Space Weather Highlights **SWO PRF 1343**
21 – 27 May 2001 **29 May 2001**

Solar activity was predominately low during the period, with a single day of moderate levels, due to an isolated, M1/1n flare from Region 9468 (N05, l = 093, class/area Dai/150 on 24 May) at 24/1944 UTC. This flare also had an associated Type II radio sweep and an Earth-directed coronal mass ejection. Activity levels dropped to very low on 26 May and then returned to low levels for the remainder of the period. Isolated C-class subflares comprised most of the solar activity during the period.

Data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Periods of elevated solar wind speeds and proton temperatures, relatively low densities, and variable IMF Bz occurred during 23-24 May, suggesting high-speed streams associated with a positive-polarity coronal hole. A weak shock from the CME that was observed on 24 May, was detected at ACE on 27/1418 UTC. No disturbances were detected during the rest of the period.

There were no proton events detected during the period. However, proton flux enhancements at greater than 100 MeV and greater than 10 MeV occurred on 21 May due to an M6 x-ray flare that occurred on 20 May.

The greater than 2 MeV electron flux at geosynchronous orbit were at mostly normal levels. Moderate levels occurred on 21 May.

The geomagnetic field was mostly quiet to unsettled with isolated active conditions occurring on 22, 24, and 26 May. Intermittent active conditions on 22 May were due to coronal hole effects. Activity increased to quiet to active levels on 27 May due to a glancing CME shock passage. A sudden impulse (SI) was detected at the Boulder USGS magnetometer at 27/1456 UTC.

Space Weather Outlook
30 May – 25 June 2001

Solar activity is expected to range from low to moderate levels during the period. Isolated M-class flares will be possible during the period.

No proton events are expected during the period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during most of the period. However, high flux levels will be possible around 12 - 15 June.

The geomagnetic field is expected to be at quiet to unsettled levels during most of the period, barring an Earth-directed CME. However, active levels will be possible around 11 June.

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	Flares: Optical S	1	2	3	4
21 May	150	118	880	B4.1	5	0	0	2	1	0	0	0
22 May	152	159	790	B4.5	1	0	0	2	0	0	0	0
23 May	159	192	1210	B6.0	5	0	0	3	0	0	0	0
24 May	170	171	1160	B5.3	4	1	0	2	1	0	0	0
25 May	162	146	770	B4.6	7	0	0	11	1	0	0	0
26 May	147	167	1030	B4.2	2	0	0	2	0	0	0	0
27 May	147	189	910	B3.2	0	0	0	0	0	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
21 May	7.9E+5	1.4E+5	4.9E+3		5.1E+7	
22 May	5.2E+5	3.8E+4	2.7E+3		1.1E+7	
23 May	2.9E+5	1.5E+4	2.4E+3		9.1E+6	
24 May	8.6E+4	1.2E+4	2.3E+3		2.9E+6	
25 May	1.2E+5	1.0E+4	2.2E+3		7.5E+6	
26 May	9.4E+4	1.1E+4	2.2E+3		1.1E+7	
27 May	2.5E+5	1.0E+4	2.3E+3		1.5E+7	

