**Space Weather Highlights** **SWO PRF 1481**
**12 - 18 January 2004** **20 January 2004**

Solar activity ranged from very low to high levels. On 12 -15 January, activity was at low levels with very low levels observed on 16 January. Region 537 (N05, L= 009, class/area Dkc/240 on 12 January) exhibited slow decay throughout the period and simplified from a beta-gamma-delta magnetic configuration to a simple beta on 17 January. Region 536 (S12, L=074, class/area Ekc/600 on 09 January), produced six C-class flare on 12 - 13 January before it rotated beyond the west limb on 14 January. New Region 540 (S11, L=285, class/area Eao/500 on 13 January) rotated onto the disk on 12 January and has maintained good areal coverage with evidence of considerable magnetic polarity mixing. The most significant activity of the period came from Region 540 late in the period. On 17 January, this region produced an M5 flare at 1750 UTC with an associated Type II radio sweep (784 km/s), a large 245 Mhz radio burst (270,000 sfu) and a partial halo CME off to the south. The period ended on 18 January with Region 540 producing an M1/1n flare at 0017 UTC with an associated Type II radio sweep (1000 km/s). At the time of this report (20 January) Region 540 continues to produce high level activity with an M6/2n at 0743 UTC with an associated halo CME.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began on 12 January with solar wind speeds near 500 km/s. A transient passage was observed on 13 January with wind speeds increasing to near 600 km/s for about a twenty-four hour period. Wind speed began a gradual and steady increase on 15 January reaching 650 km/s by 16 January due to a coronal hole high speed stream. The period ended with wind speeds still elevated near 550 – 600 km/s.

There were no greater than 10 MeV proton events at geosynchronous orbit during the summary period.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels for most of the period. High levels were observed on 12 - 13, 15, and 17 - 18 January.

The geomagnetic field ranged from quiet to minor storm levels. Activity was at quiet to unsettled levels on 12 - 14 January except for a nine-hour period of active conditions late on 13 January. Active conditions were observed on 15 January. The onset of a coronal hole high speed stream produced isolated minor storm levels on 16 January and unsettled to active levels on 17 - 18 January.

## Space Weather Outlook
## 21 January - 16 February 2004

Solar activity is expected to be at low to moderate levels with a chance of major flare activity. Region 540 has the potential for major flare activity through 25 January. Activity in the mid to latter half of the period is expected to be at low levels with a chance of moderate activity due to the return of Regions 536, 537 and 540 to the visible disk.

There is a slight chance for a greater than 10 MeV proton event during the period in association with a major flare from one of three active regions.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 28 - 29 January and again on 31 January - 09 February due to recurrent coronal holes.

Geomagnetic activity is expected to range from quiet to minor storm levels with a chance of isolated major storm levels. A second recurrent coronal hole is expected to return on 27 - 28 January resulting in active to minor storm levels. The large transequatorial coronal hole of the last few rotations has broken up into several smaller coronal holes. This series of recurrent coronal holes is due to return on 30 January - 07 February and is expected to produce minor storm level activity with a chance of isolated major storm levels. The coronal hole of last week is due to return on 11 - 14 February, with minor storm levels possible.

## *Daily Solar Data*

| Date | Radio Flux 10.7 cm | Sun spot No. | Sunspot Area ($10^{-6}$ hemi.) | X-ray Background | Flares: X-ray Flux C | M | X | Optical S | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 January | 118 | 77 | 550 | B4.2 | 4 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 13 January | 118 | 53 | 930 | B4.3 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 14 January | 121 | 58 | 790 | B3.5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 January | 119 | 57 | 510 | B3.4 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 16 January | 120 | 68 | 580 | B2.7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 17 January | 123 | 56 | 610 | B3.1 | 6 | 1 | 0 | 4 | 0 | 0 | 0 | 0 |
| 18 January | 120 | 72 | 390 | B2.7 | 3 | 1 | 0 | 2 | 1 | 0 | 0 | 0 |

## *Daily Particle Data*

| Date | Proton Fluence (protons/cm$^2$-day-sr) >1MeV | >10MeV | >100MeV | Electron Fluence (electrons/cm$^2$-day-sr) >.6MeV | >2MeV | >4MeV |
|---|---|---|---|---|---|---|
| 12 January | 7.8E+5 | 1.0E+4 | 2.1E+3 | | 1.6E+8 | |
| 13 January | 1.8E+6 | 1.0E+4 | 2.1E+3 | | 7.3E+7 | |
| 14 January | 4.7E+5 | 1.1E+4 | 2.2E+3 | | 2.3E+7 | |
| 15 January | 1.4E+6 | 1.2E+4 | 3.0E+3 | | 4.5E+7 | |
| 16 January | 1.2E+6 | 1.3E+4 | 3.6E+3 | | 2.9E+7 | |
| 17 January | 1.9E+6 | 1.3E+4 | 3.7E+3 | | 1.5E+8 | |
| 18 January | 1.1E+6 | 1.5E+4 | 3.8E+3 | | 2.4E+8 | |

