

Space Weather Highlights
14-20 March 2000

SWO PRF 1282
28 March 2000

Solar activity ranged from low to high levels. Region 8910 (N11, L = 069, class/area Ekc/810 on 22 March) produced two impulsive major flares during the period: an X1/2N at 22/1848UT with associated Type II and IV radio sweeps and a 500 SFU Tenflare, and an X1/2B at 24/0752UT with associated Type II and IV radio sweeps and a 570 SFU Tenflare. Region 8910 was large and magnetically complex, but gradually decaying at the time these flares occurred. This region crossed the west limb on 25 March. Solar activity was at moderate levels during most of the rest of the period due to isolated low-level M-class flares (see the Energetic Event Summary for event times and associated phenomena). M-flare contributors included Regions 8910, 8926 (S10, L = 013, class/area Dso/090 on 26 March) and 8928 (N19, L = 282, class/area Cso/060 on 26 March).

Real-time solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the period. Coronal hole effects were evident during 22 - 24 March with increased solar wind velocities (peak velocity 800 km/sec on 24 March) and low proton densities. IMF Bz showed increased variability on 22 March with the onset of the coronal hole effects with southerly deflections to minus 21 nT.

A greater than 10 MeV proton flux enhancement at geosynchronous orbit began around midday on 22 March, then ended early on 24 March.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels.

The geomagnetic field was mildly disturbed during 22 - 24 March due to recurrent coronal hole effects with brief active periods. Activity was at quiet to unsettled levels for the rest of the period.

Space Weather Outlook
29 March - 24 April 2000

Solar activity is expected to vary between low and moderate levels with isolated low-level M-class flares likely. There will also be a slight chance for isolated major flare activity sometime during the period.

There will be a slight chance for a proton flux event at geosynchronous orbit sometime during the period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels.

Geomagnetic field activity is expected to be at quiet to unsettled levels for most of the period. However, active periods will be possible during 08 and 18 - 20 April due to coronal hole effects.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10^6 hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
20 March	210	240	1830	C2.9	9	2	0	18	0	2	0	0
21 March	231	191	1820	C1.3	4	1	0	18	0	0	0	0
22 March	234	212	2590	C1.8	6	1	1	19	1	1	0	0
23 March	224	236	2060	C1.6	9	2	0	31	0	0	0	0
24 March	219	230	1720	C1.7	5	2	1	9	0	1	0	0
25 March	205	243	990	C1.5	9	0	0	11	1	0	0	0
26 March	211	255	1390	C1.4	4	1	0	9	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
	20 March	4.3E+4	1.1E+4	2.4E+3		6.2E+5
21 March	7.8E+4	1.1E+4	2.2E+3		3.9E+5	
22 March	8.5E+5	2.2E+4	2.4E+3		1.2E+6	
23 March	6.9E+6	5.0E+4	2.2E+3		2.0E+6	
24 March	2.3E+6	1.8E+4	2.3E+3		2.0E+6	
25 March	4.6E+5	1.3E+4	2.2E+3		4.6E+6	
26 March	3.6E+5	1.2E+4	2.5E+3		7.0E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 March	5	1-1-1-2-3-1-1-1	7	0-0-0-4-3-0-3-0	8
21 March	2	0-0-1-0-1-1-1-1	7	0-0-0-0-5-1-2-0	6	1-0-1-1-3-2-2-2
22 March	8	1-1-1-2-2-2-2-4	15	1-3-2-2-5-3-3-2	11	2-2-2-3-3-3-3-3
23 March	8	2-2-2-2-3-2-2-2	13	2-2-2-3-4-4-2-1	11	2-2-2-3-3-3-3-2
24 March	9	2-2-1-2-4-3-1-2	*	1-1-0-4-6-3-*-2	10	2-2-1-2-4-3-2-2
25 March	5	2-2-1-1-2-2-2-0	9	2-1-4-2-0-3-3-0	8	2-2-2-2-1-3-3-1
26 March	3	1-0-1-1-1-2-1-1	3	1-0-0-0-0-3-1-1	5	1-0-2-2-2-3-2-1

