

Solar activity ranged from low to high levels. The period began on 02 June with high levels of activity from Region 365 (S07, L=182, class/area Dkc/880 on 29 May) and moderate levels of activity from Region 375 (N13, L=22, class/area Ekc/800 on 08 June). Although Region 365 rotated around the west limb early on 01 June it still produced an M6 flare at 02/0022 UTC, with an associated Type II (700 km/s) and Type IV radio sweeps as well as moderate level metric and centimetric radio bursts. Just hours later, an M3 erupted from the same region at 0837 UTC with an associated Type IV radio sweep. Both flares produced CMEs, but neither appeared to have any earthbound component. The day ended with two M1 flares one from Region 365 and the other from Region 375. Activity on 03 – 05 June was at low levels with the majority of activity coming from Region 375. This region was the largest and most complex group on the visible disk during the period. On 06 June, Region 375 entered a significant growth phase and developed a beta-gamma-delta magnetic configuration. Late on 06 June, an M1 flare was observed from Region 375 at 2338 UTC with an associated Type II (383 km/s) radio sweep. Activity returned to low levels on 07 June with six C-class flares from Region 375. Region 380 (S15, L=308, class/area Eki/550 on 08 June) rotated onto the visible disk on 07 June exhibiting steady growth and increasing magnetic complexity (beta-gamma). Activity from Region 380 reached moderate levels on 08 June with an impulsive M4 flare at 1611 UTC. Region 375 produced mid to high level C-class flares on 08 June and maintained its beta-gamma-delta magnetic configuration.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. The period began with solar wind speed elevated near 650 km/s due to a large recurrent coronal hole. From 02 – 04 June the high speed flow increased solar wind speed to near 900 km/s with a relatively weak Bz component ranging between +/- 8 nT. On 05 June, solar wind speed decreased to 500 km/s. The trailing portion of the large recurrent coronal hole increased solar wind speed on 06 – 08 June with peak values near 825 km/s.

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 on 03 – 07 June.

The geomagnetic field ranged from unsettled to major storm levels. The period began on 02 June with predominantly active to major storm levels. On 03 – 04 June activity was at predominantly unsettled to active with isolated minor storming and high latitude major/severe storming due to a large recurrent coronal hole. As the high speed stream subsided, the geomagnetic field responded with a return to mostly unsettled conditions on 05 – 06 June. The trailing portion of the large recurrent coronal hole rotated into a geo-effective position on 06 – 08 June resulting in active levels with isolated periods of minor storm levels.



## Space Weather Outlook

**11 June – 07 July 2003**

Solar activity is expected to range from low to high levels during the period. Regions 365, 375 and 380 have the potential to produce major events during the period. A major event is possible from Region 375 and 380 early in the period and from Region 365 when it returns to the visible disk on 15 June. Late in the period Regions 375 and 380 are due to return to visible disk and will keep the forecast at moderate levels through the end of the period.

A greater than 10 MeV proton events is possible early in the period in association with a major flare event from Region 375 or 380.

The greater than 2 MeV electron flux is expected to reach high levels on 11 – 13 June, 30 June – 03 July, and again on 06 – 07 July.

The geomagnetic field is expected to range from quiet to major storm levels during the period. Quiet to active levels are expected during the first half of the period with isolated minor storm levels possible. With the return of a large southern coronal hole on 28 June activity is expected to be at unsettled to minor storm levels with isolated major storm levels possible.



### *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
02 June	121	61	570	C1.1	3	4	0	18	1	0	0	0
03 June	115	54	580	B3.8	5	0	0	3	0	0	0	0
04 June	106	74	600	B2.4	1	0	0	0	0	0	0	0
05 June	114	95	590	B3.6	3	0	0	2	0	0	0	0
06 June	126	98	760	B5.7	10	1	0	5	2	0	0	0
07 June	133	125	1200	B6.2	10	0	0	4	0	0	0	0
08 June	153	167	1630	B7.9	14	1	0	17	1	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
02 June	4.8E+5	1.2E+4	2.2E+3		1.1E+6	
03 June	7.6E+5	1.0E+4	2.3E+3		6.5E+7	
04 June	2.1E+6	1.0E+4	2.3E+3		1.2E+8	
05 June	1.3E+6	1.0E+4	2.2E+3		2.7E+8	
06 June	8.9E+5	1.1E+4	2.4E+3		2.6E+8	
07 June	8.5E+5	1.0E+4	2.3E+3		1.2E+8	
08 June	9.7E+5	1.0E+4	2.4E+3		2.5E+7	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	02 June	22	4-4-4-4-3-3-2-4	47	4-5-6-6-5-5-3-4	39
03 June	19	3-3-3-3-3-3-3-5	45	4-3-3-7-6-4-4-4	26	4-3-4-4-4-4-4-5
04 June	13	3-2-2-3-3-3-3-3	37	4-3-3-6-6-5-3-3	21	4-3-3-4-4-4-4-3
05 June	9	2-3-2-2-2-3-2-2	16	2-3-4-3-4-3-3-2	13	3-3-3-3-3-3-3-2
06 June	10	2-1-3-2-3-3-3-3	18	3-2-3-4-4-4-3-3	13	3-2-3-3-3-3-3-3
07 June	26	5-4-3-3-3-3-4-5	32	3-4-3-6-5-4-3-4	24	4-4-4-4-4-4-4-5
08 June	21	3-4-3-3-3-4-4-4	44	4-5-6-4-5-6-3-4	27	4-5-4-3-3-4-4-4

