

Space Weather Highlights
20-26 September 1999

Solar activity ranged from very low to low levels. The visible disk was populated by a number of small, simply-structured sunspot groups which produced B- and C-class subflares. The largest flare of the week was a C9/SF at 21/0352UT associated with a weak Type II radio sweep from Region 8706 (N20, L=207, class/area Cso/120 on 20 September).

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. There were two disturbances detected in the solar wind flow. The first disturbance occurred during 22 - 23 September and was associated with a velocity increase (360 to 630 km/sec), southward IMF Bz deflections to minus 20 nT (GSM), and brief increases in density and ion temperature. The second disturbance was detected on 26 September as a high-speed coronal hole wind stream passed the spacecraft. The disturbance was accompanied by a velocity increase from 390 to 570 km/sec, a drop in particle densities, intervals of southward IMF Bz with maximum deflections to minus 12 nT (GSM), and a sustained period of elevated ion temperatures.

No proton events were detected at geo-synchronous orbit during the period.

The greater than 2 MeV electron flux was at moderate to high levels during 20 - 21 September, then decreased to normal to moderate levels for the balance of the period.

Two geomagnetic field disturbances were detected during the week. The first occurred during 22 - 23 September and began with an 08 nT sudden impulse at 22/1222UT followed by active to major storm periods at all latitudes and brief severe storm periods at high latitudes. The solar origin of this disturbance was not readily discernible. The second disturbance began on 26 September and was in progress as the period ended. Active to major storm levels were detected during this disturbance with the major storm levels limited to high latitudes. An isolated, transequatorial coronal hole (positive polarity) was the source for this disturbance.

Space Weather Outlook
29 September - 25 October 1999

Solar activity is expected to be at low to moderate levels. Isolated M-class flare activity may occur around 08 - 20 October.

No significant proton events are expected at geo-synchronous orbit.

The greater than 2 MeV electron flux at geo-synchronous altitude is expected to be at moderate to high levels during 29 September - 01 October, 10 - 18 October, and 24 - 25 October. Otherwise, fluxes are expected to be in the normal to moderate range.

Geomagnetic field activity is expected vary from quiet to unsettled levels during most of the period. However, active levels are possible during 09 - 15 and 23 - 24 October due to recurrent coronal hole effects.



Daily Solar Data

| Date | Radio Flux 10.7 cm | Sun spot No. (10 ⁶ hemi.) | Sunspot Area | X-ray Background | Flares | | | | | | | |
|--------------|-----------------------|---|-----------------|---------------------|------------|---|---|---------|---|---|---|---|
| | | | | | X-ray Flux | | | Optical | | | | |
| | | | | | C | M | X | S | 1 | 2 | 3 | |
| 20 September | 145 | 78 | 350 | B8.0 | 7 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 21 September | 147 | 82 | 280 | B5.7 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 22 September | 140 | 103 | 290 | B4.0 | 3 | 0 | 0 | 10 | 1 | 0 | 0 | 0 |
| 23 September | 137 | 78 | 260 | B3.1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 24 September | 132 | 86 | 260 | B3.0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 25 September | 125 | 38 | 210 | B2.9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 September | 123 | 44 | 220 | B4.4 | 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) | | |
|--------------|---|--------|---------|---|--------|-------|
| | >1MeV | >10MeV | >100MeV | >.6MeV | >2MeV | >4MeV |
| 20 September | 2.0E+5 | 1.4E+4 | 2.7E+3 | | 1.2E+8 | |
| 21 September | 3.7E+5 | 1.3E+4 | 2.8E+3 | | 5.7E+7 | |
| 22 September | 1.8E+6 | 1.3E+4 | 2.6E+3 | | 6.6E+5 | |
| 23 September | 1.1E+5 | 1.4E+4 | 3.0E+3 | | 1.4E+5 | |
| 24 September | 7.2E+4 | 1.4E+4 | 2.8E+3 | | 2.2E+5 | |
| 25 September | 1.1E+5 | 1.4E+4 | 3.1E+3 | | 4.6E+5 | |
| 26 September | 4.1E+5 | 1.4E+4 | 3.1E+3 | | 5.0E+5 | |

