<br/>of Event UTC</b> |
|---|----------------------------------|---|
| 09 May 0436                             | WARNING: Geomagnetic K = 4       | 09/0436 - 0900                          |
| 10 May 1358                             | ALERT: X-ray Flux exceeded M5    | 10/1355                                 |
| 10 May 1412                             | SUMMARY: X-ray Event exceeded X1 | 10/1350 - 1359                          |
| 10 May 1447                             | ALERT: Type II Radio Emission    | 10/1358                                 |
| 10 May 1454                             | ALERT: Type IV Radio Emission    | 10/1407                                 |
| 10 May 1639                             | ALERT: Type IV Radio Emission    | 10/1451                                 |
| 11 May 1857                             | ALERT: Type IV Radio Emission    | 11/1824                                 |
| 11 May 1939                             | ALERT: Type II Radio Emission    | 11/1824                                 |
| 15 May 0230                             | WARNING: Geomagnetic K = 4       | 15/0229 - 1500                          |
| 15 May 0253                             | ALERT: Geomagnetic K = 4         | 15/0247                                 |



## Twenty-seven Day Outlook



| Date   | Radio Flux<br>10.7cm | Planetary<br>A Index | Largest<br>Kp Index | Date   | Radio Flux<br>10.7cm | Planetary<br>A Index | Largest<br>Kp Index |
|--------|----------------------|----------------------|---------------------|--------|----------------------|----------------------|---------------------|
| 16 May | 154                  | 14                   | 4                   | 30 May | 140                  | 5                    | 2                   |
| 17     | 152                  | 8                    | 3                   | 31     | 140                  | 5                    | 2                   |
| 18     | 152                  | 5                    | 2                   | 01 Jun | 143                  | 5                    | 2                   |
| 19     | 150                  | 8                    | 3                   | 02     | 143                  | 5                    | 2                   |
| 20     | 148                  | 8                    | 3                   | 03     | 143                  | 5                    | 2                   |
| 21     | 140                  | 5                    | 2                   | 04     | 140                  | 5                    | 2                   |
| 22     | 140                  | 5                    | 2                   | 05     | 136                  | 5                    | 2                   |
| 23     | 145                  | 5                    | 2                   | 06     | 138                  | 5                    | 2                   |
| 24     | 142                  | 18                   | 5                   | 07     | 138                  | 5                    | 2                   |
| 25     | 142                  | 15                   | 4                   | 08     | 140                  | 5                    | 2                   |
| 26     | 138                  | 15                   | 4                   | 09     | 150                  | 5                    | 2                   |
| 27     | 136                  | 15                   | 4                   | 10     | 154                  | 8                    | 3                   |
| 28     | 136                  | 8                    | 3                   | 11     | 154                  | 14                   | 4                   |
| 29     | 138                  | 5                    | 2                   |        |                      |                      |                     |



### *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 |
| 10 May | 1350  | 1355 | 1359 | X1.5  | 0.031               | 1B         | S30W04           | 3006  | 100        |            |           | 3  |
| 11 May | 1635  | 1649 | 1658 | M1.6  | 0.013               | 1N         | S24E41           | 3007  |            |            |           |    |
| 11 May | 1813  | 1858 | 1927 | M2.6  | 0.042               |            |                  |       | 82         | 82         | 2         | 2  |
| 11 May | 1927  | 1931 | 1935 | M2.2  | 0.012               |            |                  |       |            |            |           |    |
| 12 May | 2004  | 2019 | 2027 | M1.3  | 0.009               |            |                  |       |            |            |           |    |
| 14 May | 2358  | 0008 | 0017 | M2.2  | 0.018               |            |                  |       |            |            |           |    |

