

Solar activity ranged from low to high levels. Region 720 (N13, L=178, class/area, Ekc/1630 on 16 January) remained the largest and most impressive group on the visible disk. During this period, the region produced twenty-five C-class, eight M-class, and three X-class flares; of these thirty-six flares, three were significant. The first of these significant events was an X3.8/sf proton flare at 17/0952 UTC. Associated with this event were very significant radio bursts including a 12,000 sfu Tenflare, Type II (1568 km/s) and Type IV radio sweeps, and a complex NW directed full halo CME. Some restructuring of the sunspots was apparent following the flare. The second significant event occurred at 19/0822 UTC when Region 720 produced an X1.3/2n with associated Type II (1093 km/s) and Type IV radio sweeps. Another NW directed CME was detected with this event. The last of the significant events was Region 720's largest during its life cycle. At 20/0701 UTC, the region produced a very energetic X7.1/2b proton flare. Accompanying this flare was a large 8,400 sfu Tenflare, and Type II (712 km/s) and Type IV radio sweeps. A single image from the LASCO C2 coronagraph showed an associated CME off the NW limb at 20/0654 UTC. Shortly after this observation, the LASCO coronagraph imagery underwent severe particle contamination, and the CME was no longer discernable. Region 720 rotated around the west limb on 22 January, but still managed to produce an M1.0 flare early on the 23rd.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began under the influence of a high speed coronal hole stream, with solar wind speed ranging between 550 – 600 km/s. Transient flow, likely associated with CME activity on 15 January, arrived at around 17/0715 UTC. Solar wind speed initially increased to just above 600 km/s, but by 17/1200 UTC, speed exceeded 800 km/s. Following the CME arrival, the IMF Bz rotated southward to near -20 nT. Bz was generally northward for the latter half of the 17th, but rotated between +/- 20 nT through the 18th. The solar energetic proton event, that began at 17/1215 UTC, contaminated the ACE SWEPAM instrument resulting in unusable solar wind density, speed, and temperature values. The contamination began at 17/1322 UTC and ended at 18/2241 UTC. Upon recovery, solar wind speed was over 970 km/s, but gradually declined to near 600 km/s by the end of the 19th. Total IMF measurements were elevated, but the Bz component stayed between a +/-5 nT range through the 19th. SWEPAM data were again contaminated beginning at 20/0700 UTC, following the onset of the intense high energy proton event associated with the X7.1 flare. The instrument recovered at 21/0402 UTC, with solar wind speed near 600 km/s and in gradual decline. A strong shock was observed at ACE at 21/1642 UTC. Solar wind speed rose quickly to a maximum of 987 km/s at 21/1926 UTC. Total field rapidly increased to 38 nT, with the Bz component turning sharply southward to over -25 nT. The period of southward Bz was short-lived as Bz was generally northward after 21/1830 UTC. This transient flow was likely associated with the X7.1 flare that occurred early on the 20th. Solar wind speed gradually declined following this strong shock and finished the period at just under 600 km/s.

The sequence of significant X-ray flares produced by Region 720 resulted in a series of ≥ 10 MeV and ≥ 100 MeV proton events. A summary of the entire progression of events follows: A ≥ 10 MeV proton enhancement began following the long duration M8.6 flare on 15 January; however, the 10 pfu event threshold was not exceeded during this enhancement. A ≥ 10 MeV proton event began on 16/0210 UTC following the X2.6 flare late on the 15th. The peak flux following this flare was 365 pfu at 16/1840 UTC. The ≥ 10 MeV protons decayed to 117 pfu by midday on 17 January when a stronger injection of protons occurred following the X3.8 flare and CME. This new intensification included protons at ≥ 100 MeV. This new infusion began at 17/1215 UTC (≥ 100 MeV) and 17/1240 UTC (≥ 10 MeV). The ≥ 100 MeV proton flux maxed at 28.1 pfu at 17/1700 UTC while the ≥ 10 MeV proton flux maxed at 5040 pfu at 17/1750 UTC. The ≥ 100 MeV event ended at 18/2205 UTC while the ≥ 10 MeV event decayed to about 19 pfu early on the 20th. The hardest and most energetic proton event of Cycle 23 occurred in association with the X7.1 flare on 20 January. Protons at both ≥ 10 MeV and ≥ 100 MeV energy levels rose rapidly. The ≥ 10 MeV protons peaked at 1860 pfu at 20/0810 UTC. The ≥ 100 MeV protons peaked at 652 pfu at 20/0710 UTC, which was the highest ≥ 100 MeV proton flux level observed since October 1989. An intense ground level event (GLE), the largest of Cycle 23, immediately followed this new infusion of highly energetic protons. The ≥ 100 MeV protons ended at 21/1845 UTC while the ≥ 10 MeV proton event ended at 22/1755 UTC.



The > 2 MeV electron flux at geosynchronous orbit was at high levels from 17 – 23 January.

