

Solar activity ranged from low to high levels. The period was marked by significant activity from Region 338 (N18, L=285, class/area Eac/250 on 26 April), which produced nine M-class flares and numerous C-class flares. The largest event during the period was an M7 flare on 26 April as described below. Region 339 (N18, L=338, class/area Cso/60 on 23 April) was also very active, producing twelve C-class flares as it transited the west limb on 23 – 24 April. Region 346 (N16, L=165, class/area Cso/60 on 26 April) rotated onto the visible disk on 24 April as a small magnetically simple spot group, but produced an M-class flare on the 25th. Region 349 (S14, L= 154, class/area Dao/150 on 27 April) appeared on the visible disk late in the period and was in a significant growth phase through the end of the period.

The period began on 21 April, with moderate level activity due to an M2/1n flare from Region 338. This M2 flare was associated with a Type II (1200 km/s) and Type IV radio sweep, 300 sfu Ten-flare radio burst, and a partial halo CME. This region exhibited steady growth throughout much of the period and developed a beta-gamma-delta magnetic configuration on 25 April. Activity decreased to low levels on 22 April due to four C-class flares from Region 338. A Type II (960 km/s) radio sweep was reported on 22 April at 0716 UTC and analysis of NOAA/SXI imagery indicates the source as a CME on the east limb. On 23 April, activity reached high levels with an M5/1n flare from Region 338. The M5 was associated with a Type II (513 km/s) and Type IV radio sweep, 380 sfu Ten-flare radio burst, and a partial halo CME. On 24 - 25 April, activity returned to moderate levels due to an M3/1n flare from Region 338 on the 24th and an M1/Sf flare from Region 346 on the 25th. The M3 flare was associated with a Type II (830 km/s) and Type IV radio sweep as well as a partial halo CME. The M1 flare on the 25th was associated with a Type II (814 km/s) radio sweep and a CME off the east limb. Region 338 also produced seven C-class flares on the 25th. High level activity was observed on 26 April with Region 338 producing four M-class flares and over eight C-class flares, the largest of which was an impulsive M7. The period ended on 27 April with moderate activity due to a single M1/Sf flare from Region 338. Region 338 also produced numerous C-class flares on the 27th as it approached the west limb. For flare times and magnitudes please refer the Energetic Event and Flare lists.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Solar wind speed increased on 21 – 22 April to near 600 km/s. On 23 - 24 April, solar wind speed was in gradual decline but still elevated. By midday on 24 April, solar wind began to rise again and peaked near 600 km/s on 25 April due to a combination of high speed flow and transient flow. Solar wind speed declined on 26 April to 425 km/s but gradually, increased on 27 April to end the period near 550 km/s due to a high speed coronal hole stream.

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 reached high levels everyday of the period, 21 – 27 April.

The geomagnetic field ranged from quiet to minor storm levels. The period began on 21 – 23 April with a coronal hole high speed flow resulting in unsettled to active conditions with isolated minor storm levels on the 21st and the 23rd. A transient flow was observed on 24 – 25 April and resulted in unsettled to minor storm levels. The period ended on 26 – 27 April with gradually increasing solar wind speed, which produced unsettled to active levels.



## **Space Weather Outlook**

### **30 April – 26 May 2003**

Solar activity is expected to be at low to moderate levels. Region 349 is expected to have M-class potential early in the period as it continues to grow and develop in magnetic complexity. Activity is expected to decrease to low levels after 06 May when Region 349 rotates beyond the west limb. Region 338 is due to return to the visible disk on 11 May and represents M-class potential for the remainder of the period.

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 01 – 10 May, and again on 16 – 23 May due to returning coronal holes.

The geomagnetic field is expected to range from quiet to isolated major storm levels.

Unsettled to major storm levels are possible early in the period, 29 April – 02 May, due to a coronal hole high speed flow. Multiple returning coronal holes are expected to rotate into geo-effective positions during the latter half of the period, and are expected to produce unsettled to minor storm conditions. On 13 – 14 May, isolated major storm levels are possible with the return of a large coronal hole high speed flow.