### *Flare List*

| Date   | Time  |      |      | X-ray Class | Imp/ Brtns | Location Lat CMD | Rgn # |
|--------|-------|------|------|-------------|------------|------------------|-------|
|        | Begin | Max  | End  |             |            |                  |       |
| 09 May | 0059  | 0105 | 0113 | C2.5        |            |                  | 3004  |
| 09 May | 1332  | 1332 | 1344 |             | SF         | S34E12           | 3006  |
| 09 May | 1415  | 1431 | 1442 | C2.1        | SF         | S22E67           | 3007  |
| 09 May | 1735  | 1741 | 1749 | C1.0        |            |                  | 3007  |
| 09 May | 1749  | 1753 | 1757 | B9.9        |            |                  | 3007  |
| 09 May | 1756  | 1803 | 1813 | C1.5        |            |                  | 3006  |
| 09 May | 2054  | 2057 | 2103 | C1.2        |            |                  | 3007  |
| 09 May | 2116  | 2126 | 2138 | C1.2        |            |                  | 3006  |
| 10 May | 0135  | 0151 | 0206 | C1.6        |            |                  | 3007  |
| 10 May | 0554  | 0556 | 0600 |             | SF         | S23E58           |       |
| 10 May | 0609  | 0610 | 0613 |             | SF         | S21E57           |       |
| 10 May | 0644  | 0646 | 0648 |             | SF         | S21E57           |       |
| 10 May | 0746  | 0755 | 0805 | C2.9        | SF         | S20E57           |       |
| 10 May | 0846  | 0853 | 0857 |             | SF         | S22E56           |       |
| 10 May | 0901  | 0916 | 0948 |             | SF         | S22E67           | 3007  |
| 10 May | 0952  | 1001 | 1007 | C1.9        | SF         | S30W02           | 3006  |
| 10 May | 1013  | 1053 | 1100 |             | SF         | S22E55           |       |
| 10 May | 1149  | 1155 | 1159 | C1.0        | SF         | S21E54           | 3007  |
| 10 May | 1209  | 1211 | 1214 |             | SF         | S21E54           |       |
| 10 May | 1250  | 1258 | 1305 | C2.8        | SF         | S30W03           | 3006  |
| 10 May | 1309  | 1314 | 1318 | C1.8        | SF         | S22E55           |       |
| 10 May | 1331  | 1333 | 1453 |             | 1F         | S22E52           |       |
| 10 May | 1350  | 1355 | 1359 | X1.5        | 1B         | S30W04           | 3006  |
| 10 May | 1433  | 1435 | 1444 |             | SF         | S30W04           | 3006  |
| 10 May | 1448  | 1448 | 1449 |             | SF         | S30W04           | 3006  |