The geomagnetic field ranged from quiet to severe storming. Elevated coronal hole flow produced active levels to start the period. The transient activity associated with multiple solar eruptions on the 15th, arrived early on 17 January. This began a three-day period of minor to severe geomagnetic storming. Predominantly minor storming with isolated major storming was observed at the lower to mid latitudes, while extended periods of major to severe storming occurred at higher latitudes. Quiet to active levels returned on 20 January, with isolated storm periods at high latitudes. The strong shock that arrived late on 21 January was followed by periods of major to severe storming at all latitudes. The most severe storm levels occurred during a short period of strong southward IMF Bz following the shock arrival. The storming was short-lived, as Bz turned northward within two hours of the shock arrival. Unsettled to minor storming was observed on the 22nd. Solar wind speed continued to decline through the end of the period. The geomagnetic field responded with quiet to active levels with isolated minor storm periods at high latitudes.

Space Weather Outlook 26 January - 21 February 2005

Solar activity is expected to be at very low to low levels through 05 February with a chance of M-class activity from 05 – 19 February due to the return of old Region 720 (N13, L=178).

A greater than 10 MeV proton event is not expected through early February. Thereafter, a proton event is possible following the return of old Region 720 on 05 February.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 26 January, 29 January to 03 February and 08 – 10 February.

The geomagnetic field is expected to range from quiet to minor storm levels. Coronal hole high speed wind streams are expected to produce unsettled to active with occasional minor storm periods on 28 January – 01 February and 07 – 08 February. Otherwise, expect quiet to unsettled conditions.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
17 January	138	107	1770	C1.5	2	1	1	5	0	1	0	0
18 January	124	109	1650	B7.1	7	2	0	7	2	1	0	0
19 January	133	66	1400	B6.8	4	3	1	5	1	2	0	0
20 January	123	61	1580	B8.7	5	0	1	4	0	1	1	0
21 January	114	69	1290	B6.2	9	2	0	2	0	0	0	0
22 January	102	60	1230	B3.0	5	0	0	0	0	0	0	0
23 January	96	40	230	B1.5	1	1	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
	17 January	6.2E+8	1.1E+8	6.7E+5		1.4E+7
18 January	5.5E+8	9.4E+7	3.8E+5		2.0E+8	
19 January	1.1E+8	8.2E+6	8.8E+3		4.4E+8	
20 January	1.4E+8	5.2E+7	6.1E+6		1.1E+9	
21 January	2.8E+8	1.2E+7	3.5E+5		9.4E+8	
22 January	2.8E+7	1.4E+6	2.6E+4		1.1E+7	
23 January	8.4E+6	2.2E+5	9.1E+3		5.2E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	17 January	27	3-2-2-5-5-5-4-3	114	4-4-4-8-8-8-6-4	63
18 January	35	6-4-5-4-4-4-3-4	136	6-5-8-7-8-8-5-5	72	6-5-7-5-6-6-4-5
19 January	31	5-5-5-4-5-2-2-3	106	4-4-7-9-7-6-2-4	62	6-6-6-7-6-4-3-4
20 January	10	0-1-1-2-4-4-2-2	24	2-2-1-2-5-6-3-4	12	2-1-1-2-4-4-3-3
21 January	30	3-1-2-1-2-6-6-5	92	2-2-4-5-4-8-8-7	61	3-1-3-2-2-8-8-6
22 January	23	5-6-2-2-2-2-3-3	41	5-5-5-5-5-5-4-3	28	5-6-3-3-3-3-4-3
23 January	12	4-3-2-2-2-3-2-2	24	3-2-4-4-5-5-3-2	17	4-4-3-3-3-4-3-2



Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
17 Jan 0010	1 – 245 MHz Radio Burst	16 Jan
17 Jan 0010	1 – 245 MHz Radio Noise Storm	16 Jan
17 Jan 0102	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	16 Jan 0210
17 Jan 0131	ALERT: Geomagnetic K= 4	17 Jan 0125
17 Jan 0732	WARNING: Geomagnetic Sudden Impulse	17 Jan 0733 - 0830
17 Jan 0910	ALERT: X-Ray Flux > M5	17 Jan 0908
17 Jan 0924	ALERT: Type IV Radio Emission	17 Jan 0900
17 Jan 0933	ALERT: Type II Radio Emission	17 Jan 0916
17 Jan 1017	SUMMARY: X-ray Event > X1	17 Jan 0702
17 Jan 1116	SUMMARY: 10cm Radio Burst	17 Jan 0804
17 Jan 1137	WARNING: Geomagnetic K= 5	17 Jan 1137 - 1500
17 Jan 1143	ALERT: Geomagnetic K= 5	17 Jan 1141
17 Jan 1152	ALERT: Geomagnetic K= 6	17 Jan 1151
17 Jan 1221	WARNING: Proton 100MeV Integral Flux > 1pfu	17 Jan 1222 - 1500
17 Jan 1225	WARNING: Geomagnetic K= 6	17 Jan 1225 - 1500
17 Jan 1240	ALERT: Proton Event 100MeV Integral Flux > 1pfu	17 Jan 1215
17 Jan 1342	ALERT: Geomagnetic K= 6	17 Jan 1340
17 Jan 1427	WARNING: Geomagnetic K≥ 7	17 Jan 1427 -1800
17 Jan 1436	ALERT: Proton Event 10MeV Integral Flux > 1000pfu	17 Jan 1410
17 Jan 1453	ALERT: Type II Radio Emission	17 Jan 0944
17 Jan 1644	ALERT: Geomagnetic K= 6	17 Jan 1642
17 Jan 1755	EXT WARNING: Geomagnetic K= 6	17 Jan 1225 - 2359
17 Jan 2216	WATCH: Geomagnetic A≥ 30	20 Jan
17 Jan 2218	WATCH: Geomagnetic A 50	19 Jan
17 Jan 2220	WATCH: Geomagnetic A≥ 50	18 Jan
17 Jan 2222	EXT WARNING: Proton 100MeV Integral Flux > 1pfu	17 Jan 1222 -18 Jan 2359
17 Jan 2225	EXT WARNING: Geomagnetic K= 6	17 Jan 1225 -18 Jan 2359
17 Jan 2228	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	15 Jan 0900 -18 Jan 2359
18 Jan 0011	1 – 245 MHz Radio Burst	17 Jan
18 Jan 0011	1 – 245 MHz Radio Noise Storm	17 Jan
18 Jan 0103	CONT ALERT: Proton Event 10MeV Integral Flux > 1000pfu	17 Jan 1410
18 Jan 0109	CONT ALERT: Proton Event 100MeV Integral Flux > 1pfu	17 Jan 1215
18 Jan 0704	ALERT: Type IV Radio Emission	18 Jan 0633
18 Jan 0715	ALERT: Geomagnetic K-index of 6	18 Jan 0713
18 Jan 1354	ALERT: Geomagnetic K-index of 6	18 Jan 1354
18 Jan 1748	ALERT: Geomagnetic K-index of 6	18 Jan 1736
18 Jan 1845	ALERT: Electron 2MeV Integral Flux > 1000pfu	18 Jan 1525
18 Jan 2209	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	15 Jan 0900 - 19Jan 2359
18 Jan 2220	SUMMARY: Proton Event 10MeV Integral Flux > 1000pfu	17 Jan 1420
18 Jan 2333	EXT WARNING: Geomagnetic K= 6	17 Jan 1225 -19 Jan 2359
18 Jan 0012	1 – 245 MHz Radio Burst	18 Jan
18 Jan 0012	1 – 245 MHz Radio Noise Storm	18 Jan
19 Jan 0107	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	16 Jan 0210
19 Jan 0506	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	19 Jan 0500
19 Jan 0518	SUMMARY: 10cm Radio Burst	19 Jan 0510
19 Jan 0527	ALERT: Geomagnetic K=6	19 Jan 0520
19 Jan 0731	ALERT: X-Ray Flux > M5	19 Jan 0730
19 Jan 0810	SUMMARY: X-ray Event exceeded M5	19 Jan 0658
19 Jan 0815	ALERT: X-Ray Flux > M5	19 Jan 0810
19 Jan 0836	ALERT: Type II Radio Emission	19 Jan 0814
19 Jan 0840	ALERT: Type IV Radio Emission	19 Jan 0812
19 Jan 0844	SUMMARY: X-ray Event > X1	19 Jan 0803