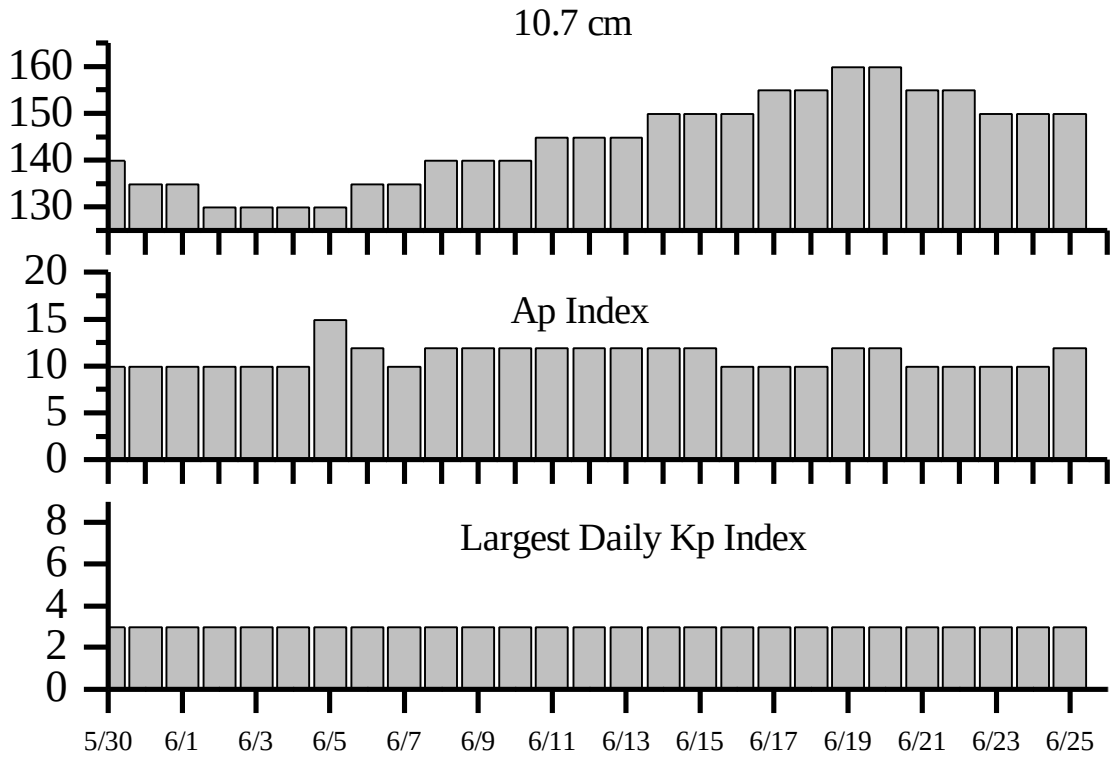
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
21 May	3	1-0-1-2-2-0-0-1	9	1-1-1-5-3-0-0-0	8	2-1-1-2-3-3-3-2
22 May	8	2-2-2-1-2-2-3-2	5	1-1-1-3-1-1-2-1	9	2-1-2-3-3-3-3-2
23 May	8	2-2-2-1-2-3-2-2	16	4-2-3-5-2-2-2-2	11	3-2-2-2-3-4-3-3
24 May	7	2-3-2-1-1-1-2-2	10	3-2-1-2-3-0-1-4	9	3-2-1-2-3-3-3-3
25 May	6	2-1-1-2-2-2-2-2	13	0-1-1-3-4-5-2-1	8	2-1-2-2-3-3-3-2
26 May	6	2-2-1-2-2-1-1-2	9	2-3-2-2-4-0-2-1	8	2-2-2-2-2-3-3-2
27 May	8	0-0-0-0-2-4-3-3	6	0-0-0-1-0-4-2-2	9	1-0-0-2-3-4-3-3

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
21 May 0018	2 – 245 MHz Bursts	20 May
21 May 1919	Electron Event >2MeV @ >=1000pfu	21 May 1640
22 May 0008	2 – 245 MHz Bursts	21 May
22 May 0008	245 MHz Noise Storm	21 May
22 May 0013	Type II Radio Emission	21 May 2224
22 May 0024	CONTINUED Electron Event >2MeV @ >=1000pfu	21 May 1640
23 May 0010	5 – 245 MHz Bursts	22 May
23 May 1554	K= 4 Warning	23/1555 – 24 May 1800
23 May 1804	K= 4 Observed	23 May 1500 – 1800
24 May 0015	5 – 245 MHz Bursts	23 May
24 May 0015	245 MHz Noise Storm	23 May
24 May 1733	Type II Radio Emission	24 May 1712
24 May 2023	Type II Radio Emission	24 May 1940
25 May 0035	245 MHz Burst	24 May
25 May 0035	245 MHz Noise Storm	24 May
25 May 1500	K= 4 Observed	25 May 1200 – 1500
26 May 0242	4 – 245 MHz Bursts	25 May
26 May 0242	245 MHz Noise Storm	25 May
26 May 1140	Type II Radio Emission	26 May 1109
27 May 0032	2 – 245 MHz Bursts	26 May
27 May 0032	245 MHz Noise Storm	26 May
27 May 1514	Sudden Impulse observed at Boulder	27 May 1456