## *Flare List*

| Date   | Time  |      |      | X-ray<br>Class | Optical       |                     | Rgn<br># |
|--------|-------|------|------|----------------|---------------|---------------------|----------|
|        | Begin | Max  | End  |                | Imp/<br>Brtns | Location<br>Lat CMD |          |
| 10 May | 1502  | 1503 | 1506 |                | SF            | S22E52              | 3007     |
| 10 May | 1510  | 1517 | 1521 |                | SF            | S22E53              | 3007     |
| 10 May | 1522  | 1526 | 1526 |                | SF            | S22E53              | 3007     |
| 10 May | 1530  | 1532 | 1534 |                | SF            | S22E53              | 3007     |
| 10 May | 1552  | 1609 | 1611 |                | SF            | S22E53              | 3007     |
| 10 May | 1643  | 1644 | 1646 |                | SF            | S22E52              | 3007     |
| 10 May | 2119  | 2207 | 2255 | C2.1           |               |                     | 3007     |
| 10 May | 2255  | 2302 | 2309 | C1.5           |               |                     |          |
| 10 May | 2309  | 2315 | 2319 | C1.6           |               |                     | 3007     |
| 11 May | 0016  | 0024 | 0029 | C1.9           |               |                     | 3007     |
| 11 May | B0238 | 0249 | 0258 | C3.2           | SF            | S24E44              | 3007     |
| 11 May | 0253  | 0253 | 0257 |                | SF            | S29W12              | 3006     |
| 11 May | 0302  | 0305 | 0330 |                | SF            | S24E44              | 3007     |
| 11 May | 0332  | 0347 | 0349 |                | SF            | S24E44              | 3007     |
| 11 May | 0416  | 0429 | 0442 | C2.3           |               |                     |          |
| 11 May | 0456  | 0522 | 0541 |                | SF            | S22E45              | 3007     |
| 11 May | 0532  | 0540 | 0545 | C1.9           | SF            | S33W07              | 3006     |
| 11 May | 0545  | 0551 | 0556 | C2.5           | SF            | S31W12              | 3006     |
| 11 May | 0602  | 0625 | 0704 |                | 1F            | S25E45              | 3007     |
| 11 May | 0611  | 0617 | 0622 | C3.1           |               |                     | 3006     |
| 11 May | 0622  | 0626 | 0630 | C4.5           |               |                     | 3007     |
| 11 May | 0718  | 0720 | 0728 |                | SF            | S24E44              | 3007     |
| 11 May | 0811  | 0821 | 0825 | C1.9           |               |                     |          |
| 11 May | 0925  | 0952 | 1014 | C3.5           |               |                     |          |
| 11 May | 1144  | 1144 | 1146 |                | SF            | S24E43              | 3007     |
| 11 May | 1159  | 1205 | 1215 | C1.7           |               |                     |          |
| 11 May | 1231  | 1246 | 1314 | C2.9           |               |                     | 3006     |
| 11 May | B1248 | 1304 | 1306 |                | SF            | S23E39              | 3007     |
| 11 May | 1308  | 1309 | 1313 |                | SF            | S35W09              | 3006     |
| 11 May | 1314  | 1326 | 1335 | C4.9           |               |                     | 3007     |
| 11 May | 1320  | 1323 | 1346 |                | SF            | S35W09              | 3006     |
| 11 May | 1321  | 1321 | 1333 |                | SF            | S32W12              | 3006     |
| 11 May | 1326  | 1326 | 1327 |                | SF            | S23E42              | 3007     |
| 11 May | 1328  | 1330 | 1334 |                | SF            | S26E43              | 3007     |
| 11 May | 1353  | 1354 | 1355 |                | SF            | S24E40              | 3007     |
| 11 May | 1355  | 1408 | 1419 | C3.5           |               |                     |          |
| 11 May | 1419  | 1424 | 1433 | C3.8           |               |                     | 3007     |
| 11 May | 1444  | 1452 | 1458 | C4.4           |               |                     |          |



