

Space Weather Highlights
31 March - 06 April 2003

SWO PRF 1440
08 April 2003

Solar Activity was at low to moderate levels. The period began on 31 March through 01 April with minor C-class activity from Region 318 (S13, L=244, class/area Dai/60 on 30 March). On 02 – 06 April, Region 324 (S11, L=189, class/area Dac/340 on 04 April) was the source of most of the activity. Region 324 produced a C3/Sf and a C6/1f flare on 02 and 03 April respectively. The largest event of the period was an M1/1f from Region 324 on 04 April at 2019 UTC. A partial halo CME was associated with this event as seen in LASCO imagery. On 05 and 06 April, Region 324 produced a C6 and C5 flare respectively. Region 324 was in a growth phase early in the period and developed a beta-gamma-delta configuration on 04 April. By the end of the period, this region was in decay. Other regions of note during the period were Region 321 (N05, L=211, class/area Eac/320 on 27 March), and Region 325 (N10, L=165, class/area Ehi/360 on 02 April). Region 321 was in gradual decay for most of the period but produced four minor C-class flares on 04 April. Region 325 was one of the largest regions on the disk but has been relatively stable during the period.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. The period began with residual effects from a high speed coronal hole stream. Solar wind velocity was over 600 km/s at the beginning of the period and decreased to around 525 km/s on March 31 through 01 April. On 02 April, velocity further decreased to 450 km/s and was relatively stable until 05 April. The end of the high speed stream was marked by a rapid decline in solar wind velocity to below 400 km/s on 06 April. Bz exhibited oscillations between +/- 10 nT until 06 April.

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

The greater than 2 MeV electron flux at geo-synchronous orbit was at high levels for the entire summary period, 31 March – 06 April.

The geomagnetic field ranged from quiet to major storm levels. The period began with unsettled to major storm levels on 31 March through early on 01 April due to coronal hole high speed stream effects. Quiet to active conditions were observed on 01 – 03 April. Multiple periods of prolonged southward Bz on 04 – 05 April, resulted in unsettled to minor storm levels. Quiet to unsettled conditions were observed on 06 April as effects of the high speed stream subsided.

Space Weather Outlook
09 April - 05 May 2003

Solar activity is expected to range from very low to low levels. The later half of the period will see the return of Regions 321, 323, 324, and 325. Combined, these regions represent a slight chance of M-class activity.

No greater than 10 MeV proton events are expected during the forecast period.

The greater than 2 MeV electron flux may reach high levels on 13 – 17 April and again on 27 April – 03 May due to returning coronal holes.

The geomagnetic field is expected to range from unsettled to major storm conditions during the period. A coronal hole is due to return to a geo-effective position on 11 –14 April with unsettled to minor storm conditions possible. Unsettled to isolated major storm levels are possible with multiple coronal hole high speed streams due on 23 April – 02 May.



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
31 March	160	165	1040	B3.8	3	0	0	2	0	0	0	0
01 April	153	161	1050	B4.0	2	0	0	2	0	0	0	0
02 April	158	189	1150	B5.1	6	0	0	4	0	0	0	0
03 April	156	154	1160	B6.5	9	0	0	5	1	0	0	0
04 April	153	148	1320	B8.5	12	1	0	16	1	0	0	0
05 April	137	94	1110	B5.1	8	0	0	2	0	0	0	0
06 April	126	75	800	B3.3	2	0	0	1	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
31 March	6.7E+5	1.1E+4	2.3E+3		3.7E+7	
01 April	2.4E+5	1.1E+4	2.4E+3		1.0E+8	
02 April	6.3E+5	1.2E+4	2.4E+3		1.6E+8	
03 April	1.4E+5	1.1E+4	2.5E+3		1.1E+8	
04 April	1.7E+6	1.2E+4	2.5E+3		6.1E+7	
05 April	4.7E+5	1.1E+4	2.5E+3		4.1E+7	
06 April	1.4E+5	1.0E+4	2.4E+3		5.6E+7	

Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
31 March	15	2-1-2-3-4-4-3-3	53	2-2-4-5-7-7-5-2	31	3-3-3-4-6-6-4-4
01 April	11	4-2-1-2-2-3-3-2	*	*-3-2-5-3-4-5-2	12	5-4-1-3-2-3-3-3
02 April	11	2-3-3-2-3-2-2-3	42	3-3-6-6-6-4-4-3	20	2-4-4-4-4-3-3-4
03 April	11	2-2-3-2-2-2-2-4	15	3-3-3-3-3-3-3-3	14	3-2-3-3-3-3-3-4
04 April	13	3-2-3-3-3-2-3-3	57	6-3-6-6-6-6-3-4	26	4-3-5-5-5-3-4-4
05 April	16	4-4-2-2-3-3-3-3	35	4-4-3-4-6-5-5-2	23	5-4-3-3-4-4-4-4
06 April	6	2-3-2-1-1-2-1-1	10	3-2-2-4-1-3-1-0	9	3-3-2-2-2-3-3-1