Daily Geomagnetic Data

| Date | Middle Latitude Fredericksburg | | High Latitude College | | Estimated Planetary | |
|--------------|-----------------------------------|-----------------|--------------------------|------------------|------------------------|-----------------|
| | A | K-indices | A | K-indices | A | K-indices |
| | 20 September | 6 | 2-1-2-1-2-1-2-2 | 14 | 1-2-4-4-3-3-2-2 | 10 |
| 21 September | 10 | 2-1-2-3-2-2-3-3 | * | 5-1-3-3-5-**-3 | 10 | 1-1-2-3-3-3-3-3 |
| 22 September | 29 | 2-2-2-2-4-3-6-6 | 36 | 3-2-2-4-6-4-5-6 | 37 | 3-2-3-3-4-3-5-7 |
| 23 September | 20 | 5-6-2-1-2-2-2-2 | * | 5-5-2-1-1-2-**-3 | 24 | 6-6-3-1-2-3-2-2 |
| 24 September | * | 0-2-2-2-**-2-2 | * | **-*-**-**-**-* | 6 | 2-2-2-2-2-1-2-2 |
| 25 September | 1 | 1-1-0-1-1-1-0-0 | * | **-*-**-**-**-* | 4 | 1-0-1-1-2-2-2-1 |
| 26 September | 13 | 1-1-1-1-2-5-3-4 | 26 | 0-0-1-3-3-6-5-5 | 15 | 1-0-1-1-3-5-4-4 |

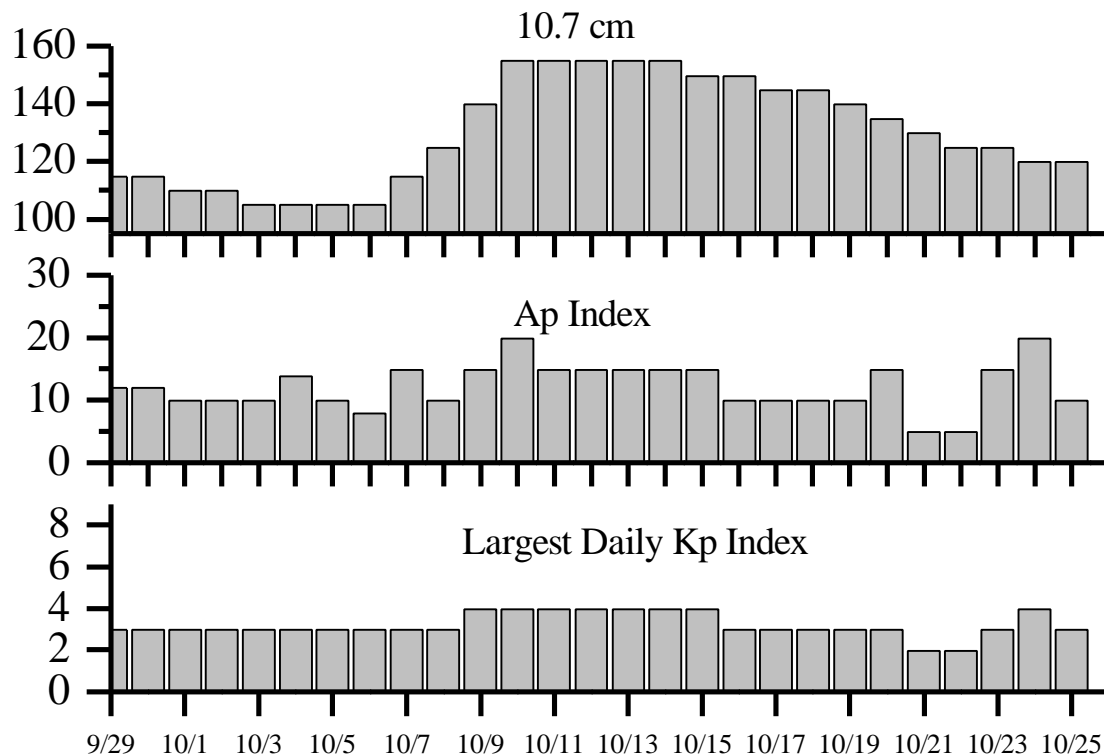


Alerts and Warnings Issued

| Date and Time of Issue (UT) | Type of Alert or Warning | Date and Time of Event (UT) |
|-----------------------------|---|-----------------------------|
| 20 Sep 1203 | CONTINUED >2MeV Electron Event =1000pfu | 14 Sep 0005 |
| 21 Sep 0329 | Type II Radio Emission | 21 Sep 0312 |
| 21 Sep 1210 | CONTINUED >2MeV Electron Event =1000pfu | 14 Sep 0005 |
| 22 Sep 1200 | CONTINUED >2MeV Electron Event =1000pfu | 14 Sep 0005 |
| 22 Sep 1200 | K= 4 Observed | 22 Sep 09-12 |
| 22 Sep 1252 | Sudden Impulse of 8nT at Boulder | 22 Sep 1222 |
| 22 Sep 1501 | K= 4 Observed | 22 Sep 12 - 15 |
| 22 Sep 2102 | K= 5 Observed | 22 Sep 18 - 21 |
| 22 Sep 2102 | K= 5 Warning | 22/2100 - 23/1500 Sep |
| 22 Sep 2114 | A = 20 Observed | 22 Sep 2100 |
| 22 Sep 2129 | A = 20 Watch | 23 Sep |
| 22 Sep 2129 | A = 30 Warning | 22/2157 - 23/2359 Sep |
| 22 Sep 1501 | K= 4 Warning | 22/1500 - 23/1500 Sep |
| 22 Sep 2159 | K= 6 Warning | 22/2200 - 23/1500 Sep |
| 23 Sep 0000 | K= 6 Observed | 22 Sep 21 - 24 |
| 23 Sep 0300 | A = 30 Observed | 23 Sep 0300 |
| 24 Sep 0539 | A =30 Observed ENDED 23/1800 Sep | 23 Sep 0300 |
| 26 Sep 1802 | K= 5 Observed | 26 Sep 15-18 |



