

## **Space Weather Highlights** **20 May - 26 May 2002**

**SWO PRF 1395**  
**28 May 2002**

Solar activity ranged from low to high levels. Activity was high on 20 May due to two impulsive major flares from Region 9961 (S22, L = 331, class/area Eai/480 on 20 May): an M5 at 20/1053 UTC and an X2/2n at 20/1527 UTC. Region 9961 produced C-class subflares during the rest of the period. It began to gradually decay on 24 May, though a magnetic delta persisted within its intermediate spots until 25 May. Activity was moderate on 21 and 24 May with isolated, lesser M-class flares from Regions 9960 and 9963. Region 9960 (N14, L = 347, class/area Dac/140 on 21 May) also produced C-class subflares during the period. It contained a delta within its trailer spots until 25 May, then began to decay and simplify. Region 9963 (N15, L = 316, class/area Dho/420 on 23 May) was stable in terms of size and complexity through most of the period, but showed minor spot growth on the last day of the period. The highlight of the period was a large filament eruption from the southwest quadrant on 22 May. The eruption was associated with a long-duration C5 parallel-ribbon flare at 22/0354 UTC, a fast full-halo CME (plane of sky velocity approx. 1500 km/sec), and a >10 MeV proton event. Region 9957 (N10, L = 010, class/area Ekc/830 on 19 May) produced isolated C-class subflares during the period. It gradually decayed during the period, but was of interest due to delta magnetic configurations within its northern and southern spot clusters.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. A relatively weak CME passage occurred on 21 – 22 May associated with enhanced velocities (peaks to around 500 km/sec). Two CME passages occurred on 23 May. The first shock passed ACE at around 23/1000 UTC as solar wind speeds increased from 400 to 600 km/sec. IMF Bz turned strongly southward following the shock with maximum southerly deflections to minus 43 nT (GSM) at around 23/1130 UTC. The second shock passed the spacecraft at approximately 23/1500 UTC, which boosted wind speeds to near 1000 km/sec for a short period. CME effects subsided late on 23 May. A weak high-speed stream associated with a recurrent coronal hole was observed on 25 May associated with a brief enhancement of solar wind velocities (peaks in the 500 to 550 km/sec range).

A greater than 10 MeV proton event followed the filament eruption of 22 May. It began at 22/1755 UTC, reached a maximum of 820 pfu at 23/1055 UTC, and ended at 24/1455 UTC. Greater than 10 MeV flux levels returned to background levels on 25 May.

Greater than 2 MeV electron fluxes at geo-synchronous orbit were at normal to moderate levels.

Geomagnetic field activity was at mostly quiet to unsettled levels through 22 May. Activity increased to active to severe storm levels on 23 May following a sudden storm commencement at 1051 UTC (87 nT, Boulder USGS magnetometer). Severe storm levels occurred during 23/1200 – 1800 UTC. This storm was associated with the filament eruption and halo CME on 22 May. The storm ended late on 23 May. Activity was at mostly quiet levels for the rest of the period.

## **Space Weather Outlook** **29 May - 24 June 2002**

Solar activity is expected to be at low to moderate levels during the period. Isolated low-level M-class flares are likely. There is a slight chance for isolated major flare activity during the period.

There will be a slight chance for a proton event during the period.

Greater than 2 MeV electron fluxes at geo-synchronous orbit are expected to be at normal to moderate levels for most of the period.

Quiet to unsettled geomagnetic field levels are expected for most of the period. However, active conditions are possible around 23 June.



### Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
20 May	171	171	2140	C1.3	6	2	1	9	1	1	0	0
21 May	186	185	1980	B9.3	5	1	0	5	1	1	0	0
22 May	181	217	1870	C4.7	4	0	0	4	0	0	0	0
23 May	180	229	1450	B5.8	2	0	0	2	0	0	0	0
24 May	189	242	1240	B5.6	6	1	0	7	0	0	0	0
25 May	183	221	1200	B6.2	3	0	0	9	0	0	0	0
26 May	183	232	1400	B8.4	8	0	0	8	0	0	0	0