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
30 May	140	10	3	13 June	145	12	3
31	135	10	3	14	150	12	3
01 June	135	10	3	15	150	12	3
02	130	10	3	16	150	10	3
03	130	10	3	17	155	10	3
04	130	10	3	18	155	10	3
05	130	15	3	19	160	12	3
06	135	12	3	20	160	12	3
07	135	10	3	21	155	10	3
08	140	12	3	22	155	10	3
09	140	12	3	23	150	10	3
10	140	12	3	24	150	10	3
11	145	12	3	25	150	12	3
12	145	12	3				

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
24 May	1930	1944	2004	M1.2	.018	1N	N07E29	9468	41	110	3	

Flare List

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Optical Rgn
21 May	0313	0317	0400	C9.0	1N	N24E11	9461
	0413	0420	0442	C1.1	SF	N22E08	9461
	0531	0549	0604	C1.0			
	0735	0810	0907	C1.7			
	0908	0919	0924	C1.5			
	1456	1506	1516	B9.6			
	1541	1603	1607	B7.0			
	1545	1546	1551		SF	S13E55	9465
22 May	1407	1410	1419	B8.8	SF	S18W16	9470
	2244	2245	2300	C1.4	SF	S18W20	9470
23 May	0329	0401	0420	C1.6			
	1026	1032	1038	C2.4			
	1111	1112	1116	B9.6	SF	N25W21	9461
	1250	1251	1259	C1.2	SF	N08E45	9468
	1428	1428	1431	C1.0	SF	N07E44	9468
	2103	2106	2108	B7.0			
	2259	2303	2307	C1.0			
24 May	0530	0533	0538		SF	N08E34	9468
	0609	0706	0801	C1.8			
	0802	0901	0925	C1.8			
	0926	0942	0951	C2.7			9465
	0947	0950	0950		SF	S07E09	9465
	1934	1939	2021	M1.2	1N	N07E29	9468
25 May	0002	0006	0020	C4.0	SF	N06W13	9463
	0407	0407	0420	C1.8	SF	S09E04	9465
	0434	0434	0437		SF	S17W51	9460
	0446	0446	0450		SF	N06E21	9468
	0504	0507	0510	C1.6	SF	N09E21	9468
	0712	0712	0721	C1.2	SF	N03E20	9468
	0933	0939	0956	C1.5			
	1053	1054	1102		SF	N03E19	9468
	1119	1120	1124	C1.2	SF	N03E19	9468
	1916	1928	2014	C5.2	1F	N03E16	9468
	1936	1946	1956		SF	N05W23	9463
	2014	2017	2019		SF	N03E16	9468
	2202	2204	2233	C2.8	SF	N07E15	9468

Flare List – continued.

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn
26 May	1207	1209	1216	C1.1	SF	N02E00	9468
	1620	1623	1624	C1.1	SF	N04E03	9468
27 May	1930	1941	1954	B8.5			

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 9454												
10	N15E74	229	0300	13	EAO	008	B	1							
11	N13E58	231	0430	11	EKO	013	B								
12	N13E46	230	0410	12	EAO	016	BG	1			3				
13	N12E32	231	0400	13	EAO	018	BG								
14	N12E18	232	0320	13	EAO	021	BG								
15	N12E05	232	0280	14	EAO	023	BG								
16	N13W08	232	0220	13	EAO	022	BG	1			1				
17	N14W22	232	0140	12	EAI	025	BG	2			1	2			
18	N14W33	230	0070	11	ESO	010	B								
19	N14W47	231	0040	10	DSO	005	B								
20	N15W60	231	0030	04	AXX	004	A								
21	N15W73	231													
22	N15W86	231													
								5	0	0	5	2	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 232