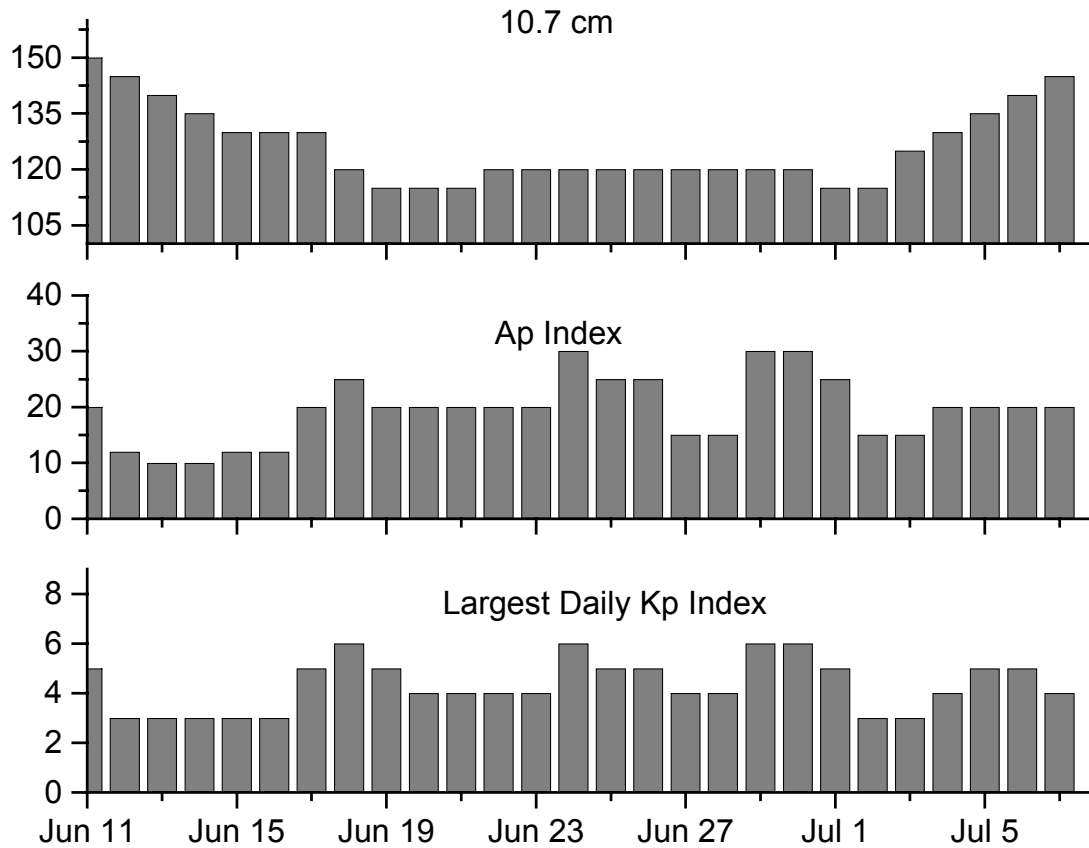


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
02 Jun 0019	ALERT: X-Ray Flux exceeded M5	02 Jun 0018
02 Jun 0025	2 – 245 MHz Radio Bursts	01 Jun
02 Jun 0046	SUMMARY: X-ray Event > M5	02 Jun 0007
02 Jun 0056	ALERT: Type II Radio Emission	02 Jun 0019
02 Jun 0059	SUMMARY: 10cm Radio Burst	02 Jun 0010
02 Jun 0104	ALERT: Type IV Radio Emission	02 Jun 0033
02 Jun 0436	ALERT: Geomagnetic K-index of 4	02 Jun 0430
02 Jun 0440	WARNING: Geomagnetic K= 4	02 Jun 0440 – 1500
02 Jun 0735	ALERT: Geomagnetic K= 5	02 Jun 0734
02 Jun 0833	WARNING: Geomagnetic K-index of 5 expected	02 Jun 0840 – 1500
02 Jun 0848	WARNING: Geomagnetic K= 6	02 Jun 0850 – 1500
02 Jun 0914	SUMMARY: 10cm Radio Burst	02 Jun 0841
02 Jun 0915	ALERT: Type IV Radio Emission	02 Jun 0837
02 Jun 1456	EXTENDED WARNING: Geomagnetic K= 4	02 Jun 0440 – 2359
02 Jun 2132	WATCH: Geomagnetic A $\geq$ 20	05 Jun
02 Jun 2243	EXTENDED WARNING: Geomagnetic K= 4	02 Jun 0440 – 03/1500
03 Jun 0012	3 – 245 MHz Radio Bursts	02 Jun
03 Jun 0044	WARNING: Geomagnetic K= 5	03 Jun 0045 – 03/1500
03 Jun 1145	ALERT: Geomagnetic K= 5	03 Jun 1145
03 Jun 1213	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Jun 1200
03 Jun 1456	EXTENDED WARNING: Geomagnetic K= 4	02 Jun 0440 – 04/1500
03 Jun 2124	WATCH: Geomagnetic A $\geq$ 20	06 Jun
03 Jun 2306	ALERT: Geomagnetic K= 5	03 Jun 2304
03 Jun 2307	WARNING: Geomagnetic K= 5	03 Jun 2310 – 04/1500
04 Jun 0017	3 – 245 MHz Radio Bursts	03 Jun
04 Jun 1325	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Jun 1300
04 Jun 1450	EXTENDED WARNING: Geomagnetic K= 4	02 Jun 0440 – 05/1500
04 Jun 1814	WARNING: Geomagnetic K= 5	04 Jun 1813 – 05/0300
04 Jun 2115	WATCH: Geomagnetic A $\geq$ 20	07 Jun
05 Jun 0941	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Jun 0920
05 Jun 2041	ALERT: Type II Radio Emission	05 Jun 2005
05 Jun 2137	WATCH: Geomagnetic A $\geq$ 20	08 Jun
06 Jun 0802	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 Jun 0740
06 Jun 1953	WATCH: Geomagnetic A $\geq$ 20	09 Jun
07 Jun 0001	ALERT: Type II Radio Emission	06 Jun 2341
07 Jun 0018	6 – 245 MHz Radio Bursts	06 Jun
07 Jun 0018	245 MHz Radio Noise Storm	06 Jun
07 Jun 0035	WARNING: Geomagnetic K= 4	07 Jun 0040 – 1500
07 Jun 0357	ALERT: Geomagnetic K-index of 4	07 Jun 0355
07 Jun 1246	ALERT: Electron 2MeV Integral Flux > 1000pfu	07 Jun 1225
07 Jun 1455	EXTENDED WARNING: Geomagnetic K= 4	07 Jun 0040 – 2359
07 Jun 1937	WATCH: Geomagnetic A $\geq$ 20	10 Jun
07 Jun 2147	ALERT: Geomagnetic K-index of 5	07 Jun 2144
07 Jun 2150	WARNING: Geomagnetic K= 5	07 Jun 2150 – 08/1500
08 Jun 0011	13 – 245 MHz Radio Bursts	07 Jun
08 Jun 0011	245 MHz Radio Noise Storm	07 Jun
08 Jun 1544	WARNING: Geomagnetic K= 4	08 Jun 1545 – 2359
08 Jun 1756	ALERT: Geomagnetic K-index of 4	08 Jun 1755
08 Jun 2321	EXTENDED WARNING: Geomagnetic K= 4	08 Jun 1545 – 09/1500