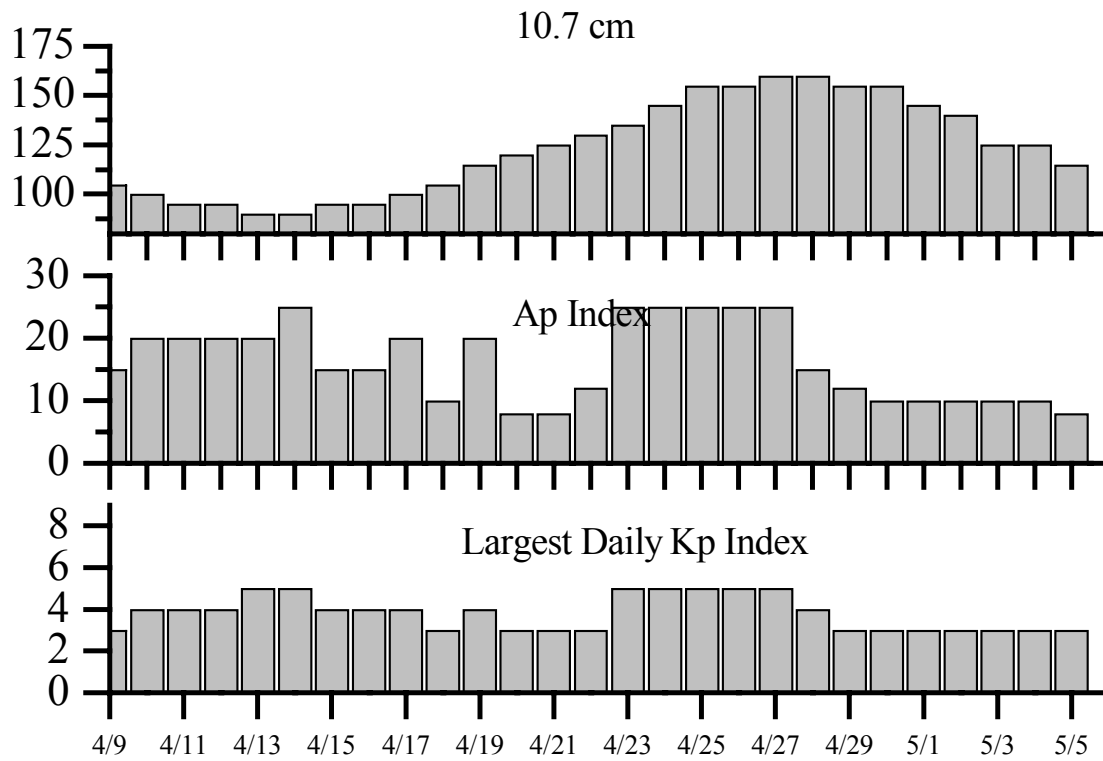


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
31 Mar 1219	ALERT: STRATWARM	Mar 31
31 Mar 1420	ALERT: Geomagnetic K= 5	31 Mar 1419
31 Mar 1455	EXTENDED WARNING: Geomagnetic K= 4 expected	30 Mar 1555 - 01 Apr 1500
31 Mar 1545	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	31 Mar 1525
31 Mar 1628	WARNING: Geomagnetic K= 5 expected	31 Mar 1628 - 2359
31 Mar 1635	ALERT: Geomagnetic K-index of 5	31 Mar 1633
01 Apr 0226	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	01 Apr 0210
02 Apr 0106	245 MHz Burst	01 Apr
02 Apr 0504	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	02 Apr 0445
02 Apr 0635	ALERT: Geomagnetic K= 4	02 Apr 0634
02 Apr 1146	ALERT: Geomagnetic K= 4	02 Apr 1146
02 Apr 1340	ALERT: Geomagnetic K= 4	02 Apr 1333
02 Apr 1506	WARNING: Geomagnetic K= 4 expected	02 Apr 1510 - 2359
02 Apr 1752	ALERT: Geomagnetic K= 4	02 Apr 1748
02 Apr 2358	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Apr 1510 -03 Apr 1500
03 Apr 0107	2 - 245 MHz Radio Bursts	02 Apr
03 Apr 1159	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	03 Apr 1140
03 Apr 1455	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Apr 1510 -03 Apr 2100
03 Apr 2059	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Apr 1510 - 04 Apr 1500
04 Apr 0850	ALERT: Geomagnetic K= 5	04 Apr 0850
04 Apr 1034	WARNING: Geomagnetic K= 5 expected	04 Apr 1033 - 1500
04 Apr 1038	ALERT: Geomagnetic K= 5	04 Apr 1038
04 Apr 1133	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	04 Apr 1115
04 Apr 1456	EXTENDED WARNING: Geomagnetic K= 5 expected	04 Apr 1033 - 2359
04 Apr 2354	EXTENDED WARNING: Geomagnetic K= 5 expected	04 Apr 1033 - 05 Apr 1500
05 Apr 0036	245 MHz Noise Storm	04 Apr
05 Apr 1459	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	05 Apr 1435
05 Apr 1728	ALERT: Geomagnetic K= 4	05 Apr 1726
05 Apr 1836	WARNING: Geomagnetic K= 4 expected	05 Apr 1836 -06 Apr 1500
05 Apr 2058	ALERT: Geomagnetic K= 4	05 Apr 2056
06 Apr 1535	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	06 Apr 1515