### 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
21 April	126	154	640	B2.9	3	1	0	6	1	0	0	0
22 April	132	147	570	B4.7	5	0	0	3	0	0	0	0
23 April	133	152	670	B4.9	5	2	0	1	2	0	0	0
24 April	128	171	690	B4.1	9	1	0	4	1	0	0	0
25 April	144	173	950	B6.4	10	1	0	6	0	0	0	0
26 April	144	193	1270	B5.3	8	4	0	9	1	0	0	0
27 April	154	200	1370	B7.2	10	1	0	5	0	1	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
21 April	1.9E+6	1.3E+4	4.1E+3		1.3E+8	
22 April	2.1E+6	1.6E+4	4.2E+3		3.3E+8	
23 April	1.2E+6	2.5E+4	5.4E+3		1.9E+8	
24 April	1.8E+6	2.2E+4	4.5E+3		9.7E+7	
25 April	3.0E+6	1.3E+4	4.5E+3		2.2E+8	
26 April	1.8E+6	2.3E+4	1.5E+4		3.2E+8	
27 April	7.9E+5	4.0E+4	3.0E+3		3.9E+8	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	21 April	12	3-3-2-2-2-2-3-4	48	6-5-6-6-3-5-4-2	21
22 April	13	3-3-2-2-2-2-3-4	30	3-4-5-5-5-4-3-3	22	4-4-4-4-3-3-3-4
23 April	13	3-4-2-3-2-2-3-2	30	3-4-5-5-5-4-3-3	18	2-4-5-4-3-3-3-3
24 April	24	3-2-4-3-4-4-4-5	38	3-3-4-5-6-6-4-3	24	3-3-4-5-4-4-4-4
25 April	19	4-4-3-3-2-4-2-4	*	4-4-*.*. *-*-2-3	32	4-5-5-5-3-4-3-5
26 April	9	2-2-3-2-2-2-3-2	21	4-3-5-3-3-4-3-2	15	4-2-4-2-3-3-3-3
27 April	11	3-3-2-2-2-2-3-3	18	3-3-3-4-4-4-2-2	15	3-4-3-3-3-4-3-3