### 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
11 Jun	150	20	5	25 Jun	120	25	5
12	145	12	3	26	120	25	5
13	140	10	3	27	120	15	4
14	135	10	3	28	120	15	4
15	130	12	3	29	120	30	6
16	130	12	3	30	120	30	6
17	130	20	5	01 Jul	115	25	5
18	120	25	6	02	115	12	3
19	115	20	5	03	125	12	3
20	115	20	4	04	130	20	4
21	115	20	4	05	135	20	5
22	120	20	4	06	140	20	5
23	120	20	4	07	145	20	4
24	120	30	6				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
02 Jun 03	0007	0022	0043	M6.5	.098	Sf	S06W90	365	4000	620	3	1
02 Jun 03	0812	0837	0852	M3.9	.044	Sf	S07W89	365	590	200	1	
02 Jun 03	1313	1317	1322	M1.0	.004	365						
02 Jun 03	1722	1733	1740	M1.8	.011	Sf	N10E70	375				
06 Jun 03	2331	2338	2358	M1.0	.012	1f	N13E17	375	210	110	1	
08 Jun 03	1605	1611	1615	M4.0	.013	2n	S19E62	380				

### *Flare List*

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
02 June	0023	0028	0035		Sf	N09E76	375
	0023	0024	0043	M6.5	Sf	S06W90	365
	0049	0053	0058		Sf	S06W90	365
	0425	0426	0432		Sf	N12E73	375
	0545	0553	0603		Sf	N11E73	375
	0648	0654	0700	C2.0			
	0841	0841	0844	M3.9	Sf	S07W89	365
	1214	1215	1217	C8.0	Sf	N07E73	375
	1227	1229	1231		Sf	N07E71	375
	1313	1317	1322	M1.0			365
	1516	1541	1612		1f	N10E71	375
	1538	1538	1542	C9.0	Sf	S10W90	365
	1631	1641	1651		Sf	N10E70	375
	1653	1654	1702		Sf	N10E66	375
	1723	1736	1751	M1.8	Sf	N10E70	375
	1925	1928	1931		Sf	N12E78	375
	2146	2147	2153		Sf	N09E68	375
	2208	2216	2218		Sf	N10E68	375
	2235	2237	2240		Sf	N09E67	375
	2304	2306	2308		Sf	N10E67	375
2344	2347	2357		Sf	N04E00	373	
03 June	0053	0054	0058		Sf	N09E64	375
	0119	0124	0129	C1.7			
	0331	0336	0340	C1.1			
	0759	0816	0822	C1.5			
	1056	1056	1100	C2.9	Sf	N10E61	375
1737	1810	1955	C2.0			375	
2229	2229	2233	B7.3	Sf	N10E54	375	
04 June	0516	0545	0608	C1.8			375
05 June	0140	0145	0200	B9.1			377
	0537	0541	0543	B5.5			
	0927	1019	1038	C2.1			
	1729	1741	1747	C1.7	Sf	N11E30	375