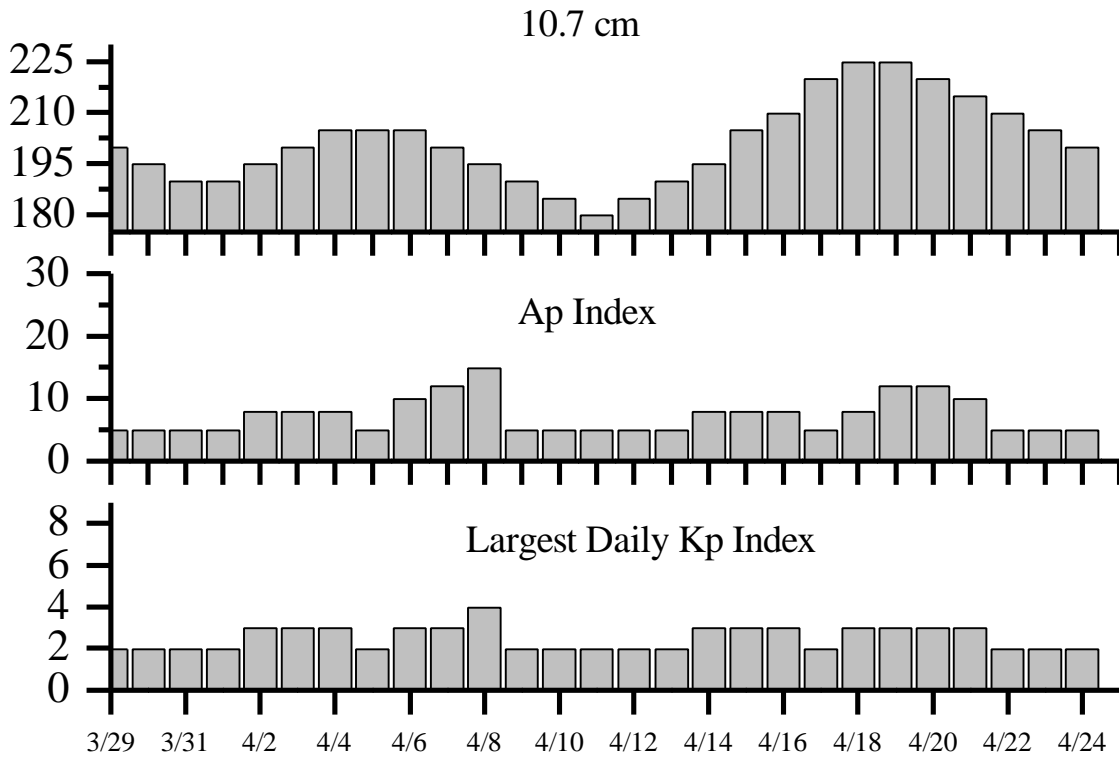


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event
20 Mar 0056	4 – 245 MHz Radio Bursts	19 Mar
20 Mar 0056	1 – 245 MHz Radio Noise Storm	19 Mar
20 Mar 0910	Type II Radio Emission	20 Mar 0843
20 Mar 0910	Type IV Radio Emission	20 Mar 0826
20 Mar 1223	Stratwarm Alert EXISTS	20 Mar
21 Mar 0050	10 – 245 MHz Radio Bursts	20 Mar
21 Mar 0050	1 – 245 MHz Radio Noise Storm	20 Mar
21 Mar 1239	Stratwarm Alert EXISTS	21 Mar
21 Mar 1943	Type II Radio Emission	21 Mar 1421
22 Mar 0052	1 – 245 MHz Radio Noise Storm	21 Mar
22 Mar 1242	Stratwarm Alert EXISTS	22 Mar
22 Mar 1540	K= 4 Warning valid	22 Mar 1540 - 23 Mar 1500
22 Mar 1805	K= 4 Observed	22 Mar 15 - 18
22 Mar 1903	X-Ray event X1/ N14W57	22 Mar 1848
22 Mar 1923	10cm Radio Burst 500 F.U.	22 Mar 1837
22 Mar 1923	Type II Radio Emission	22 Mar
22 Mar 2105	Type IV Radio Emission	22 Mar 1849
23 Mar 0037	3 – 245 MHz Radio Bursts	22 Mar
23 Mar 0037	1 – 245 MHz Radio Noise Storm	22 Mar
23 Mar 1209	Stratwarm Alert EXISTS	23 Mar
23 Mar 1455	K= 4 Warning CONTINUED, valid through	23 Mar 2100
23 Mar 2058	K= 4 Warning CONTINUED, valid through	24 Mar 2100
23 Mar 2115	A \geq 20 Watch	25 Mar
24 Mar 0021	4 – 245 MHz Radio Bursts	23 Mar
24 Mar 0021	1 – 245 MHz Radio Noise Storm	23 Mar
24 Mar 0810	X-Ray event X1.8/2B/N16W82	24 Mar 0752
24 Mar 0815	10cm Radio Burst 610 F.U.	24 Mar 0747
24 Mar 0819	Type II Radio Emission	24 Mar 0750
24 Mar 0839	Type IV Radio Emission	24 Mar 0804
24 Mar 1339	Stratwarm Alert EXISTS	24 Mar
25 Mar 0009	1– 245 MHz Radio Burst	24 Mar
25 Mar 0009	1– 245 MHz Radio Noise Storm	24 Mar
25 Mar 1306	Stratwarm Alert EXISTS	25 Mar
25 Mar 2305	Type II Radio Emission	25 Mar 2235
26 Mar 0014	1– 245 MHz Radio Burst	25 Mar
26 Mar 0035	Type IV Radio Emission	25 Mar 2245
26 Mar 1233	Stratwarm Alert EXISTS	26 Mar
26 Mar 2202	A \geq 20 Watch	27 Mar
26 Mar 2203	A \geq 20 Watch	28 Mar
26 Mar 2241	A \geq 20 Watch	29 Mar