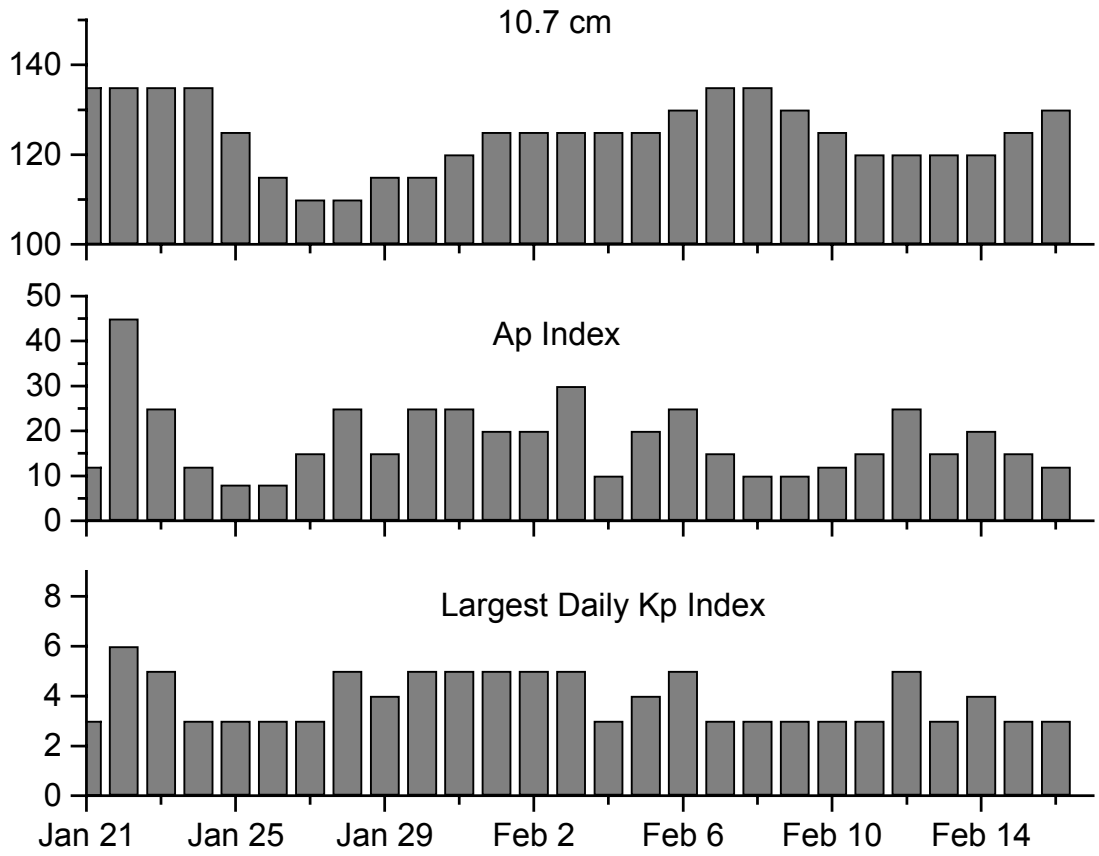
## *Daily Geomagnetic Data*

| Date | Middle Latitude Fredericksburg A | K-indices | High Latitude College A | K-indices | Estimated Planetary A | K-indices |
|---|---|---|---|---|---|---|
| 12 January | 5 | 1-1-0-0-1-2-2-3 | 12 | 1-1-0-2-4-4-3-3 | 10 | 2-2-1-2-3-3-3-3 |
| 13 January | 14 | 3-3-2-1-3-3-4-3 | 29 | 3-2-3-2-6-5-5-3 | 18 | 3-3-3-2-4-4-4-3 |
| 14 January | 7 | 3-3-1-1-2-1-1-1 | 18 | 4-2-1-4-4-4-3-2 | 12 | 3-3-2-3-3-3-2-2 |
| 15 January | 9 | 1-3-1-1-3-3-2-3 | 29 | 2-2-1-1-6-6-4-4 | 16 | 2-3-2-2-4-4-4-3 |
| 16 January | 21 | 5-3-2-4-3-3-4-3 | 44 | 4-3-2-6-5-6-5-5 | 26 | 4-4-3-5-4-4-5-4 |
| 17 January | 9 | 2-2-2-2-2-2-3-3 | 24 | 3-2-3-5-5-4-4-2 | 14 | 3-2-3-4-3-3-3-3 |
| 18 January | 15 | 1-4-3-2-2-1-4-4 | 19 | 2-4-4-3-4-2-3-4 | 18 | 2-4-4-3-3-3-4-4 |