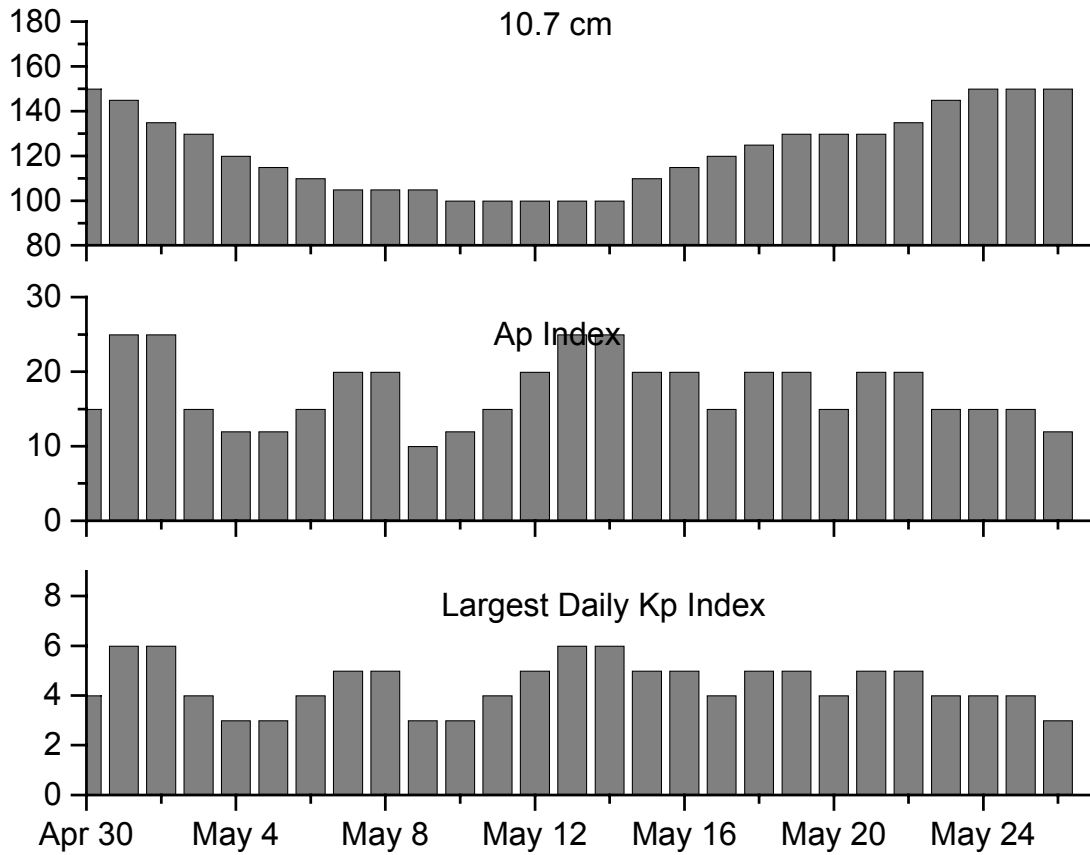


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
21 Apr 0656	ALERT: Geomagnetic K= 4	21 Apr 0655
21 Apr 1121	ALERT: Electron 2MeV Integral Flux > 1000pfu	24 Apr 0955
21 Apr 1319	SUMMARY: 10cm Radio Burst	21 Apr 1304
21 Apr 1333	ALERT: Type II Radio Emission	21 Apr 1309
21 Apr 1344	ALERT: Type IV Radio Emission	21 Apr 1302
21 Apr 2342	WARNING: Geomagnetic K= 4	22 Apr 0000 – 1500
22 Apr 0239	ALERT: Geomagnetic K= 4	22 Apr 0237
22 Apr 0844	ALERT: Type II Radio Emission	22 Apr 0716
22 Apr 1318	ALERT: Electron 2MeV Integral Flux > 1000pfu	22 Apr 1300
22 Apr 2034	WATCH: Geomagnetic A $\geq$ 20	23 Apr
22 Apr 2035	WATCH: Geomagnetic A $\geq$ 20	24 Apr
23 Apr 0120	ALERT: X-Ray Flux exceeded M5	23 Apr 0106
23 Apr 0127	2 – 245 MHz Radio Bursts	22 Apr
23 Apr 0127	SUMMARY: X-ray Event exceeded M5	23 Apr 0106
23 Apr 0138	ALERT: Type II Radio Emission	23 Apr 0118
23 Apr 0140	SUMMARY: 10cm Radio Burst	23 Apr 0106
23 Apr 0205	ALERT: Type IV Radio Emission	23 Apr 0153
23 Apr 0543	WARNING: Geomagnetic K= 4	23 Apr 0543 – 1500
23 Apr 0544	ALERT: Geomagnetic K= 4	23 Apr 0543
23 Apr 1733	ALERT: Electron 2MeV Integral Flux > 1000pfu	23 Apr 1715
23 Apr 2143	WATCH: Geomagnetic A $\geq$ 20	25 Apr
24 Apr 0132	6 – 245 MHz Radio Bursts	23 Apr
24 Apr 0901	WARNING: Geomagnetic K= 4	24 Apr 0900 – 1500
24 Apr 0933	ALERT: Geomagnetic K= 4	24 Apr 0930
24 Apr 1452	ALERT: Type II Radio Emission	24 Apr 1251
24 Apr 1458	EXTENDED WARNING: Geomagnetic K= 4	24 Apr 0900 – 25 Apr 1500
24 Apr 1617	ALERT: Type IV Radio Emission	24 Apr 1300
24 Apr 1641	ALERT: Electron 2MeV Integral Flux > 1000pfu	24 Apr 1620
24 Apr 2134	WATCH: Geomagnetic A $\geq$ 20	26 Apr
24 Apr 2136	WATCH: Geomagnetic A $\geq$ 20	27 Apr
25 Apr 0037	WARNING: Geomagnetic K= 5 expected	25 Apr 0100 – 1500
25 Apr 0142	5 – 245 MHz Radio Bursts	24 Apr
25 Apr 0147	ALERT: Geomagnetic K= 5	25 Apr 0143
25 Apr 0609	ALERT: Type II Radio Emission	25 Apr 0530
25 Apr 0942	ALERT: Electron 2MeV Integral Flux > 1000pfu	25 Apr 0900
25 Apr 1452	EXTENDED WARNING: Geomagnetic K= 5	25 Apr 0100 – 2359
25 Apr 2355	EXTENDED WARNING: Geomagnetic K= 5	25 Apr 0100 – 26 Apr 1800
26 Apr 0200	6 – 245 MHz Radio Bursts	25 Apr
26 Apr 0813	ALERT: X-Ray Flux exceeded M5	26 Apr 0807
26 Apr 0823	SUMMARY: X-ray Event exceeded M5	26 Apr 0807
26 Apr 0958	ALERT: Electron 2MeV Integral Flux > 1000pfu	26 Apr 0900
26 Apr 1521	ALERT: Type II Radio Emission	26 Apr 1447
27 Apr 0017	ALERT: Type II Radio Emission	26 Apr 2340
27 Apr 0118	17 – 245 MHz Radio Bursts	26 Apr
27 Apr 0515	WARNING: Geomagnetic K= 4	27 Apr 0515 – 1500
27 Apr 0516	ALERT: Geomagnetic K= 4	27 Apr 0515
27 Apr 1444	ALERT: Electron 2MeV Integral Flux > 1000pfu	27 Apr 1100
27 Apr 1458	EXTENDED WARNING: Geomagnetic K= 4	27 Apr 0515 – 2359
27 Apr 2203	EXTENDED WARNING: Geomagnetic K= 4	27 Apr 0515 – 28 Apr 2359