*Flare List – continued*

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
05 June	1848	1850	1902		Sf	N11E30	375	
	2333	2337	2340	C1.0				
06 June	0404	0407	0426	C1.1	Sf	N09E30	375	
	1147	1150	1154	C1.4				
	1219	1223	1225	C1.6				
	1249	1252	1255	C1.5				
	1309	1320	1335	C1.5				
	1347	1359	1458	C2.8	1f	N11E20	375	
	1420	1435	1457	C2.3				
	1504	1507	1527		Sf	N11E19	375	
	1538	1542	1546	C1.6				
	1554	1608	1637	C2.5	Sf	N10E17	375	
	1740	1744	1756	C2.5	Sf	N17E66	378	
	1925	1926	1929		Sf	N10E15	375	
	07 June	B2335	U2337	0012	M1.0	1f	N13E17	375
		0218	0219	0224	C2.6	Sf	N08E17	375
0324		0325	0330	C1.6	Sf	N08E17	375	
0506		0532	0548	C2.3				
0758		0804	0825	B7.9			375	
0939		0942	1008	C2.3			375	
1037		1037	1040	C1.5	Sf	N10E08	375	
1105		1112	1119	C1.8			375	
1320		1323	1326	C1.1			375	
1732		1749	1754	C1.4				
1959		2002	2006	C1.0			380	
2034		2037	2054		Sf	N13W04	375	
2327		2332	2336	C1.7			380	
08 June		0002	0007	0010	C1.5			380
	0109	0114	0124	C1.8				
	0337	0359	0414	C3.6			375	
	0437	0459	0529	C3.9	1f	N12W07	375	
	B0500	U0500	0514	C5.7	Sf	N12W03	375	
	0619	0619	0623	C3.5	Sf	N13W10	375	
	0652	0658	0710	C2.3			375	
	0718	0721	0724	C1.6			375	
	0741	0745	0750	C2.2			375	
	1006	1010	1012	C1.3			375	
	1142	1146	1156	C7.5	Sf	S22E63	380	
	1203	1212	1217	C6.0	Sf	S19E63	380	
	1335	1400	1423	C1.7			375	
	1337	1337	1347		Sf	S12E57	380	
	1347	1403	1441		Sf	N12W14	375	
	1530	1530	1547		Sf	S12E57	380	



**Flare List – continued**

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn
	Begin	Max	End			Location Lat CMD	
	1556	1612	1651	M4.0	2n	S19E62	380
	1659	1702	1704		Sf	N13W15	375
	1706	1707	1721		Sf	S14E53	380
	1821	1822	1827		Sf	N13W20	375
	1823	1825	1841		Sf	S19E60	380
	1850	1852	1858		Sf	N13W18	375
	1908	1911	1917		Sf	S20E59	380
	1929	1929	1938		Sf	S20E61	380
	2128	2130	2137		Sf	S17E56	380
	2137	2143	2156		Sf	N13W13	375
	2319	2319	2322		Sf	S17E56	380
	2333	2338	2341	C1.3			375

**Region Summary**

Date	Location		Sunspot Characteristics				Flares											
	Helio		Area (10 <sup>-6</sup> 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 365</i>																		
20 May	S06E68	187	0130	04	Dso	004	B											
21 May	S07E52	190	0080	03	Dao	004	B											
22 May	S07E38	191	0040	03	Cso	004	B											
23 May	S09E25	191	0020	01	Hsx	001	A											
24 May	S08E11	191	0020	03	Bxo	005	B											
25 May	S08E08	181	0190	06	Dai	016	B						1					
26 May	S06W06	182	0210	07	Dai	018	B	1	2			1	2					
27 May	S07W19	182	0400	07	Dkc	038	Bgd	2	2	1	3	2	2					
28 May	S07W32	182	0840	08	Dkc	040	Bgd	8			13	1						
29 May	S07W45	182	0880	08	Dkc	032	Bgd			1	1		1					
30 May	S07W59	182	0800	08	Dkc	025	Bgd	3			6	1						
31 May	S07W72	182	0540	08	Dkc	022	Bgd	2	1		3		1					
01 Jun	S07W84	181	0450	08	Dkc	015	Bgd		1		1							
02 Jun	S07W99	183						1	3		4							
								17	9	2	33	6	4	0	0			

Crossed West Limb.

Absolute heliographic longitude: 182





**Region Summary - continued.**

Date	Location		Sunspot Characteristics				Flares											
	Helio		Area (10 <sup>-6</sup> 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 368</i>																		
22 May	S32E76	153	0180	02	Hax	001	A											
23 May	S32E62	154	0170	03	Hax	001	A											
24 May	S33E50	152	0170	02	Hsx	001	A											
25 May	S33E37	152	0130	02	Hax	001	A	1				2						
26 May	S32E24	152	0120	03	Hax	001	A											
27 May	S32E11	152	0100	05	Cso	008	B											
28 May	S32W02	152	0120	05	Cso	006	B					1						
29 May	S32W15	152	0140	06	Dao	011	B		2				2					
30 May	S32W26	149	0060	04	Dao	006	B					1						
31 May	S33W38	148	0020	03	Cro	004	B											
01 Jun	S33W51	148	0010	01	Axx	002	A	1				1						
02 Jun	S32W63	147	0010	01	Axx	001	A											
03 Jun	S32W76	147																
04 Jun	S32W89	147																
									2	2	0	5	2	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 152

<i>Region 373</i>																		
27 May	N08E81	082	0120	02	Hax	001	A											
28 May	N08E66	082	0130	02	Hsx	002	A					3						
29 May	N08E53	084	0110	04	Cso	003	B											
30 May	N08E41	082	0080	02	Hsx	001	A	1				1						
31 May	N08E28	082	0110	02	Hsx	001	A	1				1						
01 Jun	N07E15	082	0120	04	Cso	007	B											
02 Jun	N06E00	084	0160	06	Cso	010	B					1						
03 Jun	N07W14	085	0130	05	Dso	007	B											
04 Jun	N07W28	085	0130	06	Dao	005	B											
05 Jun	N07W40	084	0110	06	Cso	004	B											
06 Jun	N07W52	083	0080	02	Cso	002	B											
07 Jun	N08W65	083	0070	02	Hsx	001	A											
08 Jun	N07W78	082	0100	02	Hsx	001	A											
									2	0	0	6	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 084



