

Space Weather Highlights
07-13 September 1998

Solar activity was at low to moderate levels with two M-class flares detected. Region 8323 (S22, L = 271, class/area Fkc/1460 on 03 September) was the probable source of an M2 x-ray flare that occurred at 09/0458UT. This flare was accompanied by major Types II and IV radio sweeps and a 310 SFU Tenflare. Region 8323 slowly decayed during the period before crossing the west limb on 10 September. Region 8333 (N12, L = 222, class/area Dao/230 on 12 September) produced an M2/1B at 11/1603UT. Isolated C-class flares from a variety of regions occurred during the remaining days.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Velocities were in the 300 - 400 km/sec range through 11 September, then increased to a range of 330 - 530 km/sec for the rest of the period. Densities ranged from 02 - 15 p/cc. Bz was northerly through 11 September, then became southerly for most of the rest of the period with maximum deflections of minus 09 nT (GSM) detected on 12 September. Solar sector orientation was mostly away (phi angle near 135 degrees) during 10 - 11 September, but was not discernible during the remaining days.

No significant proton enhancements occurred at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude was at moderate to high levels during 07 September, then dropped to normal to moderate levels for the balance of the period.

The geomagnetic field was mostly quiet to unsettled with brief active periods detected at some high latitude stations.

Space Weather Forecast
16 September - 12 October 1998

Solar activity is expected to be low to moderate. Region 8307 is expected to return to the visible disk around 16 September. Chances for major flare activity may increase upon its return. Old Region 8319 is expected to return on 17 September and may produce M-class flares.

Proton flare probabilities may increase after 16 September with the return of old Region 8307.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels during 19 - 26 September. Otherwise, normal to moderate fluxes are expected.

The geomagnetic field is expected to be at quiet to unsettled levels during most of the period. However, active periods are possible during 18 - 24 September due to a recurrent high-speed (coronal hole) wind stream.



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 | 4 |
| 07 September | 151 | 138 | 1500 | B4.7 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 08 September | 154 | 164 | 1490 | B5.4 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| 09 September | 145 | 156 | 960 | B6.0 | 5 | 1 | 0 | 9 | 1 | 0 | 0 | 0 |
| 10 September | 142 | 123 | 640 | B5.0 | 4 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| 11 September | 139 | 134 | 690 | B5.4 | 5 | 1 | 0 | 14 | 0 | 0 | 0 | 0 |
| 12 September | 135 | 118 | 870 | B5.7 | 4 | 0 | 0 | 9 | 0 | 0 | 0 | 0 |
| 13 September | 131 | 111 | 940 | B3.4 | 5 | 0 | 0 | 5 | 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 |
| 07 September | 5.1E+5 | 2.1E+4 | 7.0E+3 | | 4.8E+7 | |
| 08 September | 4.2E+5 | 2.0E+4 | 7.7E+3 | | 4.9E+6 | |
| 09 September | 2.5E+5 | 2.4E+4 | 7.0E+3 | | 1.9E+6 | |
| 10 September | 2.9E+5 | 2.0E+4 | 7.3E+3 | | 1.8E+6 | |
| 11 September | 5.6E+5 | 1.9E+4 | 7.8E+3 | | 4.1E+6 | |
| 12 September | 2.5E+5 | 2.0E+4 | 7.3E+3 | | 2.8E+6 | |
| 13 September | 9.3E+4 | 1.6E+4 | 4.3E+3 | | 3.4E+6 | |

Daily Geomagnetic Data

| Date | Middle Latitude Fredericksburg | | High Latitude College | | Estimated Planetary | |
|--------------|-----------------------------------|-----------------|--------------------------|-----------------|------------------------|-----------------|
| | A | K-indices | A | K-indices | A | K-indices |
| 07 September | 5 | 2-1-1-1-1-2-2 | * | 1-0-1-1-*-1-*-2 | 7 | 1-1-1-1-2-3-3-2 |
| 08 September | 6 | 3-3-1-1-0-1-1-1 | * | 3-4-1-2-*-1-1-1 | 11 | 4-4-1-1-2-3-2-2 |
| 09 September | 6 | 3-2-1-2-2-0-2-1 | 7 | 3-2-0-4-0-1-1-1 | 8 | 3-3-1-3-2-2-2-1 |
| 10 September | 5 | 2-2-1-1-1-0-2-2 | * | 2-2-1-*-0-1-2-1 | 5 | 2-2-0-1-2-1-2-2 |
| 11 September | 5 | 1-0-2-1-1-1-1-3 | 11 | 4-0-5-0-0-1-2-1 | 5 | 1-0-1-0-2-2-2-3 |
| 12 September | 9 | 2-2-3-2-2-3-2-2 | 21 | 2-2-3-4-5-5-2-2 | 12 | 2-2-3-3-3-3-3-2 |
| 13 September | 4 | 2-2-1-1-1-0-1-1 | 6 | 3-1-1-3-2-1-0-0 | 6 | 3-2-2-2-2-2-1-2 |