Twenty-seven Day Outlook



| Date | Radio Flux 10.7 cm | Planetary A Index | Largest Kp Index | Date | Radio Flux 10.7 cm | Planetary A Index | Largest Kp Index |
|--------|-----------------------|----------------------|---------------------|--------|-----------------------|----------------------|---------------------|
| 29 Sep | 115 | 12 | 3 | 13 Oct | 155 | 15 | 4 |
| 30 | 115 | 12 | 3 | 14 | 155 | 15 | 4 |
| 01 Oct | 110 | 10 | 3 | 15 | 150 | 15 | 4 |
| 02 | 110 | 10 | 3 | 16 | 150 | 10 | 3 |
| 03 | 105 | 10 | 3 | 17 | 145 | 10 | 3 |
| 04 | 105 | 14 | 3 | 18 | 145 | 10 | 3 |
| 05 | 105 | 10 | 3 | 19 | 140 | 10 | 3 |
| 06 | 105 | 8 | 3 | 20 | 135 | 15 | 3 |
| 07 | 115 | 15 | 3 | 21 | 130 | 5 | 3 |
| 08 | 125 | 10 | 3 | 22 | 125 | 5 | 3 |
| 09 | 140 | 15 | 3 | 23 | 125 | 15 | 3 |
| 10 | 155 | 20 | 4 | 24 | 120 | 20 | 4 |
| 11 | 155 | 15 | 4 | 25 | 120 | 10 | 3 |
| 12 | 155 | 15 | 4 | | | | |



Energetic Events

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

No Events Observed

Flare List

| Date | Time | | | X-ray Class. | Imp / Brtns | Optical | Rgn # |
|--------------|-------|-------|-------|-----------------|----------------|---------------------|----------|
| | Begin | Max | End | | | Location Lat CMD | |
| 20 September | 0052 | 0057 | 0102 | C1.3 | | | |
| | 0122 | 0139 | 0152 | C2.5 | | | |
| | 0254 | 0312 | 0321 | C2.4 | | | |
| | 0546 | 0550 | 0610 | C2.8 | | | |
| | 1310 | 1325 | 1340 | C2.6 | SF | N11W13 | 8700 |
| | 1421 | 1429 | 1442 | C1.6 | | | |
| | 2033 | 2034 | 2036 | | SF | N12W21 | 8700 |
| | 2057 | 2058 | 2101 | | SF | N11W19 | 8700 |
| 21 September | 2318 | 2332 | 2350 | C1.3 | | | |
| | 0300 | 0332 | 0341 | C5.2 | | | 8699 |
| | B0344 | U0349 | 0411 | C9.4 | SF | N20E61 | 8706 |
| 22 September | 0719 | 0719 | 0723 | C2.7 | SF | S23E28 | 8704 |
| | 0939 | 1047 | 1120 | C6.4 | | | |
| | 0147 | 0156 | 0213 | B8.2 | | | |
| | 0407 | 0411 | 0415 | B7.8 | | | |
| | 0446 | 0449 | 0451 | B6.7 | | | |
| | 0708 | 0710 | 0712 | C1.1 | SF | N09W43 | 8700 |
| | 0734 | 0734 | 0740 | | SF | N10W39 | 8700 |
| | 0907 | 0911 | 0919 | B9.5 | SF | S08E61 | 8708 |
| | 0931 | U0945 | A1014 | C2.1 | SF | S08E60 | 8708 |
| | 1022 | 1030 | 1051 | | SF | S09E60 | 8708 |
| | 1112 | 1116 | 1119 | B7.6 | | | |
| | 1229 | 1231 | 1233 | | SF | S09E61 | 8708 |
| | 1301 | 1301 | 1306 | | SF | S09E61 | 8708 |
| | 1330 | 1334 | 1430 | C5.2 | 1F | N17E39 | 8706 |
| | 1354 | 1357 | 1400 | | SF | S10E62 | 8708 |
| 1532 | 1532 | 1539 | | SF | N09W44 | 8700 | |
| 1716 | 1716 | 1720 | | SF | N10W45 | 8700 | |
| 23 September | 0019 | 0028 | 0034 | C1.2 | | | |
| | 1232 | 1234 | 1237 | | SF | N11W56 | 8700 |
| | 1428 | 1430 | 1434 | | SF | N11W58 | 8700 |
| 24 September | 1012 | 1017 | 1021 | B6.5 | | | |
| | 1506 | 1510 | 1519 | B4.7 | SF | N17E17 | 8706 |
| | 2016 | 2018 | 2022 | B5.4 | SF | N18E15 | 8706 |
| 25 September | 1318 | 1325 | 1329 | B7.3 | | | |
| | 1932 | 1935 | 1944 | B4.5 | | | |
| | 2345 | 0033 | 0052 | C1.0 | | | |



