

**Space Weather Highlights**  
**31 May – 06 June 2004**

**SWO PRF 1501**  
**08 Jun 2004**

Solar activity ranged from very low to low. Region 618 (S10, L=043, class/area, Foa/290 on 31 May) was the largest and most complex sunspot group on the disk and produced most of this period's C-class activity. The largest flare observed was a C6.5/Sf on 31/0028 UTC. Region 618 rotated quietly around the west limb on 01 June. Region 621 (S14, L=281, class/area, Dai/090 on 03 June) accounted for the remainder of the period's C-class activity. Late on 06 June, a long duration C2.5 was observed from Region 621 which began on 06/2227 UTC and ended on 07/0123 UTC. A faint, asymmetrical full halo CME was observed on LASCO imagery with a weak, Earth directed component. The summary period was highlighted by a series of four strong CMEs observed between 02 – 04 June, all from behind the northwest limb. The first of these occurred at around 02/2300 UTC and had an associated Type II radio sweep with a shock speed of 658 km/s. Bright surging was observed on the west limb on 03/0830 UTC, which preceded another CME observed on LASCO C2 imagery at 03/0950 UTC. The third event consisted of a partial halo CME associated with a prominence eruption that began at around 03/1620 UTC. A Type II radio sweep (717 km/s) accompanied this CME. The final event was a near full halo CME first visible on LASCO C2 imagery on 04/0750 UTC. A Type II radio sweep (700 km/s) was also associated with this CME.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began with solar wind speed at 500 km/s as effects of a large, transequatorial coronal hole high speed stream became geoeffective. Wind speed peaked to near 575 km/s early on 01 June and gradually declined to about 475 km/s by the end of the summary period as the coronal hole rotated out of geoeffective position. The IMF Bz did not vary much beyond +/- 7 nT through the entire period.

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 geosynchronous orbit was at high levels on 02 - 06 June.

The geomagnetic field was at quiet to active levels. The period began under the influence of a high speed coronal hole stream with isolated active conditions observed on 31 May. Quiet to unsettled conditions persisted for the remainder of the summary period as the coronal hole high speed stream subsided.

**Space Weather Outlook**  
**09 June - 05 July 2004**

Solar activity is expected to be at very low to low levels with isolated moderate activity possible after 15 June with the return of old Region 618.

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

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 17 - 18 June, and 27 - 30 June due to recurrent coronal hole high

The geomagnetic field is expected to range from quiet to active levels. Unsettled to active conditions are possible from 25 - 30 June as a generally weak, recurrent coronal high speed stream rotates into a geoeffective position. Unsettled to active conditions are possible on 10 - 11 June due to effects from the full halo CME late on 06 June.



### 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
31 May	95	54	420	B1.8	5	0	0	1	0	0	0	0
01 June	90	76	180	B1.4	0	0	0	0	0	0	0	0
02 June	90	63	160	B1.0	0	0	0	0	0	0	0	0
03 June	90	77	140	A9.7	0	0	0	0	0	0	0	0
04 June	89	55	80	A8.5	0	0	0	0	0	0	0	0
05 June	85	59	80	A7.2	0	0	0	0	0	0	0	0
06 June	88	60	60	A7.5	0	0	0	0	0	0	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
	31 May	2.5E+5	1.4E+4	3.0E+3		1.5E+7
01 June	4.5E+5	1.3E+4	3.0E+3		2.1E+7	
02 June	3.0E+5	1.4E+4	3.0E+3		3.4E+7	
03 June	5.3E+5	1.4E+4	2.9E+3		6.4E+7	
04 June	3.6E+5	1.4E+4	3.2E+3		5.8E+7	
05 June	2.2E+5	1.5E+4	3.0E+3		3.7E+7	
06 June	4.8E+5	1.3E+4	2.9E+3		3.9E+7	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	31 May	11	4-2-2-2-2-3-2	20	3-3-3-5-5-1-2-2	14
01 June	14	3-3-3-3-3-2-3-3	28	3-4-4-3-5-5-4-3	16	3-3-4-3-3-3-3-3
02 June	9	2-2-2-1-2-2-3-3	15	3-3-3-3-4-3-2-2	11	3-2-2-3-3-2-3-3
03 June	6	2-2-2-1-2-1-2-2	11	3-3-3-1-1-1-4-2	8	3-3-3-1-2-2-2-2
04 June	14	3-3-2-3-3-3-3-3	*	*-*-*-*-*-*-*	11	3-3-2-3-3-3-2-3
05 June	8	3-2-1-2-2-1-2-3	*	*-*-*-*-*-*-*	11	3-3-1-3-3-3-3-3
06 June	12	3-3-3-2-3-2-3-2	*	*-*-*-*-*-*-*	11	3-3-3-3-3-2-3-2