## *Alerts and Warnings Issued*

| Date & Time of Issue | Type of Alert or Warning | Date & Time of Event UT |
|---|---|---|
| 12 Jan 0013 | 1 - 245 MHz Radio Burst | 11 Jan |
| 12 Jan 1009 | ALERT: Electron 2MeV Integral Flux exceeded 1000pfu | 12 Jan 0945 |
| 12 Jan 1304 | ALERT: STRATWARM | 12 Jan |
| 13 Jan 0016 | 1 - 245 MHz Radio Burst | 12 Jan |
| 13 Jan 0040 | ALERT: Type II Radio Emission | 12 Jan 2212 |
| 13 Jan 0757 | WARNING: Geomagnetic K = 4 | 13 Jan 0757 - 1500 |
| 13 Jan 0802 | ALERT: Geomagnetic K = 4 | 13 Jan 0802 |
| 13 Jan 1234 | ALERT: STRATWARM | 13 Jan |
| 13 Jan 1238 | ALERT: Electron 2MeV Integral Flux > 1000pfu | 13 Jan 1220 |
| 13 Jan 1457 | WARNING: Geomagnetic K = 5 | 13 Jan 1457 - 2359 |
| 13 Jan 1459 | ALERT: Geomagnetic K = 5 | 13 Jan 1458 |
| 13 Jan 2355 | EXTENDED WARNING: Geomagnetic K = 5 | 13 Jan 1457 -14 Jan 1500 |
| 14 Jan 1341 | ALERT: STRATWARM | 14 Jan |
| 15 Jan 0016 | 2 - 245 MHz Radio Bursts | 14 Jan |
| 15 Jan 1324 | ALERT: STRATWARM | 15 Jan |
| 15 Jan 1351 | ALERT: Electron 2MeV Integral Flux > 1000pfu | 15 Jan 1330 |
| 15 Jan 1443 | WARNING: Geomagnetic K= 4 | 15 Jan 1444 - 2100 |
| 15 Jan 1452 | ALERT: Geomagnetic K = 4 | 15 Jan 1452 |
| 15 Jan 2055 | EXTENDED WARNING: Geomagnetic K = 4 | 15 Jan 1444 - 16 Jan 1500 |
| 16 Jan 0019 | 1 - 245 MHz Radio Noise Storm | 15 Jan |
| 16 Jan 1113 | WARNING: Geomagnetic K = 4 | 16 Jan 1113 - 1800 |
| 16 Jan 1122 | ALERT: Geomagnetic K = 4 | 16 Jan 1121 |
| 16 Jan 1336 | ALERT: STRATWARM | 16 Jan |
| 16 Jan 1757 | EXTENDED WARNING: Geomagnetic K = 4 | 16 Jan 1113 - 2359 |
| 16 Jan 2354 | EXTENDED WARNING: Geomagnetic K = 4 | 16 Jan 1113 - 17 Jan 1500 |
| 17 Jan 1116 | ALERT: Electron 2MeV Integral Flux > 1000pfu | 17 Jan 1055 |
| 17 Jan 1750 | ALERT: X-Ray Flux > M5 | 17 Jan 1749 |
| 17 Jan 1809 | SUMMARY: X-ray Event > M5 | 17 Jan 1750 |
| 17 Jan 1822 | ALERT: Type II Radio Emission | 17 Jan 1747 |
| 17 Jan 1847 | SUMMARY: 10cm Radio Burst | 17 Jan 1744 |
| 17 Jan 2209 | WATCH: Geomagnetic A ≥ 20 | 20 Jan |
| 18 Jan 0016 | 1 - 245 MHz Radio Burst | 17 Jan |
| 18 Jan 0019 | SUMMARY: 10cm Radio Burst | 18 Jan 0014 |
| 18 Jan 0057 | ALERT: Type II Radio Emission | 18 Jan 0016 |
| 18 Jan 0553 | ALERT: Geomagnetic K = 4 | 18 Jan 0546 |
| 18 Jan 0555 | WARNING: Geomagnetic K = 4 | 18 Jan 0555 - 1600 |
| 18 Jan 0615 | ALERT: Geomagnetic K = 4 | 18 Jan 0614 |
| 18 Jan 0633 | ALERT: Electron 2MeV Integral Flux > 1000pfu | 18 Jan 0530 |
| 18 Jan 2047 | WARNING: Geomagnetic K = 4 | 18 Jan 2047 - 19 Jan 1600 |

## *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 |
|---|---|---|---|---|---|---|---|
| 21 Jan | 135 | 12 | 3 | 04 Feb | 125 | 10 | 3 |
| 22 | 135 | 45 | 6 | 05 | 125 | 20 | 4 |
| 23 | 135 | 25 | 5 | 06 | 130 | 25 | 5 |
| 24 | 135 | 12 | 3 | 07 | 135 | 15 | 3 |
| 25 | 125 | 8 | 3 | 08 | 135 | 10 | 3 |
| 26 | 115 | 8 | 3 | 09 | 130 | 10 | 3 |
| 27 | 110 | 15 | 3 | 10 | 125 | 12 | 3 |
| 28 Jan | 110 | 25 | 5 | 11 | 120 | 15 | 3 |
| 29 | 115 | 15 | 4 | 12 | 120 | 25 | 5 |
| 30 | 115 | 25 | 5 | 13 | 120 | 15 | 3 |
| 31 | 120 | 25 | 5 | 14 | 120 | 20 | 4 |
| 01 Feb | 125 | 20 | 5 | 15 | 125 | 15 | 3 |
| 02 | 125 | 20 | 5 | 16 | 130 | 12 | 3 |
| 03 | 125 | 30 | 5 | | | | |