### Daily Particle Data

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
	20 May	1.9E+5	1.1E+4	2.1E+3		8.9E+5
21 May	2.4E+5	1.1E+4	2.1E+3		1.1E+6	
22 May	1.2E+7	1.0E+6	2.5E+3		2.3E+6	
23 May	2.6E+8	6.8E+6	2.8E+3		1.2E+7	
24 May	9.5E+6	9.6E+5	2.5E+3		9.5E+5	
25 May	1.1E+6	5.4E+4	2.9E+3		1.7E+6	
26 May	7.4E+5	3.0E+4	2.4E+3		2.1E+6	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 May	8	1-3-2-3-1-2-2-2	11	1-3-2-3-3-4-3-3	14
21 May	12	3-1-3-2-2-2-3-4	*	*_*_*_*_*_*_*_*	14	3-2-4-2-3-3-3-4
22 May	10	2-2-3-3-3-2-2-2	*	*_*_*_*_*_*_*_*	14	2-2-3-4-3-3-3-3
23 May	52	3-4-2-5-7-7-4-3	*	*_*_*_*_*_*_*_*	54	3-3-2-5-7-7-5-3
24 May	3	2-0-1-0-2-1-1-1	*	*_*_*_*_*_*_*_*	7	2-1-1-2-2-3-3-2
25 May	3	1-0-0-1-2-2-1-1	*	*_*_*_*_*_*_*_*	6	2-1-1-2-2-3-2-1
26 May	9	1-1-2-2-2-2-2-4	*	*_*_*_*_*_*_*_*	10	2-1-2-2-2-3-3-4