**Region Summary - continued.**

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

*Region 375*

01 Jun	N11E74	023	0140	10	Dao	002	B		3		1						
02 Jun	N12E64	020	0370	06	Dso	006	B	1	1		13	1					
03 Jun	N12E50	021	0390	10	Dko	011	Bg	2			3						
04 Jun	N11E39	018	0370	12	Eai	019	Bg	1									
05 Jun	N12E24	020	0360	12	Eai	030	Bg	1			2						
06 Jun	N12E09	022	0490	07	Dki	025	Bgd	3	1		4	2					
07 Jun	N12W04	022	0570	14	Eki	041	Bgd	6			4						
08 Jun	N13W18	022	0800	12	Ekc	064	Bgd	10			7	1					
								24	5	0	34	4	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 022

*Region 376*

02 Jun	S12E13	071	0030	04	Cro	004	B										
03 Jun	S11E00	071	0060	05	Dao	006	B										
04 Jun	S11W14	071	0070	05	Dso	007	B										
05 Jun	S11W30	074	0030	02	Hsx	001	A										
06 Jun	S11W44	075	0020	01	Hsx	001	A										
07 Jun	S14W43	061	0060	04	Cho	004	B										
08 Jun	S14W57	061	0020	03	Cso	003	B										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 071

*Region 377*

04 Jun	N04E71	346	0030	09	Cso	003	B										
05 Jun	N05E57	347	0070	08	Dso	007	B										
06 Jun	N04E43	348	0090	07	Dso	005	B										
07 Jun	N04E29	349	0070	10	Dso	007	B										
08 Jun	N04E14	350	0140	11	Esi	014	B										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 350



**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 378*

05 Jun	N16E69	335	0020	06	Cso	003	B											
06 Jun	N16E57	334	0040	05	Cro	002	B	1				1						
07 Jun	N17E44	334	0030	07	Cro	002	B											
08 Jun	N16E28	336	0020	03	Cso	005	B											
								1	0	0	1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 336

*Region 379*

06 Jun	S19W68	099	0040	05	Cso	003	B											
07 Jun	S19W81	099																
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 099

*Region 380*

07 Jun	S16E68	310	0400	13	Eho	010	B	2										
08 Jun	S15E56	308	0550	11	Eki	020	Bg	3	1		10		1					
								5	1	0	10	0	1	0	0			

Still on Disk.

Absolute heliographic longitude: 308

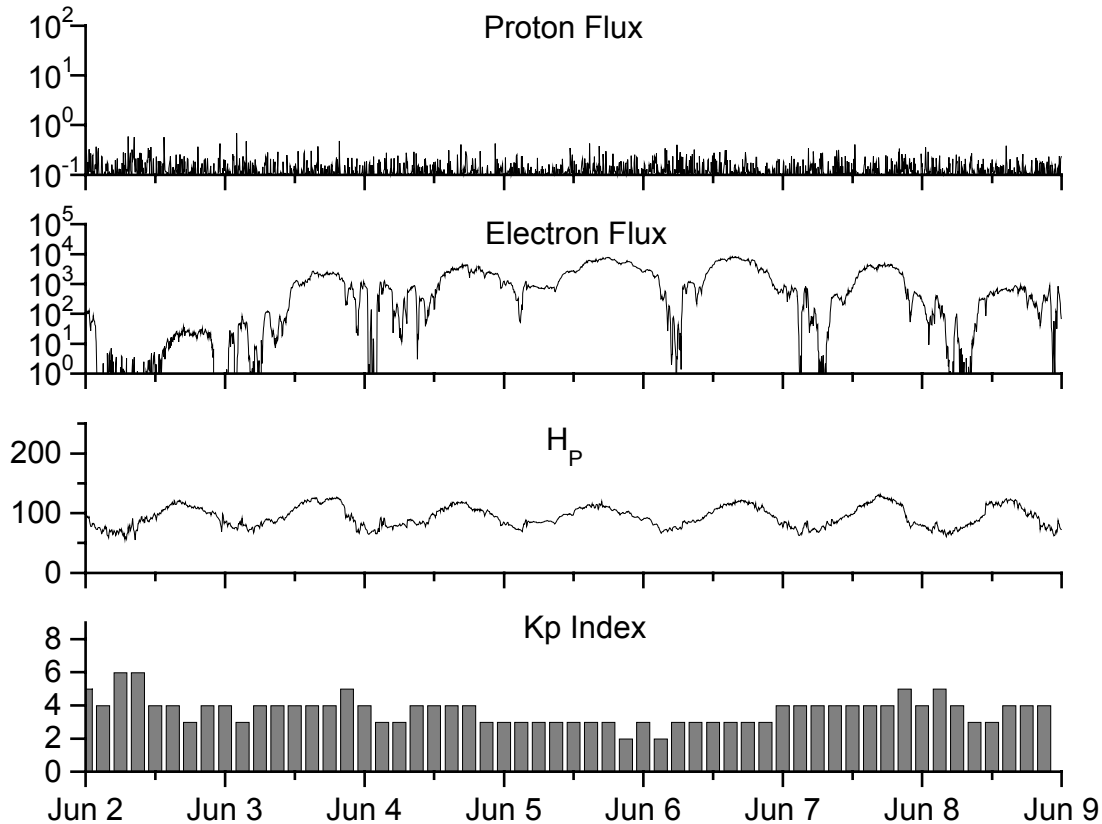


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>									
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	0.60	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.9	0.54	175.4	102.7	173.5	173.5	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	158.7	90.5	167.0	159.5	23	15.5
November	159.8	95.5	0.60	150.5	85.3	168.7	154.3	16	16.1
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	
April	114.3	60.0	0.52			126.5		20	
May	89.6	55.2	0.62			116.2		25	