## *Energetic Events*

| Date | Time | | | X-ray | | Optical Information | | | Peak Radio Flux | | Sweep Freq Intensity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Begin | Max | ½ Max | Class | Integ Flux | Imp/ Brtns | Location Lat CMD | Rgn # | 245 | 2695 | II | IV |
| 17 Jan 04 | 1735 | 1750 | 1759 | M5.0 | .033 | | | 540 | 270000 | 580 | 2 | |
| 18 Jan 04 | 0007 | 0017 | 0021 | M1.4 | .005 | 1n | S15E19 | 540 | 23000 | 190 | 3 | |

## *Flare List*

| Date | Time | | | X-ray Class. | Optical | | Rgn |
|---|---|---|---|---|---|---|---|
| | Begin | Max | End | | Imp / Brtns | Location Lat CMD | |
| 12 January | 0348 | 0348 | 0352 | C1.6 | Sf | S11W56 | 536 |
| | 0838 | 0840 | 0848 | C1.8 | Sf | S11W59 | 536 |
| | 1055 | 1058 | 1101 | B9.4 | | | 537 |
| | 1141 | 1145 | 1147 | B6.7 | | | 536 |
| | 1502 | 1506 | 1512 | C1.1 | | | 536 |
| | 1803 | 1809 | 1818 | B9.5 | | | 540 |
| | 1912 | 1917 | 1923 | C1.1 | | | 540 |
| | 2158 | 2211 | 2218 | B7.7 | | | 540 |
| | 2352 | 2353 | 0006 | B7.7 | Sf | S10W68 | 536 |
| 13 January | 0129 | 0133 | 0136 | C1.1 | | | 536 |
| | 0244 | 0245 | 0253 | C2.0 | Sf | S06W75 | 536 |
| | 0325 | 0329 | 0332 | C1.7 | | | 536 |
| | 0608 | 0608 | 0625 | C1.5 | Sf | N03W06 | 537 |
| 14 January | 0000 | 0004 | 0007 | B6.3 | | | 536 |
| | 1304 | 1309 | 1325 | B6.4 | | | |
| | 1506 | 1510 | 1516 | B7.1 | | | |
| | 1555 | 1602 | 1608 | C1.0 | | | 536 |
| 15 January | 0119 | 0123 | 0126 | B6.2 | | | 540 |
| | 0624 | 0629 | 0643 | C3.2 | 1f | S16E52 | 540 |
| | 2257 | 2304 | 2313 | C1.2 | | | 540 |
| 16 January | 0119 | 0120 | 0128 | B9.3 | Sf | N05W47 | 537 |
| | 0138 | 0141 | 0144 | B4.6 | | | |
| | 0433 | 0437 | 0440 | B4.5 | | | 540 |
| 17 January | 0105 | 0108 | 0110 | B4.1 | | | |
| | 0342 | 0355 | 0405 | C1.6 | Sf | S15E28 | 540 |
| | 0618 | 0623 | 0627 | B5.3 | | | |
| | 0756 | 0756 | 0813 | C1.0 | Sf | S15E26 | 540 |
| | 0914 | 0915 | 0922 | C1.4 | Sf | S12E20 | 540 |
| | 0939 | 0940 | 0946 | C1.2 | Sf | N08W65 | 537 |
| | 1208 | 1213 | 1219 | B5.6 | | | 540 |
| | 1243 | 1249 | 1254 | C1.5 | | | 540 |
| | 1510 | 1517 | 1522 | C1.1 | | | 540 |
| | 1735 | 1750 | 1759 | M5.0 | | | 540 |

## *Flare List - continued.*

| Date | Time Begin | Time Max | Time End | X-ray Class. | Optical Imp / Brtns | Optical Location Lat CMD | Rgn |
|---|---|---|---|---|---|---|---|
| 18 January | 0014 | 0017 | 0030 | M1.4 | 1n | S15E19 | 540 |
| | 0148 | 0151 | 0154 | B6.3 | | | |
| | 0558 | 0600 | 0603 | B5.7 | Sf | S16E16 | 540 |
| | 1033 | 1037 | 1039 | B7.0 | | | 540 |
| | 1150 | 1153 | 1155 | B5.0 | | | 540 |
| | 1348 | 1353 | 1356 | C1.4 | Sf | N05W83 | 537 |
| | 1941 | 2003 | 2022 | C3.7 | | | |
| | 2140 | 2144 | 2149 | C1.4 | | | 540 |