Flare List-continued

| Date | Time | | | X-ray Class. | Optical | | Rgn # |
|--------------|-------|------|------|-----------------|----------------|---------------------|----------|
| | Begin | Max | End | | Imp / Brtns | Location Lat CMD | |
| 26 September | 1110 | 1114 | 1121 | B5.3 | | | |
| | 1530 | 1539 | 1557 | B3.9 | | | |
| | 1845 | 1903 | 1918 | B5.3 | | | |

Region Summary

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

Region 8695

| | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|
| 10 Sep | N19E73 | 332 | 0020 | 01 | HSX | 001 | A | | | | | | | | |
| 11 Sep | N20E60 | 332 | 0040 | 01 | HSX | 001 | A | | | | | | | | |
| 12 Sep | N20E48 | 330 | 0030 | 01 | HSX | 001 | A | | | | | | | | |
| 13 Sep | N21E34 | 331 | 0040 | 05 | CSO | 005 | B | | | | | | | | |
| 14 Sep | N21E21 | 331 | 0030 | 04 | CSO | 002 | B | | | | | | | | |
| 15 Sep | N22E08 | 331 | 0040 | 04 | CSO | 003 | B | | | | | | | | |
| 16 Sep | N21W04 | 329 | 0030 | 05 | CSO | 003 | B | | | | | | | | |
| 17 Sep | N21W16 | 327 | 0020 | 01 | HSX | 001 | A | | | | | | | | |
| 18 Sep | N21W31 | 329 | 0020 | 04 | CSO | 002 | B | | | | | | | | |
| 19 Sep | N21W42 | 327 | 0010 | 01 | HSX | 001 | A | | | | | | | | |
| 20 Sep | N21W56 | 328 | 0010 | 01 | AXX | 001 | A | | | | | | | | |
| 21 Sep | N22W70 | 329 | 0000 | 00 | AXX | 001 | A | | | | | | | | |
| 22 Sep | N22W83 | 329 | | | | | | | | | | | | | |

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 329

Region 8698

| | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|
| 11 Sep | S16E64 | 328 | 0010 | 01 | AXX | 002 | A | | | | | | | | |
| 12 Sep | S16E51 | 328 | | | | | | | | | | | | | |
| 13 Sep | S16E38 | 328 | | | | | | | | | | | | | |
| 14 Sep | S16E25 | 328 | | | | | | | | | | | | | |
| 15 Sep | S16E12 | 328 | | | | | | | | | | | | | |
| 16 Sep | S16W01 | 328 | | | | | | | | | | | | | |
| 17 Sep | S16W14 | 328 | | | | | | | | | | | | | |
| 18 Sep | S16W27 | 328 | | | | | | | | | | | | | |
| 19 Sep | S16W40 | 328 | | | | | | | | | | | | | |
| 20 Sep | S16W53 | 328 | | | | | | | | | | | | | |
| 21 Sep | S16W66 | 328 | | | | | | | | | | | | | |
| 22 Sep | S16W79 | 328 | | | | | | | | | | | | | |

