

Space Weather Highlights
13 April - 19 April 2020

SWPC PRF 2329
20 April 2020

Solar activity was very low throughout the reporting period. No sunspots were observed on the visible disk and no Earth-directed CMEs were observed in available coronagraph imagery.

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 unsettled. Unsettled levels were observed on 14-15 Apr in response to several periods of prolonged southward Bz. The remainder of the reporting period observed quiet conditions.

Space Weather Outlook
20 April - 16 May 2020

Solar activity is expected to be very low throughout the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at mostly normal to moderate levels. 29-30 April will likely observed high levels in response to coronal hole influence.

Geomagnetic field activity is expected to be at quiet to active levels. Active levels are likely on 20 Apr, 27 Apr and 05 May; unsettled levels are likely on 21-23 Apr and 30 Apr. All enhancements in geomagnetic active are in response to multiple, recurrent CH HSSs. The remainder of the outlook period is expected to observed quiet conditions.



Daily Solar Data

| Date | Radio Flux 10.7cm | Sun spot No. | Sunspot Area (10 ⁻⁶ hemi.) | X-ray Background Flux | Flares | | | | | | | |
|----------|-------------------------|--------------------|---|-----------------------------|--------|---|---|---------|---|---|---|---|
| | | | | | X-ray | | | Optical | | | | |
| | | | | | C | M | X | S | 1 | 2 | 3 | 4 |
| 13 April | 70 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 April | 69 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 April | 68 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 April | 69 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 April | 68 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 April | 70 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 April | 69 | 0 | 0 | A0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Daily Particle Data

| Date | Proton Fluence (protons/cm ² -day -sr) | | Electron Fluence (electrons/cm ² -day -sr) | |
|----------|--|---------|--|---------|
| | >1 MeV | >10 MeV | >2MeV | |
| | 13 April | 5.6e+04 | 4.7e+04 | 1.7e+06 |
| 14 April | 6.3e+04 | 4.7e+04 | 1.7e+06 | |
| 15 April | 5.9e+04 | 4.7e+04 | 1.2e+06 | |
| 16 April | 5.5e+04 | 4.7e+04 | 1.4e+06 | |
| 17 April | 6.0e+04 | 4.7e+04 | 1.6e+06 | |
| 18 April | 5.7e+04 | 4.6e+04 | 1.4e+06 | |
| 19 April | 6.2e+04 | 4.7e+04 | 1.7e+06 | |

Daily Geomagnetic Data

| Date | Middle Latitude Fredericksburg | | High Latitude College | | Estimated Planetary | |
|----------|-----------------------------------|-----------------|--------------------------|-----------------|------------------------|-----------------|
| | A | K-indices | A | K-indices | A | K-indices |
| | 13 April | 4 | 1-2-1-1-2-2-1-0 | 6 | 2-1-1-3-2-2-0-1 | 5 |
| 14 April | 7 | 2-3-3-2-1-0-1-2 | 6 | 2-2-3-3-1-0-0-1 | 8 | 3-3-3-2-1-0-1-3 |
| 15 April | 6 | 3-2-2-1-2-1-1-1 | 5 | 1-3-2-2-2-0-0-1 | 7 | 3-3-2-2-2-1-1-1 |
| 16 April | 5 | 2-1-2-1-1-3-1-0 | 2 | 0-1-1-1-1-0-0-0 | 5 | 2-2-1-1-1-2-1-0 |
| 17 April | 4 | 1-0-1-2-2-1-1-1 | 4 | 1-1-1-3-2-0-0-1 | 4 | 1-1-1-2-1-0-0-1 |
| 18 April | 4 | 2-2-1-1-2-1-1-0 | 5 | 1-1-3-3-1-0-0-0 | 4 | 1-2-2-1-1-1-0-0 |
| 19 April | 2 | 0-0-1-1-2-0-1-0 | 1 | 0-0-0-0-2-0-0-0 | 2 | 0-1-1-1-1-1-0-0 |