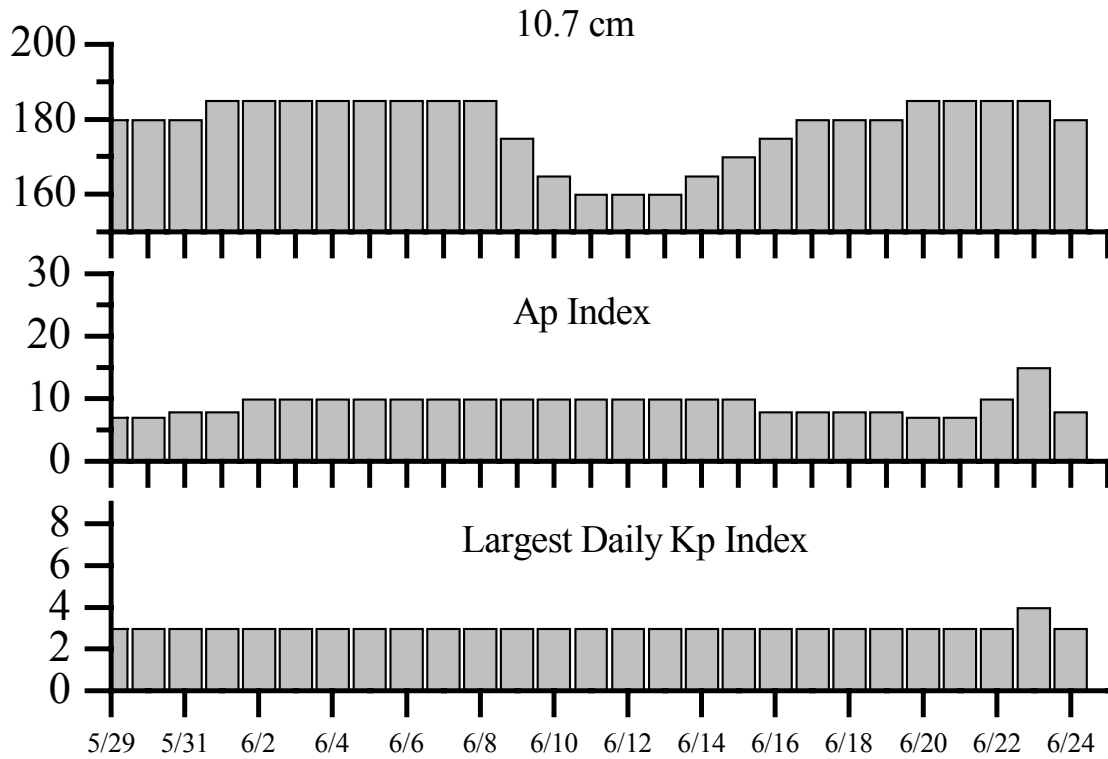


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
20 May 0023	1- 245 MHz Radio Bursts	19 May
20 May 0023	1 - 245 MHz Radio Noise Storms	19 May
20 May 347	SUMMARY: Geomagnetic Sudden Impulse	20 May 0342
20 May 1054	ALERT: X-Ray Flux > M5	20 May 1053
20 May 1107	SUMMARY: X-ray Event > M5	20 May 1053
20 May 1529	ALERT: X-Ray Flux > M5	20 May 1524
20 May 1537	SUMMARY: X-ray Event > X1	20 May 1527
20 May 1745	ALERT: Geomagnetic K= 4	20 May 1745
20 May 1821	SUMMARY: 10cm Radio Burst	20 May 1525
21 May 0040	4- 245 MHz Radio Bursts	20 May
21 May 2146	ALERT: Type II Radio Emission	21 May 2122
21 May 2155	WARNING: Geomagnetic Sudden Impulse	21 May 2200 - 2210
21 May 2212	SUMMARY: Geomagnetic Sudden Impulse	21 May 2205
21 May 2327	ALERT: Geomagnetic K=4	21 May 2325
22 May 0104	1- 245 MHz Radio Burst	21 May
22 May 1713	WARNING: Proton 10MeV Integral Flux > 10pfu	22 May 1715 - 2359
22 May 1810	ALERT: Proton Event 10MeV Integral Flux >10pfu	22 May 1755
22 May 1841	WATCH: Geomagnetic A $\geq$ 20	24 May
22 May 2347	EXT WARNING: Proton 10MeV Int. Flux > 10pfu	22/1715-24/0100 May
23 May 0037	1- 245 MHz Radio Burst	22 May
23 May 022	CONT ALERT: Proton Event 10MeV Int. Flux > 10pfu	22 May 1755
23 May 200	ALERT: Proton Event 10MeV Integral Flux > 100pfu	23 May 0150
23 May 1047	WARNING: Geomagnetic Sudden Impulse	23 May 1047 -1115
23 May 1114	WARNING: Geomagnetic K= 5	23 May 1113 - 1500
23 May 1116	ALERT: Geomagnetic K= 5	23 May 1115
23 May 1133	WARNING: Geomagnetic K= 6	23 May 1135 - 2359
23 May 1139	SUMMARY: Geomagnetic Sudden Impulse	23 May 1051
23 May 1257	ALERT: Geomagnetic K= 6	23 May 1242
23 May 1605	SUMMARY: Geomagnetic Sudden Impulse	23 May 1545
23 May 1700	ALERT: Geomagnetic K= 7	23 May 1630
23 May 2026	SUMMARY: Proton Event 10MeV Int. Flux > 100pfu	23 May 1055
24 May 0032	EXT WARNING: Proton 10MeV Int. Flux > 10pfu	22/1715-24/0600 May
24 May 0036	CONT ALERT: Proton Event 10MeV Int. Flux > 10pfu	22 May 1755
24 May 0340	ALERT: Type II Radio Emission	24 May 0322
24 May 0511	EXT WARNING: Proton 10MeV Int. Flux > 10pfu	22/1715-24/1200 May
24 May 1155	EXT WARNING: Proton 10MeV Int. Flux > 10pfu	22/1715-24/2100 May
24 May 2106	SUMMARY: Proton Event 10MeV Int. Flux > 10pfu	23 May 1055
25 May 0009	1 - 245 MHz Burst	24 May
26 May 2309	ALERT: Geomagnetic K=4	26 May 2305



**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 May	180	7	3	12 Jun	160	10	3
30	180	7	3	13	160	10	3
31	180	8	3	14	165	10	3
01 Jun	185	8	3	15	170	10	3
02	185	10	3	16	175	8	3
03	185	10	3	17	180	8	3
04	185	10	3	18	180	8	3
05	185	10	3	19	180	8	3
06	185	10	3	20	185	7	3
07	185	10	3	21	185	7	3
08	185	10	3	22	185	10	3
09	175	10	3	23	185	15	4
10	165	10	3	24	180	8	3
11	160	10	3				



### *Energetic Events*

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Integ Flux	Imp/Location		Rgn #	Radio Flux		Intensity	
			Max			Brtns	Lat		CMD	245	2695	II
20 May	1014	1029	1034	M4.7	.025			9961	150	60		
20 May	1049	1053	1056	M5.0	.012			9961	100			
20 May	1521	1527	1531	X2.1	.065	2n	S21E65	9961	810	420		
21 May	2120	2139	2200	M1.5	.024	2f	N17E38	9960	120	53	1	
24 May	0637	0646	0651	M1.1	.006			9963				