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 328



Region Summary-continued

| Date | Location | | Sunspot Characteristics | | | | Flares | | | | | | | | | | |
|--------------------------------------|---------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|---|---|---|
| | (° Lat ° CMD) | Helio | Area (10 ⁶ hemi) | Extent (helio) | Spot Class | Spot Count | Mag Class | X-ray | | | Optical | | | | | | |
| | | Lon | | | | | | C | M | X | S | 1 | 2 | 3 | 4 | | |
| <i>Region 8701</i> | | | | | | | | | | | | | | | | | |
| 13 Sep | N18E13 | 352 | 0010 | 03 | BXO | 004 | B | | | | | | | | | | |
| 14 Sep | N18E00 | 352 | | | | | | | | | | | | | | | |
| 15 Sep | N18W13 | 352 | | | | | | | | | | | | | | | |
| 16 Sep | N18W26 | 352 | | | | | | | | | | | | | | | |
| 17 Sep | N18W39 | 352 | | | | | | | | | | | | | | | |
| 18 Sep | N18W52 | 352 | | | | | | | | | | | | | | | |
| 19 Sep | N18W65 | 352 | | | | | | | | | | | | | | | |
| 20 Sep | N18W78 | 352 | | | | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Crossed West Limb. | | | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: 352 | | | | | | | | | | | | | | | | | |
| <i>Region 8702</i> | | | | | | | | | | | | | | | | | |
| 16 Sep | N22E28 | 297 | 0000 | 03 | BXO | 002 | B | | | | | | | | | | |
| 17 Sep | N22E15 | 297 | | | | | | | | | | | | | | | |
| 18 Sep | N24E03 | 295 | 0010 | 03 | BXO | 003 | B | | | | | | | | | | |
| 19 Sep | N24W10 | 295 | | | | | | | | | | | | | | | |
| 20 Sep | N24W23 | 295 | | | | | | | | | | | | | | | |
| 21 Sep | N24W40 | 299 | 0000 | 03 | BXO | 003 | B | | | | | | | | | | |
| 22 Sep | N23W53 | 299 | 0000 | 04 | BXO | 002 | B | | | | | | | | | | |
| 23 Sep | N23W66 | 299 | | | | | | | | | | | | | | | |
| 24 Sep | N23W79 | 299 | | | | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Crossed West Limb. | | | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: 295 | | | | | | | | | | | | | | | | | |
| <i>Region 8704</i> | | | | | | | | | | | | | | | | | |
| 17 Sep | S21E63 | 248 | 0070 | 03 | HSX | 001 | A | | | | | | | | | | |
| 18 Sep | S21E52 | 246 | 0110 | 10 | CSO | 005 | B | | | | | | | | | | |
| 19 Sep | S22E42 | 243 | 0180 | 12 | CSO | 007 | B | | | | | | | | | | |
| 20 Sep | S22E28 | 244 | 0110 | 12 | ESO | 006 | B | | | | | | | | | | |
| 21 Sep | S22E16 | 243 | 0130 | 12 | ESO | 009 | B | 1 | | | | 1 | | | | | |
| 22 Sep | S22E01 | 245 | 0120 | 13 | CSO | 014 | B | | | | | | | | | | |
| 23 Sep | S21W11 | 243 | 0100 | 09 | CSO | 008 | B | | | | | | | | | | |
| 24 Sep | S20W25 | 244 | 0120 | 07 | CSO | 006 | B | | | | | | | | | | |
| 25 Sep | S21W39 | 245 | 0110 | 06 | CSO | 003 | B | | | | | | | | | | |
| 26 Sep | S20W52 | 245 | 0110 | 02 | HSX | 001 | A | | | | | | | | | | |
| | | | | | | | | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 245



Region Summary-continued

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

Region 8705

| | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|---|---|---|---|---|---|---|---|---|
| 18 Sep | S11E28 | 270 | 0010 | 01 | AXX | 002 | A | | | | | | | | | | | |
| 19 Sep | S11E15 | 270 | | | | | | | | | | | | | | | | |
| 20 Sep | S11E02 | 270 | | | | | | | | | | | | | | | | |
| 21 Sep | S11W11 | 270 | | | | | | | | | | | | | | | | |
| 22 Sep | S11W24 | 270 | | | | | | | | | | | | | | | | |
| 23 Sep | S11W37 | 270 | | | | | | | | | | | | | | | | |
| 24 Sep | S11W50 | 270 | | | | | | | | | | | | | | | | |
| 25 Sep | S11W63 | 270 | | | | | | | | | | | | | | | | |
| 26 Sep | S11W76 | 270 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 270

Region 8706

| | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|---|--|---|---|---|---|---|---|---|---|---|
| 19 Sep | N19E77 | 208 | 0080 | 02 | HSX | 001 | A | | | | | | | | | | | |
| 20 Sep | N20E66 | 206 | 0120 | 09 | CSO | 002 | B | | | | | | | | | | | |
| 21 Sep | N22E53 | 206 | 0110 | 08 | CSO | 003 | B | 1 | | 1 | | | | | | | | |
| 22 Sep | N19E38 | 208 | 0090 | 02 | HSX | 002 | A | 1 | | | 1 | | | | | | | |
| 23 Sep | N20E25 | 207 | 0110 | 05 | CSO | 005 | B | | | | | | | | | | | |
| 24 Sep | N19E11 | 208 | 0090 | 02 | HSX | 001 | A | | | | 2 | | | | | | | |
| 25 Sep | N20W01 | 207 | 0090 | 02 | HSX | 001 | A | | | | | | | | | | | |
| 26 Sep | N20W15 | 208 | 0080 | 02 | HSX | 001 | A | | | | | | | | | | | |
| | | | | | | | | | | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 207