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 Mar	200	5	2	12 Apr	185	5	2
30	195	5	2	13	190	5	2
31	190	5	2	14	195	8	3
01 Apr	190	5	2	15	205	8	3
02	195	8	3	16	210	8	3
03	200	8	3	17	220	5	2
04	205	8	3	18	225	8	3
05	205	5	2	19	225	12	3
06	205	10	3	20	220	12	3
07	200	12	3	21	215	10	3
08	195	15	4	22	210	5	2
09	190	5	2	23	205	5	2
10	185	5	2	24	200	5	2
11	180	5	2				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Integ Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
			Max				Lat	CMD	245	2695	II	IV
20 Mar	0821	0834	0850	M2.2	.027	2B	S18E92		110	97	2	2
20 Mar	1637	1644	1650	M2.4	.012	2B	N11W39	8910	240	44		
21 Mar	1412	1424	1435	M1.0	.012	SF	N31W36	8918			1	
22 Mar	0107	0118	0129	M1.9	.017	1N	N16W48	8910		73		
22 Mar	1834	1848	1856	X1.1	.087	2N	N14W57	8910	85	500	3	3
23 Mar	0027	0030	0033	M1.3	.004							
23 Mar	1132	1214	1230	M2.0	.041	SF	N15W69	8910				
24 Mar	0741	0752	0759	X1.8	.110	2B	N16W82	8910	100	570	2	2
24 Mar	1125	1129	1133	M2.8	.009	SF	N21E67	8928				
24 Mar	1513	1522	1525	M2.6	.008							
26 Mar	1727	1734	1739	M2.3	.010	SF	S12W55	8926				

Flare List

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
20 March	0053	0055	0117		SF	N12W23	8910
	0256	0306	0328		SF	N15W24	8910
	0434	0536	0557		SF	N09W24	8910
	0527	0532	0535	C2.2			
	0550	0551	0557		SF	N34W15	8918
	0613	0652	0744	C2.6	SF	N12W29	8910
	0623	0631	0644		SF	N32W19	8918
	0756	0756	0805		SF	N35W17	8918
	0805	0805	0810		SF	N12E60	8916
	0825	0828	0842	M2.2	2B	S18E92	
	0827	0831	0841		SF	N15W40	8914
	0926	0928	1006	C4.0	SF	S15E65	
	1028	1035	1042	C4.8			
	B1054	U1054	1111	C8.4	SN	N11W35	8910
	1231	1235	1244		SF	S31W34	8909
	1421	1434	1453		SF	N09W28	8910
	1433	1439	1455		SF	N14E40	8916
	1454	1458	1515	C2.7	SF	N31W24	8918
	1528	1531	1533	C2.5			
	1616	1617	1624		SF	N11W29	8910
1625	1643	1707	M2.4	2B	N11W39	8910	
1815	1816	1819	C2.1	SF	N13W34	8910	
1903	1905	1908		SF	N10W32	8910	
2307	2312	2315	C4.2				