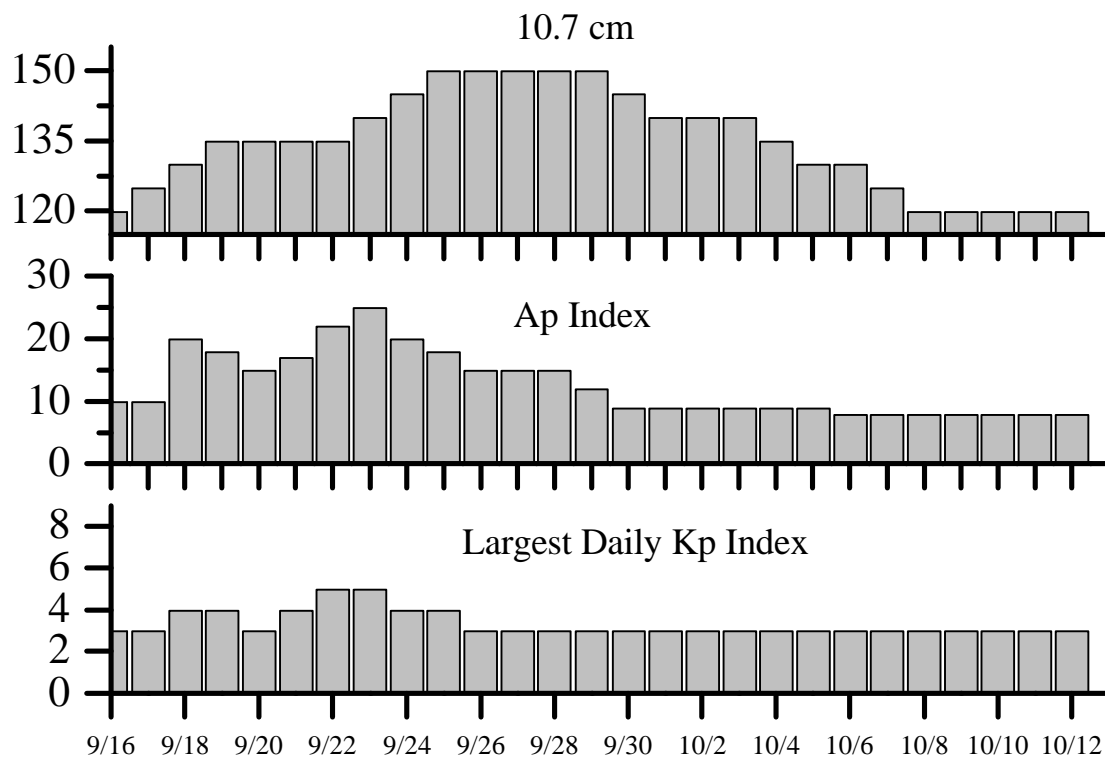


Alerts and Warnings Issued

| <u>Date and Time of Issue (UT)</u> | <u>Type of Alert or Warning</u> | <u>Date and Time of Event (UT)</u> |
|------------------------------------|-------------------------------------------------|------------------------------------|
| 07 Sep 0010 | 4-245 MHz Radio Bursts | 06 Sep |
| 07 Sep 0010 | 1-245 MHz Radio Noise Storm | 06 Sep |
| 07 Sep 1200 | >2 MeV Electron Event ≥ 1000 pfu Continued | 27 Aug 2105 |
| 08 Sep 0051 | 3-245 MHz Radio Bursts | 07 Sep |
| 08 Sep 0051 | 1-245 MHz Radio Noise Storm | 07 Sep |
| 08 Sep 1200 | >2 MeV Electron Event ≥ 1000 pfu Continued | 27 Aug 2105 |
| 08 Sep 0602 | K=4 Observed | 08 Sep 03-06 |
| 09 Sep 0142 | 5-245 MHz Radio Bursts | 08 Sep |
| 09 Sep 0142 | 1-245 MHz Noise Storm | 08 Sep |
| 09 Sep 0506 | 10cm Radio Burst 200 F.U. | 09 Sep 0457 |
| 09 Sep 0525 | Type IV Radio Emission | 09 Sep 0445 |
| 09 Sep 0533 | Type II Radio Emission | 09 Sep 0500 |
| 10 Sep 0017 | 3-245 MHz Radio Bursts | 09 Sep |
| 12 Sep 0030 | 2-245 MHz Radio Bursts | 11 Sep |
| 13 Sep 0014 | 1-245 MHz Radio Burst | 12 Sep |



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 |
|--------|-----------------------|----------------------|---------------------|--------|-----------------------|----------------------|---------------------|
| 16 Sep | 120 | 10 | 3 | 30 Sep | 145 | 9 | 3 |
| 17 | 125 | 10 | 3 | 01 Oct | 140 | 9 | 3 |
| 18 | 130 | 20 | 4 | 02 | 140 | 9 | 3 |
| 19 | 135 | 18 | 4 | 03 | 140 | 9 | 3 |
| 20 | 135 | 15 | 3 | 04 | 135 | 9 | 3 |
| 21 | 135 | 17 | 4 | 05 | 130 | 9 | 3 |
| 22 | 135 | 22 | 5 | 06 | 130 | 8 | 3 |
| 23 | 140 | 25 | 5 | 07 | 125 | 8 | 3 |
| 24 | 145 | 20 | 4 | 08 | 120 | 8 | 3 |
| 25 | 150 | 18 | 4 | 09 | 120 | 8 | 3 |
| 26 | 150 | 15 | 3 | 10 | 120 | 8 | 3 |
| 27 | 150 | 15 | 3 | 11 | 120 | 8 | 3 |
| 28 | 150 | 15 | 3 | 12 | 120 | 8 | 3 |
| 29 | 150 | 12 | 3 | | | | |