### 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 Apr	150	15	4	14 May	100	25	6
01 May	145	25	6	15	110	20	5
02	135	25	6	16	115	20	5
03	130	15	4	17	120	15	4
04	120	12	3	18	125	20	5
05	115	12	3	19	130	20	5
06	110	15	4	20	130	15	4
07	105	20	5	21	130	20	5
08	105	20	5	22	135	20	5
09	105	10	3	23	145	15	4
10	100	12	3	24	150	15	4
11	100	15	4	25	150	15	4
12	100	20	5	26	150	12	3
13	100	25	6				



### *Energetic Events*

Date	Time			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	$\frac{1}{2}$	Class	Integ	Imp/ Brtns	Location		Radio Flux		Intensity		
			Max		Flux		Lat	CMD	245	2695	II	IV	
21 Apr	1254	1307	1314	M2.8	.015	1n	N18E02		338	1400	300	3	3
23 Apr	0039	0106	0115	M5.1	.035	1n	N22W25		338	12000	380	2	
23 Apr	1536	1556	1611	M2.0	.027	1f	N20W22		338	66			
24 Apr	1245	1253	1303	M3.3	.020	1n	N21W39		338	830	89	2	1
25 Apr	0523	0540	0558	M1.2	.018	Sf	N14E79		346	100	82	2	
26 Apr	0051	0058	0100	M2.1	.005	Sf	N20W65		338	420	55		
26 Apr	0301	0306	0312	M2.1	.009	Sn	N20W69		338	100			
26 Apr	0801	0807	0809	M7.0	.000				338	3600			
26 Apr	2337	2340	2342	M2.5	.003				338	6200	71	1	
27 Apr	1527	1532	1535	M1.7	.004	Sf	N21W85		338	1600	65		

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
21 April	0034	0038	0048		Sf	N17W47		339
	0223	0231	0244	B9.9				
	0644	0650	0655	B7.7				
	1302	1308	1325	M2.8	1n	N18E02		338
	1554	1600	1610	C2.3	Sf	S13E47		337
	1723	1726	1729	B7.6				
	1742	1742	1747		Sf	N16W53		339
	1854	1858	1903	B5.5				
	1932	1939	1942	C1.3	Sf	N18W52		339
	2136	2141	2201	C1.8	Sf	S08E47		337
22 April	2232	2232	2237		Sf	N18W64		339
	0125	0132	0139	B7.2				
	0810	0813	0815	C1.1				338
	0929	0935	0938	C1.0				
	1615	1616	1624	C2.2	Sf	N20W17		338
	1957	2006	2022	C4.0	Sf	N20W14		338
23 April	2106	2107	2112	C3.0	Sf	N17W70		339
	0011	0015	0022	B7.9				
	0045	0102	0140	M5.1	1n	N22W25		338
	0313	0322	0335	C2.2				339
	0522	0536	0545	C3.4				339
	0752	0758	0814	B9.8				
	0913	0917	0920	C1.1				339
	0951	0956	1001	B7.9				
	1031	1035	1041	C1.9				338
	1200	1213	1232	C5.8				339
	1543	1558	1625	M2.0	1f	N20W22		338
	1623	1624	1626		Sf	N17W78		339
	1811	1822	1835	B8.6				