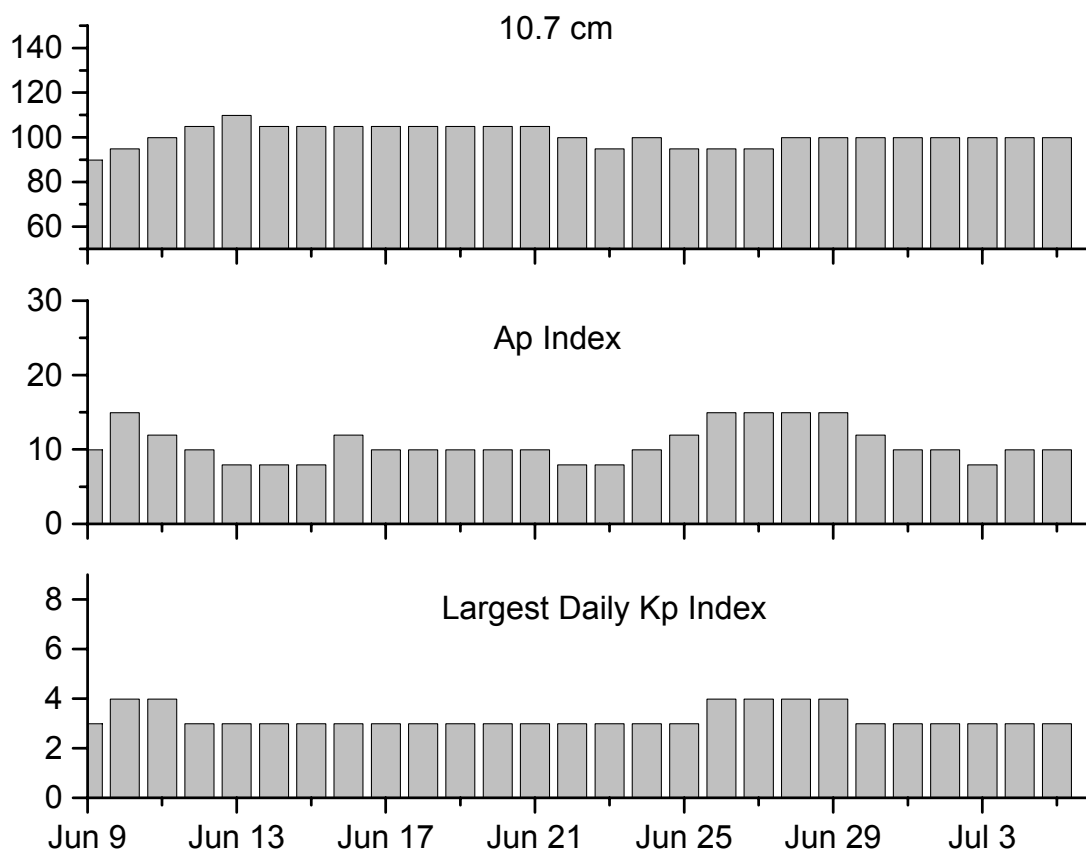


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
01 Jun 0025	4 – 245 MHz Radio Bursts	31 May
01 Jun 0052	WARNING: Geomagnetic K= 4	01 Jun 0100 - 1500
01 Jun 0158	ALERT: Geomagnetic K=4	01 Jun 0155
01 Jun 1457	EXTENDED WARNING: Geomagnetic K= 4	01 Jun 0100 - 2359
01 Jun 2349	EXTENDED WARNING: Geomagnetic K= 4	01 Jun 0100 - 02 Jun 1500
02 Jun 0010	2 – 245 MHz Radio Bursts	01 Jun
02 Jun 1527	ALERT: Electron 2MeV Integral Flux > 1000pfu	02 Jun 1510
02 Jun 1731	WARNING: Geomagnetic K= 4	02 Jun 1735 - 2359
02 Jun 1734	ALERT: Geomagnetic K= 4	02 Jun 1733
02 Jun 2342	ALERT: Type II Radio Emission	02 Jun 2310
03 Jun 0006	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Jun 1735 - 03 Jun 1500
03 Jun 1240	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Jun 1210
03 Jun 2053	ALERT: Type II Radio Emission	03 Jun 1625
04 Jun 1212	ALERT: Type II Radio Emission	04 Jun 0741
04 Jun 1319	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Jun 1250
05 Jun 1407	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	06 Jun 1345
06 Jun 0328	WARNING: Geomagnetic K= 4 expected	06 Jun 0330 - 1600
06 Jun 1542	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 Jun 1525