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical Location		Rgn
	Begin	Max	End			Lat	CMD	
20 May	0116	0120	0124		Sf	S21E69	9961	
	0337	0338	0343		Sf	S23E76	9961	
	0356	0404	0415		Sf	S20E71	9961	
	0719	0733	0734		C2.2			
	0732	0732	0740		C3.9	Sf	S23E74	9961
	1014	1029	1034		M4.7		9961	
	1049	1053	1056		M5.0		9961	
	1346	1346	1351			Sf	S25E68	9961
	1431	1435	1446			Sf	N13E49	9960
	1508	1529	1538		X2.1	2n	S21E65	9961
	1811	1819	1839		C4.1	1f	S23E67	9961
	1950	1950	1954		C1.8	Sf	S24E70	9961
	2019	2027	2044		C3.0	Sf	S21E62	9961
	2116	2120	2124		C2.0			
	2155	2156	2200			Sf	S21E60	9961
21 May	0142	0145	0148		C2.2	Sf	S24E58	9961
	0501	U0504	0549		C4.8	Sf	N15E44	9960
	0633	0633	A0636			Sf	N14E74	9963
	B1024	U1026	1026		C1.9	Sf	N12E29	9960
	1720	1722	1731		C3.2	Sf	N11E69	9963
	2124	2137	2244		M1.5	2f	N17E38	9960
22 May	2327	0018	0117		C9.7	1f	S25W64	9948
	B0400	U0400	0437		C5.0	Sf	S22W53	
	0824	0831	0848		C1.7			
	1542	1548	1606		C2.5	Sf	S23E44	9961
	1839	1842	1850			Sf	S12E67	9965
23 May	2052	2052	2057		C2.4	Sf	S23E40	9961
	0101	0106	0114		B9.5			
	0230	0235	0243		C1.1			
	1659	1701	1702			Sf	S24E30	9961
24 May	2051	2054	2058		C1.2	Sf	N11E38	9963
	0637	0646	0651		M1.1			9963
	0655	0702	0709			Sf	N13E30	9963
	0723	0740	0757		C1.3			



*Flare List - continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
24 May	B0823	U0830	A0845	C2.0	Sf	N18E35	9963
	0955	0959	1004	C1.3			
	1050	1055	1058	C2.9			
	1756	1758	1803		Sf	N14E27	9963
	1805	1812	1819		Sf	N14E27	9963
	1908	1910	1920	C2.6	Sf	N13E25	9963
	1908	1910	1917		Sf	N10W29	9957
	2040	2040	2050		Sf	N16E11	9962
	2149	2151	2153	C1.1			
	25 May	0114	0114	0117	B9.3	Sf	N16W25
0536		0539	0542		Sf	N07E79	9969
0545		0547	0550	C1.3	Sf	N12W09	9960
0710		U0711	0715		Sf	N07E82	9969
1001		1004	1007	C1.1			
1619		1624	1628		Sf	N07E73	9969
1650		U1659	A1818	C1.7	Sf	S18W13	9961
1840		1841	1846		Sf	N04E70	9969
1937		1937	1957		Sf	N04E70	9969
2009		2013	2022		Sf	N04E69	9969
26 May	0045	0106	0122	C1.6			
	0241	0241	0252	C1.1	Sf	N15E07	9963
	0314	0322	0337		Sf	N07E65	9969
	0448	0448	0501		Sf	N16W44	9957
	0618	0619	0621		Sf	N06E64	9969
	0804	0821	0828	C1.0			
	0922	0946	1011	C1.1			
	1029	1043	1053	C1.3			
	1327	1331	1400	C4.4	Sf	S23W11	9961
	1419	1419	1423		Sf	N03E57	9969
	1508	1510	1516	C1.7	Sf	N03E57	9969
	1511	1511	1523		Sf	N11W54	9957
	2117	2125	2134	C1.2			



### Region Summary

Date	Location		Sunspot Characteristics				Flares											
	° Lat ° CMD	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 9948</i>																		
10 May	S21E71	094	0280	04	Cho	003	B											
11 May	S21E61	091	0420	14	Eko	006	B											
12 May	S22E50	089	0430	14	Eko	008	B	1				1						
13 May	S22E38	088	0360	13	Eko	005	B	1				1						
14 May	S22E26	087	0410	13	Eko	006	B	1				3						
15 May	S22E14	085	0420	14	Eko	007	B		1			2						
16 May	S22E01	085	0370	14	Eko	004	B	2										
17 May	S21W15	088	0390	10	Cho	005	B					1						
18 May	S21W31	091	0380	05	Cho	002	B											
19 May	S21W44	090	0330	04	Hkx	001	A											
20 May	S21W57	089	0320	05	Hkx	002	A											
21 May	S20W70	089	0340	04	Hhx	002	A	1					1					
22 May	S21W84	090	0300	03	Hhx	001	A											
								6	1	0	8	1	0	0	0			

Crossed West Limb.