*Flare List - continued*

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
24 April	0116	0120	0126	B6.4				
	0204	0210	0214	C1.2				
	0243	0247	0251	C1.0			339	
	0448	0456	0509	C7.1			339	
	0532	0533	0548	C4.5	Sf	S15E08	337	
	0634	0637	0642	C1.0			339	
	0749	0756	0802	B8.5				
	0809	0816	0823	C1.4			339	
	1250	1251	1312	M3.3	In	N21W39	338	
	1349	1355	1358		Sf	S18E83		
	1423	1435	1439		Sf	S18E83		
	1541	1553	1611	C8.2				
	2228	2233	2235	C1.3			338	
	2301	2307	2314	C1.2			339	
	2329	2332	2337		Sf	N21W42	338	
	25 April	0100	0109	0122	C1.5			
		0526	0533	0537	M1.2	Sf	N14E79	346
		0819	0840	0847	C1.0			
		0910	0915	0920	C1.7			
1348		1415	1440	C1.5	Sf	N22W51	338	
1715		1725	1735	C2.7	Sf	N21W54	338	
1926		1930	1937	C1.8	Sf	N20W57	338	
1943		1953	2008	C7.5	Sf	N19W58	338	
2054		2056	2113	C6.8	Sf	N21W62	338	
2154		2200	2204	C4.1			338	
2355		0001	0006	C1.6			338	
26 April	0057	0058	0105	M2.1	Sf	N20W65	338	
	0140	0145	0235	C6.6	1f	N21W59	338	
	B0305	0309	0315	M2.1	Sn	N20W69	338	
	0801	0807	0809	M7.0			338	
	1423	1423	1428	C1.4	Sf	N20W73	338	
	1444	1452	1455	C6.0	Sf	N21W66	338	
	1525	1527	1529		Sf	N21W66	338	
	1537	1543	1546	C1.3			338	
	1602	1605	1607	B7.4			338	
	1634	1635	1638	C5.5	Sf	N21W67	338	
	1702	1705	1709	B7.7			338	
	1758	U1759	A1830	C5.1	Sf	N20W75	338	
	1935	1938	1947	C3.8	Sf	N21W67	338	
	2038	2046	2049	B8.5				
	2052	2055	2057	B9.4				
	2321	2321	2326		Sf	N20W71	338	
	2337	2340	2342	M2.5			338	



**Flare List - continued**

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
26 April	2353	2357	0001	C1.2			338
27 April	0015	0017	0018		Sf	N21W71	338
	0030	0033	0036		Sf	N20W71	338
	0044	0059	0122	C9.3	2f	N21W67	338
	0222	0236	0249	C6.7			338
	0310	0314	0322		Sf	S16E57	349
	0337	0357	0416	C6.5			338
	0537	0541	0543	C2.5			338
	0650	0650	0705		Sf	S16E58	349
	0737	0740	0743	C8.1			
	0809	0816	0822	C3.6			338
	1210	1217	1230	C1.6			338
	1329	1333	1341	C1.7			338
	1531	1531	A1550	M1.7	Sf	N21W85	338
	1601	1608	1635	C2.2			338
	2131	2134	2139	C1.3			338

**Region Summary**

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 334*

10 Apr	S08E69	356	0110	03	Cao	006	B								
11 Apr	S08E55	356	0120	03	Cao	004	B								
12 Apr	S08E43	355	0110	03	Cao	006	B								
13 Apr	S08E29	356	0100	03	Cao	005	B								
14 Apr	S08E16	356	0070	04	Cso	007	B								
15 Apr	S08E02	357	0060	04	Cso	007	B								
16 Apr	S10W12	357	0060	04	Cao	005	B								
17 Apr	S08W24	356	0060	04	Dso	004	B								
18 Apr	S08W38	357	0060	02	Hsx	001	A								
19 Apr	S07W51	357	0030	02	Hsx	001	A								
20 Apr	S07W65	358	0030	01	Hsx	001	A								
21 Apr	S07W78	358	0020	02	Hsx	001	A								
22 Apr	S07W92	358	0020	02	Hsx	003	A								

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 357





**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 335</i>																		
13 Apr	S21E56	329	0040	03	Cso	003	B											
14 Apr	S21E42	330	0040	03	Dso	003	B	1										
15 Apr	S22E28	331	0030	02	Dso	002	B											
16 Apr	S21E20	325	0020	07	Cao	015	B											
17 Apr	S22E06	326	0010	06	Bxo	002	B											
18 Apr	S22W09	328	0020	06	Bxo	007	B											
19 Apr	S21W21	327	0030	04	Bxo	007	B											
20 Apr	S23W33	326	0020	04	Bxo	006	B											
21 Apr	S24W43	323	0010	03	Cro	003	B											
22 Apr	S24W56	323																
23 Apr	S24W69	323																
24 Apr	S24W82	323																
25 Apr	S24W95	323																

1 0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 326

<i>Region 336</i>																		
17 Apr	N12E75	257	0100	02	Hsx	001	A											
18 Apr	N13E62	257	0160	02	Hax	001	A											
19 Apr	N13E50	256	0120	03	Hax	001	A											
20 Apr	N13E37	256	0150	03	Hax	002	A											
21 Apr	N13E23	257	0120	04	Cao	005	B											
22 Apr	N14E10	256	0070	03	Dso	005	B											
23 Apr	N13W03	256	0060	04	Cso	006	B											
24 Apr	N14W16	256	0030	04	Cso	008	B											
25 Apr	N14W29	256	0010	03	Bxo	006	B											
26 Apr	N14W42	256	0010	04	Bxo	006	B											
27 Apr	N14W56	256	0010	03	Bxo	004	B											