## *Flare List*

| Date   | Time  |      |      | X-ray<br>Class | Imp/<br>Brtns | Optical             |          |
|--------|-------|------|------|----------------|---------------|---------------------|----------|
|        | Begin | Max  | End  |                |               | Location<br>Lat CMD | Rgn<br># |
| 11 May | 1534  | 1545 | 1601 | C8.6           | 1F            | S24E39              | 3007     |
| 11 May | 1548  | 1552 | 1605 |                | SF            | S32W14              | 3006     |
| 11 May | 1609  | 1612 | 1615 |                | SF            | S24E39              | 3007     |
| 11 May | 1624  | 1648 | 1707 | M1.6           | 1N            | S24E41              | 3007     |
| 11 May | 1653  | 1657 | 1704 |                | SF            | S32W15              | 3006     |
| 11 May | 1741  | 1754 | 1805 |                | SF            | S25E37              | 3007     |
| 11 May | 1813  | 1858 | 1927 | M2.6           |               |                     |          |
| 11 May | 1830  | 1838 | 1847 |                | SF            | S22E38              | 3007     |
| 11 May | 1927  | 1931 | 1935 | M2.2           |               |                     |          |
| 11 May | 1928  | 1936 | 1946 |                | SF            | S25E37              | 3007     |
| 11 May | 1951  | 1951 | 1954 |                | SF            | S25E37              | 3007     |
| 11 May | 2232  | 2241 | 2256 | C4.3           |               |                     |          |
| 11 May | 2336  | 2336 | 2350 |                | SF            | S23E33              | 3007     |
| 12 May | 0012  | 0014 | 0016 |                | SF            | S23E32              | 3007     |
| 12 May | 0048  | 0058 | 0102 |                | SF            | S23E31              | 3007     |
| 12 May | 0155  | 0200 | 0257 |                | SF            | S27E36              | 3007     |
| 12 May | 0210  | 0224 | 0238 | C8.4           |               |                     | 3010     |
| 12 May | 0407  | 0407 | 0410 |                | SF            | S32W21              | 3006     |
| 12 May | 0528  | 0537 | 0559 | C1.6           |               |                     |          |
| 12 May | 0533  | 0533 | 0542 | C2.2           | SF            | S32W21              | 3006     |
| 12 May | 0734  | 0746 | 0755 | C5.9           |               |                     |          |
| 12 May | 1009  | 1010 | 1018 |                | SF            | S32W24              | 3006     |
| 12 May | 1028  | 1045 | 1100 | C2.8           | SF            | S31W24              | 3006     |
| 12 May | 1130  | 1131 | 1136 |                | SF            | S13E85              |          |
| 12 May | 1145  | 1156 | 1206 | C2.0           | SF            | S23E26              | 3007     |
| 12 May | 1257  | 1302 | 1321 |                | SF            | S23E25              | 3007     |
| 12 May | 1505  | 1511 | 1515 | C1.7           |               |                     | 3006     |
| 12 May | 1802  | 1810 | 1817 | C4.3           |               |                     | 3010     |
| 12 May | 2004  | 2019 | 2027 | M1.3           |               |                     |          |
| 12 May | 2151  | 2201 | 2209 | C2.8           | SF            | S32W32              | 3006     |
| 13 May | 0009  | 0010 | 0011 |                | SF            | S24E22              | 3007     |
| 13 May | 0056  | 0104 | 0113 | C2.4           |               |                     |          |
| 13 May | 0446  | 0456 | 0512 | C2.6           | SF            | S22E15              | 3007     |
| 13 May | 0742  | 0742 | 0747 |                | SF            | S23E16              | 3007     |
| 13 May | 0838  | 0843 | 0855 | C2.9           | SF            | S20E16              | 3007     |
| 13 May | 0942  | 0945 | 0949 | C2.7           |               |                     |          |
| 13 May | 0956  | 1009 | 1019 | C4.2           |               |                     |          |
| 13 May | 1055  | 1056 | 1103 |                | SF            | S23E14              | 3007     |





## *Flare List*

| Date   | Time  |      |      | X-ray<br>Class | Optical       |                     | Rgn<br># |
|--------|-------|------|------|----------------|---------------|---------------------|----------|
|        | Begin | Max  | End  |                | Imp/<br>Brtns | Location<br>Lat CMD |          |
| 13 May | 1352  | 1357 | 1405 | C1.8           |               |                     | 3011     |
| 13 May | 1622  | 1622 | 1625 |                | SF            | S25E12              | 3007     |
| 13 May | 1827  | 1835 | 1840 | C3.3           |               |                     | 3011     |
| 13 May | 2207  | 2226 | 2234 | C2.6           |               |                     |          |
| 14 May | 0512  | 0515 | 0527 |                | SF            | S22E09              | 3007     |
| 14 May | 0727  | 0738 | 0750 | C1.9           |               |                     |          |
| 14 May | 0904  | 0925 | 0943 | C3.0           |               |                     |          |
| 14 May | 1055  | 1058 | 1107 |                | SF            | S08E55              | 3010     |
| 14 May | 1214  | 1219 | 1225 | C1.8           | SF            | S22W49              | 3006     |
| 14 May | 1422  | 1427 | 1431 | C1.8           | SF            | N12E70              | 3011     |
| 14 May | 1510  | 1516 | 1523 | C2.1           | SF            | N14E82              | 3011     |
| 14 May | 1535  | 1538 | 1544 |                | SF            | N11E70              | 3011     |
| 14 May | 1611  | 1625 | 1644 | C2.3           |               |                     |          |
| 14 May | 1923  | 1930 | 1948 | C3.6           | SN            | S33W53              | 3006     |
| 14 May | 2004  | 2016 | 2031 | C4.2           | SF            | S12E55              | 3010     |
| 14 May | 2120  | 2207 | 2228 | C5.7           | SF            | S13E51              | 3010     |
| 14 May | 2228  | 2238 | 2245 | C4.5           | SF            | S13E52              | 3010     |
| 14 May | 2250  | 2250 | 2259 |                | SF            | S13E52              | 3010     |
| 14 May | 2358  | 0008 | 0017 | M2.2           |               |                     |          |
| 15 May | 0413  | 0414 | 0421 |                | SF            | S18E51              | 3010     |
| 15 May | 1210  | 1217 | 1223 | C1.9           |               |                     |          |
| 15 May | 2327  | 2341 | 2348 | C2.0           |               |                     |          |