## 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 Jun	90	10	3	23	95	8	3
10	95	15	4	24	100	10	3
11	100	12	4	25	95	12	3
12	100	10	3	26	95	15	4
13	100	8	3	27	95	15	4
14	105	8	3	28	100	15	4
15	105	8	3	29	100	15	4
16 Jun	105	12	3	30	100	12	3
17	105	10	3	01 Jul	100	10	3
18	105	10	3	02	100	10	3
19	105	10	3	03	100	8	3
20	105	10	3	04	100	10	3
21	105	10	3	05	100	10	3
22	100	8	3				



### *Energetic Events*

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
			Class	Flux	Brtns	Lat CMD	#	245	2695	II

*No Events Observed*

### *Flare List*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
31 May	0013	0022	0044	C6.5	Sf	S09W72	618
	0423	0437	0451	C2.3			618
	0511	0516	0520	C1.1			618
	0847	0852	0856	C1.0			618
	0952	0955	0957	B3.8			
	1030	1036	1040	C3.8			618
	1112	1115	1119	B4.5			618
	1518	1521	1523	B2.7			618
	1618	1622	1624	B2.8			618
	1819	1823	1825	B5.0			618
	1907	1911	1915	B3.4			618
	2002	2011	2014	B4.0			618
	2020	2024	2026	B6.2			618
	2312	2315	2317	B3.5			
	2320	2328	2331	B4.3			618
2355	0016	0030	B6.7			618	
01 June	0114	0118	0120	B2.7			618
	0422	0425	0432	B2.1			
	1447	1454	1458	B4.1			618
	1833	1837	1841	B1.9			618
02 June	2033	2039	2048	B3.5			621
	0957	1048	1206	B2.4			
	1327	1331	1336	B2.2			621
	1649	1653	1655	B1.7			621
03 June	1744	1747	1750	B1.9			621
	1040	1043	1046	B1.7			
	1224	1228	1230	B2.4			621
04 June	No Flares Observed						
05 June	0555	0604	0612	B2.3			625
	1238	1244	1248	B1.9			
	1332	1350	1407	B2.6			
	2118	2123	2127	B2.0			627



*Flare List – continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
06 June	0117	0124	0131	B1.5			621
	0203	0207	0212	B1.2			621
	1125	1129	1132	B1.7			627
	1259	1303	1307	B1.3			627
	1502	1506	1508	B1.3			621
	1552	1555	1557	B1.6			621

*Region Summary*

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 618</i>																		
20 May	S10E69	036	0030	09	Cso	008	B	3										
21 May	S11E55	037	0150	12	Cai	019	B	1	1		1							
22 May	S10E41	037	0310	14	Eai	030	Bgd	5			2							
23 May	S10E26	039	0330	16	Fki	046	Bgd	4			3							
24 May	S10E13	039	0410	18	Fki	057	Bgd	1										
25 May	S10W00	039	0380	16	Fhc	046	Bgd											
26 May	S10W13	039	0330	17	Fsc	031	Bgd				2							
27 May	S10W27	039	0330	16	Fac	040	Bgd	1			1							
28 May	S10W44	043	0310	14	Eac	031	Bg	3			3							
29 May	S10W60	046	0520	15	Fkc	032	G											
30 May	S09W72	045	0360	19	Fac	017	Bg	1										
31 May	S10W83	043	0290	16	Fao	005	B	5			1							
01 Jun	S08W89	035	0030	02	Hrx	001	A											
									24	1	0	13	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 039

*Region 620*

23 May	S15E34	031	0010	03	Cso	004	B											
24 May	S15E21	031	0040	04	Cso	005	B											
25 May	S15E08	031	0010	03	Cro	002	B											
26 May	S15W03	029	0010	03	Bxo	004	B											
27 May	S15W16	029																
28 May	S15W29	029																
29 May	S15W42	029																
30 May	S15W55	029																
31 May	S15W68	029																
01 Jun	S15W81	029																
									0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 029



**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 621*

29 May	S14E62	284	0110	07	Dai	005	B											
30 May	S15E51	282	0140	06	Dac	014	B											
31 May	S15E38	282	0100	08	Dai	016	B											
01 Jun	S16E25	281	0070	09	Dso	018	B											
02 Jun	S14E12	281	0060	07	Dao	019	Bg											
03 Jun	S14W01	281	0090	08	Dai	030	B											
04 Jun	S14W15	282	0050	07	Csi	021	B											
05 Jun	S14W28	282	0030	08	Cao	011	B											
06 Jun	S14W41	282	0020	05	Cso	007	B											

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 281

*Region 622*

30 May	S12E72	261	0080	02	Hax	003	A											
31 May	S12E58	262	0030	02	Hax	003	A											
01 Jun	S12E46	260	0030	02	Cao	002	B											
02 Jun	S12E32	261	0050	02	Cao	002	B											
03 Jun	S09E20	260	0010	02	Axx	003	A											
04 Jun	S10E07	260																
05 Jun	S10W06	260																
06 Jun	S10W19	260																