Region 8707

| | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|---|---|---|---|---|---|---|---|---|
| 22 Sep | S07W08 | 254 | 0000 | 02 | BXO | 003 | B | | | | | | | | | | | |
| 23 Sep | S07W21 | 253 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | | |
| 24 Sep | S07W34 | 253 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | | |
| 25 Sep | S07W47 | 253 | | | | | | | | | | | | | | | | |
| 26 Sep | S07W60 | 253 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 254



Region Summary-continued

| Date | Location | | Sunspot Characteristics | | | | Flares | | | | | | | | | | |
|--------------------------------------|----------------|-------|--------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|---|---|---|
| | (° Lat ° CMD) | Helio | Area (10 ⁶ hemi) | Extent (helio) | Spot Class | Spot Count | Mag Class | X-ray | | | Optical | | | | | | |
| | | Lon | | | | | | C | M | X | S | 1 | 2 | 3 | 4 | | |
| <i>Region 8708</i> | | | | | | | | | | | | | | | | | |
| 22 Sep | S09E55 | 191 | 0040 | 05 | CRO | 009 | B | 1 | | | 6 | | | | | | |
| 23 Sep | S10E42 | 190 | 0040 | 05 | CRO | 008 | B | | | | | | | | | | |
| 24 Sep | S10E29 | 190 | 0040 | 05 | DSO | 008 | B | | | | | | | | | | |
| 25 Sep | S11E18 | 188 | 0010 | 03 | BXO | 004 | B | | | | | | | | | | |
| 26 Sep | S11E04 | 189 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | |
| | | | | | | | | | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk. | | | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: 189 | | | | | | | | | | | | | | | | | |
| <i>Region 8709</i> | | | | | | | | | | | | | | | | | |
| 24 Sep | S15E48 | 171 | 0000 | 03 | BXO | 002 | B | | | | | | | | | | |
| 25 Sep | S15E35 | 171 | | | | | | | | | | | | | | | |
| 26 Sep | S15E22 | 171 | | | | | | | | | | | | | | | |
| | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk. | | | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: 171 | | | | | | | | | | | | | | | | | |
| <i>Region 8710</i> | | | | | | | | | | | | | | | | | |
| 26 Sep | N20E76 | 117 | 0030 | 01 | HSX | 001 | A | | | | | | | | | | |
| | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk. | | | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: 117 | | | | | | | | | | | | | | | | | |