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 9460												
14	S24E60	190	0000	00	AXX	001	A								
15	S24E48	189	0000	00	AXX	001	A								
16	S24E35	189													
17	S24E22	189													
18	S24E09	189													
19	S24W04	189													
20	S24W17	189													
21	S24W30	189													
22	S24W43	189													
23	S24W56	189													
24	S24W69	189													
25	S24W82	189									1				
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 189

			Region 9461												
15	N15E76	161	0010	04	BXO	002	B								
16	N16E63	161	0090	05	DAO	004	B	1			1				
17	N18E49	161	0110	08	DAO	008	B	2			2				
18	N19E39	158	0100	09	DAO	016	B								
19	N19E25	159	0170	09	DAO	015	B								
20	N22E10	161	0130	09	DSO	012	B								
21	N22W06	164	0070	05	CSO	005	B	2			1	1			
22	N22W19	163	0080	04	CSO	004	B								
23	N22W31	162	0040	03	DAO	005	B				1				
24	N22W45	163	0040	02	CAO	004	B								
25	N22W58	163	0030	01	HAX	001	A								
26	N22W71	163	0030	01	HSX	001	A								
27	N22W84	162	0030	01	HAX	001	A								
								5	0	0	5	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 164

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 9462												
17	N18E73	137	0100	02	HAX	001	A								
18	N20E62	135	0050	02	HSX	001	A								
19	N19E48	136	0050	02	HSX	001	A								
20	N20E36	135	0060	02	HAX	001	A								
21	N22E23	135	0060	02	HSX	002	A								
22	N21E09	135	0080	03	CSO	003	B								
23	N19W03	134	0080	03	CSO	003	B								
24	N18W16	134	0070	02	HSX	001	A								
25	N20W28	133	0060	02	HSX	001	A								
26	N21W40	132	0070	02	HSX	001	A								
27	N21W54	132	0060	02	HSX	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 134

			Region 9463												
18	N07E72	125	0050	05	DSO	002	B								
19	N07E59	125	0230	09	DAO	006	B								
20	N09E46	125	0400	11	EKO	014	B								
21	N12E31	127	0500	12	EKI	022	BG								
22	N10E18	126	0380	13	EKI	030	BG								
23	N07E04	127	0720	15	EKI	033	B								
24	N07W09	127	0670	16	FKI	025	B	1							
25	N08W23	128	0480	14	EKI	026	B				2				
26	N08W38	130	0530	13	EKO	020	BG								
27	N08W51	129	0490	15	EKI	013	BG								
								1	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 127

			Region 9464												
19	S11E70	114	0070	10	CAO	003	B								
20	S07E53	118	0070	06	DAO	004	B								
21	S07E38	120	0010	01	AXX	001	A								
22	S08E23	121	0010	01	HSX	001	A								
23	S09E11	120	0010	05	BXO	003	B								
24	S09W02	120	0020	04	BXO	004	B								
25	S09W15	120													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 120

Region Summary- continued.

Date	Location (° Lat ° CMD)	Helio Lon	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 9465											
20	S08E63	108	0110	10	DAO	004	B								
21	S09E48	110	0080	10	DSO	003	B				1				
22	S10E34	110	0040	05	CSO	006	B								
23	S10E19	112	0010	03	BXO	005	B								
24	S11E10	108	0020	05	BXO	006	B	1			1				
25	S13W01	106	0010	03	BXO	006	B	1			1				
26	S10W18	110	0020	05	CRO	005	B								
27	S11W33	111	0010	08	BXO	007	B								
								2	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 106

				Region 9466											
21	S02E40	118	0030	02	HSX	002	B								
22	S02E26	118	0010	01	AXX	003	A								
23	S04E14	117	0020	02	AXX	007	A								
24	S05W02	120	0060	04	DAO	007	B								
25	S04W12	117	0030	03	CSO	007	B								
26	S04W25	117	0050	06	BXO	004	B								
27	S04W38	117	0000	00		000									
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 120