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 260

*Region 623*

01 Jun	N07W23	329	0020	03	Cao	004	B											
02 Jun	N08W35	328	0010	01	Hrx	001	A											
03 Jun	N08W48	328																
04 Jun	N08W61	328																
05 Jun	N08W74	328																
06 Jun	N08W87	328																

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 329



**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 624*

01 Jun	S09E64	242	0030	01	Hsx	001	A										
02 Jun	S08E51	242	0040	01	Hsx	001	A										
03 Jun	S07E38	242	0020	02	Cao	002	B										
04 Jun	S08E24	243	0010	01	Axx	002	A										
05 Jun	S08E11	243	0010	02	Axx	002	A										
06 Jun	S08W02	243	0010	02	Axx	002	A										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:243

*Region 625*

03 Jun	S12W56	336	0020	01	Hsx	002	A										
04 Jun	S12W69	336	0020	01	Axx	002	A										
05 Jun	S12W82	336															
06 Jun	S12W95	336															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:336

*Region 626*

05 Jun	N05W06	260	0020	03	Cso	003	B										
06 Jun	N05W19	260	0010	02	Axx	002	A										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:260

*Region 627*

05 Jun	S08E30	224	0020	02	Hax	003	A										
06 Jun	S08E17	224	0020	06	Cso	009	B										
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:224