## *Region Summary*

| Date | Location ( ° Lat ° CMD) | Location Helio Lon | Sunspot Characteristics Area ($10^{-6}$ hemi) | Extent (helio) | Spot Class | Spot Count | Mag Class | Flares X-ray C | X-ray M | X-ray X | Optical S | Optical 1 | Optical 2 | Optical 3 | Optical 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Region 536* | | | | | | | | | | | | | | |
| 01 Jan | S11E73 | 078 | 0380 | 05 | Hkx | 001 | A | 2 | | | 1 | | | | |
| 02 Jan | S11E63 | 074 | 0770 | 11 | Eko | 003 | B | 3 | | | | | | | |
| 03 Jan | S12E51 | 073 | 0910 | 11 | Eko | 012 | B | 1 | | | 2 | | | | |
| 04 Jan | S10E38 | 074 | 0740 | 11 | Eki | 029 | B | 5 | | | 1 | | | | |
| 05 Jan | S11E25 | 074 | 0960 | 11 | Ekc | 035 | Bg | 1 | | | 1 | | | | |
| 06 Jan | S10E12 | 074 | 0980 | 11 | Ekc | 034 | Bgd | 2 | | | 1 | | | | |
| 07 Jan | S12W04 | 076 | 0800 | 14 | Ekc | 038 | Bgd | 2 | | | | | | | |
| 08 Jan | S11W16 | 075 | 0780 | 10 | Dkc | 055 | Bgd | | | | | | | | |
| 09 Jan | S12W28 | 074 | 0600 | 11 | Ekc | 049 | Bg | 2 | | | 1 | | | | |
| 10 Jan | S12W41 | 074 | 0550 | 11 | Ekc | 030 | Bg | 5 | | | 4 | 1 | | | |
| 11 Jan | S12W54 | 074 | 0480 | 11 | Ekc | 022 | Bg | 4 | | | 3 | | | | |
| 12 Jan | S12W68 | 074 | 0250 | 11 | Eki | 025 | Bg | 3 | | | 3 | | | | |
| 13 Jan | S12W81 | 074 | 0240 | 11 | Eao | 006 | Bg | 3 | | | 1 | | | | |
| | | | | | | | | 33 | 0 | 0 | 18 | 1 | 0 | 0 | 0 |

Crossed West Limb.
Absolute heliographic longitude: 076

## *Region Summary - continued.*

| Date | Location ( ° Lat ° CMD) | Helio Lon | Sunspot Characteristics Area ($10^{-6}$ hemi) | Extent (helio) | Spot Class | Spot Count | Mag Class | Flares X-ray C | M | X | Optical S | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Region 537* | | | | | | | | | | | | |
| 06 Jan | N04E76 | 010 | 0060 | 07 | Hax | 006 | A | 1 | 1 | | | | | | |
| 07 Jan | N05E64 | 008 | 0190 | 07 | Cso | 010 | B | | 2 | | 2 | | 1 | | |
| 08 Jan | N04E50 | 009 | 0210 | 07 | Dao | 019 | Bgd | 2 | 1 | | 3 | 1 | | | |
| 09 Jan | N05E37 | 009 | 0270 | 07 | Cko | 019 | Bgd | 2 | 2 | | 2 | 1 | 1 | | |
| 10 Jan | N05E24 | 009 | 0210 | 07 | Dkc | 016 | Bgd | | | | 1 | | | | |
| 11 Jan | N05E11 | 009 | 0210 | 07 | Dkc | 011 | Bgd | 2 | | | | | | | |
| 12 Jan | N05W03 | 009 | 0240 | 06 | Dkc | 016 | Bgd | | | | | | | | |
| 13 Jan | N05W16 | 009 | 0190 | 05 | Dac | 010 | Bgd | 1 | | | 1 | | | | |
| 14 Jan | N04W29 | 010 | 0190 | 03 | Hsx | 004 | Bgd | | | | | | | | |
| 15 Jan | N04W43 | 010 | 0180 | 05 | Ckc | 012 | Bgd | | | | | | | | |
| 16 Jan | N04W57 | 011 | 0160 | 04 | Dac | 010 | Bd | | | | 1 | | | | |
| 17 Jan | N04W70 | 011 | 0170 | 05 | Dao | 003 | B | 1 | | | 1 | | | | |
| 18 Jan | N04W83 | 010 | 0050 | 05 | Cao | 003 | B | 1 | | | 1 | | | | |
| | | | | | | | | 10 | 6 | 0 | 12 | 2 | 2 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 009

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Region 538* | | | | | | | | | | | | |
| 07 Jan | N07E04 | 068 | 0010 | 03 | Cro | 003 | B | | | | | | | | |
| 08 Jan | N05W04 | 063 | 0010 | 02 | Bxo | 002 | B | | | | | | | | |
| 09 Jan | N05W17 | 063 | | | | | | | | | | | | | |
| 10 Jan | N05W30 | 063 | | | | | | | | | | | | | |
| 11 Jan | N05W43 | 063 | | | | | | | | | | | | | |
| 12 Jan | N05W56 | 063 | | | | | | | | | | | | | |
| 13 Jan | N05W69 | 063 | | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.
Absolute heliographic longitude: 068