Energetic Events

| Date | Time (UT) | | | X-ray | | Optical Information | | | Peak | | Sweep Freq | |
|-----------|-----------|------|------|-------|-------|---------------------|----------|------|------------|------|------------|----|
| | Begin | Max | ½ | Class | Integ | Imp Brtns | Location | | Radio Flux | | Intensity | |
| | | | Max | | Flux | | Lat | CMD | 245 | 2695 | II | IV |
| 09 Sep 98 | 0452 | 0458 | 0505 | M2.8 | .012 | | | | 400 | 310 | 3 | 3 |
| 11 Sep 98 | 1558 | 1603 | 1607 | M2.1 | .006 | | | 8333 | 600 | 38 | | |

Flare List

| Date | Time | | | X-ray Class. | Imp / Brtns | Optical | | Rgn # |
|--------------|-------|------|------|-----------------|----------------|----------|---------|----------|
| | Begin | Max | End | | | Location | Lat CMD | |
| 07 September | 0101 | 0105 | 0110 | C1.0 | | | | |
| | 0816 | 0820 | 0829 | B8.3 | | | | |
| | 1423 | 1423 | 1426 | | SF | S17E38 | 8328 | |
| | 1609 | 1612 | 1614 | | SF | S24W46 | 8323 | |
| 08 September | 1919 | 1920 | 1925 | | SF | S17E36 | 8328 | |
| | 0005 | 0005 | 0008 | | SF | S19W55 | 8323 | |
| | 0322 | 0332 | 0340 | B8.0 | | | | |
| | 0436 | 0439 | 0501 | B7.0 | | | | |
| | 1014 | 1041 | 1136 | C1.3 | | | | |
| | 1210 | 1218 | 1247 | C2.5 | | | | |
| | 1357 | 1359 | 1405 | | SF | N26E63 | 8331 | |
| | 1557 | 1559 | 1613 | | SF | N14E14 | 8329 | |
| | 1659 | 1659 | 1702 | | SF | N21E18 | 8326 | |
| | 1714 | 1715 | 1717 | | SF | S19W59 | 8323 | |
| | 1800 | 1810 | 1835 | C1.0 | | | | |
| | 2237 | 2241 | 2244 | C1.4 | | | | 8323 |
| | 2315 | 2316 | 2319 | C1.1 | SF | S22W60 | 8323 | |
| 09 September | 0010 | 0010 | 0019 | | SF | S22W60 | 8323 | |
| | 0441 | 0444 | 0447 | C1.4 | | | | |
| | 0452 | 0458 | 0505 | M2.8 | | | | |
| | 0758 | 0759 | 0805 | | SF | S16E11 | 8328 | |
| | 0807 | 0813 | 0821 | | SF | N28E51 | 8331 | |
| | 1404 | 1418 | 1431 | C1.3 | | | | |
| | 1635 | 1635 | 1638 | | SF | S15E08 | 8328 | |
| | 1641 | 1644 | 1648 | C1.2 | | | | |
| | 1734 | 1737 | 1806 | C1.7 | 1F | N25E47 | 8331 | |
| | 1807 | 1807 | 1817 | | SF | N26E46 | 8331 | |
| | 1818 | 1819 | 1824 | | SF | N12W01 | 8329 | |
| 1826 | 1829 | 1833 | C1.0 | | | | | |
| 2007 | 2009 | 2014 | | SF | N13W03 | 8329 | | |
| 2133 | 2138 | 2146 | | SF | N22E43 | 8331 | | |



Flare List-continued

| Date | Time | | | X-ray Class. | Optical | | Rgn # |
|--------------|-------|-------|-------|-----------------|----------------|---------------------|----------|
| | Begin | Max | End | | Imp / Brtns | Location Lat CMD | |
| 10 September | 0259 | 0303 | 0323 | C4.2 | SF | N22W05 | 8326 |
| | 1303 | 1311 | 1318 | C1.0 | | | |
| | 1546 | 1552 | 1602 | B8.7 | SF | N10W39 | 8333 |
| | 1633 | 1637 | 1653 | B8.7 | SF | N12W14 | 8329 |
| | 1808 | 1808 | 1823 | | SF | S17W02 | 8328 |
| | B2135 | U2136 | 2147 | C2.2 | SF | S25W90 | 8323 |
| | B2159 | 2208 | 2223 | C2.0 | SF | N11W43 | 8333 |
| | 2341 | 2341 | A2345 | | SF | N11W45 | 8333 |
| 11 September | 0435 | 0436 | 0450 | | SF | N12W47 | 8333 |
| | 0509 | 0532 | 0605 | C1.7 | SF | N11W43 | 8333 |
| | 0822 | 0822 | 0827 | | SF | N14W19 | 8329 |
| | 0858 | 0859 | 0902 | | SF | N13W25 | 8329 |
| | 0921 | 0940 | 1020 | C1.6 | | | |
| | 1054 | 1056 | 1111 | C1.8 | SF | N20W14 | 8329 |
| | 1134 | 1146 | 1157 | | SF | N11W48 | 8333 |
| | 1300 | 1302 | 1312 | | SF | N10W50 | 8333 |
| | 1335 | 1335 | 1339 | | SF | N10W51 | 8333 |
| | 1400 | 1423 | 1429 | | SF | N12W53 | 8333 |
| | 1501 | 1524 | 1549 | C2.5 | SF | N10W52 | 8333 |
| | 1558 | 1603 | 1607 | M2.1 | | | 8333 |
| | 1835 | 1836 | 1840 | | SF | N28W21 | 8327 |
| | 2026 | 2030 | 2034 | | SF | N11W56 | 8333 |
| | 2043 | 2050 | 2052 | C2.0 | SF | N11W53 | 8333 |
| | 2106 | 2110 | 2125 | | SF | N11W52 | 8333 |
| 12 September | 0000 | 0000 | 0008 | | SF | N10W56 | 8333 |
| | 0011 | 0012 | 0022 | | SF | N11W56 | 8333 |
| | 0028 | 0030 | 0033 | | SF | N13W54 | 8333 |
| | 0138 | 0139 | 0150 | C1.2 | SF | N13W36 | 8329 |
| | 0747 | 0753 | 0755 | C3.1 | | | |
| | B1252 | U1253 | 1308 | C1.1 | SF | N25E07 | 8331 |
| | 1420 | 1424 | 1432 | B8.5 | SF | N25E07 | 8331 |
| | 1552 | 1552 | 1604 | | SF | N09W64 | 8333 |
| | 1853 | 1901 | 1903 | | SF | N26E06 | 8331 |
| 2028 | 2033 | 2053 | C1.9 | SF | N20W38 | 8326 | |