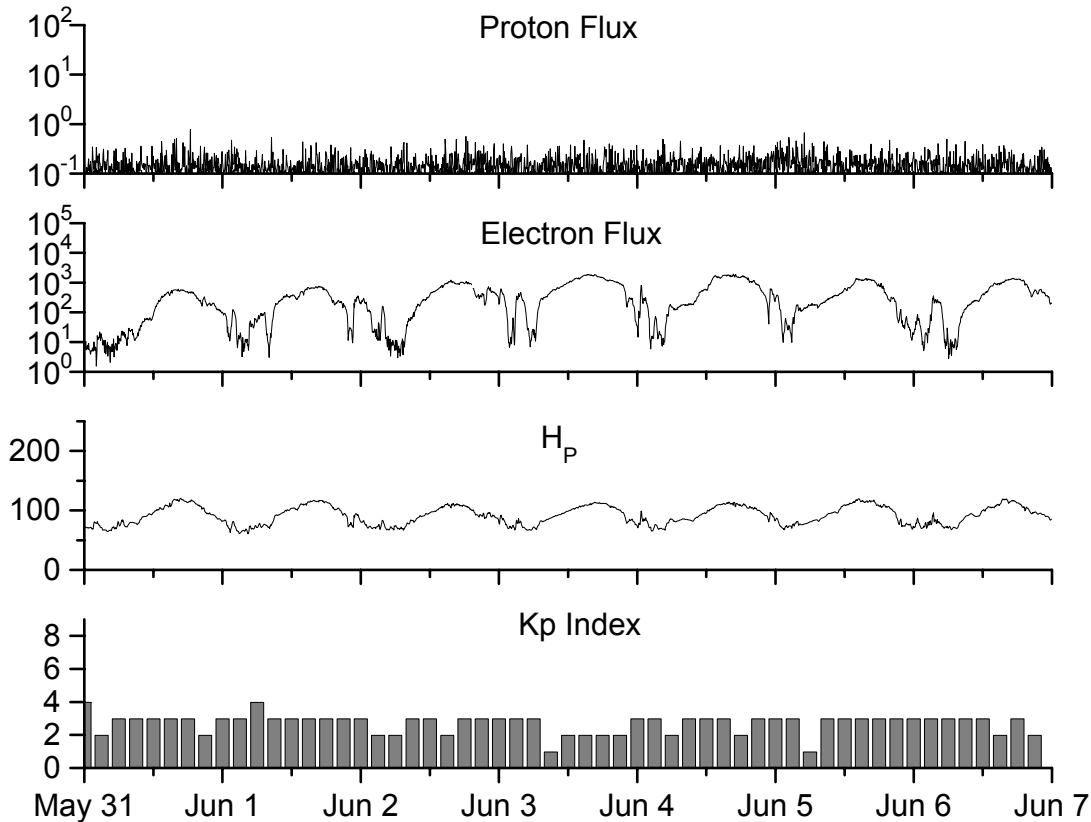


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2002</b>									
June	146.0	88.3	0.60	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.6	0.54	175.4	102.7	173.5	176.3	11	13.7
August	191.0	116.4	0.61	169.2	98.7	183.9	169.5	16	14.2
September	206.4	109.6	0.53	163.4	94.6	175.8	164.1	14	15.0
October	153.9	97.5	0.63	158.8	90.5	167.0	159.4	23	15.6
November	159.8	95.5	0.60	150.9	85.2	168.7	154.8	16	16.3
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
<b>2003</b>									
January	149.3	79.7	0.53	141.7	81.0	144.0	149.2	13	18.2
February	87.0	46.0	0.53	136.4	78.5	124.5	144.7	17	18.9
March	119.7	61.1	0.51	128.1	74.2	132.2	139.5	21	19.4
April	119.7	60.0	0.50	121.5	70.3	126.3	136.3	20	20.0
May	89.6	55.2	0.62	118.3	67.8	129.3	135.0	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	132.6	24	21.8
July	132.8	85.0	0.64	106.9	62.0	127.8	129.5	20	22.3
August	114.3	72.7	0.64	102.8	60.3	122.1	127.5	23	22.4
September	82.6	48.8	0.59	100.7	59.8	112.3	126.0	19	21.9
October	118.9	65.6	0.55	96.6	58.4	153.1	124.1	32	21.1
November	118.9	67.2	0.57	93.6	57.0	153.1	121.8	31	20.0
December	75.4	47.0	0.62			115.1		18	
<b>2004</b>									
January	62.3	37.2	0.60			114.1		20	
February	75.6	46.0	0.61			107.0		13	
March	81.0	48.9	0.60			112.2		12	
April	59.3	39.3	0.66			101.3		10	
May	77.3	41.5	0.54			99.7		9	

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 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 23, RI= 120.8, occurred April 2000. \*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 May 2004*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W98) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

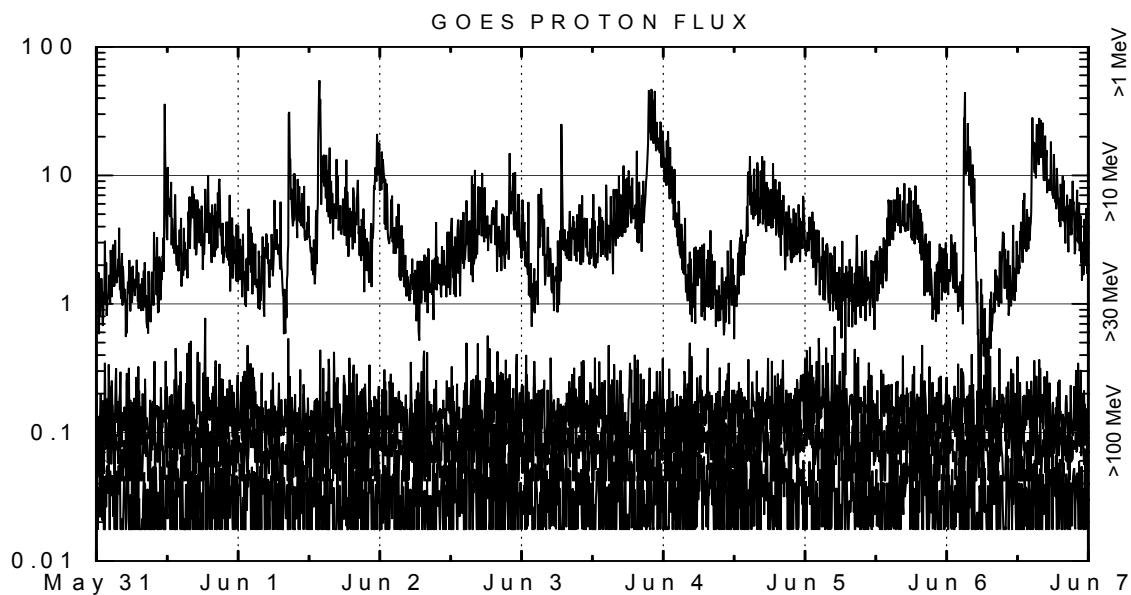
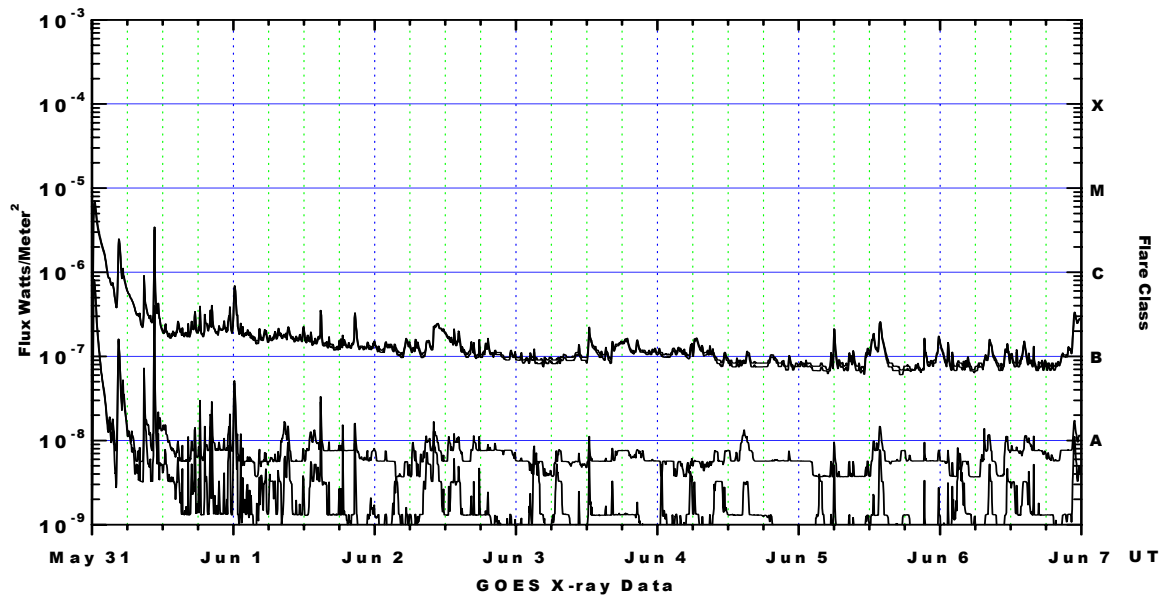
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