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Region 539* | | | | | | | | | | | | |
| 07 Jan | N09E29 | 043 | 0010 | 04 | Cro | 002 | B | | | | | | | | |
| 08 Jan | N09E15 | 044 | 0010 | 03 | Bxo | 002 | B | | | | | | | | |
| 09 Jan | N09E02 | 044 | | | | | | | | | | | | | |
| 10 Jan | N09W11 | 044 | | | | | | | | | | | | | |
| 11 Jan | N09W24 | 044 | | | | | | | | | | | | | |
| 12 Jan | N09W37 | 044 | | | | | | | | | | | | | |
| 13 Jan | N09W50 | 044 | | | | | | | | | | | | | |
| 14 Jan | N09W63 | 044 | | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Crossed West Limb.
Absolute heliographic longitude: 044

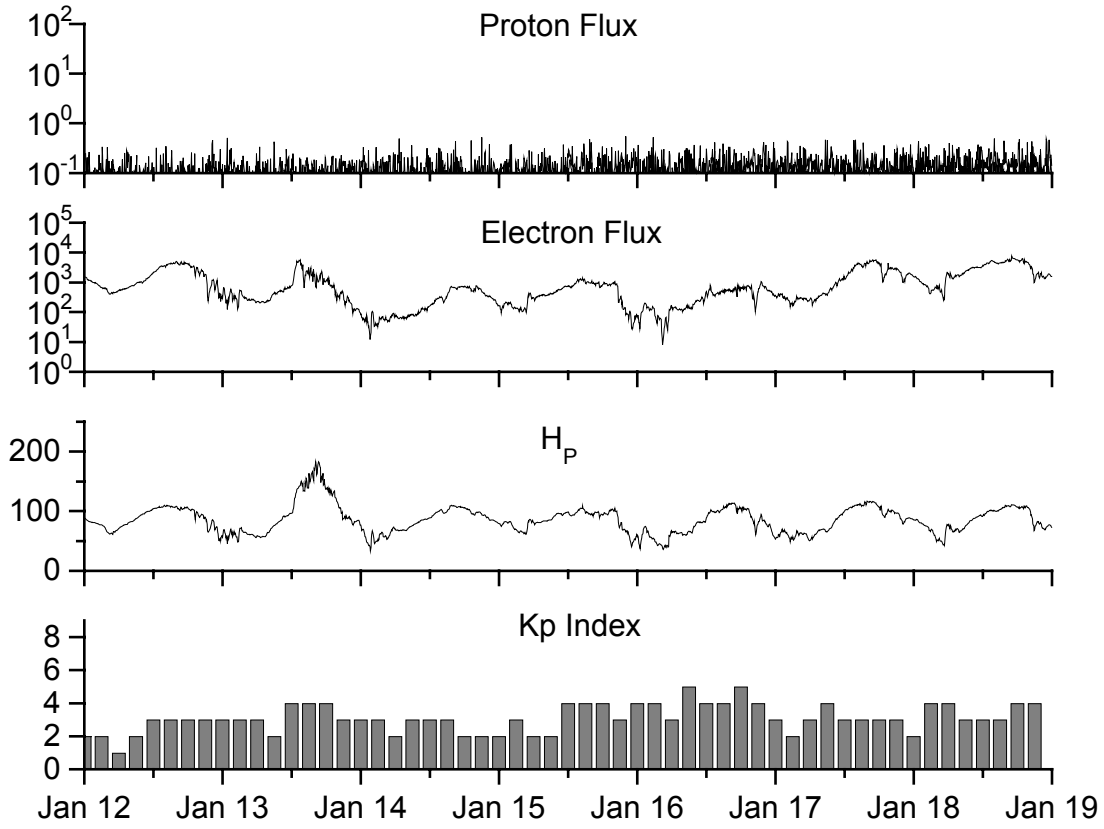
## *Region Summary - continued.*

| Date | Location ( ° Lat ° CMD) | Helio Lon | Sunspot Characteristics: Area ($10^{-6}$ hemi) | Extent (helio) | Spot Class | Spot Count | Mag Class | Flares: X-ray C | X-ray M | X-ray X | Optical S | Optical 1 | Optical 2 | Optical 3 | Optical 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Region 540* | | | | | | | | | | | | |
| 12 Jan | S11E76 | 290 | 0060 | 06 | Hhx | 006 | A | 1 | | | | | | | |
| 13 Jan | S11E68 | 285 | 0500 | 15 | Eao | 007 | B | | | | | | | | |
| 14 Jan | S13E59 | 286 | 0180 | 11 | Eao | 004 | B | | | | | | | | |
| 15 Jan | S13E43 | 284 | 0300 | 14 | Eso | 010 | B | 2 | | | | 1 | | | |