**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 02 Jun 2003*

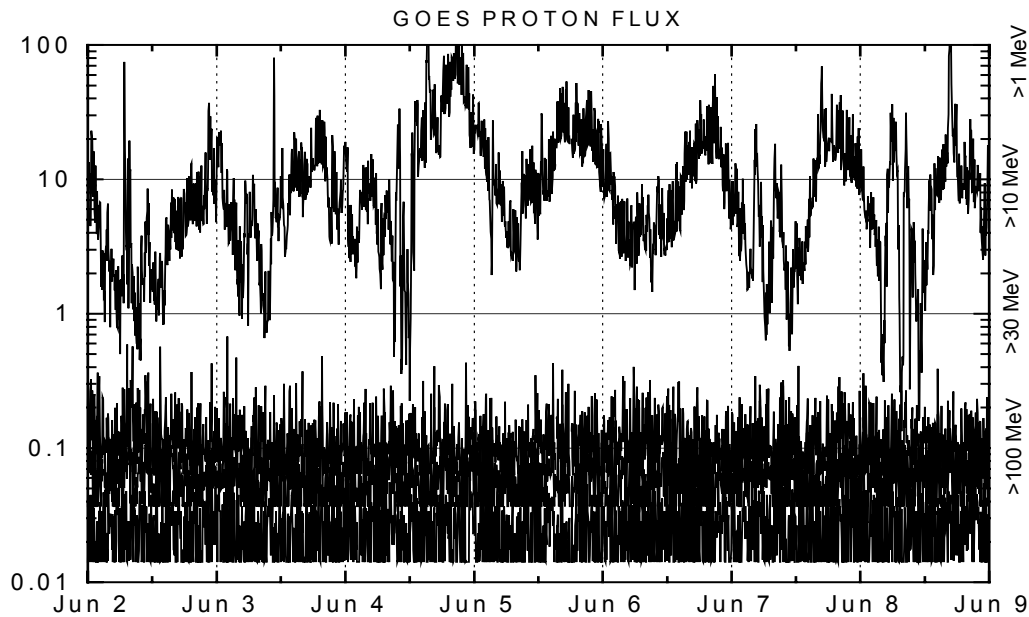
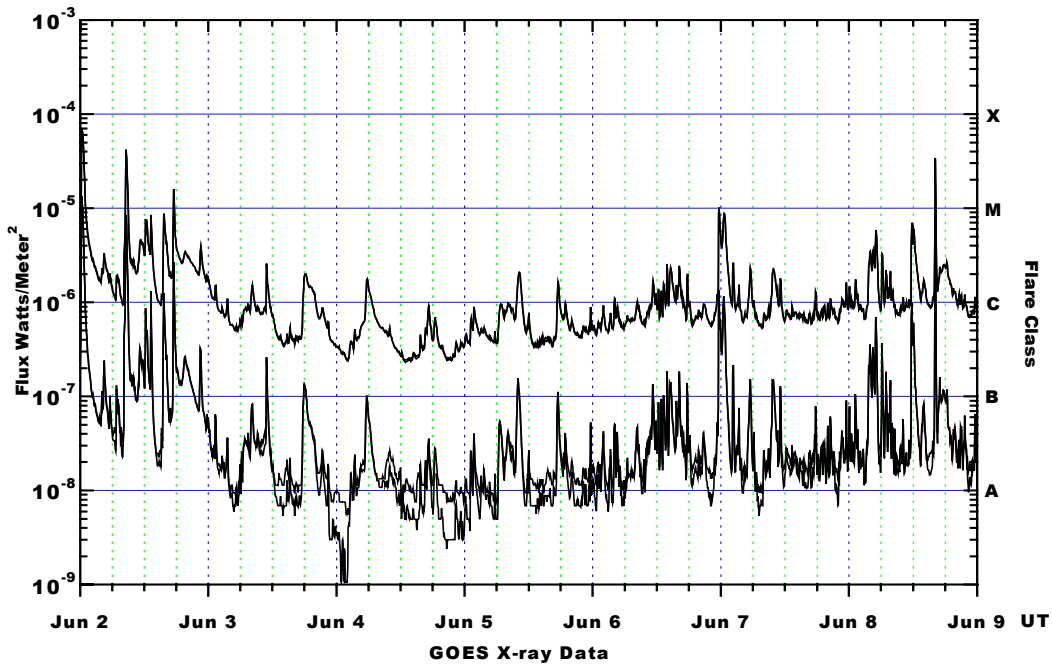
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12.