Flare List-continued

| Date | Time | | | X-ray Class. | Imp / Brtns | Optical | | Rgn # |
|--------------|-------|------|------|-----------------|----------------|---------------------|--|----------|
| | Begin | Max | End | | | Location Lat CMD | | |
| 13 September | 0711 | 0713 | 0716 | B5.0 | | | | |
| | 0852 | 0905 | 1002 | C3.8 | SF | N12W51 | | 8329 |
| | 1224 | 1229 | 1245 | | SF | N10W55 | | 8329 |
| | 1259 | 1303 | 1329 | C1.3 | SF | N21W49 | | 8326 |
| | 1414 | 1418 | 1428 | C1.6 | SF | N12W76 | | 8333 |
| | 1511 | 1518 | 1525 | B7.3 | | | | |
| | 1607 | 1615 | 1625 | C1.4 | | | | |
| | 1819 | 1820 | 1836 | C8.3 | SF | N11W80 | | 8333 |
| | 2127 | 2132 | 2135 | B5.2 | | | | |
| | 2141 | 2147 | 2155 | B5.8 | | | | |

Region Summary

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

Region 8321

| | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 27 Aug | N33E74 | 293 | 0020 | 01 | HRX | 001 | A | | | | | | | | | | |
| 28 Aug | N32E61 | 292 | 0020 | 01 | HSX | 001 | A | | | | | | | | | | |
| 29 Aug | N31E50 | 290 | 0020 | 01 | HSX | 001 | A | | | | | | | | | | |
| 30 Aug | N31E37 | 290 | 0020 | 01 | HSX | 001 | A | | | | | | | | | | |
| 31 Aug | N31E25 | 289 | 0010 | 01 | AXX | 002 | A | | | | | | | | | | |
| 01 Sep | N31E12 | 289 | 0010 | 04 | BXO | 005 | B | | | | | | | | | | |
| 02 Sep | N32W01 | 289 | 0020 | 03 | BXO | 003 | B | | | | | | | | | | |
| 03 Sep | N31W13 | 287 | 0010 | 00 | AXX | 002 | A | | | | | | | | | | |
| 04 Sep | N31W26 | 287 | | | | | | | | | | | | | | | |
| 05 Sep | N31W39 | 287 | | | | | | | | | | | | | | | |
| 06 Sep | N31W52 | 287 | | | | | | | | | | | | | | | |
| 07 Sep | N31W65 | 287 | | | | | | | | | | | | | | | |
| 08 Sep | N31W78 | 287 | | | | | | | | | | | | | | | |

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 289



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 8323</i> | | | | | | | | | | | | | | | | | | |
| 28 Aug | S21E82 | 271 | 0050 | 02 | HSX | 001 | A | | | | | | | | | | | |
| 29 Aug | S23E65 | 275 | 0270 | 11 | EHO | 005 | B | 2 | | | | | | | | | | |
| 30 Aug | S21E54 | 273 | 0780 | 13 | EKC | 009 | B | 2 | | | | | | | | | | |
| 31 Aug | S22E42 | 272 | 0890 | 14 | EKC | 029 | BG | 4 | 1 | | | | | | | | | |
| 01 Sep | S23E11 | 290 | 1230 | 16 | FKC | 041 | BG | 6 | 1 | | | 12 | | | | | | |
| 02 Sep | S22E16 | 272 | 1430 | 16 | FKI | 043 | BGD | 2 | | | | 4 | | | | | | |
| 03 Sep | S22E03 | 271 | 1460 | 18 | FKC | 033 | BG | 1 | 1 | | | 3 | | | | | | |
| 04 Sep | S22W13 | 274 | 1400 | 15 | EKC | 027 | BG | | | | | | | | | | | |
| 05 Sep | S22W23 | 271 | 1180 | 15 | EKI | 031 | BG | 3 | | | | 4 | | | | | | |
| 06 Sep | S22W36 | 271 | 1180 | 17 | FKI | 035 | BG | 3 | | | | 7 | | | | | | |
| 07 Sep | S22W50 | 272 | 0970 | 16 | FKI | 022 | BG | | | | | 1 | | | | | | |
| 08 Sep | S22W64 | 272 | 0760 | 16 | FKI | 017 | BG | 2 | | | | 3 | | | | | | |
| 09 Sep | S22W76 | 271 | 0350 | 20 | FAO | 007 | BG | | | | | 1 | | | | | | |
| 10 Sep | S27W84 | 266 | 0080 | 02 | HSX | 001 | A | 1 | | | | 1 | | | | | | |
| | | | | | | | | 26 | 3 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | | |

Crossed West Limb.