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
21 March	0008	0008	0012		SF	N14W39	8910
	0031	0035	0039		SF	N30W32	8918
	0041	U0045	A0100		SF	N29W32	8918
	0111	0111	0115		SF	N31W29	8918
	0116	0121	A0136		SF	N31W29	8918
	0234	0242	A0308	C5.2	SF	N13W38	8910
	0242	0242	A0309		SF	S29W34	8909
	0401	0410	0428		SF	N11W36	8910
	0656	0656	0700		SF	N08W37	8910
	0701	0718	0755	C7.1	SF	N11W39	8910
	0742	0746	0749	C5.3			
	0918	0930	A1024		SF	N11W41	8910
	21 March	1430	1511	A1534		SF	N31W36
1430		1511	A0000	M1.0	SF	N31W36	8918
1446		1455	1532		SF	N13E64	8918
1518		1519	1521		SF	N09W42	8910
1519		1519	1525		SF	N11E33	8916
1603		1606	1613		SF	N12W47	8910
1927		2015	2037		SF	N30W41	8918
22 March	2128	2141	2157	C8.8			
	0110	0115	0152	M1.9	1N	N16W48	8910
	0129	0130	0149		SF	S20E50	8921
	0221	0222	0227		SF	N32W50	8918
	0524	0524	0527		SF	N09W50	8910
	0539	0541	0549		SF	S17E46	8921
	0653	0701	0705		SF	S17E45	8921
	0714	0721	0800	C5.5	SF	N19W25	8917
	0720	0722	0725		SF	N31W46	8918
	0732	U0733	A0745		SF	S17E45	8921
	0758	0811	0818		SF	N31W46	8918
	0918	0925	0935	C3.8			
	1049	1049	A1104	C9.3	SF	S16W30	8913
	1116	1117	1122		SF	N31W50	8918
	1129	1130	1136		SF	N15W68	8910
	1221	1221	1229		SF	N25W47	8918
	1306	1306	1323	C5.1	SF	N12W57	8910
	1704	1707	1712		SF	N12W58	8910
	1707	1708	1713		SF	S16W34	8913
	1741	1744	1749	C7.7	SF	N19W31	8917
1757	1800	1811		SF	N15W59	8910	
1818	1820	1822	C3.5	SF	N19W29	8917	
1829	U1844	A1847	X1.1	2N	N14W57	8910	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
23 March	0027	0030	0033	M1.3			
	0055	0101	0105	C9.3			
	0159	0203	0206	C5.0			
	0322	0325	0332	C4.1			
	0408	0409	A0445	C2.8	SF	S14W38	8913
	0423	0424	A0445		SF	N16W67	8914
	0601	0621	0645	C5.0	SF	N23W10	8915
	0801	0801	0808	C7.5	SF	N19W39	8917
	0921	0932	0938		SF	N17E07	8916
	1006	1023	1037		SF	N14E02	8916
	1023	1024	1028		SF	N21W38	8917
	1023	1028	1032		SF	N13W67	8910
	1136	1137	1146	M2.0	SF	N15W69	8910
	1154	1159	1224		SF	N16W68	8910
	1308	1312	1321		SF	N17E06	
	1427	1428	1431		SF	N08W72	8910
	1443	1501	1514		SF	S16E41	8921
	1448	1448	1453		SF	N17E00	8916
	1552	1554	1600		SF	N17E03	
	1629	1634	1640	C2.8			
	1758	1805	1821		SF	S19E41	8921
	1811	1813	1822		SF	N10W83	8910
	1816	1820	1849		SF	N17E02	8927
	1828	1830	1833		SF	S17W48	8913
	1915	1916	1922	C2.6	SF	N19W45	8917
	1937	1938	1940		SF	N10W72	8910
	2024	2025	2027		SF	N32W63	8918
	2125	2126	2129		SF	N16E02	8927
	2127	2129	2136		SF	N11W74	8910
	2146	2154	2214	C7.1	SF	N11W77	8910
	2151	2211	2220		SF	N16E00	8927
	2230	2232	2239		SF	N17E00	8927
	2245	2254	2303		SF	N17W08	8927
	2308	2309	2312		SF	N17W08	8927
	2329	2340	0003		SF	N16W02	8927
B2359	U0000	A0006		SF	N17W08	8927	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
24 March	0019	0019	A0019		SF	S17E22	8921	
	0035	0040	0047	C3.1				
	0309	0314	0317	C4.4				
	0430	0434	0438	C8.5				
	0710	0713	0723		SF	S10W21	8926	
	B0745	U0757	A0845	X1.8	2B	N16W82	8910	
	0757	0757	0825		SF	N19W52	8917	
	1113	1113	1124		SF	N16W06	8927	
	1127	1132	1134	M2.8	SF	N21E67	8928	
	1145	1147	1156		SF	S09W23	8926	
	1438	1444	1454		SF	N20E64	8928	
	1513	1522	1525	M2.6				
	1534	1535	1547		SF	S10W26	8926	
	1554	1554	1558		SF	S18E66	8925	
	1816	1824	1839	C3.7				
	2125	2135	2141	C4.1				
	25 March	0219	0225	0231	C4.6			
		0533	0546	0602	C7.4			
		0939	U0942	1000	C8.0	SF	S09W38	8926
1223		1224	1233	C5.0	SF	S10W38	8926	
1318		1319	1325	C2.7	SF	S10W39	8926	
1447		1451	1459		SF	N10E42	8924	
1530		1536	1545	C2.8				
1819		1822	1847		SF	S18E51	8925	
1918		1918	1928	C3.5	SF	N17E41	8928	
2045		2055	2112		SF	S18E48	8925	
2158		2158	2203	C2.9	SF	S09W45	8926	
2201		2208	2213		SF	N10E39	8924	
2206		2207	2210		SF	N23W07	8920	
2250		2253	2313	C7.4	1F	S14W02	8921	
2253		2259	2306		SF	S18E47	8925	
26 March	1138	1216	1251	C4.5				
	1329	1339	1343	C2.9				
	1444	1508	1604	C2.8	SF	N08W30	8916	
	1601	1606	1614		SF	S18E38	8925	
	1618	1626	1632		SF	S18E01	8921	
	1624	1624	1635		SF	S18E38	8925	
	1638	1641	1644		SF	S11E27	8925	
	1645	1645	1649		SF	S18E01	8921	
	1731	1736	1752	M2.3	SF	S12W55	8926	
	1802	1806	1810		SF	S17W14	8921	
2206	2212	2234	C4.1	SF	S09W59	8926		



Region Summary

Date	Location		Sunspot Characteristics				Flares											
	° Lat	° CMD	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<i>Region 8906</i>																		
08 Mar	S17E68	124	0740	08	HKX	012	A											
09 Mar	S16E55	124	0480	12	EKO	019	B	2				1	1					
10 Mar	S16E44	122	0730	10	DKC	029	B	10				12	1					
11 Mar	S16E31	122	0800	09	DKC	022	BD	3	1			6	1					
12 Mar	S15E18	122	0850	16	FKC	041	BD	4	1			5	1					
13 Mar	S16E06	121	0840	13	EKC	032	BD	5	1			6	1					
14 Mar	S16W09	122	0900	14	EKC	038	BD	2				9						
15 Mar	S16W20	120	0720	15	EKC	047	BGD	1	1			4	1					
16 Mar	S16W37	124	0680	10	DKI	022	BGD	5				4	1					
17 Mar	S16W49	123	0610	09	DKI	020	B	5	1			7						
18 Mar	S17W62	123	0410	08	DKO	010	BG		2			1	2					
19 Mar	S17W75	122	0370	10	DKO	007	B	2	1			4	1					
20 Mar	S16W88	122	0230	11	EAO	004	B											
								39	8	0	59	1	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 121