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
09 Apr	105	15	3	23 Apr	135	25	5
10	100	20	4	24	145	25	5
11	95	20	4	25	155	25	5
12	95	20	4	26	155	25	5
13	90	20	5	27	160	25	5
14	90	25	5	28	160	15	4
15	95	15	4	29	155	12	3
16	95	15	4	30	155	10	3
17	100	20	4	01 May	145	10	3
18	105	10	3	02	140	10	3
19	115	20	4	03	125	10	3
20	120	8	3	04	125	10	3
21	125	8	3	05	115	8	3
22	130	12	3				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
04 Apr	1905	2019	2040	M1.9	.042	1f	S11W40		324	59	66		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
31 March	0051	0055	0104	B7.5				
	0411	0418	0427	C1.2				318
	1618	1619	1630	C1.6	Sf	S07W26		323
	2123	2125	2139	C1.8	Sf	S12E38		326
01 April	0001	0003	0015		Sf	S12W50		318
	0216	0220	0224	B7.8				
	0238	0252	0329	C1.9				323
	0804	0807	0809	B9.1				
02 April	1436	1437	1512	C2.3	Sf	S14W56		318
	0012	0014	0020	C1.8	Sf	S12W07		324
	1129	1131	1138	B9.5	Sf	S11W14		324
	1228	1236	1239	C1.1				324
	1413	1416	1434	B7.0				
	1527	U1528	1548	C3.6	Sf	S11W14		324
	1709	1713	1715	C1.0				321
	2042	2043	2047		Sf	S12W21		324
	2131	2136	2142	C1.1				324
	2240	2245	2255	C1.0				
03 April	0138	0139	0149	C3.6	Sf	S07W30		324
	0434	0437	0443	C1.5	Sf	S07W32		324
	0653	0658	0702	C1.0				
	0710	0717	0724	C1.9				
	1017	1026	1050	C6.5	1f	S10W25		324
	1817	1818	1824	C1.8	Sf	S12W30		324
	1856	1910	1916	C1.7				
	1935	1945	1951	C2.5				
	2016	2017	2024		Sf	S12W31		324
	2235	2236	2243	C2.4	Sf	S11W35		324
04 April	0134	0135	0142		Sf	N09W62		321
	0238	0241	0248	C1.2	Sf	S04W65		323
	0342	0434	0436	C1.9				324
	0650	0655	0703	C2.4				324
	0839	0840	0847	C2.8	Sf	S08W48		324
	0946	1001	1019	C2.0				324
	1213	1216	1223	C3.9	Sf	S12W40		324
	1347	1355	1402	C3.1	Sf	N07W63		321
	1415	1416	1427	C3.4	Sf	S12W43		324



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
04 April	1416	1421	1508		Sf	N08W62	321
	1436	1445	1454		Sf	S11W40	324
	1546	1555	1602	C2.7			321
	1702	1704	1714	C1.6	Sf	N08W64	321
	1707	1712	1716	C2.2			321
	1728	1736	1745	C2.0			0
	1729	1732	1741		Sf	N08W64	321
	1735	1739	1745		Sf	S12W45	324
	1851	1851	1856		Sf	S11W43	324
	1857	1858	1900		Sf	N08W66	321
	1907	1908	1922		Sf	N08W65	321
	1948	1949	1954		Sf	N08W66	321
	1950	2017	2123	M1.9	1f	S11W40	324
	2050	2055	2109		Sf	N08W66	321
	05 April	0031	0037	0042	C2.0		
0127		0209	0221	C3.4			
0841		0851	0858	C1.2			
0909		0916	0940	C6.9			324
1012		1016	1022	C3.5			
1126		1131	1134	C1.1			
1503		1507	1520	C4.9	Sf	S12W58	324
1723		1723	1726		Sf	S12W59	324
06 April	1850	1856	1903	C1.2			
	0800	0811	0819	C4.2			324
	1922	1923	1947	C5.9	Sf	S09W71	324



Region Summary

Date	Location		Sunspot Characteristics				Flares											
	Helio		Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4			
<i>Region 318</i>																		
22 Mar	S16E74	241	0040	05	Cao	004	B											
23 Mar	S15E62	240	0070	08	Cao	006	B	1										
24 Mar	S15E49	240	0060	07	Cao	007	B											
25 Mar	S15E36	240	0040	03	Dso	003	B											
26 Mar	S15E22	240	0040	10	Dao	010	B											
27 Mar	S15E09	240	0030	08	Dro	007	B											
28 Mar	S15W06	242	0030	07	Dso	011	B											
29 Mar	S14W20	243	0090	06	Dao	014	B	3				3						
30 Mar	S13W34	244	0060	09	Dai	014	B											
31 Mar	S13W49	245	0050	08	Dao	008	B	1										
01 Apr	S12W65	248	0030	05	Cro	004	B	1				2						
02 Apr	S13W76	246	0030	01	Hrx	001	A											
03 Apr	S13W89	246																
								6	0	0	5	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 242

<i>Region 319</i>																		
23 Mar	N13E53	249	0030	05	Cao	005	B											
24 Mar	N13E40	249	0040	09	Dso	009	B											
25 Mar	N13E27	249	0070	09	Dsi	010	B					1						
26 Mar	N13E13	249	0120	08	Dai	017	B											
27 Mar	N13W01	250	0340	09	Dki	030	Bg	2										
28 Mar	N12W18	254	0440	11	Eki	032	Bg											
29 Mar	N12W30	253	0300	11	Cao	013	B	1				1						
30 Mar	N13W42	252	0250	12	Eao	011	Bg											
31 Mar	N13W57	253	0130	09	Dao	005	B											
01 Apr	N12W74	257	0130	03	Hax	002	A											
02 Apr	N12W88	258	0120	02	Hsx	002	A											
								3	0	0	1	1	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 250



Region Summary - continued.