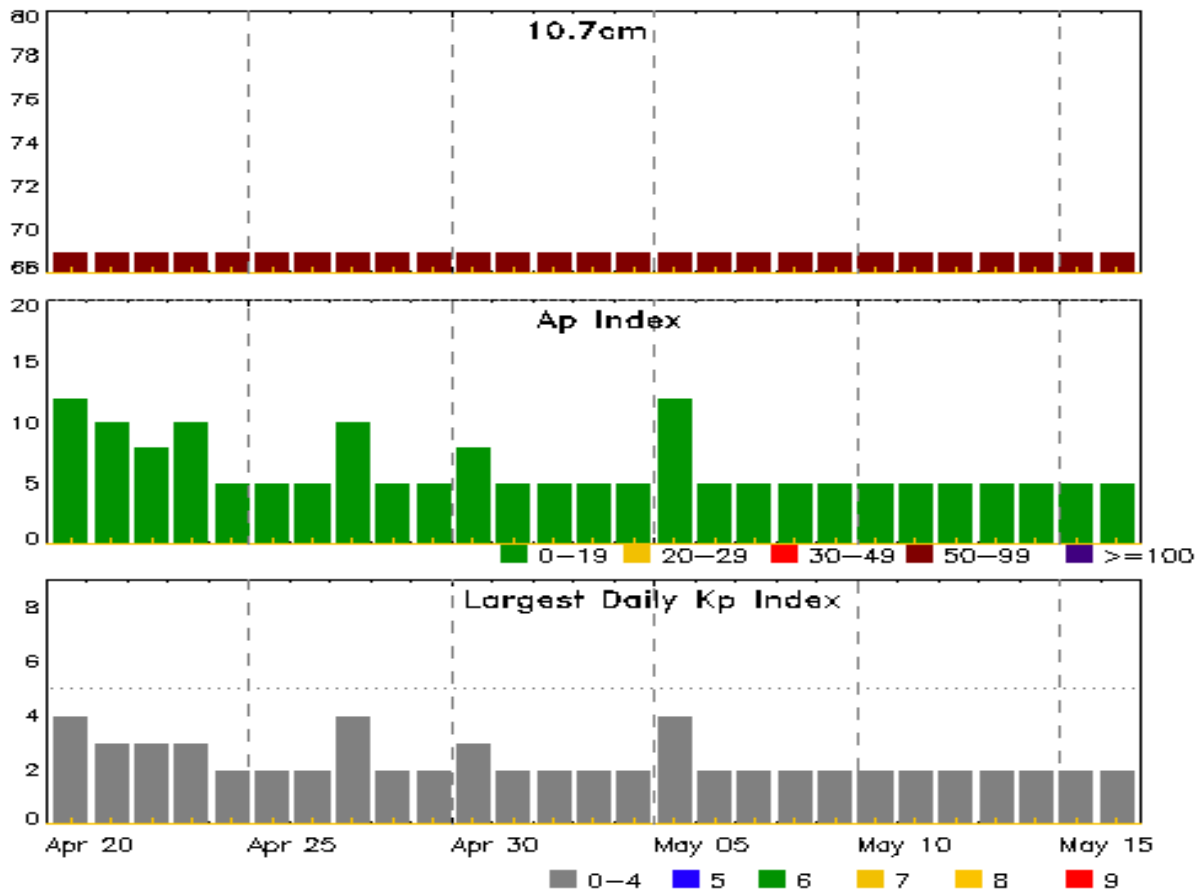


Alerts and Warnings Issued

| Date & Time of Issue UTC | Type of Alert or Warning | Date & Time of Event UTC |
|---|---------------------------------|---|
| 14 Apr 0514 | WARNING: Geomagnetic K = 4 | 14/0514 - 0900 |



Twenty-seven Day Outlook



| Date | Radio Flux 10.7cm | Planetary A Index | Largest Kp Index | Date | Radio Flux 10.7cm | Planetary A Index | Largest Kp Index |
|--------|----------------------|----------------------|---------------------|--------|----------------------|----------------------|---------------------|
| 20 Apr | 69 | 12 | 4 | 04 May | 69 | 5 | 2 |
| 21 | 69 | 10 | 3 | 05 | 69 | 12 | 4 |
| 22 | 69 | 8 | 3 | 06 | 69 | 5 | 2 |
| 23 | 69 | 10 | 3 | 07 | 69 | 5 | 2 |
| 24 | 69 | 5 | 2 | 08 | 69 | 5 | 2 |
| 25 | 69 | 5 | 2 | 09 | 69 | 5 | 2 |
| 26 | 69 | 5 | 2 | 10 | 69 | 5 | 2 |
| 27 | 69 | 10 | 4 | 11 | 69 | 5 | 2 |
| 28 | 69 | 5 | 2 | 12 | 69 | 5 | 2 |
| 29 | 69 | 5 | 2 | 13 | 69 | 5 | 2 |
| 30 | 69 | 8 | 3 | 14 | 69 | 5 | 2 |
| 01 May | 69 | 5 | 2 | 15 | 69 | 5 | 2 |
| 02 | 69 | 5 | 2 | 16 | 69 | 5 | 2 |
| 03 | 69 | 5 | 2 | | | | |