Absolute heliographic longitude: 085

<i>Region 9950</i>																		
11 May	S06E44	108	0030	04	Bxo	005	B	1				1						
12 May	S06E31	108	0090	06	Cso	008	B											
13 May	S06E18	108	0100	07	Dao	009	B											
14 May	S05E04	109	0060	07	Dso	012	B											
15 May	S06W09	108	0050	05	Cso	011	B											
16 May	S05W23	109	0030	04	Cso	005	B					1						
17 May	S05W37	110	0030	03	Cso	004	B											
18 May	S05W51	111	0020	01	Hsx	001	A											
19 May	S04W64	110	0050	01	Hsx	001	A											
20 May	S04W77	109	0010	01	Axx	001	A											
21 May	S04W90	109																
								1	0	0	2	0	0	0	0			

Crossed West Limb.

Absolute heliographic longitude: 109



**Region Summary - continued.**

Date	Location		Sunspot Characteristics				Flares															
	( ° Lat ° CMD)	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
		Lon						C	M	X	S	1	2	3	4							
<i>Region 9951</i>																						
12 May	N10E68	071	0020	01	Axx	001	A															
13 May	N10E55	071	0020	01	Axx	001	A															
14 May	N11E41	072	0020	01	Hsx	002	A															
15 May	N11E28	071	0010	01	Hsx	001	A															
16 May	N11E14	072	0000	00	Axx	001	A															
17 May	N11E01	072																				
18 May	N12W12	072	0010	03	Bxo	003	B															
19 May	N12W25	072																				
20 May	N12W38	072																				
21 May	N12W51	072																				
22 May	N12W64	072																				
23 May	N12W77	072																				
24 May	N12W90	072																				

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 072

<i>Region 9954</i>																						
15 May	S22E65	034	0150	04	Cao	003	B															
16 May	S22E54	032	0130	04	Hax	003	A															
17 May	S22E40	033	0170	03	Dao	004	B		1		2											
18 May	S22E27	033	0130	03	Dao	004	B															
19 May	S22E14	032	0100	05	Dao	006	B															
20 May	S20E01	031	0110	04	Dao	006	B															
21 May	S22W10	029	0090	04	Dso	008	B															
22 May	S22W26	032	0060	05	Dso	008	B															
23 May	S22W38	031	0040	04	Dso	005	B															
24 May	S21W50	030	0020	01	Hsx	001	A															
25 May	S22W64	031	0010	01	Hsx	001	A															
26 May	S22W77	031																				

0 1 0 2 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 031





**Region Summary - continued.**

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

*Region 9955*

15 May	S14E67	032	0040	01	Hsx	001	A											
16 May	S14E55	031	0040	01	Hsx	001	A											
17 May	S14E42	031	0050	02	Hsx	001	A											
18 May	S14E28	032	0030	02	Hsx	001	A	2			2							
19 May	S14E15	031	0030	01	Hsx	002	A											
20 May	S15E02	030	0020	02	Hsx	001	A											
21 May	S13W11	030	0010	01	Hrx	001	A											
22 May	S13W24	030	0010	03	Cro	002	B											
23 May	S13W37	030																
24 May	S13W50	030																
25 May	S13W63	030																
26 May	S13W76	030																
											2	0	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 030

*Region 9956*

16 May	S08W04	090	0000	00	Axx	001	B											
17 May	S08W17	090																
18 May	S08W30	090																
19 May	S08W43	090																
20 May	S08W56	090																
21 May	S08W69	090																
22 May	S08W82	090																
											0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 090

*Region 9957*

16 May	N06E67	019	0570	15	Eko	004	B											
17 May	N08E58	015	0830	17	Fkc	027	Bgd	3	1		1		1					
18 May	N08E47	013	0810	14	Ekc	027	Bgd	3			4							
19 May	N08E34	012	0830	14	Ekc	038	Bgd	2			3							
20 May	N09E22	010	0830	13	Ekc	037	Bgd											
21 May	N09E08	011	0760	14	Ekc	059	Bgd											
22 May	N10W04	010	0520	15	Eai	047	Bgd											
23 May	N10W19	012	0420	12	Eac	046	Bgd											
24 May	N11W32	012	0350	14	Eac	046	Bg							1				
25 May	N10W45	012	0310	13	Eai	026	Bgd							1				
26 May	N10W58	011	0280	13	Eai	022	Bg							2				
											8	1	0	12	0	1	0	0

Still on Disk.