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

Region 320

24 Mar	N05E07	282	0030	04	Dso	005	B											
25 Mar	N05W06	282	0020	06	Bxo	005	B											
26 Mar	N05W20	282	0020	02	Hsx	005	A											
27 Mar	N05W33	282	0020	05	Bxo	006	B	1										
28 Mar	N06W48	284	0030	05	Cso	011	B											
29 Mar	N07W63	286	0040	06	Cso	006	B											
30 Mar	N06W74	284	0100	06	Cao	004	B											
31 Mar	N06W87	284																
									1	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 282

Region 321

24 Mar	N05E78	211	0060	10	Dao	003	B	1										
25 Mar	N05E65	211	0290	10	Dko	008	B				4							
26 Mar	N05E51	211	0350	10	Dki	015	Bg	1			3							
27 Mar	N05E34	211	0320	12	Eac	029	Bgd	1										
28 Mar	N04E21	215	0370	12	Eac	038	Bg											
29 Mar	N04E11	212	0200	09	Dai	017	B											
30 Mar	N05W03	213	0210	11	Ehi	025	B	1			1							
31 Mar	N06W16	212	0140	11	Eai	017	Bg											
01 Apr	N06W29	212	0100	10	Dao	016	B											
02 Apr	N07W40	210	0180	06	Dao	014	B	1										
03 Apr	N08W54	211	0140	07	Dao	011	B											
04 Apr	N08W68	212	0200	07	Dai	013	B	4			9							
05 Apr	N09W83	213	0110	07	Dai	006	B											
									9	0	0	17	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 213



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares											
	Helio		Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4			
<i>Region 323</i>																		
25 Mar	S07E55	221	0020	03	Cso	002	B											
26 Mar	S07E41	221	0050	06	Dso	007	B											
27 Mar	S07E28	221	0040	07	Cso	008	B											
28 Mar	S09E11	225	0030	08	Dso	012	B											
29 Mar	S08W01	224	0120	09	Dsi	020	B	1				3						
30 Mar	S08W15	225	0230	09	Dai	024	Bg	1										
31 Mar	S08W29	225	0310	11	Eki	021	Bg	1				1						
01 Apr	S08W43	226	0350	11	Eac	022	Bg	1										
02 Apr	S07W56	226	0270	11	Eai	026	Bg											
03 Apr	S07W70	227	0240	13	Eao	016	B											
04 Apr	S07W87	231	0090	07	Cso	007	B	1				1						
								5	0	0	5	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 224

<i>Region 324</i>																		
27 Mar	S16E68	181	0080	03	Dao	005	B											
28 Mar	S14E53	183	0060	05	Dao	003	B											
29 Mar	S14E41	182	0020	04	Bxo	003	B											
30 Mar	S13E23	187	0050	11	Eso	011	B											
31 Mar	S12E06	190	0020	05	Cao	009	B											
01 Apr	S11W08	191	0060	06	Dao	011	B											
02 Apr	S12W21	191	0120	07	Dao	022	B	4				4						
03 Apr	S11W35	192	0200	08	Dai	021	Bg	5				5	1					
04 Apr	S11W45	189	0340	10	Dac	034	Bgd	6	1			6	1					
05 Apr	S11W62	192	0240	10	Dai	019	Bgd	1				2						
06 Apr	S12W74	191	0120	09	Dai	010	Bg	2				1						
								18	1	0	18	2	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 190



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

Region 325

27 Mar	N12E80	169	0200	03	Hhx	001	A	1									
28 Mar	N12E65	171	0260	06	Hhx	001	A										
29 Mar	N13E54	169	0300	03	Hax	001	A										
30 Mar	N13E40	170	0320	05	Hkx	005	A										
31 Mar	N12E26	170	0330	06	Dho	009	B										
01 Apr	N12E14	169	0310	09	Cko	008	B										
02 Apr	N10E05	165	0360	13	Ehi	021	B										
03 Apr	N11W09	166	0360	10	Dko	011	B										
04 Apr	N12W24	168	0310	07	Cko	007	B										
05 Apr	N13W38	168	0340	04	Hkx	002	A										
06 Apr	N13W49	166	0250	06	Cko	007	B										
										1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 165

Region 326

28 Mar	S12E74	162	0060	03	Hsx	001	A										
29 Mar	S13E62	161	0050	01	Hsx	001	A										
30 Mar	S13E49	161	0050	01	Hsx	002	A										
31 Mar	S13E32	164	0040	01	Hsx	001	A	1			1						
01 Apr	S13E21	162	0030	01	Hsx	001	A										
02 Apr	S11E09	161	0030	01	Hsx	002	A										
03 Apr	S11W04	161	0030	06	Cso	004	B										
04 Apr	S11W17	161	0020	01	Hsx	002	A										
05 Apr	S11W31	161	0010	01	Axx	002	A										
06 Apr	S11W44	161	0010	01	Hsx	001	A										
										1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 161