<i>Region 8908</i>																		
09 Mar	S19E71	108	0100	09	CSO	003	B											
10 Mar	S19E59	107	0070	08	CSO	006	B											
11 Mar	S19E45	108	0040	04	CSO	003	B											
12 Mar	S20E33	107	0020	04	CSO	004	B											
13 Mar	S20E21	106	0010	04	BXO	003	B											
14 Mar	S23E08	106	0000	03	BXO	002	B											
15 Mar	S23E03	097																
16 Mar	S23W10	097																
17 Mar	S23W23	097																
18 Mar	S23W36	097																
19 Mar	S23W49	097																
20 Mar	S23W62	097																
21 Mar	S23W84	106																
								0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 97



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares																
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical												
		Lon						C	M	X	S	1	2	3	4								
<i>Region 8909</i>																							
11 Mar	S29E76	077	0030	02	HRX	001	A																
12 Mar	S29E64	076	0040	02	HSX	002	A																
13 Mar	S29E55	072	0050	08	CSO	003	B																
14 Mar	S28E40	073	0050	07	CSO	004	B																
15 Mar	S28E27	073	0020	08	BXO	003	B																
16 Mar	S28E12	075	0010	07	CSO	002	B																
17 Mar	S29E01	073	0020	07	CSO	003	B																
18 Mar	S28W16	077	0030	03	DRO	004	B	1						1									
19 Mar	S29W25	073	0010	07	BXO	006	B							1									
20 Mar	S28W41	075	0000	00	AXX	001	A							1									
21 Mar	S28W54	075												1									
22 Mar	S28W67	075																					
23 Mar	S28W80	075																					
								1	0	0	3	1	0	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 73

<i>Region 8910</i>																						
12 Mar	N11E68	072	0140	06	CAO	004	B															
13 Mar	N09E56	071	0100	05	DAO	003	B	2						2								
14 Mar	N10E43	070	0250	06	DAO	010	B	3						7								
15 Mar	N11E31	069	0250	08	DAO	023	B															
16 Mar	N11E18	069	0230	08	DAI	021	BG	3						4	1							
17 Mar	N11E05	069	0250	10	DAI	034	B	2						3								
18 Mar	N11W10	071	0390	09	DAI	035	BG		1					3		1						
19 Mar	N12W23	071	0590	12	EKC	048	BGD	2						11								
20 Mar	N13W35	069	0680	12	EKC	055	BGD	3	1					9		1						
21 Mar	N12W49	070	0610	11	EKC	026	BD	2						8								
22 Mar	N13W61	069	0810	11	EKC	025	BG	1	1	1	1	5	1	1	1							
23 Mar	N13W75	070	0450	12	EAC	011	BG	1	1			8										
24 Mar	N13W84	066	0080	03	HSX	001	A							1		1						
								19	4	2	60	2	4	0	0							

Crossed West Limb.

Absolute heliographic longitude: 69



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 8912

14 Mar	N15W02	115	0000	00	AXX	001	A															
15 Mar	N15W15	115																				
16 Mar	N15W28	115																				
17 Mar	N15W41	115																				
18 Mar	N15W54	115																				
19 Mar	N15W67	115																				
20 Mar	N15W80	115																				
																						0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 115

Region 8913

14 Mar	S14E66	047	0000	00	AXX	001	A															
15 Mar	S16E57	043	0030	07	BXO	005	B															
16 Mar	S16E42	045	0060	07	DAO	007	B	1				2										
17 Mar	S16E30	044	0100	09	DAO	011	B	1				2										
18 Mar	S16E17	044	0140	10	DAO	012	B															
19 Mar	S16E04	044	0220	11	EAI	021	B															
20 Mar	S16W11	045	0210	12	EAI	033	B															
21 Mar	S16W24	045	0260	12	EAO	021	B															
22 Mar	S16W38	046	0190	12	EAI	017	B	1				2										
23 Mar	S16W50	045	0130	13	EAO	012	B	1				2										
24 Mar	S15W64	046	0100	12	EAO	008	B															
25 Mar	S16W78	046	0070	13	EAO	006	B															
26 Mar	S16W84	039	0040	01	HSX	001	A															
																						4 0 0 8 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 44

Region 8914

16 Mar	N16E05	082	0010	02	BXO	003	B															
17 Mar	N16W08	082																				
18 Mar	N16W21	082																				
19 Mar	N16W34	082																				
20 Mar	N16W47	082										1		1								1
21 Mar	N16W60	082																				
22 Mar	N16W73	082																				
																						0 1 0 1 0 1 0 0

Crossed West Limb.