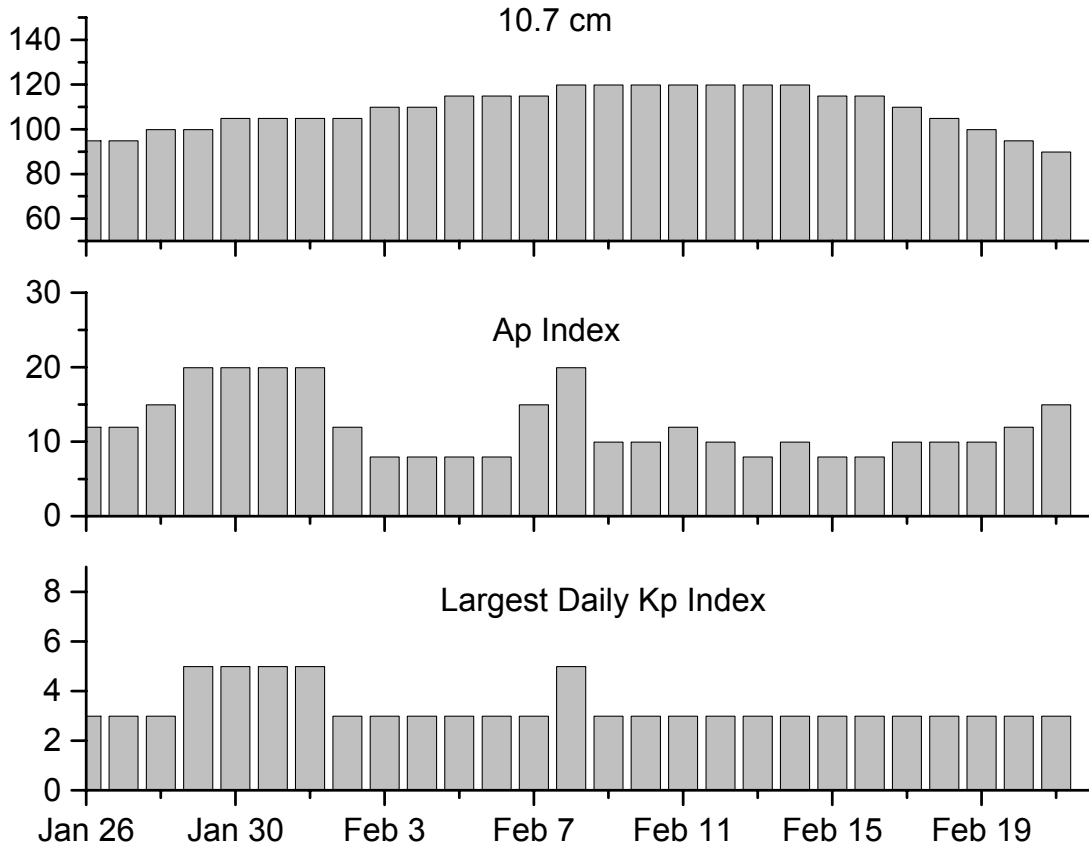


Alerts and Warnings Issued – continued.

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
19 Jan 1052	ALERT: Geomagnetic K= 6	19 Jan 1051
19 Jan 1108	SUMMARY: 10cm Radio Burst	19 Jan 0741
19 Jan 1359	SUMMARY: 10cm Radio Burst	19 Jan 1033
19 Jan 1535	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	17 Jan 1215
19 Jan 2003	EXTENDED WARNING: Geomagnetic K = 6	17 Jan 1225 –20 Jan 2359
19 Jan 2010	WATCH: Geomagnetic A ≥ 20	21 Jan
19 Jan 2013	WATCH: Geomagnetic A ≥ 20	22 Jan
19 Jan 2300	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	15 Jan 0900 – 20 Jan 2359
20 Jan 0012	5 – 245 MHz Radio Bursts	19 Jan
20 Jan 0105	CONT ALERT: Proton Event 100MeV Integral Flux > 1pfu	17 Jan 1215
20 Jan 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	20 Jan 0500
20 Jan 0646	ALERT: X-Ray Flux > M5	20 Jan 0644
20 Jan 0658	ALERT: Type II Radio Emission	20 Jan 0644
20 Jan 0702	ALERT: Proton Event 10MeV Integral Flux > 100pfu	20 Jan 0701
20 Jan 0704	ALERT: Proton Event 100MeV Integral Flux > 1pfu	20 Jan 0701
20 Jan 0712	ALERT: Proton Event 10MeV Integral Flux > 1000pfu	20 Jan 0705
20 Jan 0721	ALERT: Type IV Radio Emission	20 Jan 0643
20 Jan 0730	ALERT: Proton Event 10MeV Integral Flux > 1000pfu	20 Jan 0730
20 Jan 0810	SUMMARY: X-ray Event > X1	20 Jan 0636
20 Jan 0830	WARNING: Proton 10MeV Integral Flux > 10pfu	20 Jan 0830 -2359
20 Jan 0906	SUMMARY: 10cm Radio Burst	20 Jan 0635
20 Jan 1320	ALERT: Type IV Radio Emission	20 Jan 1232
20 Jan 1845	WARNING: Proton 100MeV Integral Flux > 1pfu	20 Jan 1845 -2359
20 Jan 2039	SUMMARY: Proton Event 10MeV Integral Flux > 1000pfu	20 Jan 0705 -1440
21 Jan 0518	ALERT: Electron 2MeV Integral Flux > 1000pfu	21 Jan 0500
21 Jan 0649	EXT WARNING: Proton 100MeV Integral Flux > 1pfu	20 Jan 1845 -21 Jan 1800
21 Jan 0654	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	20 Jan 0830 - 21 Jan 2359
21 Jan 1654	WARNING: Geomagnetic Sudden Impulse expected	21 Jan 1710 -21 Jan 1725
21 Jan 1704	WARNING: Geomagnetic K = 4	21 Jan 1710 - 2359
21 Jan 1715	SUMMARY: Geomagnetic Sudden Impulse	21 Jan 1711
21 Jan 1718	ALERT: Geomagnetic K = 4	21 Jan 1711
21 Jan 1720	WARNING: Geomagnetic K = 5	21 Jan 1720 -2359
21 Jan 1727	ALERT: Geomagnetic K = 5	21 Jan 1725
21 Jan 1732	ALERT: Geomagnetic K = 6	21 Jan 1730
21 Jan 1742	WARNING: Geomagnetic K ≥ 7	21 Jan 1742 -2359
21 Jan 1751	ALERT: Geomagnetic K = 7	21 Jan 1741
21 Jan 1834	ALERT: Geomagnetic K = 6	21 Jan 1832
21 Jan 1840	ALERT: Geomagnetic K = 7	21 Jan 1839
21 Jan 2202	WATCH: Geomagnetic A ≥ 30	22 Jan
21 Jan 2204	WATCH: Geomagnetic A ≥ 20	23 Jan
21 Jan 2322	SUMMARY: Proton Event 10MeV Integral Flux > 100pfu	20 Jan 0705 -21 Jan 1750
21 Jan 2326	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	20 Jan 0650 - 21 Jan 1845
21 Jan 2330	EXT WARNING: Geomagnetic K= 5	21 Jan 1720 - 22 Jan 1500
21 Jan 2354	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	20 Jan 0830 - 22 Jan 2359
22 Jan 0056	CONT ALERT: Proton Event 10MeV Integral Flux > 1000pfu	20 Jan 0730
22 Jan 0545	ALERT: Geomagnetic K-index of 6	22 Jan 0544
22 Jan 2343	SUMMARY: Proton Event 10MeV Integral Flux > 10pfu	16 Jan 0210 -22 Jan 1755
22 Jan 2354	ALERT: Electron 2MeV Integral Flux > 1000pfu	22 Jan 2330
23 Jan 0245	ALERT: Geomagnetic K= 4	23 Jan 0244
23 Jan 1732	WARNING: Geomagnetic K= 4	23 Jan 1732 - 2359
23 Jan 1736	ALERT: Geomagnetic K= 4	23 Jan 1735
23 Jan 2335	EXT WARNING: Geomagnetic K= 4	23 Jan 1732 - 1500