				Region 9467											
21	S05E55	103	0060	01	HAX	001	A								
22	S05E42	102	0060	02	HSX	001	A								
23	S07E29	102	0080	02	HSX	001	A								
24	S08E15	103	0080	02	HSX	001	A								
25	S08E00	105	0060	02	HSX	002	A								
26	S07W13	105	0070	02	HSX	001	A								
27	S06W26	104	0050	02	HSX	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 105

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 9468												
21	N07E65	093	0070	07	CAO	002	B								
22	N07E53	091	0070	08	CAO	004	B								
23	N05E39	092	0150	08	DAO	010	B	2			2				
24	N05E25	093	0150	08	DAI	020	B		1		1	1			
25	N07E12	093	0090	08	DAO	022	B	5			7	1			
26	N06W02	094	0150	07	DAO	016	B	2			2				
27	N06W16	094	0100	08	DAO	014	B								
								9	1	0	12	2	0	0	0
Still on Disk.															
Absolute heliographic longitude:		94													
			Region 9469												
22	N08W71	215	0050	04	CSO	004	B								
23	N07W83	214	0050	02	HAX	002	A								
24	N07W96	214	0000	00		000									
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		215													
			Region 9470												
22	S15W19	163	0010	02	BXO	003	B	1			2				
23	S16W32	163	0000	01	AXX	001	A								
24	S16W45	163													
25	S16W58	163													
26	S16W71	163													
27	S16W84	163													
								1	0	0	2	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		163													
			Region 9471												
23	S13W02	133	0000	00	AXX	001	A								
24	S13W16	134	0010	01	BXO	002	B								
25	S13W29	134													
26	S13W42	134													
27	S13W55	134													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		133													

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 9472												
23	N12E61	070	0050	02	HSX	001	A								
24	N12E47	071	0040	02	HSX	001	A								
25	N12E34	071	0010	01	HSX	001	A								
26	N12E21	071	0020	02	HAX	002	A								
27	N12E08	070	0010	02	AXX	002	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		70													
			Region 9473												
26	N12E12	080	0010	03	BXO	003	B								
27	N12E00	078	0010	02	AXX	002	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		78													
			Region 9474												
26	N18E53	039	0030	05	BXO	003	B								
27	N19E42	036	0050	06	DAO	005	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		36													
			Region 9475												
26	N17E71	021	0050	01	HSX	001	A								
27	N17E59	019	0030	08	CAO	003	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		19													
			Region 9476												
27	S22W68	146	0020	01	HRX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		146													
			Region 9477												
27	S16E20	058	0040	06	DSO	006	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		58													

Region Summary- continued.