*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*

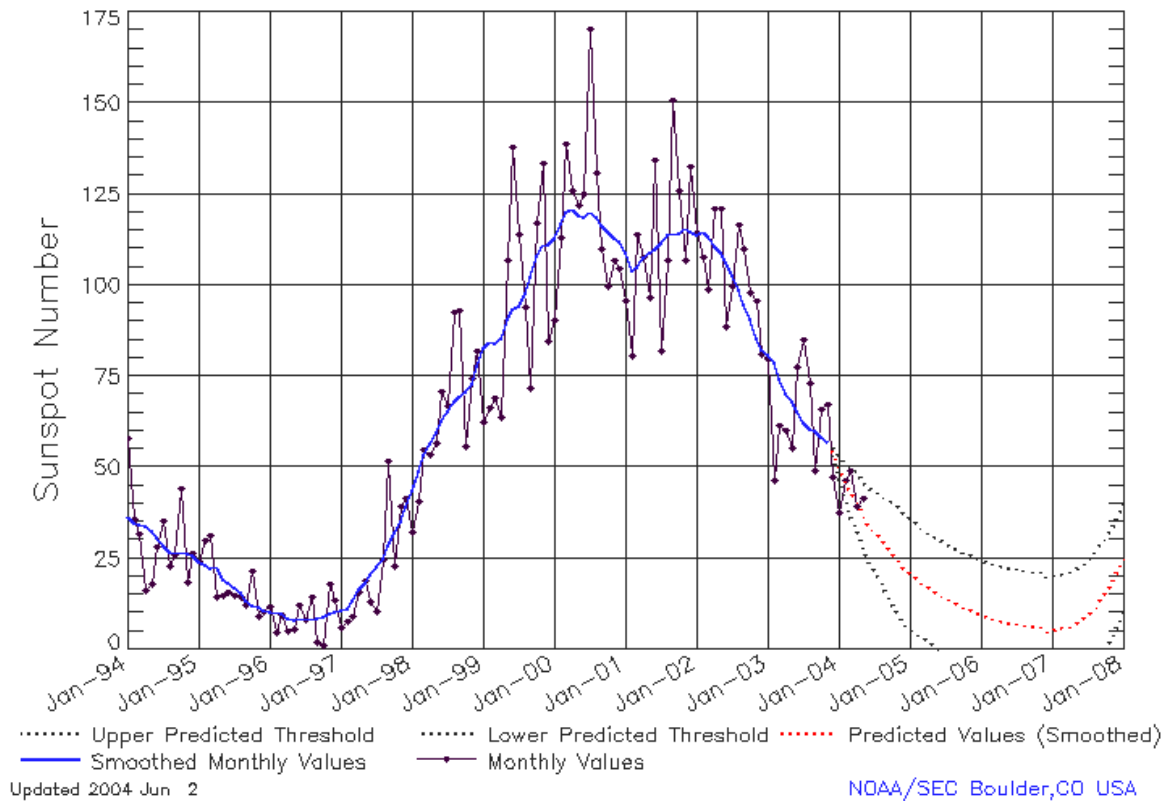
X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W98) 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 04