Absolute heliographic longitude: 010





**Region Summary - continued.**

Date	Location		Sunspot Characteristics					Flares															
	( ° Lat ° CMD)	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical												
		Lon						C	M	X	S	1	2	3	4								
<i>Region 9961</i>																							
19 May	S22E76	330	0110	09	Dao	005	B	1				2											
20 May	S22E62	330	0480	13	Eai	014	Bg	4	2	1	8	1	1										
21 May	S23E48	331	0330	13	Eai	016	Bgd	1			1												
22 May	S22E34	332	0330	13	Eai	021	Bg	2			2												
23 May	S22E22	331	0290	14	Eai	027	Bgd				1												
24 May	S22E09	331	0260	15	Eai	023	Bgd																
25 May	S21W04	331	0280	15	Eai	024	Bgd	1			1												
26 May	S21W17	330	0250	14	Eai	023	Bg	1			1												
								10	2	1	16	1	1	0	0								

Still on Disk.

Absolute heliographic longitude: 331

<i>Region 9962</i>																							
20 May	N15E59	333	0020	01	Hrx	001	A																
21 May	N15E47	332	0020	01	Hsx	001	A																
22 May	N15E34	332	0030	02	Hsx	001	A																
23 May	N15E21	332	0030	06	Cso	005	B																
24 May	N15E08	332	0040	07	Cao	004	B				1												
25 May	N16W07	334	0030	02	Hsx	001	A																
26 May	N16W21	334	0030	02	Hsx	001	A																
								0	0	0	1	0	0	0	0								

Still on Disk.

Absolute heliographic longitude: 334

<i>Region 9963</i>																							
20 May	N17E75	317	0120	03	Hax	001	A																
21 May	N17E60	319	0210	03	Hax	002	A	1			2												
22 May	N16E48	318	0340	11	Dho	012	B																
23 May	N14E36	317	0420	10	Dho	010	B	1			1												
24 May	N15E23	317	0360	09	Dko	016	B	2	1		5												
25 May	N14E09	318	0380	11	Eho	027	B																
26 May	N14W03	316	0410	11	Ehi	029	B	1			1												
								5	1	0	9	0	0	0	0								

Still on Disk.

Absolute heliographic longitude: 316



**Region Summary - continued.**

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

*Region 9964*

22 May	S15E08	358	0010	04	Bxo	004	B											
23 May	S14W05	358	0010	03	Bxo	004	B											
24 May	S14W16	356	0010	05	Bxo	003	B											
25 May	S14W29	356																
26 May	S14W42	356																
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 358

*Region 9965*

22 May	S10E62	304	0080	04	Cao	004	B											1
23 May	S10E48	305	0060	08	Cso	006	B											
24 May	S10E37	303	0030	09	Cso	003	B											
25 May	S08E19	308	0040	02	Hsx	002	A											
26 May	S08E05	308	0040	02	Hsx	002	A											
												0	0	0	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 308

*Region 9966*

23 May	N10E34	319	0010	04	Bxo	004	B											
24 May	N09E20	320	0010	04	Bxo	003	B											
25 May	N10E04	323	0000	01	Axx	001	A											
26 May	N11W06	319	0020	03	Cso	005	B											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 323

*Region 9967*

23 May	N13E46	307	0010	01	Axx	001	A											
24 May	N13E33	307	0030	05	Cso	005	B											
25 May	N14E19	308	0010	01	Hrx	001	A											
26 May	N13E05	308	0020	04	Cso	007	B											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 308

*Region 9968*

24 May	S13E26	314	0020	03	Cso	004	B											
25 May	S14E13	314	0010	01	Hrx	001	A											
26 May	S14E00	313	0000	00	Axx	001	A											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 313



***Region Summary - continued.***

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

*Region 9969*

25 May	N09E67	260	0040	04	Dso	003	B				6				
26 May	N09E55	258	0100	08	Dao	009	B	1			4				
								1	0	0	10	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 258