## Region Summary

| Date               | Location |           | Sunspot Characteristics    |                |            |            | Flares    |       |   |   |         |   |   |   |   |   |  |
|--------------------|----------|-----------|----------------------------|----------------|------------|------------|-----------|-------|---|---|---------|---|---|---|---|---|--|
|                    | Lat CMD  | Helio Lon | Area 10 <sup>6</sup> hemi. | Extent (helio) | Spot Class | Spot Count | Mag Class | X-ray |   |   | Optical |   |   |   |   |   |  |
|                    |          |           |                            |                |            |            |           | C     | M | X | S       | 1 | 2 | 3 | 4 |   |  |
| <b>Region 3001</b> |          |           |                            |                |            |            |           |       |   |   |         |   |   |   |   |   |  |
| 26 Apr             | S29E68   | 345       | 110                        | 2              | Hsx        | 1          | A         | 1     |   |   |         |   |   |   |   |   |  |
| 27 Apr             | S26E58   | 343       | 120                        | 4              | Hsx        | 1          | A         | 1     |   |   |         | 1 |   |   |   |   |  |
| 28 Apr             | S32E48   | 339       | 130                        | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 29 Apr             | S32E35   | 339       | 120                        | 2              | Hax        | 1          | A         | 1     |   |   |         |   |   |   |   |   |  |
| 30 Apr             | S32E22   | 339       | 120                        | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 01 May             | S32E09   | 339       | 110                        | 2              | Hax        | 2          | A         |       |   |   |         |   |   |   |   |   |  |
| 02 May             | S32E01   | 334       | 110                        | 7              | Hsx        | 2          | A         |       |   |   |         |   |   |   |   |   |  |
| 03 May             | S31W14   | 335       | 80                         | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 04 May             | S32W27   | 335       | 90                         | 1              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 05 May             | S32W40   | 335       | 90                         | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 06 May             | S32W53   | 335       | 90                         | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 07 May             | S32W67   | 335       | 90                         | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 08 May             | S32W80   | 335       | 90                         | 2              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
| 09 May             | S32W90   | 332       | 60                         | 1              | Hsx        | 1          | A         |       |   |   |         |   |   |   |   |   |  |
|                    |          |           |                            |                |            |            |           | 3     | 0 | 0 | 1       | 0 | 0 | 0 | 0 | 0 |  |

Crossed West Limb.  
 Absolute heliographic longitude: 334

|                    |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|--------------------|--------|-----|-------|---|-----|---|---|---|---|---|---|---|---|---|---|---|--|
| <b>Region 3003</b> |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 29 Apr             | S23E50 | 324 | 20    | 2 | Bxo | 2 | B |   |   |   |   |   |   |   |   |   |  |
| 30 Apr             | S23E36 | 325 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 01 May             | S23E22 | 326 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 02 May             | S23E08 | 327 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 03 May             | S23W06 | 327 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 04 May             | S23W20 | 328 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 05 May             | S24W27 | 322 | 10    | 2 | Bxo | 3 | B |   |   |   |   |   |   |   |   |   |  |
| 06 May             | S24W40 | 322 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 07 May             | S24W54 | 322 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 08 May             | S24W67 | 322 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 09 May             | S24W81 | 323 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|                    |        |     |       |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