Absolute heliographic longitude: 271

| | | | | | | | | | | | | | | | | | | |
|--------------------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|--|--|
| <i>Region 8325</i> | | | | | | | | | | | | | | | | | | |
| 02 Sep | S28E47 | 241 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | | |
| 03 Sep | S31E32 | 242 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | | |
| 04 Sep | S31E19 | 242 | 0000 | 00 | | 000 | | | | | | | | | | | | |
| 05 Sep | S31E06 | 242 | 0000 | 00 | | 000 | | | | | | | | | | | | |
| 06 Sep | S31W07 | 242 | 0000 | 00 | | 000 | | | | | | 1 | | | | | | |
| 07 Sep | S31W20 | 242 | 0000 | 00 | | 000 | | | | | | | | | | | | |
| 08 Sep | S31W33 | 241 | 0000 | 00 | | 000 | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | |

Died on Disk.

Absolute heliographic longitude: 242



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 8326</i> | | | | | | | | | | | | | | | | | | |
| 03 Sep | N19E73 | 201 | 0100 | 09 | DSO | 002 | B | | | | | | | | | | | |
| 04 Sep | N18E60 | 201 | 0160 | 13 | ESO | 003 | B | 1 | | | | 1 | | | | | | |
| 05 Sep | N21E50 | 198 | 0070 | 10 | DSO | 006 | B | 4 | | | | 5 | | | | | | |
| 06 Sep | N22E39 | 196 | 0080 | 10 | DSO | 011 | B | 2 | | | | 4 | | | | | | |
| 07 Sep | N22E25 | 197 | 0080 | 10 | DSO | 015 | B | | | | | | | | | | | |
| 08 Sep | N22E12 | 196 | 0090 | 10 | DAO | 017 | B | | | | | 1 | | | | | | |
| 09 Sep | N21W01 | 196 | 0020 | 10 | BXO | 008 | B | | | | | | | | | | | |
| 10 Sep | N22W12 | 194 | 0020 | 08 | BXO | 005 | B | 1 | | | | 1 | | | | | | |
| 11 Sep | N21W27 | 196 | 0010 | 10 | CSO | 004 | B | | | | | | | | | | | |
| 12 Sep | N21W40 | 196 | | | | | | 1 | | | | 1 | | | | | | |
| 13 Sep | N21W53 | 196 | | | | | | 1 | | | | 1 | | | | | | |
| | | | | | | | | 10 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | |

Still on Disk.

Absolute heliographic longitude: 196

| | | | | | | | | | | | | | | | | | | |
|--------------------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|---|--|
| <i>Region 8327</i> | | | | | | | | | | | | | | | | | | |
| 03 Sep | N30E78 | 196 | 0050 | 02 | HSX | 001 | A | | | | | | | | | | | |
| 04 Sep | N28E64 | 197 | 0070 | 03 | HSX | 001 | A | | | | | | | | | | | |
| 05 Sep | N30E52 | 196 | 0030 | 01 | HSX | 003 | A | | | | | | | | | | | |
| 06 Sep | N30E39 | 196 | 0030 | 03 | CSO | 003 | B | | | | | | | | | | | |
| 07 Sep | N30E28 | 194 | 0020 | 04 | BXO | 004 | B | | | | | | | | | | | |
| 08 Sep | N29E14 | 194 | 0010 | 04 | BXO | 003 | B | | | | | | | | | | | |
| 09 Sep | N29E01 | 194 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | | |
| 10 Sep | N28W13 | 195 | 0000 | 00 | AXX | 001 | A | | | | | | | | | | | |
| 11 Sep | N29W24 | 193 | 0000 | 00 | AXX | 002 | A | | | | | 1 | | | | | | |
| 12 Sep | N29W37 | 193 | | | | | | | | | | | | | | | | |
| 13 Sep | N29W50 | 193 | | | | | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |

Still on Disk.

Absolute heliographic longitude: 194



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 8328

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|--|--|--|
| 04 Sep | S18E72 | 189 | 0010 | 01 | AXX | 002 | A | | | | | | | | | | | | |
| 05 Sep | S17E58 | 190 | 0100 | 02 | HSX | 002 | A | | | | | | | | | | | | |
| 06 Sep | S16E45 | 190 | 0120 | 03 | CSO | 005 | B | | | | | | 1 | | | | | | |
| 07 Sep | S17E33 | 189 | 0100 | 06 | CSO | 010 | B | | | | | | 2 | | | | | | |
| 08 Sep | S18E20 | 188 | 0160 | 07 | CSO | 011 | B | | | | | | | | | | | | |
| 09 Sep | S18E08 | 187 | 0140 | 07 | CSO | 010 | B | | | | | | 2 | | | | | | |
| 10 Sep | S17W08 | 190 | 0090 | 04 | CSO | 005 | B | | | | | | 1 | | | | | | |
| 11 Sep | S18W20 | 189 | 0090 | 04 | CSO | 006 | B | | | | | | | | | | | | |
| 12 Sep | S18W34 | 190 | 0080 | 04 | CSO | 004 | B | | | | | | | | | | | | |
| 13 Sep | S18W47 | 189 | 0080 | 04 | CSO | 003 | B | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | | | |

Still on Disk.