*Region 9970*

26 May	N05E54	259	0180	07	Dao	006	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 259

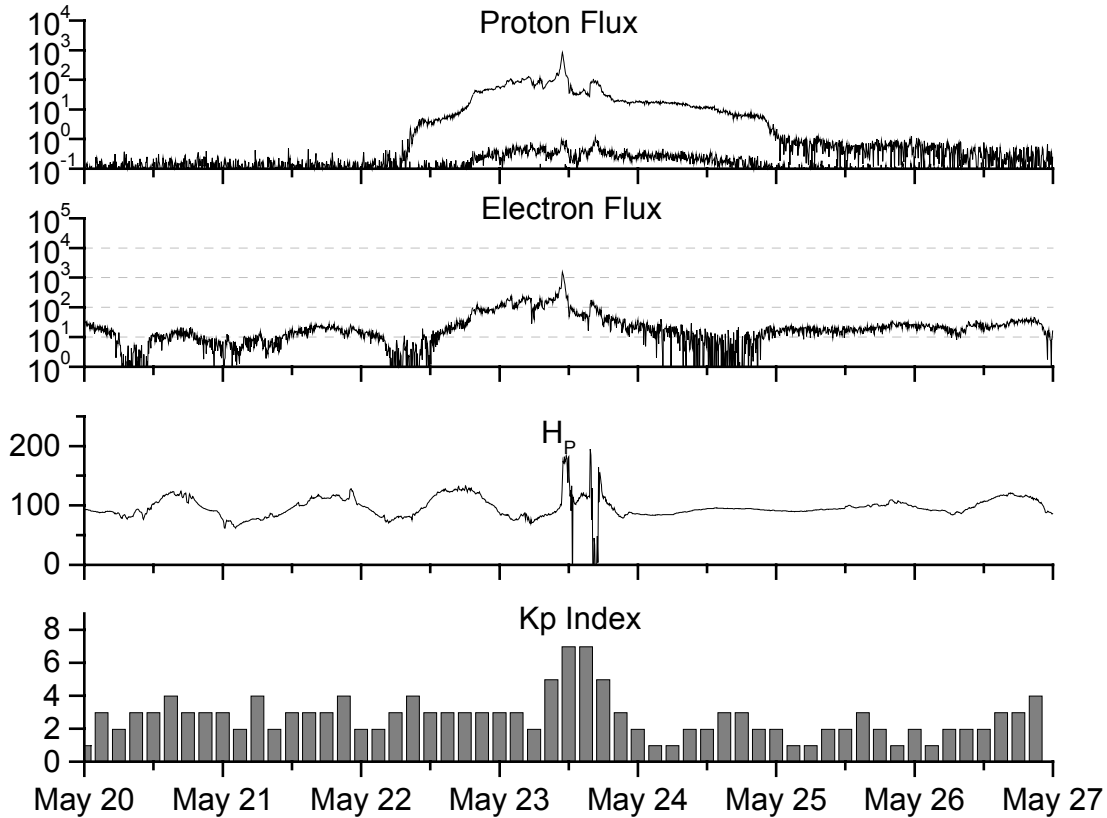


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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
<b>2000</b>									
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72	166.2	114.4	167.7	175.6	18	14.6
November	149.9	106.5	0.71	162.7	112.7	178.8	173.6	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.0	08	14.4
<b>2001</b>									
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	174.8	12	12.5
June	196.7	134.0	0.68	167.2	109.9	173.7	178.8	12	12.4
July	124.6	82.2	0.66	172.1	111.8	131.3	183.9	11	12.4
August	159.4	106.8	0.67	176.7	113.8	163.2	188.8	13	12.5
September	229.1	150.7	0.66	178.8	114.3	233.3	191.3	12	12.3
October	197.4	125.6	0.64	179.5	114.1	208.2	191.9	18	11.9
November	178.6	106.5	0.60			212.5		14	
December	217.5	131.8	0.61			236.6		08	
<b>2002</b>									
January	189.0	113.9	0.60			226.4		07	
February	194.5	108.0	0.56			205.1		09	
March	153.1	98.1	0.64			179.5		10	
April	194.9	120.4	0.62			189.7		15	

**NOTE:** All smoothed values after June 1999 and monthly values after December 2000 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 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 May 2002*