Absolute heliographic longitude: 82



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 8915</i>																		
16 Mar	N22E76	011	0080	02	HSX	001	A											
17 Mar	N23E62	012	0130	02	HSX	001	A											
18 Mar	N23E49	012	0170	04	CSO	003	B											
19 Mar	N23E36	012	0170	03	HSX	002	A											
20 Mar	N23E24	010	0200	03	HSX	002	A											
21 Mar	N22E13	008	0170	08	CAO	004	B											
22 Mar	N23W01	009	0210	03	HAX	002	A											
23 Mar	N23W14	009	0140	03	HSX	001	A	1				1						
24 Mar	N23W27	009	0170	03	HSX	001	A											
25 Mar	N23W41	009	0130	03	HSX	002	A											
26 Mar	N23W52	007	0150	02	HSX	001	A											
									1	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 9

<i>Region 8916</i>																		
17 Mar	N12E74	000	0070	02	HSX	001	A											
18 Mar	N13E64	357	0280	11	CSO	006	B											
19 Mar	N14E53	355	0260	09	DAO	011	B					3						
20 Mar	N13E40	354	0250	11	ESO	016	B					2						
21 Mar	N13E27	354	0300	10	DAO	010	B					1						
22 Mar	N12E14	354	0240	11	EAO	013	B											
23 Mar	N13E01	354	0180	10	CAO	011	B					3						
24 Mar	N12W14	356	0140	08	DAO	010	B											
25 Mar	N12W27	355	0110	08	DSO	009	B											
26 Mar	N13W42	357	0140	04	DSO	005	B	1				1						
								1	0	0	10	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 354

<i>Region 8917</i>																		
18 Mar	N20E18	043	0010	03	BXO	002	B											
19 Mar	N19E04	044	0070	06	DAO	014	B					2						
20 Mar	N19W08	042	0160	08	DAO	014	B											
21 Mar	N19W22	043	0180	08	DAO	010	B											
22 Mar	N20W35	043	0250	08	DAI	017	B	3				3						
23 Mar	N19W47	042	0230	09	DAO	010	B	2				3						
24 Mar	N20W61	043	0160	09	DAO	010	B					1						
25 Mar	N19W74	042	0060	09	DSO	004	B											
26 Mar	N18W85	040	0070	02	HSX	001	A											
								5	0	0	9	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 44



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
<i>Region 8918</i>														
19 Mar	N32W14	062	0030	06	CRO	006	B						2	
20 Mar	N32W27	061	0060	07	DSO	012	B	1					4	
21 Mar	N32W41	062	0210	11	EAO	009	B		1				8	
22 Mar	N32W53	061	0460	12	EHO	013	B	1					5	
23 Mar	N32W66	061	0330	12	EAO	007	B						1	
24 Mar	N32W76	058	0190	09	CSO	003	B							
25 Mar	N32W89	058												
								2	1	0	20	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 62

<i>Region 8919</i>														
19 Mar	S22E58	350	0000	04	BXO	003	B							
20 Mar	S22E45	350												
21 Mar	S21E30	351	0000	00	AXX	002	A							
22 Mar	S21E17	351												
23 Mar	S21E04	351												
								0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 351

<i>Region 8920</i>														
20 Mar	N24E55	339	0010	00	AXX	001	A							
21 Mar	N24E40	341	0000	00	AXX	001	A							
22 Mar	N24E30	338	0020	06	BXO	005	B							
23 Mar	N23E16	339	0030	06	CSO	006	B							
24 Mar	N24E03	339												
25 Mar	N24W10	339									1			
26 Mar	N24W23	339												
								0	0	0	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 339



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 8921</i>																		
20 Mar	S15E71	323	0030	04	CSO	002	B											
21 Mar	S16E60	321	0080	06	CAO	006	B											
22 Mar	S17E48	320	0370	09	DAO	014	B					4						
23 Mar	S17E37	318	0340	10	DKI	017	B					2						
24 Mar	S17E23	319	0420	10	EKC	026	B					1						
25 Mar	S18E09	319	0240	10	DAI	027	B	1					1					
26 Mar	S17W03	318	0260	10	DAI	029	B					3						
								1	0	0	0	10	1	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 318

<i>Region 8922</i>																		
21 Mar	N14E57	324	0010	01	AXX	002	A											
22 Mar	N13E44	324	0030	02	CRO	003	B											
23 Mar	N14E32	323	0000	01	AXX	002	A											
24 Mar	N12E17	325	0000	00	AXX	001	A											
25 Mar	N12E04	325																
26 Mar	N12W09	325																
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 325

<i>Region 8923</i>																		
22 Mar	S27E43	325	0010	03	BXO	003	B											
23 Mar	S26E32	323	0020	05	CSO	003	B											
24 Mar	S26E18	324	0020	06	CAO	002	B											
25 Mar	S27E05	323	0010	06	CAO	002	B											
26 Mar	S26W12	327	0000	00	AXX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 323

<i>Region 8924</i>																		
23 Mar	N13E70	285	0110	11	CAO	004	B											
24 Mar	N12E55	287	0140	10	CSO	004	B											
25 Mar	N10E41	287	0120	07	DAO	012	B					2						
26 Mar	N10E27	288	0200	07	DAI	024	BG											
								0	0	0	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 288



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 8925

23 Mar	S17E76	279	0030	03	HAX	001	A											
24 Mar	S17E63	279	0090	07	CAO	002	B						1					
25 Mar	S18E50	278	0080	06	CSO	008	B						3					
26 Mar	S18E35	280	0170	07	DSI	017	BG						3					
										0	0	0	7	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 280