Crossed West Limb.  
 Absolute heliographic longitude: 327



### *Region Summary - continued*

| Date               | Location |           | Sunspot Characteristics    |                |            |            |           | Flares |   |   |         |    |   |   |   |   |  |  |  |  |  |  |  |
|--------------------|----------|-----------|----------------------------|----------------|------------|------------|-----------|--------|---|---|---------|----|---|---|---|---|--|--|--|--|--|--|--|
|                    | Lat CMD  | Helio Lon | Area 10 <sup>6</sup> hemi. | Extent (helio) | Spot Class | Spot Count | Mag Class | X-ray  |   |   | Optical |    |   |   |   |   |  |  |  |  |  |  |  |
|                    |          |           |                            |                |            |            |           | C      | M | X | S       | 1  | 2 | 3 | 4 |   |  |  |  |  |  |  |  |
| <b>Region 3004</b> |          |           |                            |                |            |            |           |        |   |   |         |    |   |   |   |   |  |  |  |  |  |  |  |
| 02 May             | S16E12   | 323       | 30                         | 6              | Bxo        | 9          | B         |        |   |   |         |    |   |   |   |   |  |  |  |  |  |  |  |
| 03 May             | S15W02   | 322       | 100                        | 7              | Csi        | 21         | B         | 2      |   |   |         | 4  |   |   |   |   |  |  |  |  |  |  |  |
| 04 May             | S16W17   | 325       | 300                        | 9              | Dkc        | 18         | BG        | 12     | 3 |   |         | 17 | 3 |   |   |   |  |  |  |  |  |  |  |
| 05 May             | S16W29   | 324       | 500                        | 9              | Dkc        | 26         | BD        | 27     | 1 |   |         | 10 |   |   |   |   |  |  |  |  |  |  |  |
| 06 May             | S16W42   | 324       | 490                        | 9              | Dkc        | 25         | BD        | 5      |   |   |         | 2  |   |   |   |   |  |  |  |  |  |  |  |
| 07 May             | S16W56   | 324       | 490                        | 9              | Dkc        | 25         | BD        | 1      |   |   |         |    |   |   |   |   |  |  |  |  |  |  |  |
| 08 May             | S16W69   | 324       | 480                        | 8              | Dkc        | 22         | BD        | 4      |   |   |         | 1  |   |   |   |   |  |  |  |  |  |  |  |
| 09 May             | S13W85   | 326       | 180                        | 4              | Hsx        | 1          | A         | 1      |   |   |         |    |   |   |   |   |  |  |  |  |  |  |  |
|                    |          |           |                            |                |            |            |           | 52     | 4 | 0 | 34      | 3  | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |

Crossed West Limb.  
 Absolute heliographic longitude: 322

|                    |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--------------------|--------|-----|-------|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| <b>Region 3005</b> |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 02 May             | N20E05 | 330 | 20    | 3 | Bxo | 3 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 03 May             | N20W08 | 329 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 04 May             | N20W22 | 330 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 05 May             | N20W36 | 331 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 06 May             | N20W49 | 331 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 07 May             | N20W63 | 331 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 08 May             | N20W76 | 331 | 30    | 3 | Cao | 3 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 09 May             | N20W90 | 332 | 0     |   | Axx | 1 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|                    |        |     |       |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