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

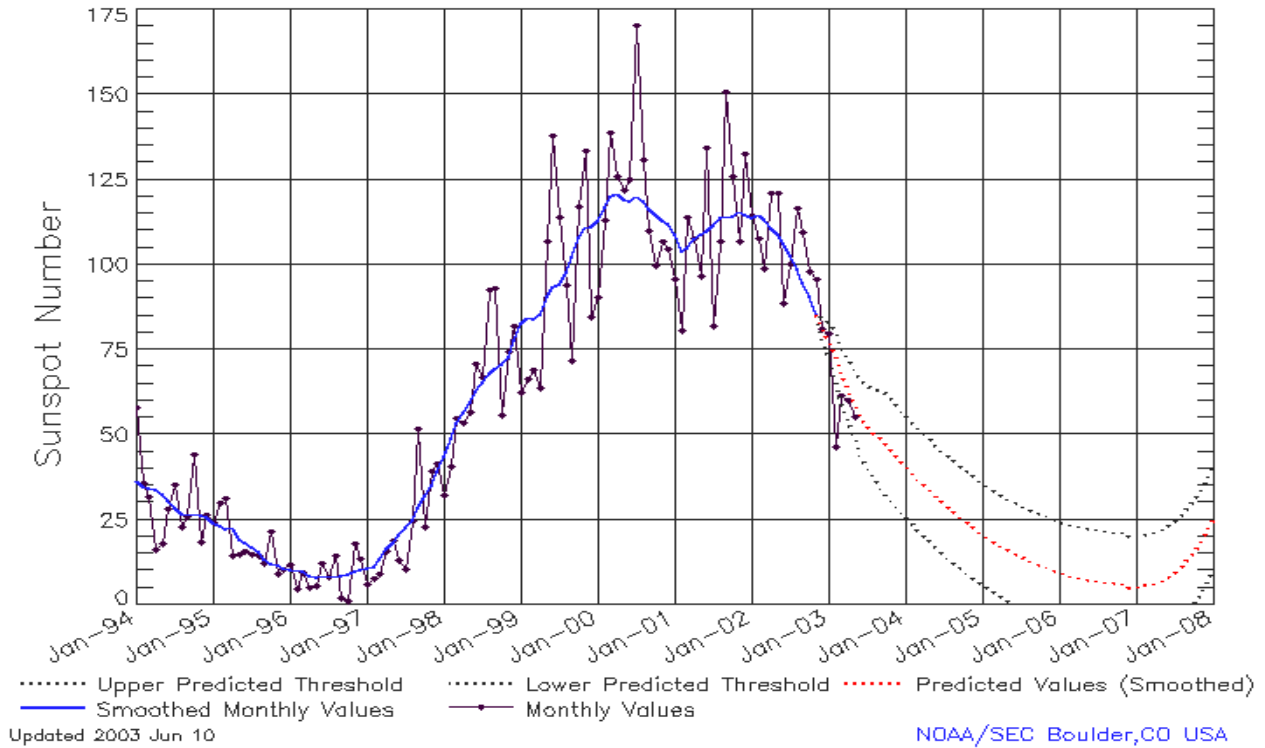
X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 12 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.



## ISES Solar Cycle Sunspot Number Progression

Data Through 31 May 03



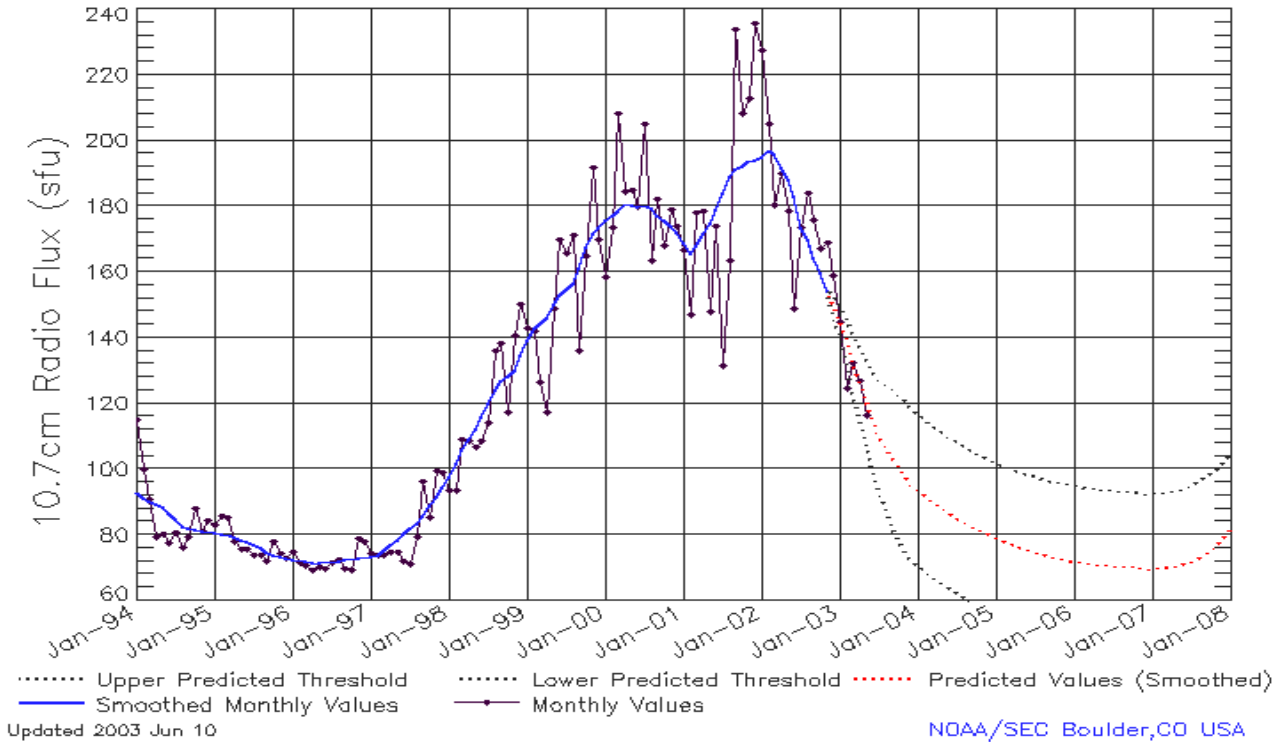
### SEC Prediction of Smoothed Sunspot Number