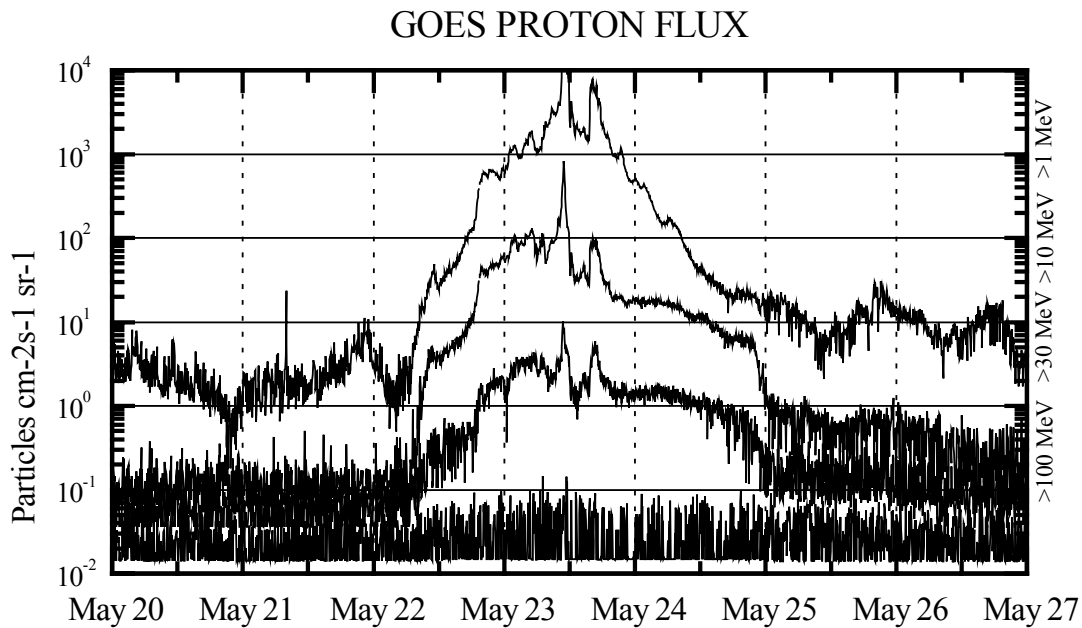
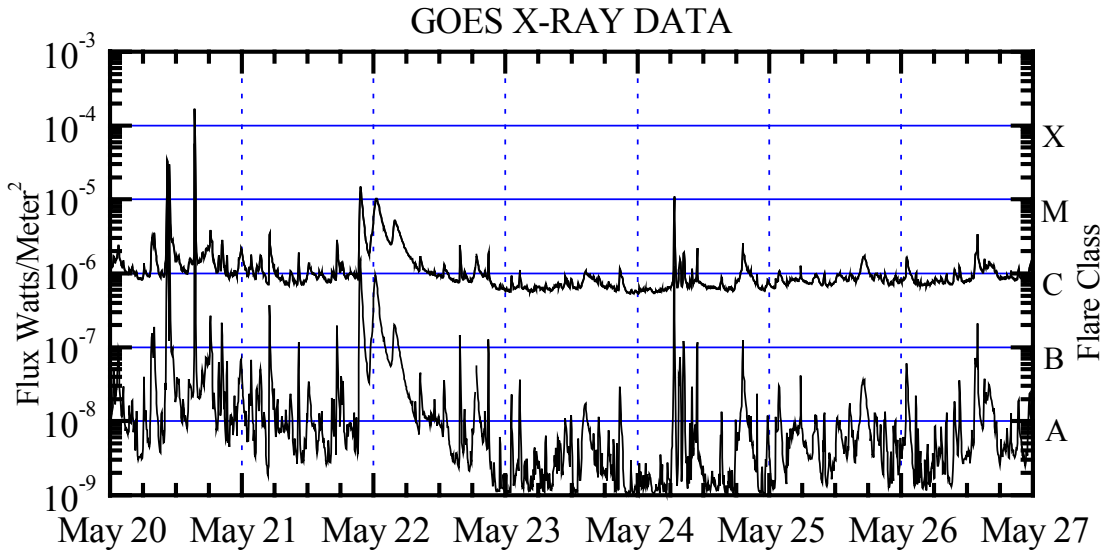
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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

*H<sub>p</sub>* 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<sub>p</sub>* 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 K<sub>p</sub> 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<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H<sub>p</sub> 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<sup>2</sup>) 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/cm<sup>2</sup>-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/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