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 256



**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 337*

18 Apr	S12E74	245	0180	03	Hkx	002	A		1								
19 Apr	S14E66	239	0240	09	Cao	006	B										
20 Apr	S14E55	238	0340	10	Dko	010	B					1					
21 Apr	S13E43	237	0370	09	Dki	022	Bd	2				2					
22 Apr	S14E29	237	0270	09	Dki	019	Bg										
23 Apr	S14E15	238	0310	08	Dko	019	Bg										
24 Apr	S14E00	240	0280	06	Dko	022	Bg	1				1					
25 Apr	S14W13	240	0270	07	Dko	018	Bg										
26 Apr	S14W26	240	0220	06	Dko	013	B										
27 Apr	S14W40	240	0220	08	Dki	021	Bgd										
										3	1	0	4	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 240

*Region 338*

19 Apr	N18E26	280	0020	11	Bxo	004	B										
20 Apr	N18E09	284	0040	08	Dso	008	B										
21 Apr	N18W05	285	0050	10	Dai	025	Bg	1				1					
22 Apr	N18W20	286	0100	10	Dai	020	Bg	3				2					
23 Apr	N18W32	285	0170	12	Eai	031	Bg	1	2			2					
24 Apr	N18W45	285	0200	11	Eai	025	Bg	1	1			1	1				
25 Apr	N18W58	285	0210	11	Eao	028	Bgd	7				5					
26 Apr	N18W71	285	0250	13	Eac	019	Bgd	8	4			9	1				
27 Apr	N18W85	285	0200	08	Dai	007	Bg	8	1			3		1			
										28	9	0	20	5	1	0	0

Still on Disk.

Absolute heliographic longitude: 285

*Region 339*

20 Apr	N18W45	338	0020	05	Cso	006	Bg	1				2					
21 Apr	N16W58	338	0050	08	Dso	012	B	1				4					
22 Apr	N16W71	337	0060	07	Dso	008	B	1				1					
23 Apr	N16W84	337	0060	04	Cso	005	B	4				1					
24 Apr	N16W97	337						5									
										12	0	0	8	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 338



**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 340*

21 Apr	S04E55	225	0010	02	Axx	002	A	1										
22 Apr	S06E43	223	0010	01	Hrx	002	A											
23 Apr	S06E30	223	0010	00	Hsx	002	A											
24 Apr	S07E13	227	0010	01	Axx	002	A											
25 Apr	S07E00	227																
26 Apr	S07W13	227																
27 Apr	S07W26	227																
									1	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 227

*Region 341*

21 Apr	S10E74	206	0010	04	Cro	004	B											
22 Apr	S10E61	205	0020	04	Cro	004	B											
23 Apr	S10E50	203	0010	01	Axx	001	A											
24 Apr	S10E37	203																
25 Apr	S10E24	203																
26 Apr	S10E11	203																
27 Apr	S10W02	203																
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 203

*Region 342*

22 Apr	N18W07	273	0020	02	Axx	006	A											
23 Apr	N18W21	274	0020	02	Axx	004	A											
24 Apr	N17W35	275	0020	03	Bxo	006	B											
25 Apr	N17W48	275	0040	05	Cso	009	B											
26 Apr	N17W61	275	0050	04	Cso	005	B											
27 Apr	N17W75	275	0030	01	Hsx	001	A											
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 273



**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 343*

23 Apr	N06E60	193	0030	06	Cro	004	B												
24 Apr	N06E45	195	0040	06	Dso	006	B												
25 Apr	N06E32	195	0020	06	Cso	006	B												
26 Apr	N06E19	195	0020	01	Axx	001	A												
27 Apr	N06E05	195	0010	03	Bxo	005	B												
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 195

*Region 344*

24 Apr	N16E39	201	0030	06	Dso	007	B												
25 Apr	N16E26	201	0170	07	Dao	017	B												
26 Apr	N16E13	201	0400	08	Dki	020	Bgd												
27 Apr	N16W00	201	0450	08	Dki	020	Bgd												
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 201

*Region 345*

24 Apr	S17E74	166	0030	05	Cso	004	B												
25 Apr	S17E61	166	0170	06	Dao	008	B												
26 Apr	S17E48	166	0170	07	Dao	006	B												
27 Apr	S17E34	166	0190	05	Dao	006	B												
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 166

*Region 346*

24 Apr	N16E74	166	0050	02	Hsx	001	A												
25 Apr	N16E61	166	0060	02	Hsx	001	A		1		1								
26 Apr	N16E48	166	0060	04	Cso	003	B												
27 Apr	N16E35	165	0060	02	Hsx	001	A												
									0	1	0	1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 165