Absolute heliographic longitude: 187

Region 8329

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|----|---|---|---|---|---|--|--|--|
| 05 Sep | N15E52 | 196 | 0150 | 10 | DSO | 009 | B | 1 | | | | | 1 | | | | | | |
| 06 Sep | N15E38 | 197 | 0200 | 09 | DAO | 014 | B | | | | | | | | | | | | |
| 07 Sep | N16E25 | 197 | 0150 | 10 | DSO | 013 | B | | | | | | | | | | | | |
| 08 Sep | N14E11 | 197 | 0300 | 14 | EAI | 024 | B | | | | | | 1 | | | | | | |
| 09 Sep | N14W02 | 197 | 0240 | 13 | ESI | 021 | B | | | | | | 2 | | | | | | |
| 10 Sep | N14W18 | 200 | 0200 | 13 | ESO | 011 | B | | | | | | 1 | | | | | | |
| 11 Sep | N15W32 | 201 | 0240 | 10 | DSO | 010 | B | 1 | | | | | 3 | | | | | | |
| 12 Sep | N14W46 | 202 | 0210 | 11 | ESO | 003 | B | 1 | | | | | 1 | | | | | | |
| 13 Sep | N14W60 | 202 | 0210 | 10 | DSO | 003 | B | 1 | | | | | 2 | | | | | | |
| | | | | | | | | 4 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | | | |

Still on Disk.

Absolute heliographic longitude: 197

Region 8330

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|--|--|--|
| 06 Sep | S20E68 | 167 | 0050 | 07 | CRO | 003 | B | | | | | | | | | | | | |
| 07 Sep | S20E57 | 165 | 0060 | 10 | DAO | 003 | B | | | | | | | | | | | | |
| 08 Sep | S22E44 | 164 | 0060 | 10 | CSO | 003 | B | | | | | | | | | | | | |
| 09 Sep | S22E36 | 159 | 0040 | 02 | HSX | 002 | A | | | | | | | | | | | | |
| 10 Sep | S22E24 | 158 | 0040 | 01 | HSX | 001 | A | | | | | | | | | | | | |
| 11 Sep | S23E12 | 157 | 0040 | 01 | HSX | 001 | A | | | | | | | | | | | | |
| 12 Sep | S23E00 | 156 | 0130 | 01 | HSX | 001 | A | | | | | | | | | | | | |
| 13 Sep | S24W13 | 155 | 0030 | 04 | CSO | 003 | B | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |

Still on Disk.

Absolute heliographic longitude: 156



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 8331

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|---|--|--|--|---|---|---|---|---|---|---|---|
| 06 Sep | N25E74 | 161 | 0080 | 01 | HSX | 001 | A | | | | | | | | | | | | |
| 07 Sep | N24E63 | 159 | 0120 | 02 | HSX | 001 | A | | | | | | | | | | | | |
| 08 Sep | N24E51 | 157 | 0100 | 09 | CSO | 006 | B | | | | | 1 | | | | | | | |
| 09 Sep | N26E41 | 154 | 0160 | 12 | ESO | 012 | B | 1 | | | | 3 | 1 | | | | | | |
| 10 Sep | N26E24 | 158 | 0190 | 10 | DAO | 015 | B | | | | | | | | | | | | |
| 11 Sep | N25E14 | 155 | 0180 | 11 | CAO | 020 | B | | | | | | | | | | | | |
| 12 Sep | N25E02 | 154 | 0160 | 13 | EAI | 025 | B | 1 | | | | 3 | | | | | | | |
| 13 Sep | N25W12 | 154 | 0180 | 13 | EAI | 023 | B | | | | | | | | | | | | |
| | | | | | | | | | | | | 2 | 0 | 0 | 7 | 1 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 154

Region 8332

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|---|
| 08 Sep | S27E12 | 196 | 0010 | 03 | BXO | 003 | B | | | | | | | | | | | | |
| 09 Sep | S28W04 | 199 | 0000 | 00 | AXX | 002 | A | | | | | | | | | | | | |
| 10 Sep | S28W17 | 199 | | | | | | | | | | | | | | | | | |
| 11 Sep | S28W30 | 199 | | | | | | | | | | | | | | | | | |
| 12 Sep | S28W43 | 199 | | | | | | | | | | | | | | | | | |
| 13 Sep | S28W56 | 199 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 199

Region 8333

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|---|---|--|--|----|---|---|----|---|---|---|---|
| 09 Sep | N12W27 | 222 | 0010 | 04 | BXO | 003 | B | | | | | | | | | | | | |
| 10 Sep | N12W41 | 223 | 0020 | 04 | BXO | 004 | B | 1 | | | | 3 | | | | | | | |
| 11 Sep | N11W55 | 224 | 0120 | 07 | CSO | 009 | B | 3 | 1 | | | 10 | 1 | | | | | | |
| 12 Sep | N11W71 | 227 | 0230 | 07 | DAO | 005 | B | 1 | | | | 4 | | | | | | | |
| 13 Sep | N12W83 | 225 | 0200 | 07 | DAO | 003 | B | 2 | | | | 2 | | | | | | | |
| | | | | | | | | | | | | 7 | 1 | 0 | 19 | 1 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 222

Region 8334

| | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|---|---|---|---|---|---|---|---|
| 11 Sep | S25W35 | 204 | 0010 | 04 | BXO | 002 | B | | | | | | | | | | | | |
| 12 Sep | S25W47 | 203 | 0030 | 05 | BXO | 006 | B | | | | | | | | | | | | |
| 13 Sep | S23W62 | 204 | 0030 | 05 | CSO | 003 | B | | | | | | | | | | | | |
| | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 204



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 8335

| | | | | | | | | | | | | | | | | | | | | |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|--|--|-----------------|
| 12 Sep | S22E68 | 088 | 0030 | 07 | CRO | 004 | B | | | | | | | | | | | | | |
| 13 Sep | S22E54 | 088 | 0210 | 08 | DAO | 003 | B | | | | | | | | | | | | | 0 0 0 0 0 0 0 0 |

Still on Disk.