Region 8926

23 Mar	S10W18	013	0030	03	DAO	005	B											
24 Mar	S10W31	013	0090	08	DAI	011	B						3					
25 Mar	S10W45	013	0080	08	DSO	019	BGD	4					4					
26 Mar	S09W58	013	0090	08	DSO	012	BGD	1	1				2					
								5	1	0	9	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 13

Region 8927

23 Mar	N18E00	355	0040	06	DAO	006	B						8					
24 Mar	N17W14	356	0060	07	DSO	009	B						1					
25 Mar	N16W28	356	0040	08	CAO	014	B											
26 Mar	N17W41	356	0130	09	DSO	017	BG											
										0	0	0	9	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 355

Region 8928

24 Mar	N19E60	282	0060	09	CSO	002	B		1				2					
25 Mar	N19E45	283	0050	10	DAO	007	B	1					1					
26 Mar	N19E33	282	0060	11	CSO	008	B											
								1	1	0	3	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 282

Region 8929

25 Mar	S25E53	275	0000	00	AXX	001	A											
26 Mar	S25E40	275																
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 275



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares										
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
		Lon						C	M	X	S	1	2	3	4		
<i>Region 8930</i>																	
25 Mar	S36E54	274	0000	03	BXO	002	B										
26 Mar	S36E41	274															
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 274																	
<i>Region 8931</i>																	
26 Mar	S14E47	268	0010	08	BXO	008	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 268																	
<i>Region 8932</i>																	
26 Mar	S14E71	244	0070	02	HSX	001	A										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 244																	