	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	99	95	91	85	<b>81</b>
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)
2003	<b>78</b>	<b>73</b>	<b>68</b>	<b>63</b>	<b>59</b>	<b>56</b>	<b>52</b>	<b>50</b>	<b>49</b>	<b>47</b>	<b>45</b>	<b>43</b>
	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(15)
2004	<b>41</b>	<b>39</b>	<b>37</b>	<b>35</b>	<b>33</b>	<b>31</b>	<b>30</b>	<b>28</b>	<b>27</b>	<b>25</b>	<b>24</b>	<b>22</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2005	<b>21</b>	<b>20</b>	<b>18</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>12</b>	<b>11</b>	<b>10</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2006	<b>10</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>5</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2007	<b>5</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>10</b>	<b>11</b>	<b>13</b>	<b>16</b>	<b>18</b>	<b>21</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)



## ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 May 03



### SEC Prediction of Smoothed F10.7cm Radio Flux

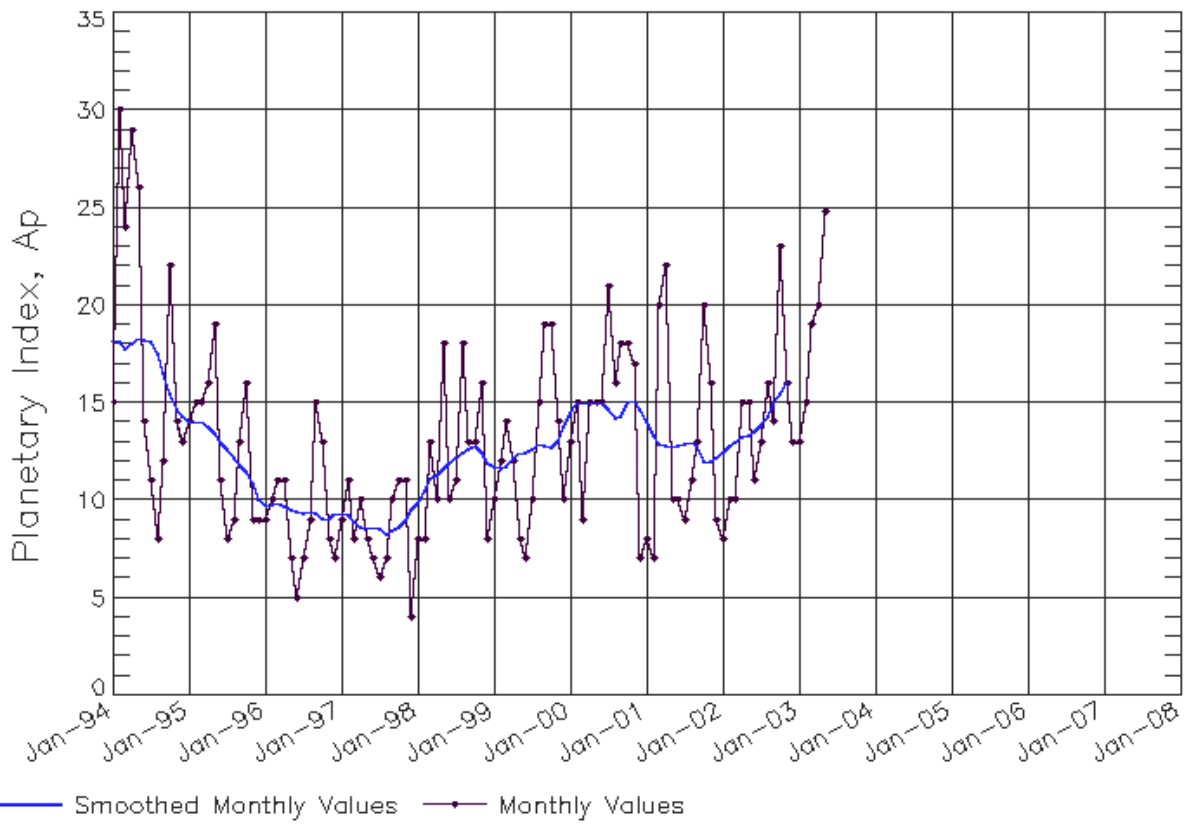
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	98	102	106	109	112	116	120	124	127	128	130	134
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1999	139	143	144	146	150	153	154	156	161	167	172	173
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2000	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	174	170	164	160	154	<b>150</b>
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)
2003	<b>145</b>	<b>139</b>	<b>133</b>	<b>127</b>	<b>121</b>	<b>115</b>	<b>110</b>	<b>107</b>	<b>104</b>	<b>101</b>	<b>98</b>	<b>95</b>
	(3)	(5)	(7)	(9)	(11)	(13)	(15)	(17)	(19)	(21)	(22)	(23)
2004	<b>94</b>	<b>92</b>	<b>91</b>	<b>89</b>	<b>88</b>	<b>87</b>	<b>85</b>	<b>84</b>	<b>83</b>	<b>82</b>	<b>81</b>	<b>80</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2005	<b>79</b>	<b>78</b>	<b>78</b>	<b>77</b>	<b>76</b>	<b>75</b>	<b>75</b>	<b>74</b>	<b>74</b>	<b>73</b>	<b>73</b>	<b>73</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2006	<b>72</b>	<b>72</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>70</b>	<b>70</b>	<b>70</b>	<b>70</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2007	<b>70</b>	<b>70</b>	<b>70</b>	<b>70</b>	<b>71</b>	<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>76</b>	<b>77</b>	<b>79</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)





# ISES Solar Cycle Ap Progression

Data Through 31 May 03



Updated 2003 Jun 10

NOAA/SEC Boulder, CO USA