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
26 Jan	95	12	3	09 Feb	120	10	3
27	95	12	3	10	120	10	3
28	100	15	3	11	120	12	3
29	100	20	5	12	120	10	3
30	105	20	5	13	120	8	3
31	105	20	5	14	120	10	3
01 Feb	105	20	5	15	115	8	3
02	105	12	3	16	115	8	3
03	110	8	3	17	110	10	3
04	110	8	3	18	105	10	3
05	115	8	3	19	100	10	3
06	115	8	3	20	95	12	3
07	115	15	3	21	90	15	3
08	120	20	5				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	Max	Class	Flux	Imp/	Location	Rgn	Radio Flux		Intensity	
						Brtns	Lat CMD		245	2695	II	IV
17 Jan 05	0310	0321	0332	M2.6	.022			720				
17 Jan 05	0659	0952	1007	X3.8	.840			720				
18 Jan 05	1123	1132	1159	M1.6	.023			720				
18 Jan 05	1538	1551	1559	M4.6	.034	2n	N14W40	720	100			
19 Jan 05	0658	0731	0755	M6.7	.077	2n	N19W47	720	5000			
19 Jan 05	0803	0822	0840	X1.3	.220			720	2		2	
19 Jan 05	1019	1024	1029	M2.7	.013	1n	N18W47	720				
19 Jan 05	1532	1540	1548	M1.6	.010	2f	N13W50	720				
20 Jan 05	0636	0701	0726	X7.1	1.300	2b	N12W58	720	8400		3	2
21 Jan 05	1010	1016	1019	M1.7	.004			720	51			
21 Jan 05	1347	1355	1410	M1.2	.011			719				
23 Jan 05	0128	0151	0201	M1.0	.009			720				

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn
	Begin	Max	End			Location Lat CMD	
17 January	0244	0259	0307	C3.9			720
	0310	0321	0332	M2.6			720
	0606	0610	0615	C3.9			720
	0659	0952	1007	X3.8			720
	B0906	U0950	A1011		2f	N13W23	720
	B1012	U1032	A1043		Sf	N13W22	720
	1946	1955	2010		Sf	N14W28	720
	2014	2018	2026		Sf	N16W27	720
	2052	2054	2058		Sf	N13W26	720
	2214	2215	2217		Sf	N10W26	720
18 January	0039	0041	0059	C6.0	Sf	N13W29	720
	0209	0210	0221	C3.2	Sf	N17W28	720
	0435	0435	0438		Sf	N16W34	720
	0541	0546	0549	C2.0			720
	0552	0615	0624	C6.1			720
	B0748	0752	A0752	C2.4	1f	N14W39	720
	1123	1132	1159	M1.6			720
	1540	1549	1636	M4.6	2n	N14W40	720
	1748	1749	1756		Sf	N14W41	720
	1830	1900	1938	C4.2	1f	N18W38	720
1843	1848	1852	C2.1			720	
1940	2127	2247		Sf	N15W43	720	
2247	2257	2309		Sf	N13W41	720	
2316	2324	2337		Sf	N17W43	720	
19 January	0310	0324	0337	C1.8			720
	0444	0448	0452	C1.9			
	0514	0527	0541	C7.2	Sf	N12W44	720