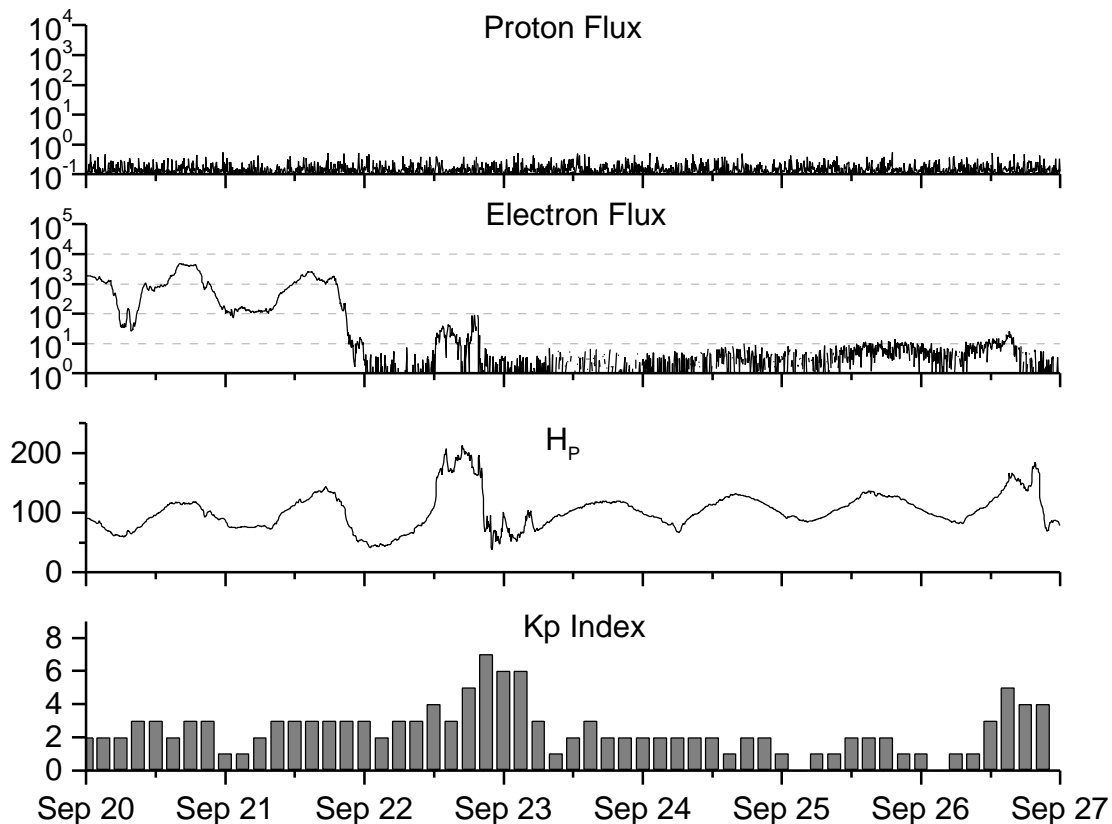


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

| Month | Sunspot Numbers | | | | Radio Flux | | Geomagnetic | | |
|-------------|-----------------|--------------|-----------------|---------------|--------------|-----------------------|-----------------|-----------------|-----------------|
| | Observed SWO | values RI | Ratio RI/SWO | Smooth SWO | values RI | *Penticton 10.7 cm | Smooth Value | Planetary Ap | Smooth Value |
| 1997 | | | | | | | | | |
| September | 52.8 | 51.3 | 0.88 | 40.5 | 28.3 | 96.2 | 85.7 | 10 | 08.4 |
| October | 33.6 | 22.8 | 0.68 | 45.4 | 31.8 | 84.9 | 88.6 | 11 | 08.6 |
| November | 53.5 | 39.0 | 0.73 | 49.3 | 35.0 | 99.5 | 91.3 | 11 | 09.0 |
| December | 57.9 | 41.2 | 0.71 | 54.2 | 39.0 | 98.8 | 94.2 | 05 | 09.5 |
| 1998 | | | | | | | | | |
| January | 51.8 | 31.9 | 0.62 | 60.6 | 43.7 | 93.4 | 97.5 | 08 | 09.9 |
| February | 54.4 | 40.3 | 0.74 | 67.4 | 48.8 | 93.4 | 101.7 | 08 | 10.5 |
| March | 81.8 | 54.8 | 0.67 | 73.3 | 53.4 | 109.1 | 105.8 | 13 | 11.1 |
| April | 73.6 | 53.4 | 0.73 | 77.7 | 56.5 | 108.3 | 109.1 | 10 | 11.3 |
| May | 74.3 | 56.3 | 0.76 | 81.4 | 59.3 | 106.7 | 112.4 | 18 | 11.6 |
| June | 93.6 | 70.7 | 0.76 | 85.9 | 62.4 | 108.4 | 116.2 | 10 | 11.9 |
| July | 98.3 | 66.2 | 0.67 | 90.3 | 65.4 | 114.0 | 120.3 | 11 | 12.2 |
| August | 118.6 | 91.7 | 0.77 | 93.7 | 67.8 | 136.0 | 124.1 | 18 | 12.4 |
| September | 119.0 | 92.9 | 0.78 | 96.1 | 69.4 | 138.4 | 126.8 | 13 | 12.5 |
| October | 77.0 | 55.5 | 0.72 | 97.7 | 70.5 | 117.3 | 127.9 | 13 | 12.5 |
| November | 99.5 | 74.0 | 0.74 | 101.3 | 73.0 | 140.2 | 130.0 | 16 | 12.3 |
| December | 120.8 | 81.9 | 0.69 | 108.8 | 77.9 | 150.1 | 134.3 | 08 | 11.9 |
| 1999 | | | | | | | | | |
| January | 94.3 | 62.4 | 0.66 | 116.5 | 82.6 | 142.6 | 139.0 | 10 | 11.7 |
| February | 93.4 | 66.3 | 0.71 | 120.2 | 84.6 | 142.0 | 142.6 | 12 | 11.6 |
| March | 100.5 | 68.8 | 0.68 | | | 126.3 | | 14 | |
| April | 92.9 | 63.9 | 0.69 | | | 117.2 | | 12 | |
| May | 140.5 | 106.3 | 0.76 | | | 148.6 | | 08 | |
| June | 208.3 | 137.4 | 0.66 | | | 170.0 | | 07 | |
| July | 169.2 | 113.5 | 0.67 | | | 165.6 | | 10 | |
| August | 136.1 | 93.7 | 0.69 | | | 170.8 | | 15 | |