Region 327

31 Mar	S07W12	208	0020	03	Bxo	004	B										
01 Apr	S06W25	208	0030	04	Dao	003	B										
02 Apr	S05W38	208	0030	04	Cro	006	B										
03 Apr	S04W53	210	0030	05	Cao	006	B										
04 Apr	S06W76	220	0010	01	Axx	002	A										
05 Apr	S06W89	220															
										0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 208



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 328

31 Mar	S03E14	182	0000	01	Axx	001	A											
01 Apr	S13E02	181	0010	03	Hsx	004	B											
02 Apr	S12W13	183	0010	03	Axx	005	A											
03 Apr	S12W26	183																
05 Apr	S12W52	183																
06 Apr	S12W65	183																
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 181

Region 329

03 Apr	N01E18	139	0020	03	Cso	004	B											
04 Apr	N02E04	140	0020	04	Cso	002	B											
05 Apr	N02W09	140																
06 Apr	N02W22	140																
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 140

Region 330

03 Apr	N07E74	083	0140	04	Hhx	001	A											
04 Apr	N07E62	082	0330	04	Hhx	001	A											
05 Apr	N07E49	081	0400	03	Hkx	001	A											
06 Apr	N07E38	079	0380	06	Dko	003	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 079

Region 331

05 Apr	S07W09	139	0010	04	Bxo	004	B											
06 Apr	S07W22	139	0040	06	Dso	004	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 139

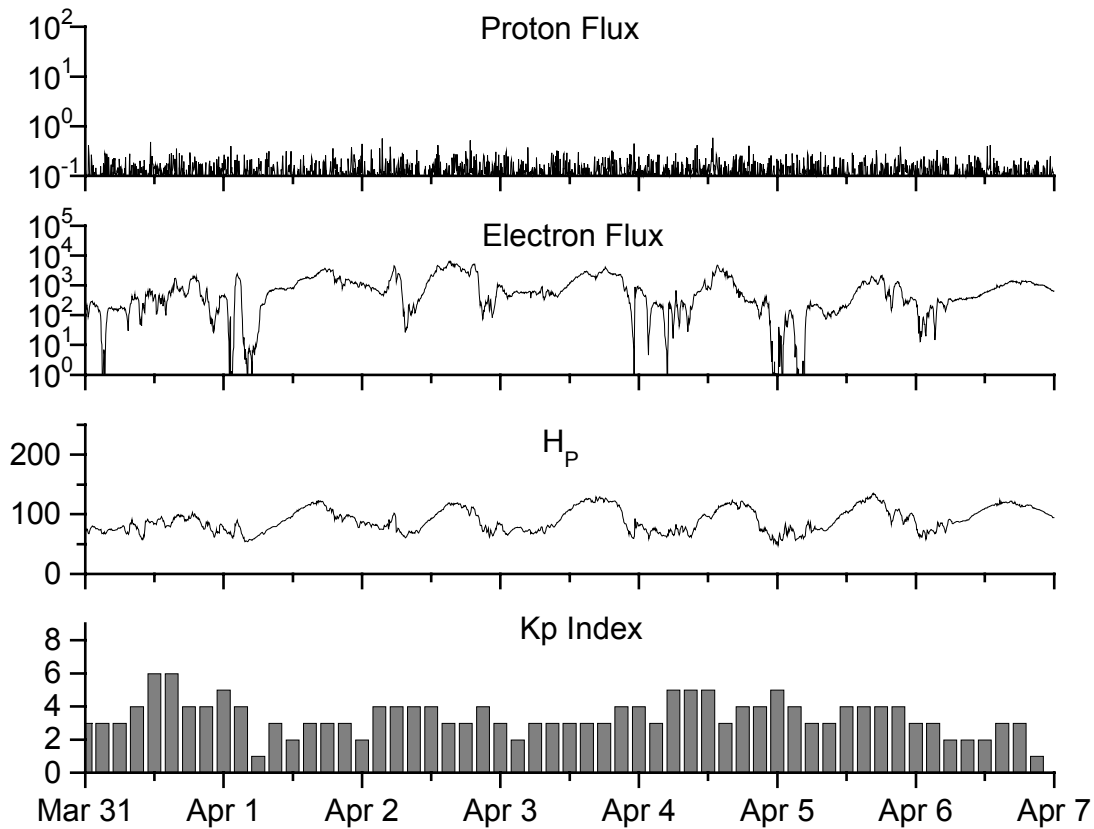


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2001									
April	163.6	108.2	0.66	159.4	107.7	178.1	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	147.9	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	163.1	188.8	13	12.5
September	229.1	150.7	0.66	178.8	114.3	233.8	191.3	13	12.8
October	197.4	125.6	0.64	179.5	114.1	208.1	191.9	20	12.0
November	178.6	106.5	0.60	183.7	115.6	212.7	193.7	16	12.0
December	217.5	132.2	0.61	184.5	114.6	235.6	193.9	09	12.2
2002									
January	189.0	114.1	0.60	184.8	113.5	227.3	194.6	08	12.4
February	194.5	107.4	0.55	188.6	114.7	205.0	197.2	10	12.8
March	153.1	98.4	0.64	188.9	113.4	180.3	195.7	10	13.0
April	194.9	120.7	0.62	186.2	110.5	189.8	191.5	15	13.2
May	204.1	120.8	0.59	183.6	108.9	178.4	188.0	15	13.3
June	146.0	88.3	0.61	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.9	0.54	175.4	102.7	173.5	176.3	13	13.9
August	191.0	116.4	0.61	169.3	98.7	183.9	169.5	16	14.3
September	206.4	109.6	0.53	163.4	94.6	175.8	164.2	14	14.9
October	153.9	97.5	0.63			167.0		23	
November	159.8	95.5	0.60			168.7		16	
December	147.9	80.8	0.55			158.6		13	
2003									
January	149.3	79.5	0.53			144.6		13	
February	87.9	46.2	0.53			124.6		15	
March	119.7	61.5	0.51			132.3		19	