| 16 Jan | S13E28 | 286 | 0350 | 13 | Eao | 013 | B | | | | | | | | |
| 17 Jan | S14E15 | 286 | 0350 | 14 | Eso | 009 | B | 5 | 1 | | 3 | | | | |
| 18 Jan | S14E02 | 285 | 0330 | 16 | Fko | 036 | B | 1 | 1 | | 1 | 1 | | | |
| | | | | | | | | 9 | 2 | 0 | 4 | 2 | 0 | 0 | 0 |
| Still on Disk. | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: | | 285 | | | | | | | | | | | | | |
| | | | *Region 541* | | | | | | | | | | | | |
| 15 Jan | S09W03 | 330 | 0030 | 05 | Dso | 005 | B | | | | | | | | |
| 16 Jan | S09W18 | 332 | 0010 | 02 | Bxo | 003 | B | | | | | | | | |
| 17 Jan | S09W31 | 332 | 0060 | 03 | Dao | 003 | B | | | | | | | | |
| 18 Jan | S10W44 | 331 | 0010 | 02 | Bxo | 003 | B | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk. | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: | | 330 | | | | | | | | | | | | | |
| | | | *Region 542* | | | | | | | | | | | | |
| 16 Jan | N11E54 | 260 | 0060 | 03 | Cso | 002 | B | | | | | | | | |
| 17 Jan | N11E43 | 258 | 0030 | 01 | Hsx | 001 | A | | | | | | | | |
| 18 Jan | N11E30 | 258 | | | | | | | | | | | | | |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk. | | | | | | | | | | | | | | | |
| Absolute heliographic longitude: | | 258 | | | | | | | | | | | | | |

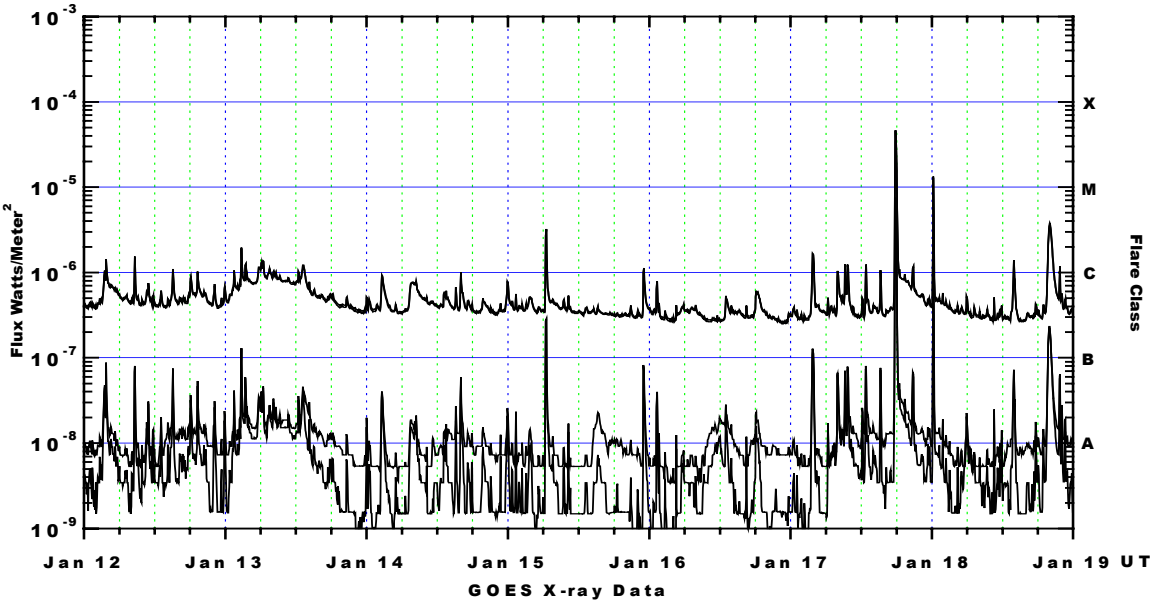
***Recent Solar Indices (preliminary)***
***of the observed monthly mean values***