NOTE: All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates. The lowest smoothed sunspot indices number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI= 158.5, occurred July 1989. * After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 20 September 1999*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

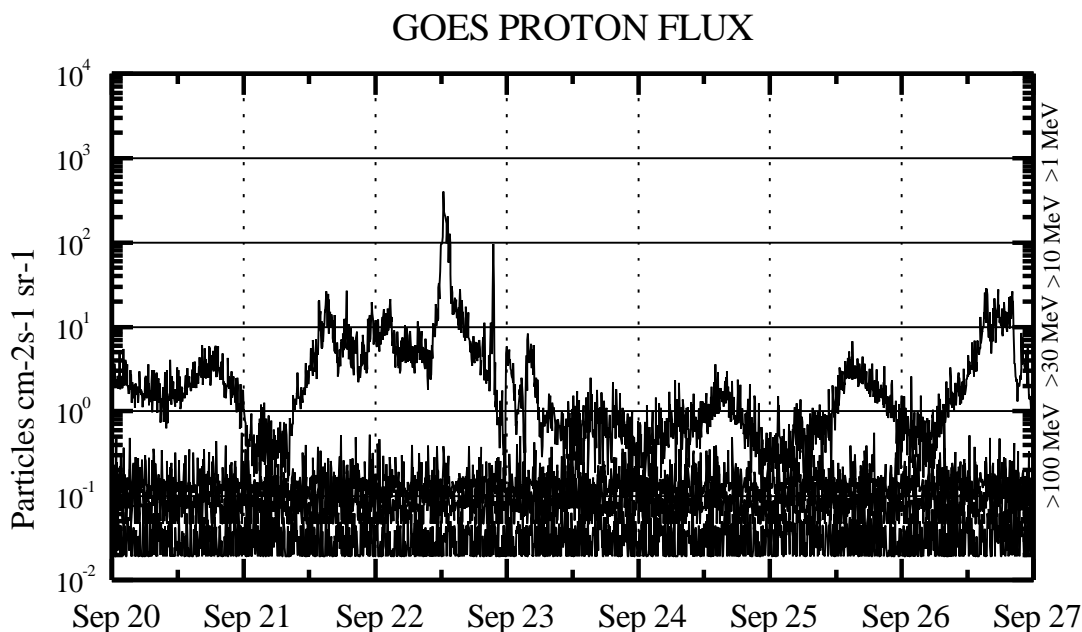
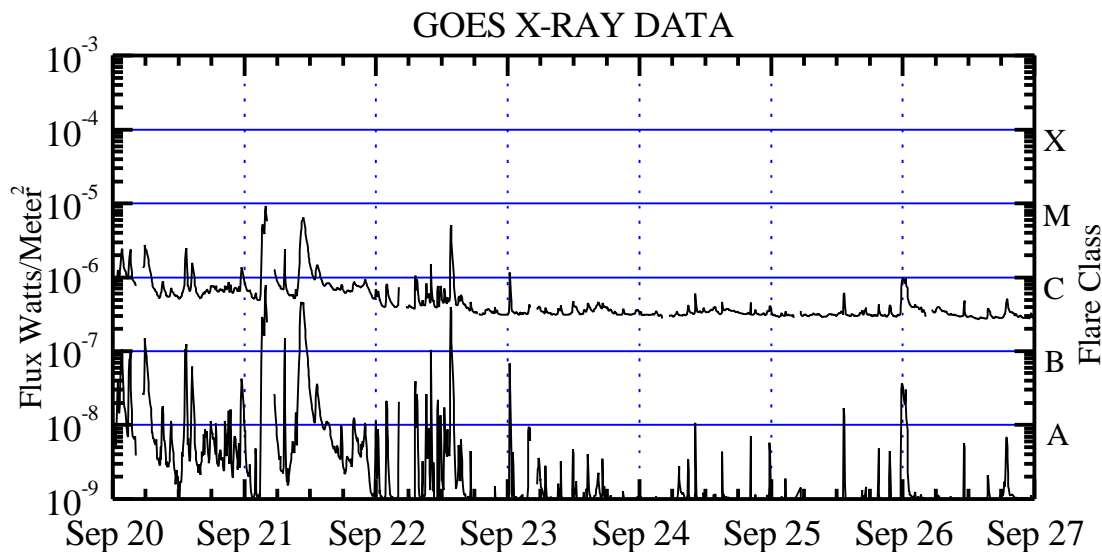
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are "global" parameters that are applicable to a first order approximation over large areas. H_p is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five minute averaged x-ray flux (watts / m²) as measured by GOES 8 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five minute averaged integral proton flux (protons/cm² -sec -sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.





Space
Environment
Center

Solar-Terrestrial Indices

Monthly Values

August 1999 Month 35