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 31 March 2003

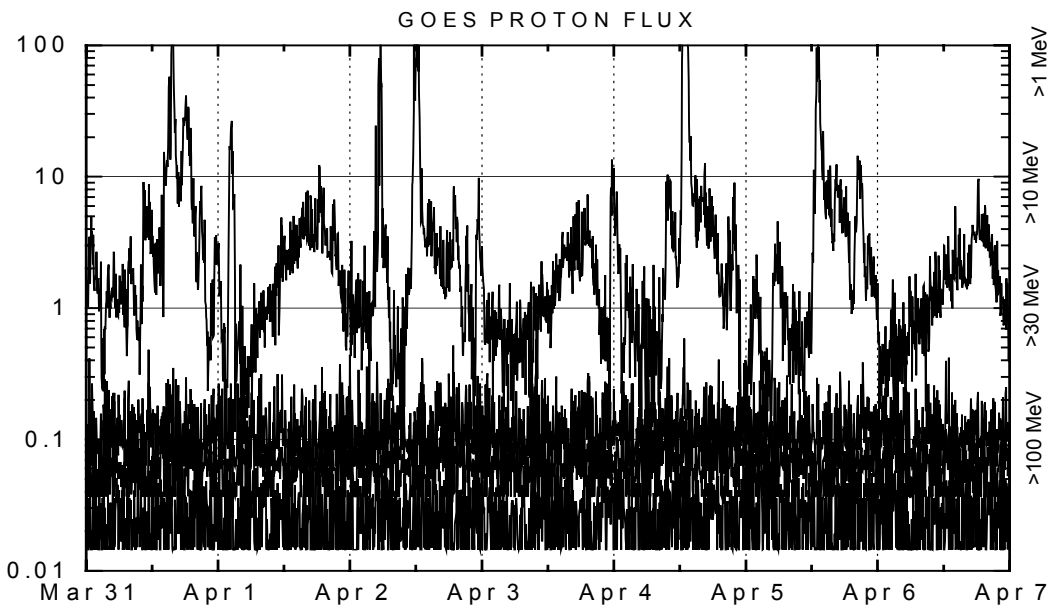
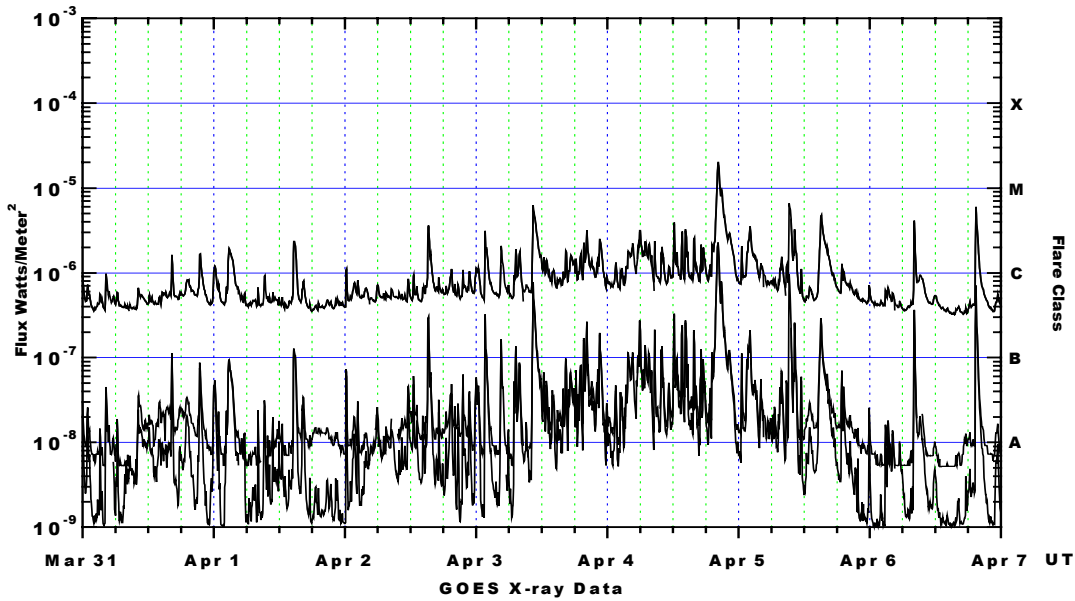
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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 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_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.