*Region 347*

26 Apr	S20E36	178	0040	03	Bxo	004	B												
27 Apr	S20E22	178	0020	03	Dro	003	B												
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 178



***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 348*

26 Apr	S36E58	156	0020	06	Bxo	004	B										
27 Apr	S36E44	156	0030	06	Cso	007	B										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 156

*Region 349*

26 Apr	S14E60	154	0030	01	Hrx	002	A										
27 Apr	S14E46	154	0150	06	Dao	015	B				2						
										0	0	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 154

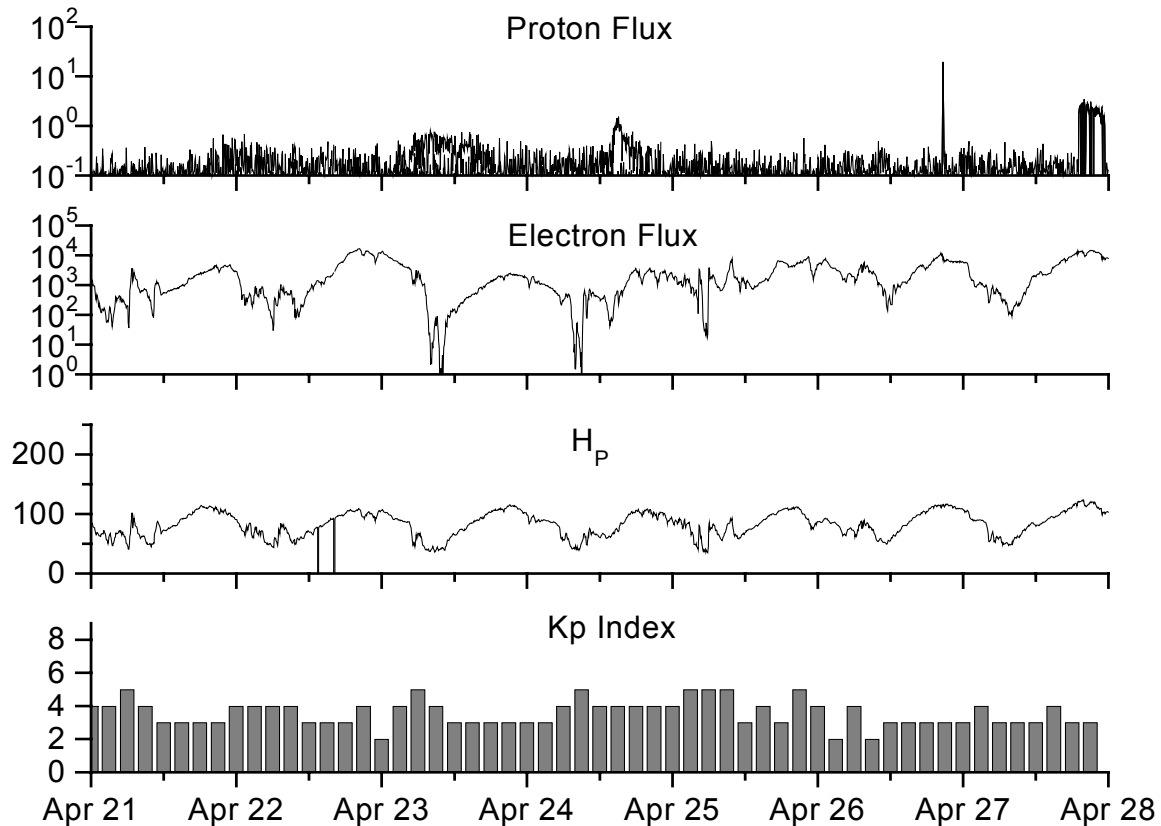


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>2001</b>									
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
<b>2002</b>									
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	
<b>2003</b>									
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 21 April 2003*