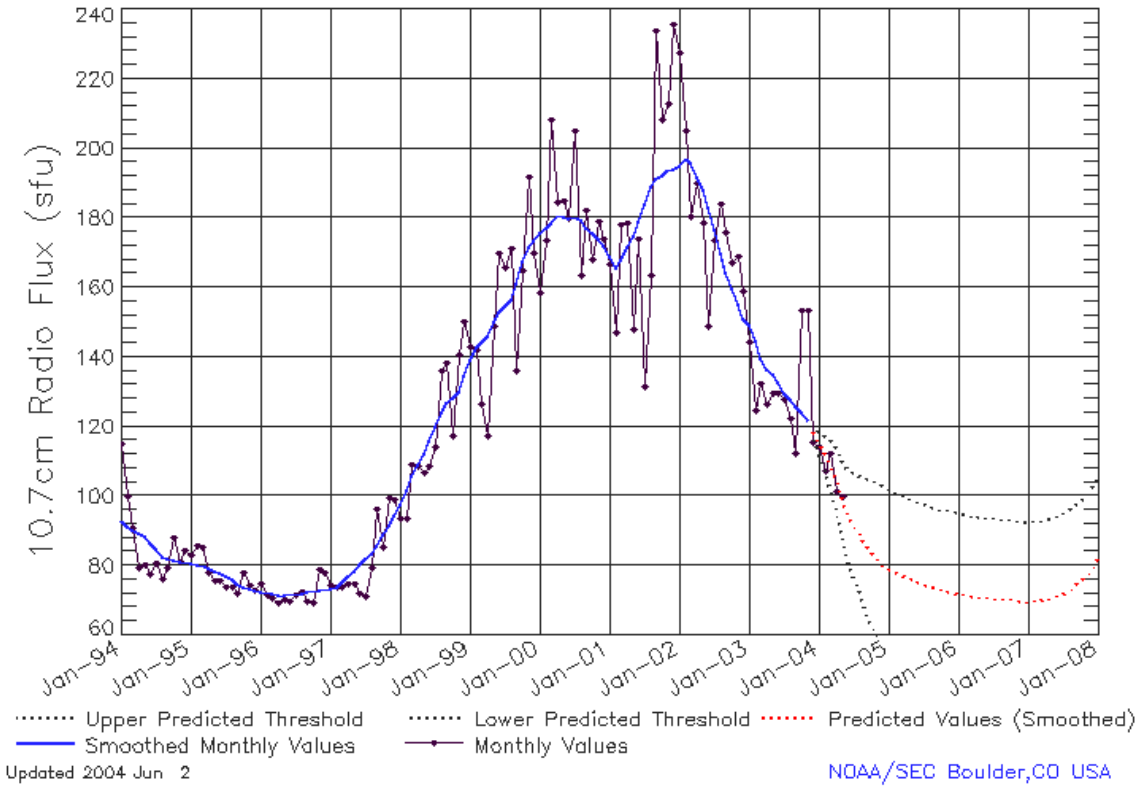
## SEC Prediction of Smoothed Sunspot Number

	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	82
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2003	81	79	74	70	68	65	62	60	60	58	57	<b>55</b>
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)
2004	<b>50</b>	<b>46</b>	<b>43</b>	<b>41</b>	<b>37</b>	<b>34</b>	<b>33</b>	<b>31</b>	<b>29</b>	<b>26</b>	<b>24</b>	<b>22</b>
	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(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 04