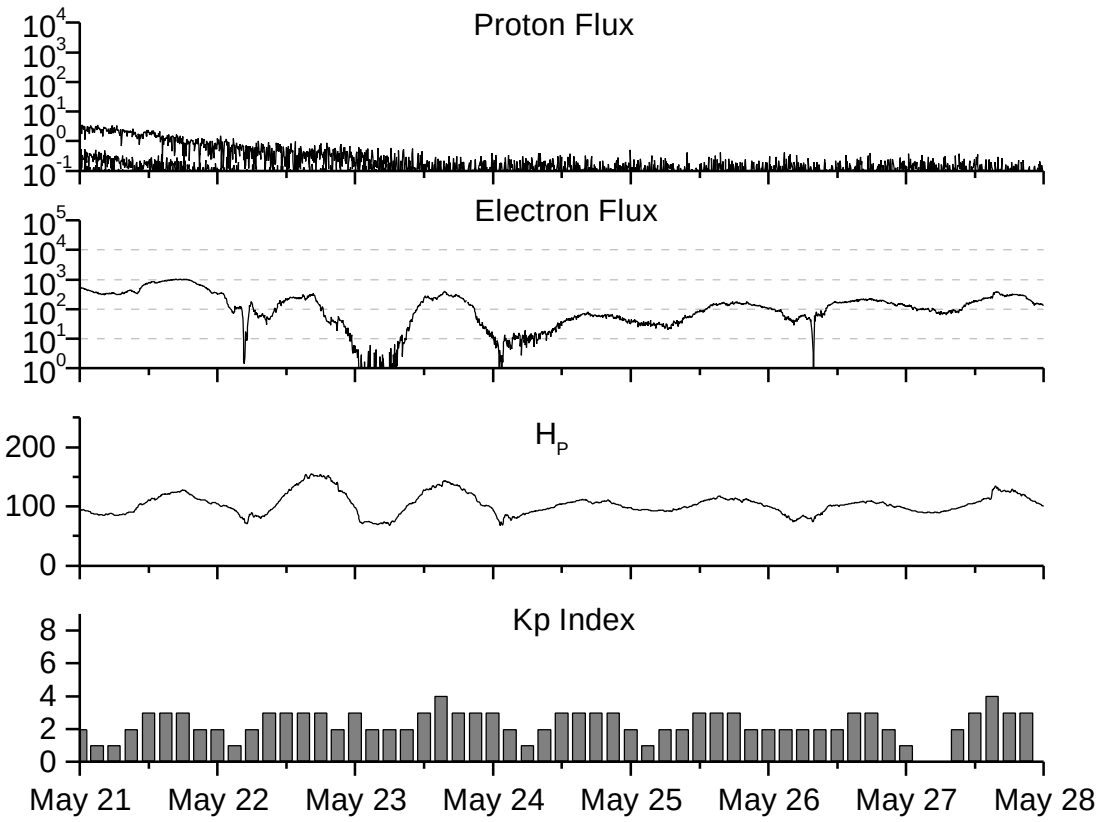
Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
	Region 9478														
27	N14E15	063	0010	03	BXO	003	B	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 63

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
					1999				
May	140.5	106.4	0.76	131.7	90.5	148.6	149.9	08	12.4
June	208.3	137.7	0.66	136.0	93.1	169.8	152.9	07	12.4
July	169.2	113.5	0.67	138.0	94.3	165.6	154.4	10	12.6
August	136.1	93.7	0.69	142.8	97.5	170.8	156.3	15	12.9
September	107.4	71.5	0.67	150.0	102.3	135.7	161.0	19	12.8
October	167.7	116.7	0.70	158.5	107.8	164.8	167.2	19	12.7
November	199.3	133.2	0.67	164.7	110.0	191.5	171.5	14	13.1
December	123.5	86.4	0.69	165.9	111.1	169.8	173.4	10	13.8
					2000				
January	140.8	90.1	0.64	168.0	112.9	158.1	175.5	13	14.5
February	161.9	112.9	0.70	172.1	116.7	173.2	176.8	15	15.0
March	203.6	138.5	0.68	175.4	119.9	208.2	178.4	09	15.0
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
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			178.8		17	
December	146.4	104.5	0.71			173.6		08	
					2001				
January	142.7	95.1	0.67			166.7		08	
February	131.0	80.1	0.61			147.3		06	
March	166.7	114.2	0.69			177.7		17	
April	163.6	108.2	0.66			178.3		18	

NOTE: All smoothed values after December 1999 and monthly values after June 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 21 May 2001