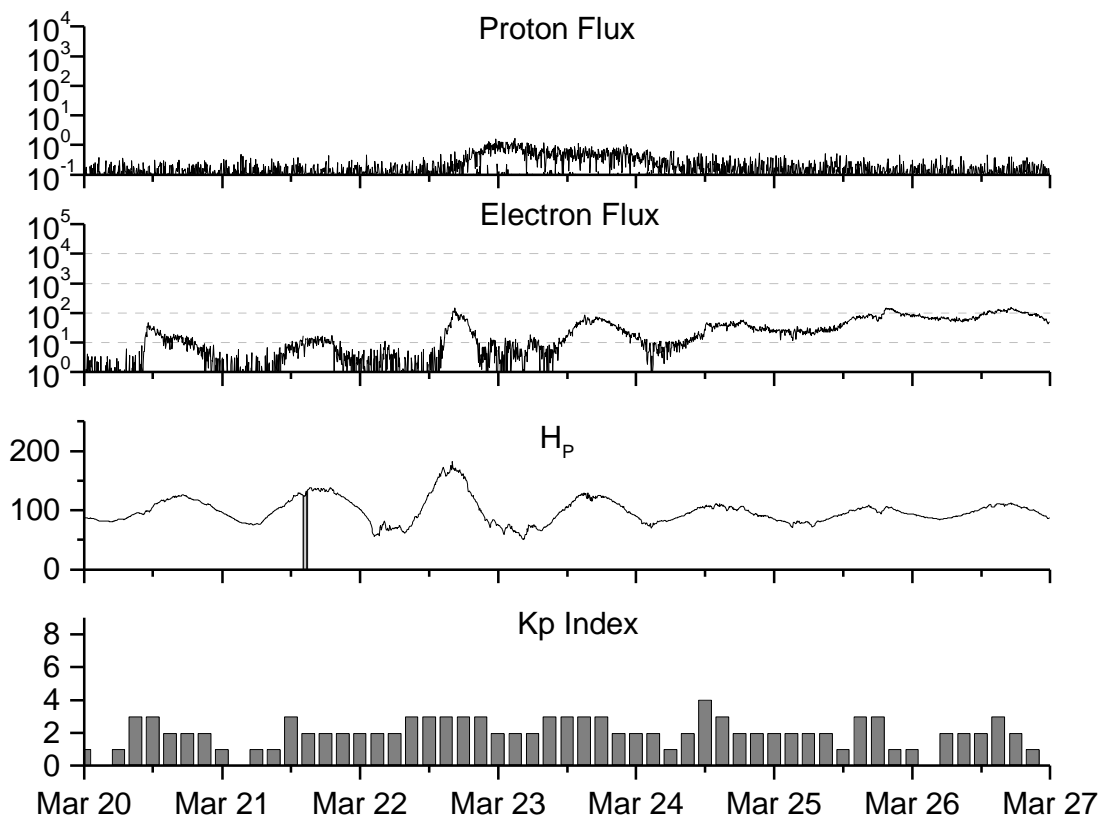


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	<u>Observed values</u>		<u>Ratio</u>	<u>Smooth values</u>		<u>*Penticton</u>	<u>Smooth</u>	<u>Planetary</u>	<u>Smooth</u>
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
1998									
February	54.4	40.3	0.74	67.4	48.9	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	108.9	10	11.3
May	74.3	56.3	0.76	81.4	59.4	106.7	112.0	18	11.6
June	93.6	70.7	0.76	85.9	62.5	108.4	115.8	10	11.9
July	98.3	66.6	0.68	90.3	65.5	114.0	120.3	11	12.2
August	118.6	92.2	0.78	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.5	138.3	126.8	13	12.6
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.8
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.4
December	120.8	81.9	0.68	108.8	77.9	150.1	134.3	08	11.9
1999									
January	94.3	62.0	0.66	116.5	82.6	142.6	139.0	10	11.7
February	93.4	66.3	0.71	120.2	84.6	142.0	142.6	12	11.6
March	100.5	68.8	0.68	120.5	83.8	126.3	144.0	14	11.7
April	92.9	63.7	0.69	123.8	85.4	117.2	145.8	12	12.2
May	140.5	106.3	0.76	131.7	90.4	148.6	150.0	08	12.4
June	208.3	137.4	0.66	136.0	93.0	169.8	152.9	07	12.4
July	169.2	113.5	0.67	138.0	94.4	165.6	154.4	10	12.3
August	136.1	93.7	0.69	142.8	97.5	170.8	156.4	15	12.2
September	107.4	70.9	0.66			135.7		19	
October	167.7	116.4	0.69			164.9		19	
November	199.3	132.7	0.67			191.7		14	
December	123.5	86.4	0.70			169.8		10	
2000									
January	140.8	90.2	0.64			158.3		06	
February	161.9	112.3	0.69			173.7		13	

NOTE: All smoothed values after November 1998 and monthly values after June 1999 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 March 2000

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

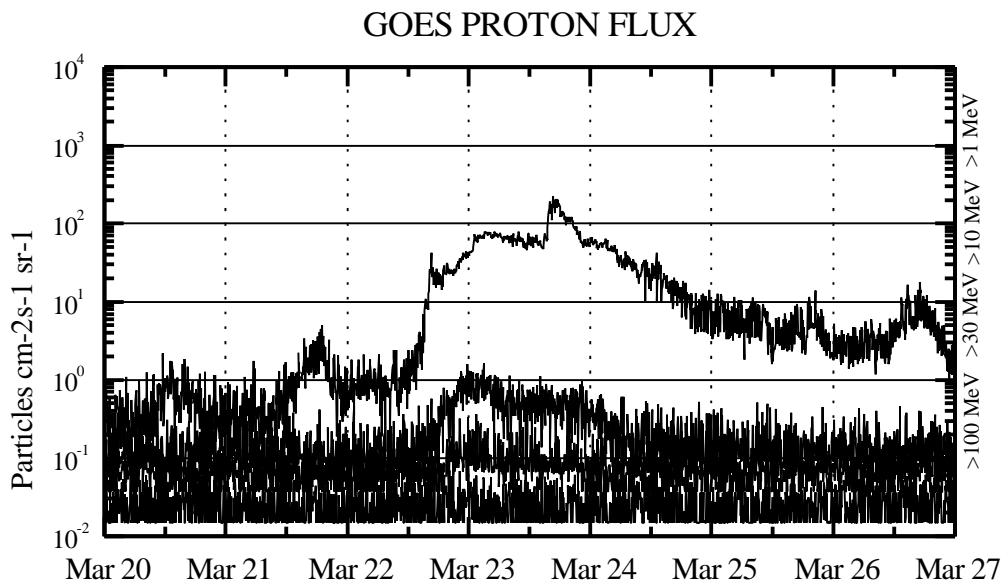
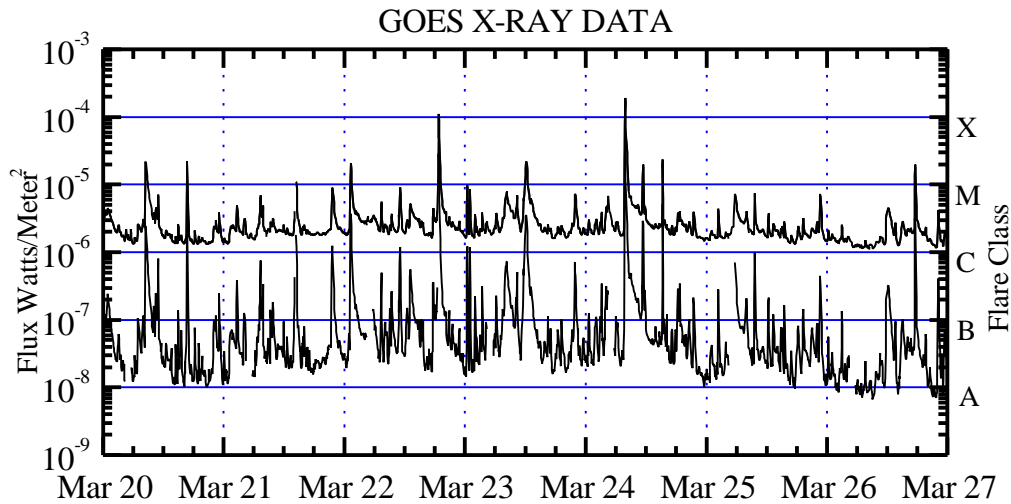
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are " global " parameters that are applicable to a first order approximation over large areas. H_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/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/cm² -sec -sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