Crossed West Limb.  
 Absolute heliographic longitude: 330



### *Region Summary - continued*

| Date               | Location |           | Sunspot Characteristics       |                   |               |               |              | Flares |   |   |         |   |   |   |   |  |  |  |  |  |
|--------------------|----------|-----------|-------------------------------|-------------------|---------------|---------------|--------------|--------|---|---|---------|---|---|---|---|--|--|--|--|--|
|                    | Lat CMD  | Helio Lon | Area<br>10 <sup>6</sup> hemi. | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray  |   |   | Optical |   |   |   |   |  |  |  |  |  |
|                    |          |           |                               |                   |               |               |              | C      | M | X | S       | 1 | 2 | 3 | 4 |  |  |  |  |  |
| <b>Region 3006</b> |          |           |                               |                   |               |               |              |        |   |   |         |   |   |   |   |  |  |  |  |  |
| 03 May             | S27E76   | 246       | plage                         |                   |               |               |              |        |   |   | 1       |   |   |   |   |  |  |  |  |  |
| 04 May             | S27E62   | 246       | 50                            | 6                 | Cro           | 4             | B            |        | 1 |   |         |   |   |   |   |  |  |  |  |  |
| 05 May             | S29E50   | 245       | 50                            | 9                 | Cao           | 4             | B            | 3      | 1 |   |         | 1 |   |   |   |  |  |  |  |  |
| 06 May             | S29E37   | 245       | 70                            | 9                 | Cao           | 8             | B            | 6      |   |   |         |   |   |   |   |  |  |  |  |  |
| 07 May             | S29E23   | 245       | 80                            | 9                 | Cao           | 10            | B            | 2      |   |   |         | 1 |   |   |   |  |  |  |  |  |
| 08 May             | S29E10   | 245       | 80                            | 9                 | Cao           | 10            | B            |        |   |   |         |   |   |   |   |  |  |  |  |  |
| 09 May             | S31E04   | 238       | 50                            | 12                | Cso           | 10            | BD           | 2      |   |   |         | 1 |   |   |   |  |  |  |  |  |
| 10 May             | S30W07   | 235       | 180                           | 14                | Eai           | 22            | BGD          | 2      |   | 1 | 3       | 1 |   |   |   |  |  |  |  |  |
| 11 May             | S31W20   | 235       | 130                           | 14                | Eao           | 19            | B            | 4      |   |   |         | 8 |   |   |   |  |  |  |  |  |
| 12 May             | S31W33   | 235       | 140                           | 14                | Eao           | 20            | B            | 4      |   |   |         | 5 |   |   |   |  |  |  |  |  |
| 13 May             | S31W46   | 235       | 120                           | 14                | Eao           | 18            | B            |        |   |   |         |   |   |   |   |  |  |  |  |  |
| 14 May             | S31W59   | 235       | 10                            | 7                 | Bxo           | 8             | B            | 2      |   |   |         | 2 |   |   |   |  |  |  |  |  |
| 15 May             | S31W72   | 235       | 10                            | 7                 | Bxo           | 3             | B            |        |   |   |         |   |   |   |   |  |  |  |  |  |
|                    |          |           |                               |                   |               |               |              | 25     | 2 | 2 | 21      | 1 | 0 | 0 | 0 |  |  |  |  |  |

Still on Disk.

Absolute heliographic longitude: 238

### **Region 3007**

|        |        |     |     |    |     |    |     |    |   |   |    |   |   |   |   |   |  |  |
|--------|--------|-----|-----|----|-----|----|-----|----|---|---|----|---|---|---|---|---|--|--|
| 08 May | S23E64 | 190 | 60  | 5  | Cao | 3  | B   | 2  |   |   |    |   |   |   |   |   |  |  |
| 09 May | S24E58 | 184 | 160 | 13 | Dso | 8  | B   | 3  |   |   |    | 1 |   |   |   |   |  |  |
| 10 May | S24E45 | 184 | 240 | 14 | Esi | 20 | B   | 4  |   |   |    | 6 |   |   |   |   |  |  |
| 11 May | S24E32 | 184 | 300 | 15 | Ehc | 20 | BGD | 6  | 1 |   | 16 | 3 |   |   |   |   |  |  |
| 12 May | S24E18 | 184 | 350 | 15 | Ekc | 30 | BGD | 1  |   |   |    | 5 |   |   |   |   |  |  |
| 13 May | S24E05 | 184 | 330 | 11 | Ekc | 28 | B   | 2  |   |   |    | 6 |   |   |   |   |  |  |
| 14 May | S24W08 | 184 | 340 | 12 | Ekc | 30 | B   |    |   |   |    | 1 |   |   |   |   |  |  |
| 15 May | S24W21 | 184 | 340 | 12 | Ekc | 30 | B   |    |   |   |    |   |   |   |   |   |  |  |
|        |        |     |     |    |     |    |     | 18 | 1 | 0 | 35 | 3 | 0 | 0 | 0 | 0 |  |  |

Still on Disk.

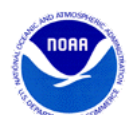
Absolute heliographic longitude: 184

### **Region 3008**

|        |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--------|--------|-----|-------|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 11 May | N16E34 | 182 | 10    | 3 | Bxo | 2 | B |   |   |   |   |   |   |   |   |   |   |  |
| 12 May | N16E20 | 182 | 30    | 4 | Cao | 5 | B |   |   |   |   |   |   |   |   |   |   |  |
| 13 May | N16E07 | 182 | 30    | 5 | Cao | 4 | B |   |   |   |   |   |   |   |   |   |   |  |
| 14 May | N16W06 | 182 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 15 May | N16W19 | 182 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |   |  |
|        |        |     |       |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

Still on Disk.