Absolute heliographic longitude: 88



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

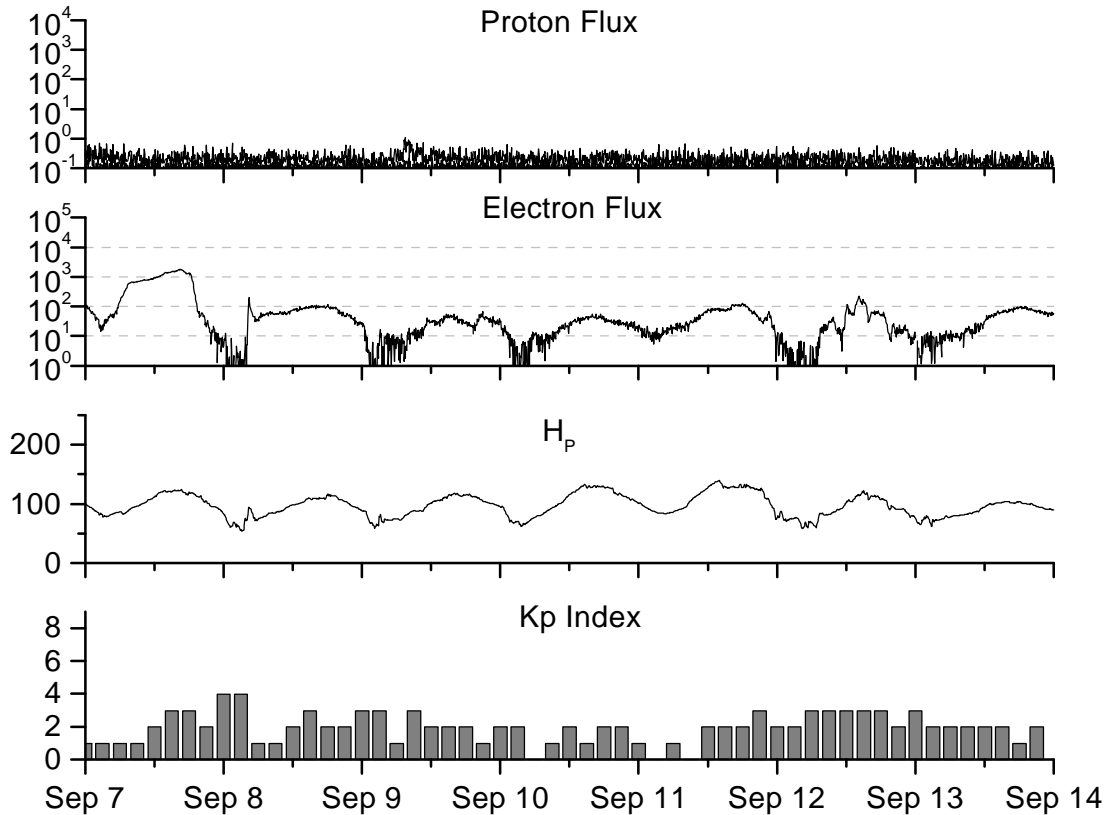
| Month | Sunspot Numbers | | | Radio Flux | | Geomagnetic | | | |
|-------------|------------------------|-------------|-----------------|----------------------|---------------------|------------------------|-----------------|-----------------|-----------------|
| | Observed values SWO | Ratio RI | Ratio RI/SWO | Smooth values SWO | Smooth values RI | **Penticton 10.7 cm | Smooth Value | Planetary Ap | Smooth Value |
| 1996 | | | | | | | | | |
| September | 02.9 | 01.6 | 0.55 | 13.3 | 08.4 | 69.4 | 72.3 | 15 | 09.3 |
| October | 02.3 | 00.9 | 0.39 | 14.0 | 08.8 | 69.2 | 72.6 | 13 | 09.1 |
| November | 26.7 | 17.9 | 0.67 | 15.4 | 09.8 | 78.7 | 73.0 | 08 | 09.1 |
| December | 21.1 | 13.3 | 0.63 | 16.2 | 10.4 | 77.8 | 73.3 | 07 | 09.3 |
| 1997 | | | | | | | | | |
| January | 09.0 | 05.7 | 0.63 | 16.5 | 10.5 | 74.0 | 73.4 | 09 | 09.3 |
| February | 11.3 | 07.6 | 0.67 | 17.4 | 11.0 | 73.8 | 73.7 | 11 | 09.2 |
| March | 14.4 | 08.7 | 0.60 | 20.4 | 13.5 | 73.5 | 75.1 | 08 | 08.9 |
| April | 24.5 | 15.5 | 0.63 | 24.0 | 16.5 | 74.5 | 76.8 | 10 | 08.6 |
| May | 28.6 | 18.5 | 0.65 | 26.4 | 18.3 | 74.6 | 78.4 | 08 | 08.6 |
| June | 22.1 | 12.7 | 0.57 | 29.0 | 20.3 | 71.7 | 80.1 | 07 | 08.6 |
| July | 17.0 | 10.4 | 0.61 | 32.4 | 22.6 | 71.1 | 81.8 | 06 | 08.5 |
| August | 36.7 | 24.4 | 0.66 | 35.9 | 25.0 | 79.0 | 83.4 | 07 | 08.3 |
| 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 | | | 109.1 | | 13 | |
| April | 73.6 | 53.4 | 0.73 | | | 108.3 | | 10 | |
| May | 74.3 | 56.3 | 0.76 | | | 106.7 | | 18 | |
| June | 93.6 | 70.7* | 0.76* | | | 108.4* | | 10 | |
| July | 98.3 | 66.2* | 0.67* | | | 114.0* | | 11* | |
| August | 118.6 | 91.7* | 0.77* | | | 136.0* | | 18* | |