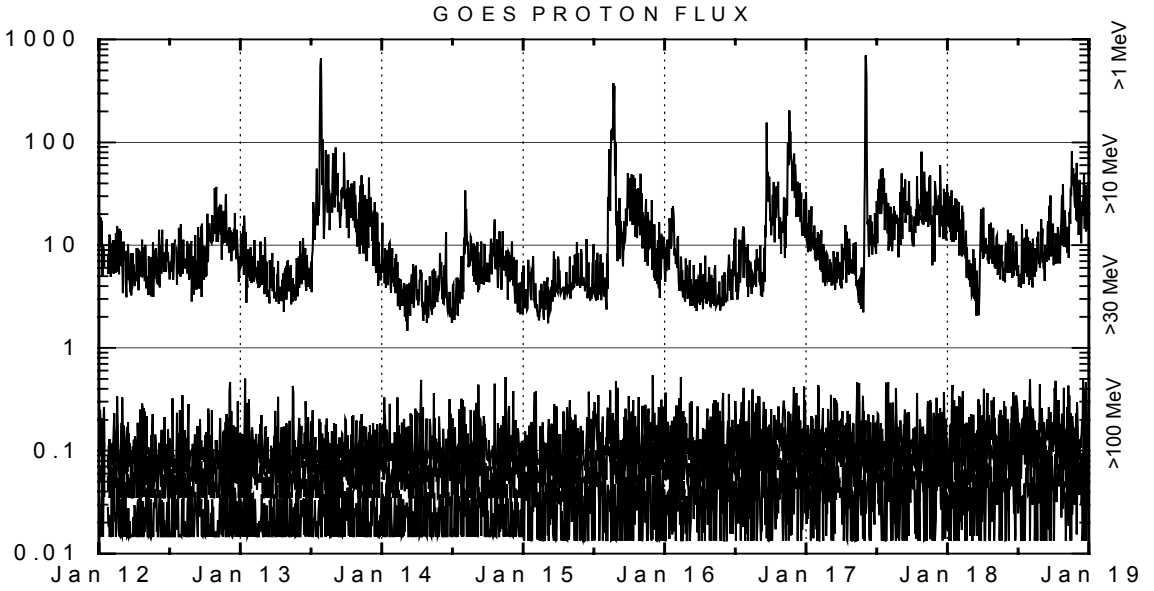
| | Sunspot Numbers | | | | | Radio Flux | | Geomagnetic | |
|---|---|---|---|---|---|---|---|---|---|
| | Observed values | | Ratio | Smooth values | | *Penticton | Smooth | Planetary | Smooth |
| Month | SWO | RI | RI/SWO | SWO | RI | 10.7 cm | Value | Ap | Value |
| | | | | **2002** | | | | | |
| January | 189.0 | 114.1 | 0.60 | 184.8 | 113.5 | 227.3 | 194.6 | 08 | 12.3 |
| February | 194.5 | 107.4 | 0.55 | 188.6 | 114.7 | 205.0 | 197.2 | 10 | 12.8 |
| March | 153.1 | 98.4 | 0.64 | 188.9 | 113.3 | 180.3 | 195.7 | 10 | 12.9 |
| April | 194.9 | 120.7 | 0.62 | 186.2 | 110.5 | 189.8 | 191.5 | 15 | 13.2 |
| May | 204.1 | 120.8 | 0.59 | 183.6 | 108.9 | 178.4 | 188.0 | 15 | 13.3 |
| June | 146.0 | 88.3 | 0.60 | 179.9 | 106.3 | 148.7 | 183.0 | 11 | 13.5 |
| July | 183.5 | 99.6 | 0.54 | 175.4 | 102.7 | 173.5 | 176.3 | 11 | 13.7 |
| August | 191.0 | 116.4 | 0.61 | 169.2 | 98.7 | 183.9 | 169.5 | 16 | 14.2 |
| September | 206.4 | 109.6 | 0.53 | 163.4 | 94.6 | 175.8 | 164.1 | 14 | 15.0 |
| October | 153.9 | 97.5 | 0.63 | 158.8 | 90.5 | 167.0 | 159.4 | 23 | 15.6 |
| November | 159.8 | 95.5 | 0.60 | 150.9 | 85.2 | 168.7 | 154.8 | 16 | 16.3 |
| December | 147.9 | 80.8 | 0.55 | 144.6 | 82.1 | 158.6 | 150.9 | 13 | 17.0 |
| | | | | **2003** | | | | | |
| January | 149.3 | 79.7 | 0.53 | 141.7 | 81.0 | 144.0 | 149.2 | 13 | 18.2 |
| February | 87.0 | 46.0 | 0.53 | 136.4 | 78.5 | 124.5 | 144.7 | 17 | 18.9 |
| March | 119.7 | 61.1 | 0.51 | 128.1 | 74.2 | 132.2 | 139.5 | 21 | 19.4 |
| April | 119.7 | 60.0 | 0.50 | 121.5 | 70.3 | 126.3 | 136.3 | 20 | 20.0 |
| May | 89.6 | 55.2 | 0.62 | 118.3 | 67.8 | 129.3 | 135.0 | 26 | 21.0 |
| June | 118.4 | 77.4 | 0.65 | 113.6 | 65.2 | 129.4 | 132.6 | 24 | 21.8 |
| July | 132.8 | 85.0 | 0.64 | | | 127.8 | | 20 | |
| August | 114.3 | 72.7 | 0.64 | | | 122.1 | | 23 | |
| September | 82.6 | 48.8 | 0.59 | | | 112.3 | | 19 | |
| October | 118.9 | 65.6 | 0.55 | | | 153.1 | | 32 | |
| November | 118.9 | 67.2 | 0.57 | | | 153.1 | | 31 | |
| December | 75.4 | 47.0 | 0.62 | | | 115.1 | | 17 | |

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *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 12 January 2004*
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm$^2$ –sec –sr) as measured by GOES-11 (W113) 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-12.
*Hp* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.
*Kp* plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) 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 Kp 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 Kp are " global " parameters that are applicable to a first order approximation over large areas. Hparallel 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/m$^{2)}$ as measured by GOES 12 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/cm$^2$ –sec-sr) as measured by GOES-11 (W113) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm$^2$-sec-sr) at greater than 10 MeV.