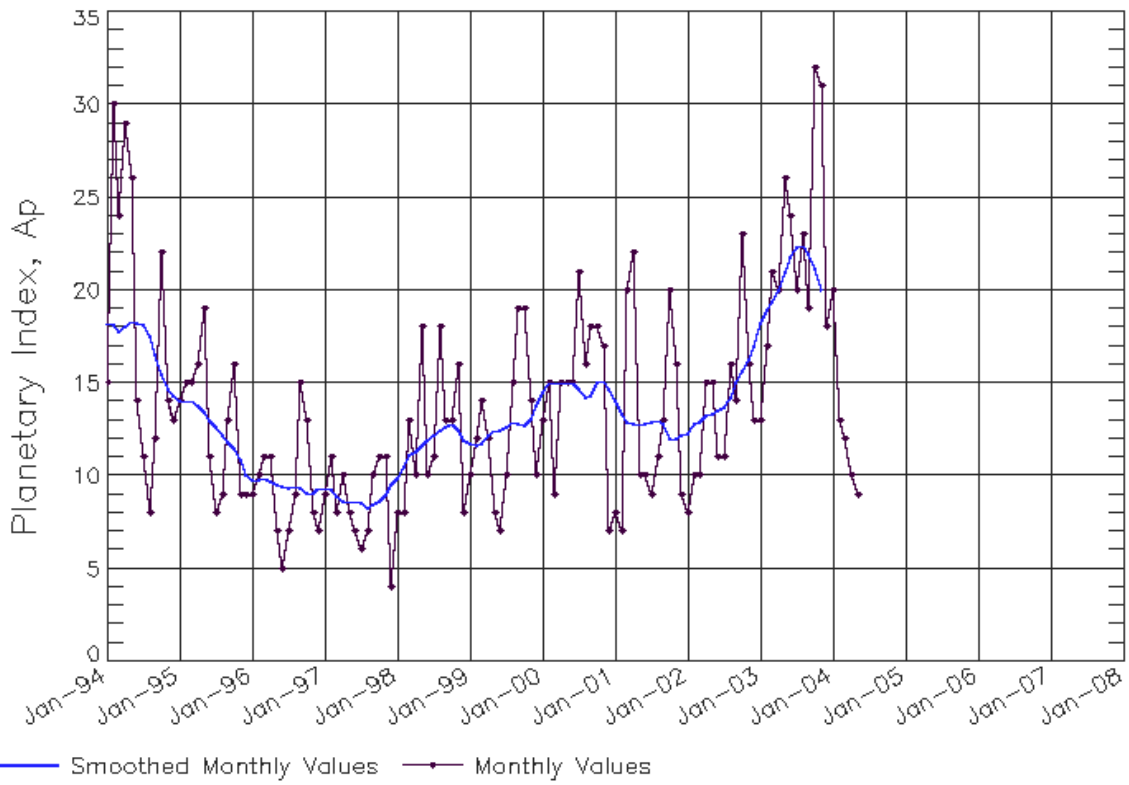
### SEC Prediction of Smoothed F10.7cm Radio Flux

	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 (***)	170 (***)	164 (***)	159 (***)	155 (***)	151 (***)
2003	149 (***)	145 (***)	140 (***)	136 (***)	135 (***)	133 (***)	130 (***)	128 (***)	126 (***)	124 (***)	122 (***)	<b>119</b> (1)
2004	<b>115</b> (3)	<b>112</b> (5)	<b>109</b> (7)	<b>105</b> (9)	<b>99</b> (11)	<b>95</b> (13)	<b>92</b> (15)	<b>89</b> (17)	<b>86</b> (19)	<b>84</b> (21)	<b>82</b> (22)	<b>80</b> (23)
2005	<b>79</b> (23)	<b>78</b> (23)	<b>78</b> (23)	<b>77</b> (23)	<b>76</b> (23)	<b>75</b> (23)	<b>75</b> (23)	<b>74</b> (23)	<b>74</b> (23)	<b>73</b> (23)	<b>73</b> (23)	<b>73</b> (23)
2006	<b>72</b> (23)	<b>72</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)
2007	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>72</b> (23)	<b>73</b> (23)	<b>74</b> (23)	<b>76</b> (23)	<b>77</b> (23)	<b>79</b> (23)



# ISES Solar Cycle Ap Progression

Data Through 31 May 04



Updated 2004 Jun 2

NOAA/SEC Boulder, CO USA

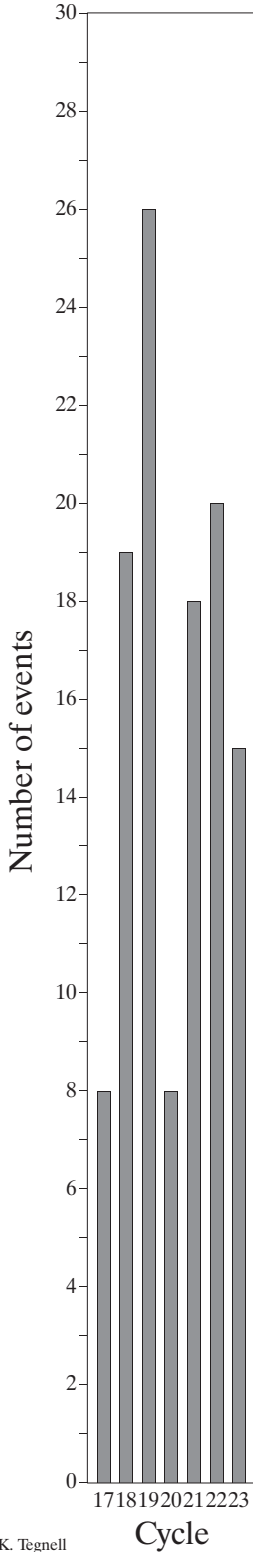


# Severe Storm ( $A_p \geq 100$ ) Geomagnetic Conditions



Space Environment Center

Comparison of Cycles at current month in cycle



K. Tegnell