Flare List – continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
19 January	0726	0813	0956	M6.7	2n	N19W47	720
	0803	0822	0840	X1.3			720
	0956	0956	1004		Sf	N18W47	720
	1004	1005	1013		Sf	N18W47	720
	1015	1023	A1042	M2.7	1n	N18W47	720
	1539	1539	1539	M1.6	2f	N13W50	720
	1556	1607	1618		Sf	N13W60	720
	2322	2325	2332	C5.3	Sf	S01E55	723
20 January	0037	0047	0056	C1.6			720
	0325	0333	0347	C4.8	Sf	N11W58	720
	0641	0646	0854	X7.1	2b	N12W58	720
	B0727	0721	A0000		3n	N14W62	
	0855	0858	0918		Sf	N14W57	720
	0919	0922	0933		Sf	N14W57	720
	1612	1646	1707	C8.0	Sf	N19W64	720
	1813	1816	1819	C3.6			720
21 January	2147	2153	2156	C4.5			720
	0022	0023	0028	C5.8	Sf	N15W67	720
	0423	0425	0432	C6.3	Sf	N19W69	720
	0630	0636	0638	C1.6			720
	0641	0646	0649	C1.8			720
	0821	0835	0840	C1.3			719
	0905	0912	0918	C1.7			719
	1010	1016	1019	M1.7			720
	1207	1212	1216	C1.3			719
	1347	1355	1410	M1.2			719
	1705	1711	1714	C1.6			720
	2043	2049	2055	C1.6			720
22 January	0414	0432	0447	C3.1			719
	0608	0612	0615	B4.7			725
	0715	0719	0723	B5.1			720
	0800	0803	0805	B8.5			720
	1203	1207	1213	B7.3			720
	1235	1245	1247	C1.3			720
	1724	1728	1734	B8.9			725
	2045	2048	2050	B6.6			720
	2050	2053	2055	C1.6			
	2056	2100	2105	C1.4			720
23 January	2108	2113	2118	C1.9			720
	0128	0151	0201	M1.0			720
	0443	0505	0523	C4.5			720



Region Summary

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 718</i>																		
07 Jan	S09E78	204	0060	02	Hax	001	A											
08 Jan	S08E67	202	0090	03	Cao	002	B											
09 Jan	S08E54	202	0090	03	Dao	003	B											1
10 Jan	S08E44	198	0100	03	Dao	003	B											
11 Jan	S06E32	197	0070	05	Dao	002	B	2										
12 Jan	S07E19	197	0180	13	Eao	016	B											
13 Jan	S07E07	196	0160	16	Fko	019	B	8					6					
14 Jan	S05W06	196	0250	18	Fao	022	B	3	1				1					
15 Jan	S07W21	197	0360	17	Fki	026	Bg		1				4					
16 Jan	S07W34	197	0310	17	Fai	019	Bg											
17 Jan	S07W47	197	0240	17	Fai	017	B											
18 Jan	S07W64	200	0140	16	Fao	010	B											
19 Jan	S06W76	199	0110	10	Dao	003	B											
20 Jan	S07W88	198	0100	06	Cso	003	B											
								13	2	0	11	1	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude:196

<i>Region 720</i>																		
10 Jan	N09E65	177	0010	06	Bxo	003	B											
11 Jan	N13E52	177	0050	05	Cao	003	B											
12 Jan	N13E37	179	0420	08	Dkc	022	B						2					
13 Jan	N13E24	179	1080	09	Dkc	038	Bd	1										
14 Jan	N13E10	180	1540	10	Dkc	023	Bd	23	3			8	2	1				
15 Jan	N13W03	179	1620	10	Dkc	054	Bd	11	5	2	19	3	2	1				
16 Jan	N13W15	178	1630	15	Ekc	037	Bd	5	1		7	1						
17 Jan	N13W30	180	1460	14	Ekc	048	Bd	2	1	1	5		1					
18 Jan	N13W44	180	1400	14	Ekc	044	Bg	7	2		7	2	1					
19 Jan	N14W56	179	1220	13	Ekc	031	Bd	2	3	1	4	1	2					
20 Jan	N14W70	180	1400	15	Ekc	027	Bgd	5		1	4		1					
21 Jan	N13W83	179	1090	15	Ekc	017	Bgd	6	1		2							
22 Jan	N11W93	176	0900	06	Dkc	006	Bgd	3										
								65	16	5	58	9	8	1	0			

Crossed West Limb.