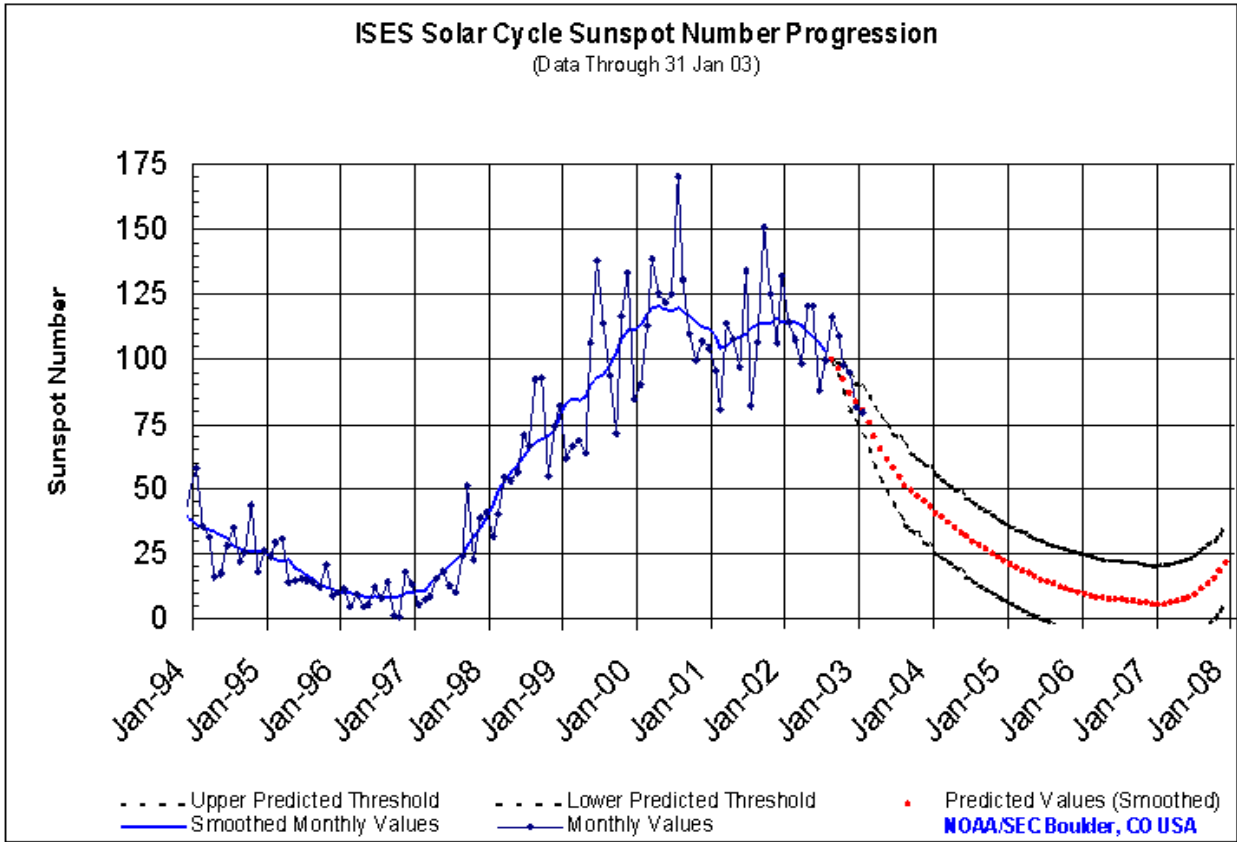


Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 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