*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.

** From June 1991 onward, 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 31 August 1998

Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

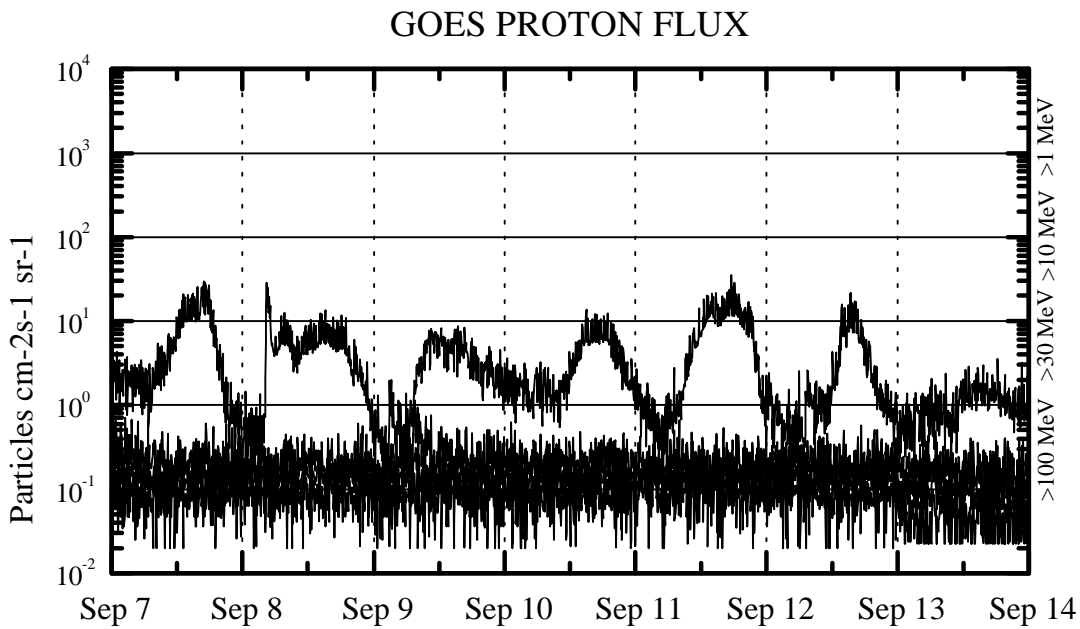
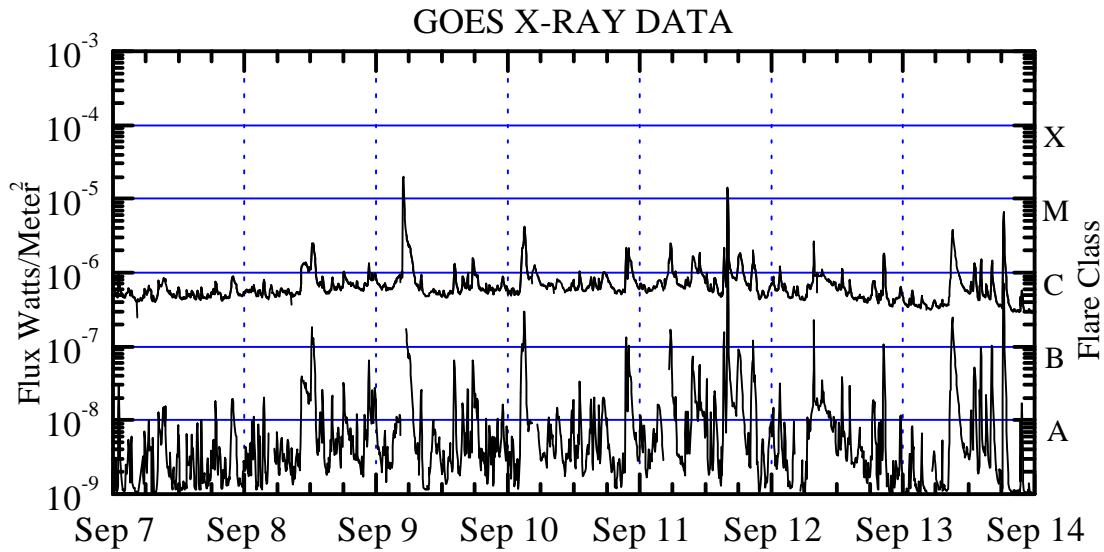
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-8.

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_{parallel} is subject to a 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.