Absolute heliographic longitude:179



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 721

16 Jan	S03E14	149	0020	04	Cso	002	B										
17 Jan	S03E02	148	0000	01	Axx	001	A										
18 Jan	S03W11	148															
19 Jan	S03W24	148															
20 Jan	S03W37	148															
21 Jan	S03W50	148															
22 Jan	S03W63	148															
23 Jan	S03W76	148															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:148

Region 722

16 Jan	N19E04	159	0000	01	Axx	001	A										
17 Jan	N19W09	159															
18 Jan	N19W25	161	0000	01	Axx	001	A										
19 Jan	N19W38	161															
20 Jan	N19W51	161															
21 Jan	N19W64	161															
22 Jan	N19W77	161															
23 Jan	N19W90	161															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:159

Region 723

17 Jan	N06E77	073	0070	02	Hax	001	A										
18 Jan	N07E63	073	0100	02	Hsx	001	A										
19 Jan	N06E52	071	0070	09	Cao	002	B	1			1						
20 Jan	N06E35	075	0080	02	Hsx	001	A										
21 Jan	N06E22	074	0070	02	Hsx	001	A										
22 Jan	N07E07	076	0120	03	Cso	003	B										
23 Jan	N06W04	074	0070	02	Hsx	001	A										
										1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 074



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 724

18 Jan	S12W07	143	0010	03	Cso	003	B											
19 Jan	S12W20	143																
20 Jan	S12W33	143																
21 Jan	S12W46	143																
22 Jan	S12W59	143																
23 Jan	S12W72	143																

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 143

Region 725

21 Jan	S04W36	132	0090	05	Dsi	008	B											
22 Jan	S04W49	132	0190	05	Dsi	009	Bg											
23 Jan	S03W64	134	0150	06	Cao	007	B											

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 132

Region 726

21 Jan	S02E27	069	0040	04	Cso	003	B											
22 Jan	S01E14	069	0020	03	Cro	002	B											
23 Jan	S01W02	072	0010	01	Axx	002	A											

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 072

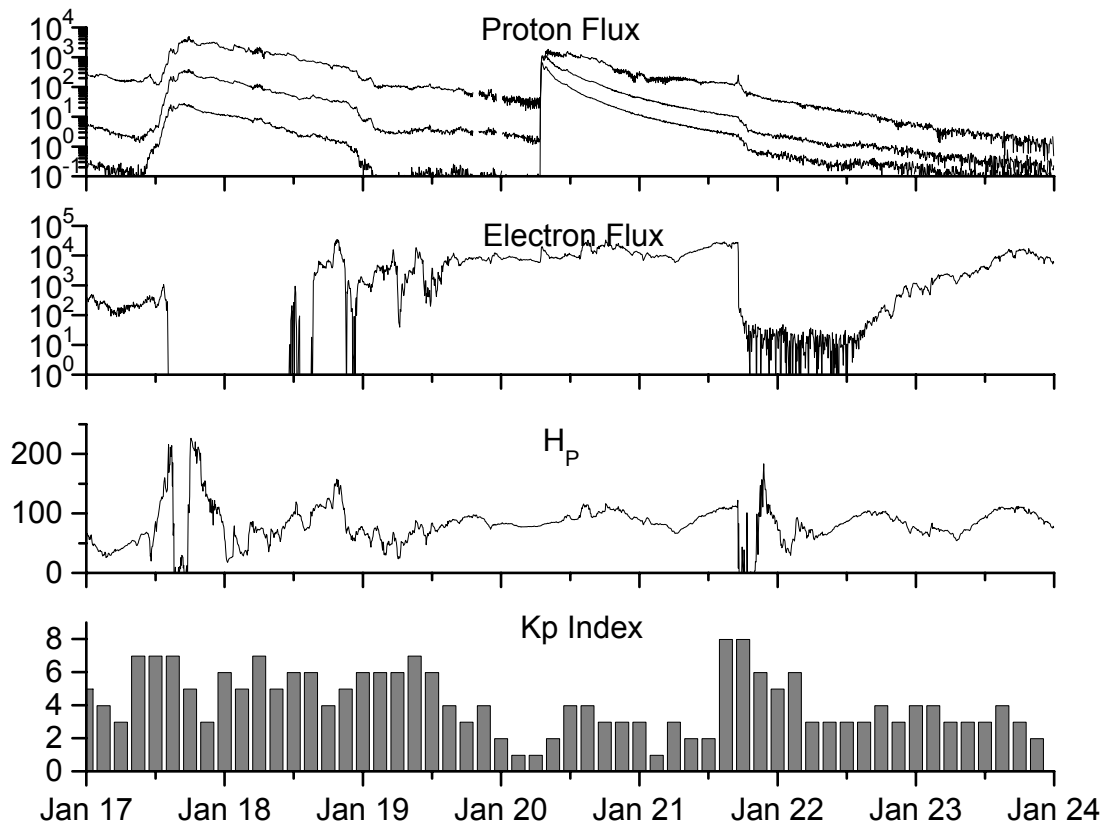


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
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	135.0	20	20.1
May	89.6	55.2	0.62	118.3	67.8	129.3	133.1	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	130.2	24	21.5
July	132.8	85.0	0.64	106.9	62.0	127.8	127.2	19	22.0
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
2004									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58			118.5		23	
August	69.5	40.9	0.59			110.1		11	
September	50.0	27.7	0.55			103.1		10	
October	77.9	48.4	0.62			105.7		9	
November	70.5	43.7	0.62			113.2		26	
December	34.7	17.9	0.52			94.6		11	