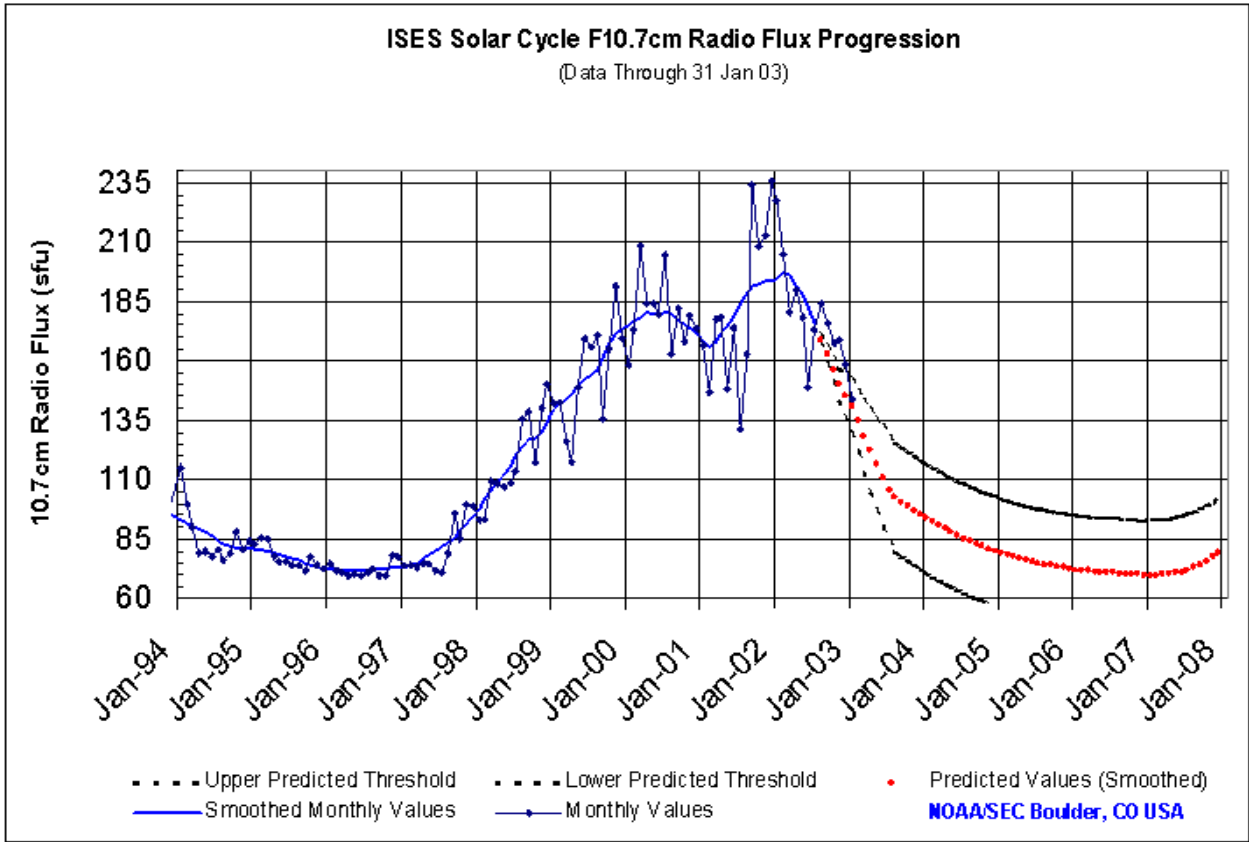




SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	44 (***)	49 (***)	53 (***)	57 (***)	59 (***)	63 (***)	66 (***)	68 (***)	70 (***)	71 (***)	73 (***)	78 (***)
1999	83 (***)	85 (***)	84 (***)	86 (***)	91 (***)	93 (***)	94 (***)	97 (***)	102 (***)	108 (***)	111 (***)	111 (***)
2000	113 (***)	117 (***)	120 (***)	121 (***)	119 (***)	119 (***)	120 (***)	119 (***)	116 (***)	114 (***)	113 (***)	112 (***)
2001	109 (***)	104 (***)	105 (***)	108 (***)	109 (***)	110 (***)	112 (***)	114 (***)	114 (***)	114 (***)	116 (***)	115 (***)
2002	114 (***)	115 (***)	113 (***)	110 (***)	109 (***)	106 (***)	103 (***)	100 (1)	96 (3)	92 (5)	87 (7)	83 (8)
2003	80 (9)	75 (10)	70 (11)	65 (12)	61 (13)	58 (14)	54 (15)	51 (15)	49 (15)	47 (15)	45 (15)	43 (15)
2004	41 (15)	39 (15)	37 (15)	35 (15)	33 (15)	31 (15)	30 (15)	28 (15)	27 (15)	25 (15)	24 (15)	22 (15)
2005	21 (15)	20 (15)	18 (15)	17 (15)	16 (15)	15 (15)	14 (15)	13 (15)	12 (15)	12 (15)	11 (15)	10 (15)
2006	10 (15)	9 (15)	8 (15)	8 (15)	8 (15)	7 (15)	7 (15)	7 (15)	7 (15)	6 (15)	6 (15)	5 (15)
2007	5 (15)	6 (15)	6 (15)	6 (15)	7 (15)	8 (15)	10 (15)	11 (15)	13 (15)	16 (15)	18 (15)	21 (15)





SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	98 (***)	102 (***)	106 (***)	109 (***)	112 (***)	116 (***)	120 (***)	124 (***)	127 (***)	128 (***)	130 (***)	134 (***)
1999	139 (***)	143 (***)	144 (***)	146 (***)	150 (***)	153 (***)	154 (***)	156 (***)	161 (***)	167 (***)	172 (***)	173 (***)
2000	175 (***)	176 (***)	178 (***)	181 (***)	180 (***)	180 (***)	180 (***)	180 (***)	177 (***)	176 (***)	174 (***)	172 (***)
2001	169 (***)	166 (***)	168 (***)	172 (***)	175 (***)	179 (***)	184 (***)	189 (***)	191 (***)	192 (***)	194 (***)	194 (***)
2002	195 (***)	197 (***)	196 (***)	192 (***)	188 (***)	183 (***)	176 (***)	169 (1)	163 (3)	156 (5)	150 (7)	146 (9)
2003	141 (11)	135 (13)	128 (15)	122 (17)	116 (19)	111 (21)	106 (22)	103 (23)	101 (23)	99 (23)	97 (23)	95 (23)
2004	94 (23)	92 (23)	91 (23)	89 (23)	88 (23)	87 (23)	85 (23)	84 (23)	83 (23)	82 (23)	81 (23)	80 (23)
2005	79 (23)	78 (23)	78 (23)	77 (23)	76 (23)	75 (23)	75 (23)	74 (23)	74 (23)	73 (23)	73 (23)	73 (23)
2006	72 (23)	72 (23)	71 (23)	71 (23)	71 (23)	71 (23)	71 (23)	71 (23)	70 (23)	70 (23)	70 (23)	70 (23)
2007	70 (23)	70 (23)	70 (23)	70 (23)	71 (23)	71 (23)	72 (23)	73 (23)	74 (23)	76 (23)	77 (23)	79 (23)



ISES Solar Cycle Ap Progression

(Data Through 31 Jan 03)