Absolute heliographic longitude: 182



### *Region Summary - continued*

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

#### ***Region 3009***

|        |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|--------|--------|-----|-------|---|-----|---|---|---|---|---|---|---|---|---|---|---|--|
| 11 May | N14W21 | 237 | 10    | 3 | Bxo | 3 | B |   |   |   |   |   |   |   |   |   |  |
| 12 May | N14W35 | 237 | 30    | 4 | Cao | 6 | B |   |   |   |   |   |   |   |   |   |  |
| 13 May | N14W48 | 237 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 14 May | N14W61 | 237 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 15 May | N14W74 | 237 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|        |        |     |       |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

Still on Disk.

Absolute heliographic longitude: 237

#### ***Region 3010***

|        |        |     |     |   |     |    |   |   |   |   |   |   |   |   |   |   |  |
|--------|--------|-----|-----|---|-----|----|---|---|---|---|---|---|---|---|---|---|--|
| 12 May | S13E71 | 131 | 30  | 2 | Hsx | 1  | A | 2 |   |   |   |   |   |   |   |   |  |
| 13 May | S15E61 | 128 | 90  | 8 | Dso | 5  | B |   |   |   |   |   |   |   |   |   |  |
| 14 May | S15E48 | 128 | 190 | 9 | Dso | 12 | B | 3 |   |   | 4 |   |   |   |   |   |  |
| 15 May | S15E35 | 128 | 190 | 9 | Dso | 12 | B |   |   |   | 1 |   |   |   |   |   |  |
|        |        |     |     |   |     |    |   | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |  |

Still on Disk.

Absolute heliographic longitude: 128

#### ***Region 3011***

|        |        |     |    |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|--------|--------|-----|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|--|
| 13 May | N16E66 | 123 | 30 | 6 | Cro | 3 | B | 2 |   |   |   |   |   |   |   |   |  |
| 14 May | N16E53 | 123 | 30 | 4 | Cro | 2 | B | 2 |   |   | 3 |   |   |   |   |   |  |
| 15 May | N16E40 | 123 | 10 | 5 | Bxo | 2 | B |   |   |   |   |   |   |   |   |   |  |
|        |        |     |    |   |     |   |   | 4 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |  |

Still on Disk.

Absolute heliographic longitude: 123

#### ***Region 3012***

|        |        |     |       |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|--------|--------|-----|-------|---|-----|---|---|---|---|---|---|---|---|---|---|---|--|
| 13 May | S19E01 | 188 | 10    | 3 | Bxo | 2 | B |   |   |   |   |   |   |   |   |   |  |
| 14 May | S19W12 | 188 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
| 15 May | S19W25 | 188 | plage |   |     |   |   |   |   |   |   |   |   |   |   |   |  |
|        |        |     |       |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

Still on Disk.

Absolute heliographic longitude: 188



**Region Summary - continued**

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

**Region 3013**

|        |        |     |    |   |     |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 May | S28E29 | 147 | 10 | 2 | Bxo | 3 | B |   |   |   |   |   |   |   |   |   |   |
| 15 May | S28E16 | 147 | 10 | 1 | Axx | 1 | A |   |   |   |   |   |   |   |   |   |   |
|        |        |     |    |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 147

**Region 3014**

|        |        |     |     |   |     |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|-----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 May | N21E53 | 110 | 100 | 5 | Cao | 7 | B |   |   |   |   |   |   |   |   |   |   |
|        |        |     |     |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 110

**Region 3015**

|        |        |     |    |   |     |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|----|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 May | N14E55 | 108 | 60 | 4 | Dao | 4 | B |   |   |   |   |   |   |   |   |   |   |
|        |        |     |    |   |     |   |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 108



## ***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](https://www.swpc.noaa.gov/sites/default/files/images/u2/Usr_guide.pdf) -- User  
Guide