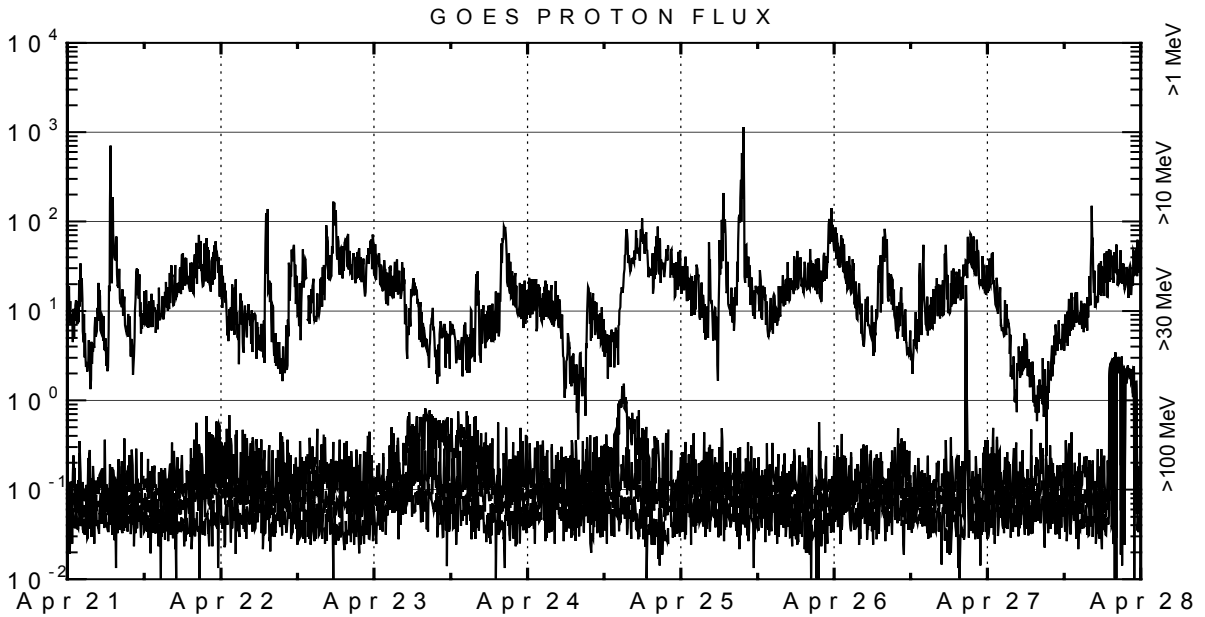
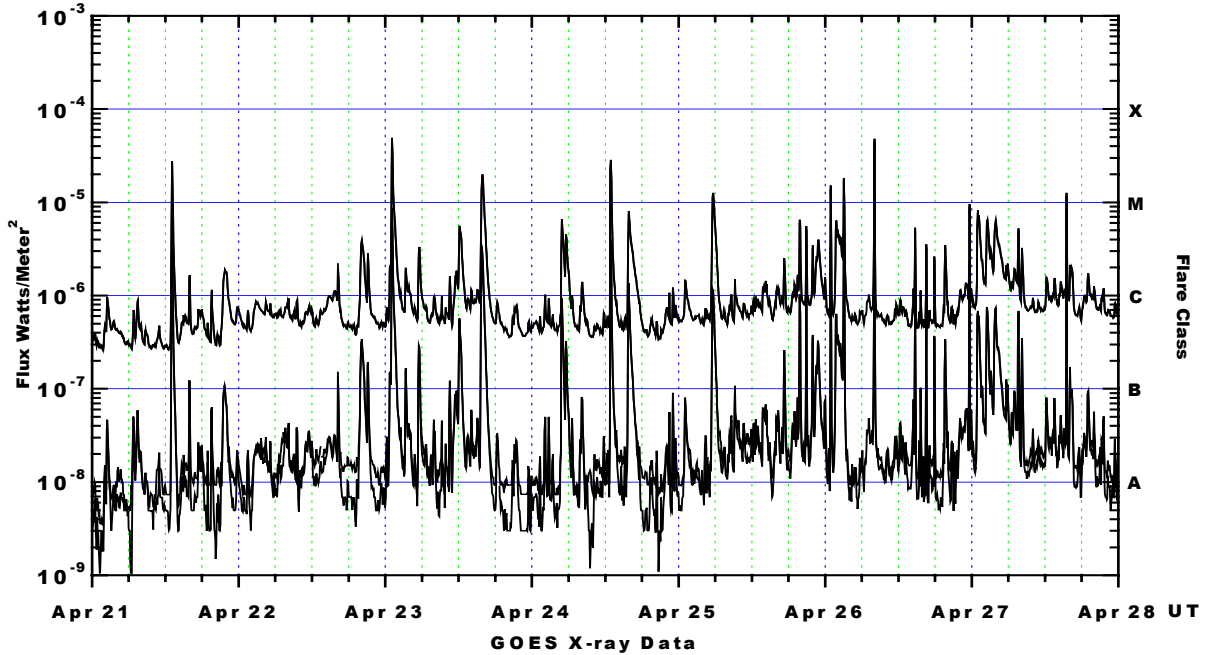
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr ) as measured by GOES-10 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*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-10.

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-10. 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 10\* and 12 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-10\* (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