Energetic Events

| Date | Time | | | X-ray | Optical Information | | | Peak | | Sweep Freq | |
|------|-------|-----|----------|-------|---------------------|------------|------------------|-------|----------------|-----------------|--------------|
| | Begin | Max | Half Max | Class | Integ Flux | Imp/ Brtns | Location Lat CMD | Rgn # | Radio Flux 245 | Radio Flux 2695 | Intensity II |

No Events Observed

Flare List

| Date | Time | | | X-ray Class | Optical | | |
|--------|-------|------|------|-------------|------------|------------------|-------|
| | Begin | Max | End | | Imp/ Brtns | Location Lat CMD | Rgn # |
| 18 Apr | 0640 | 0641 | 0643 | A1.1 | | | |



Region Summary

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

No Active Regions



**Recent Solar Indices (preliminary)
Observed monthly mean values**

| Month | Sunspot Numbers | | | | | Radio Flux | | Geomagnetic | | |
|-------------|-----------------|-----|--------|---------------|-----|------------|--------|-------------|--------|--|
| | Observed values | | Ratio | Smooth values | | Penticton | Smooth | Planetary | Smooth | |
| | SEC | RI | RI/SEC | SEC | RI | 10.7 cm | Value | Ap | Value | |
| 2018 | | | | | | | | | | |
| April | 7.0 | 5.3 | 0.76 | 9.6 | 4.7 | 70.0 | 70.6 | 7 | 8.0 | |
| May | 15.0 | 7.9 | 0.53 | 9.2 | 4.5 | 70.9 | 70.2 | 8 | 7.6 | |
| June | 19.7 | 9.4 | 0.48 | 9.1 | 4.3 | 72.5 | 70.0 | 7 | 7.4 | |
| July | 1.3 | 1.0 | 0.77 | 9.4 | 4.2 | 69.7 | 70.0 | 6 | 7.3 | |
| August | 10.0 | 5.2 | 0.53 | 9.0 | 4.0 | 69.1 | 70.0 | 10 | 7.3 | |
| September | 5.7 | 2.0 | 0.35 | 8.7 | 3.9 | 68.3 | 70.1 | 9 | 7.3 | |
| October | 6.9 | 2.9 | 0.42 | 9.2 | 4.1 | 69.5 | 70.3 | 7 | 7.1 | |
| November | 7.3 | 2.9 | 0.48 | 9.5 | 4.0 | 68.9 | 70.4 | 6 | 7.0 | |
| December | 5.6 | 1.9 | 0.34 | 9.3 | 3.6 | 70.0 | 70.3 | 7 | 6.9 | |
| 2019 | | | | | | | | | | |
| January | 16.0 | 4.6 | 0.29 | 9.0 | 3.2 | 71.6 | 70.0 | 6 | 6.8 | |
| February | | 0.5 | | 8.7 | 3.0 | 70.6 | 69.8 | 7 | 6.7 | |
| March | 14.8 | 5.6 | 0.39 | 8.3 | 2.8 | 71.5 | 69.7 | 6 | 6.6 | |
| April | 11.5 | 5.5 | 0.48 | 7.9 | 2.6 | 72.4 | 69.6 | 6 | 6.7 | |
| May | 18.1 | 5.9 | 0.34 | 7.4 | 2.3 | 71.3 | 69.6 | 7 | 6.7 | |
| June | 11.6 | 0.7 | 0.06 | 7.3 | 2.2 | 68.1 | 69.6 | 5 | 6.5 | |
| July | 1.6 | 0.5 | 0.31 | 7.0 | 2.1 | 67.1 | 69.7 | 6 | 6.3 | |
| August | 2.5 | 0.3 | 0.16 | 7.0 | 2.1 | 67.0 | 69.8 | 7 | 6.2 | |
| September | 2.6 | 0.7 | 0.27 | 6.8 | 1.9 | 68.1 | 69.7 | 10 | 6.2 | |
| October | 1.8 | 0.2 | 0.11 | | | 67.4 | | 8 | | |
| November | 1.1 | 0.3 | 0.27 | | | 70.2 | | 4 | | |
| December | 7.2 | 0.9 | 0.14 | | | 70.9 | | 4 | | |
| 2020 | | | | | | | | | | |
| January | 9.2 | 3.8 | 0.41 | | | 72.3 | | 5 | | |
| February | 5.5 | 0.2 | 0.04 | | | 71.0 | | 6 | | |
| March | 3.0 | 0.9 | 0.30 | | | 70.1 | | 6 | | |

Note: Values are final except for the most recent 6 months which are considered preliminary.
Cycle 24 started in Dec 2008 with an RI=1.7.



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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