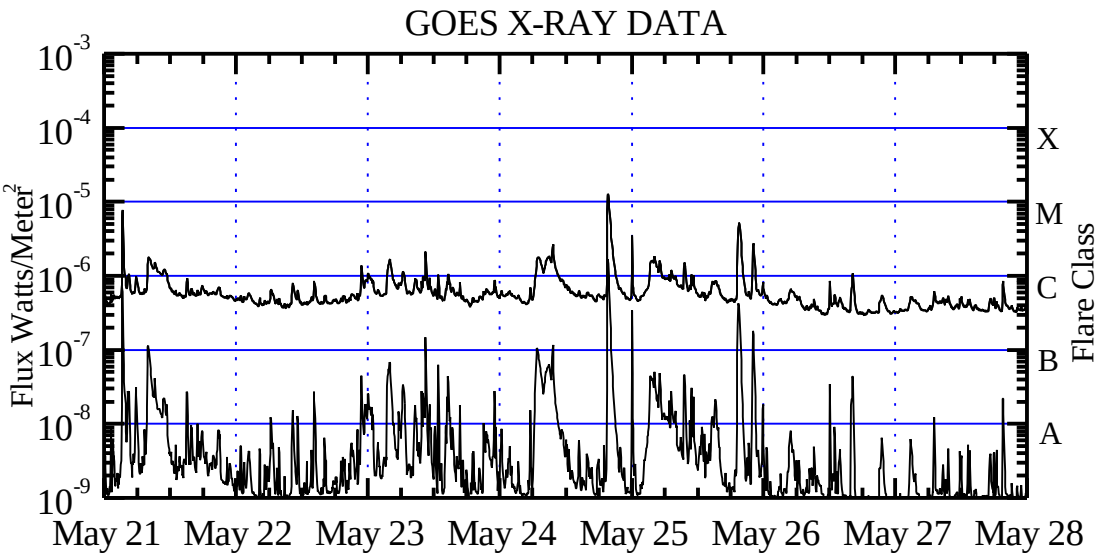
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2–sec –sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

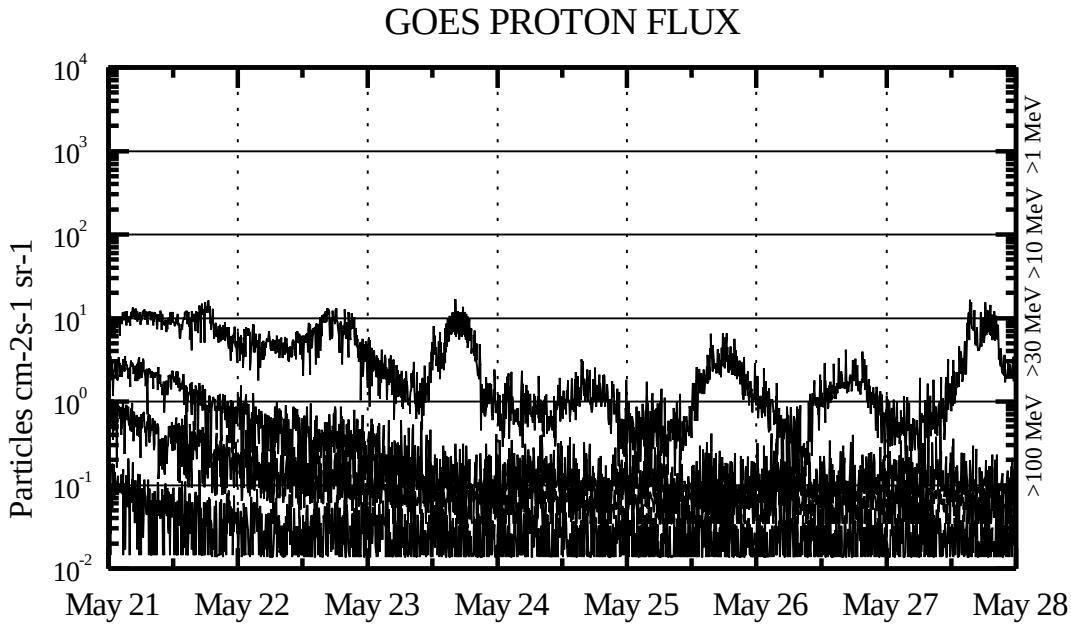
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-8.

Hp 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.

Kp 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 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.





W*eekly GOES Satellite X-ray and Proton Plots*

X-ray plot contains five-minute averaged x-ray flux (watts/m$^{2)}$ 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^2 –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^2-sec-sr) at greater than 10 MeV.