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 17 January 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W107) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

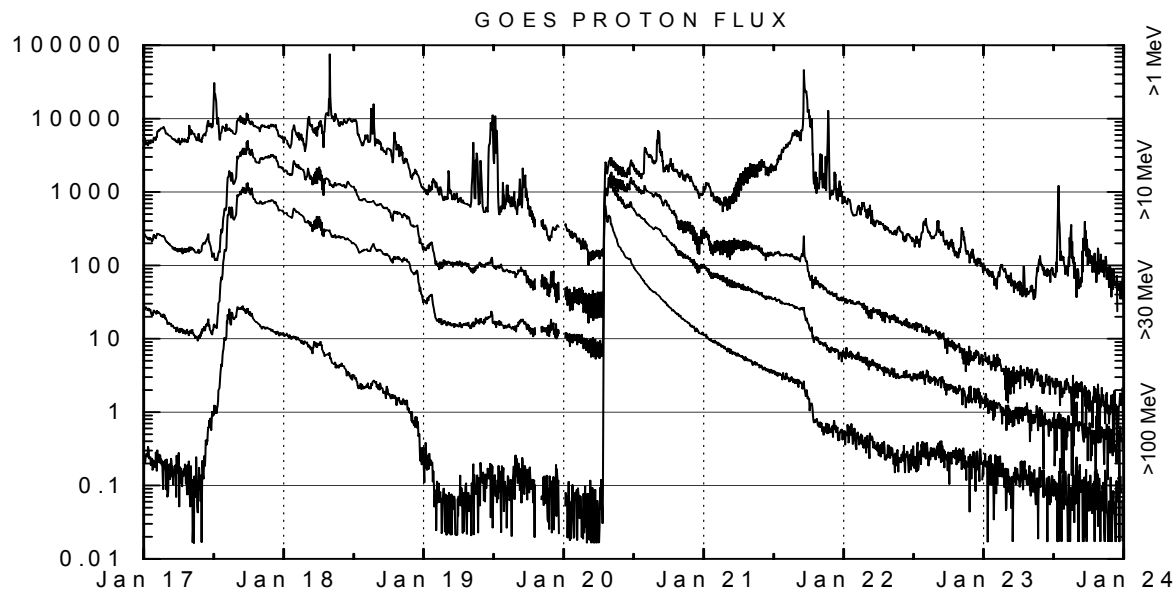
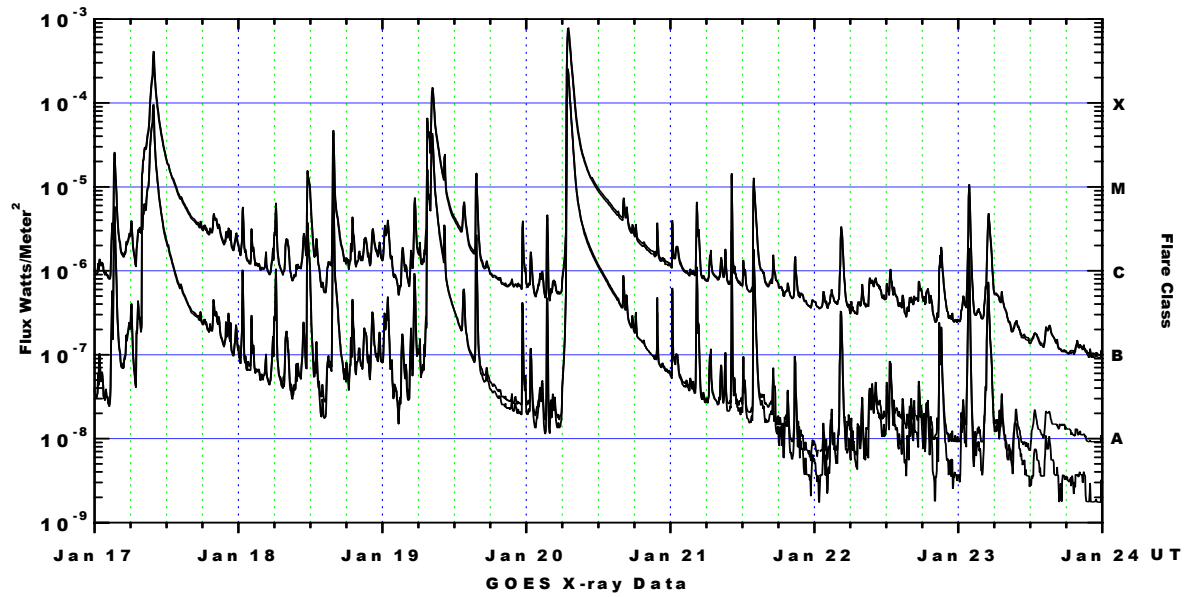
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p 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.

K_p 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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 12 (W75) and GOES 10 (W135) 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-11 (W107) 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.

