

Solar activity was low. Region 634 (N12, L=073, class/area, Eki/370 on 20 June) and 635 (S12, L=056, class/area, Fkc/600 on 20 June) dominated activity this period. Region 634 was in a gradual growth phase through the first half of the period and was responsible for majority of the low C-class flares from 14-17 June. A delta configuration was observed to form in this region on 19 June, but activity levels remained low. Region 635 rotated onto the visible disk on 14 June, and exhibited slow growth throughout the period. A delta magnetic configuration formed here on 18 June. C-class flare output increased from this region late in the period, but a C3/Sf on 19 June was the largest event observed.

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 over 500 km/s. A high speed stream rotated into a geoeffective position on 14 June and continued through 16 June. Solar wind speed peaked near 600 km/s early on the 16th before beginning a gradual decline through the remainder of the period. IMF Bz experienced extended periods of southward orientation between -10 and -15 nT on 14 and 15 June, but generally ranged from +5 to -5 nT.

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 low to moderate levels through the entire period.

The geomagnetic field ranged from quiet to minor storm levels. The high speed solar windstream and southward periods of IMF Bz resulted in occasional active periods at all latitudes and minor storm periods at high latitudes on 14 and 15 June. Quiet to unsettled conditions prevailed on 16, 19 and 20 June. Active periods were observed at high latitudes on 17 and 18 June.

**Space Weather Outlook**  
**23 June - 19 July 2004**

Solar activity is expected to be at very low to moderate levels. Regions 634 and 635 have potential to produce an isolated M-class flare before they rotate around the west limb on 26 and 27 June. Thereafter, activity is expected to be predominantly very low to low.

There is a slight chance for a greater than 10 MeV proton event from Region 634 and 635.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 27 - 30 June and 13 - 16 July due to recurrent coronal hole high speed streams.

The geomagnetic field is expected to range from quiet to active levels. Unsettled to active conditions are possible on 26 - 28 June, 1 July, and 12-14 July as generally weak, recurrent coronal high speed streams rotate into a geoeffective position.



### 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
14 June	100	77	560	B2.8	2	0	0	0	0	0	0	0
15 June	109	87	860	B2.5	1	0	0	0	1	0	0	0
16 June	112	113	1020	B2.1	1	0	0	0	0	0	0	0
17 June	111	106	930	B1.8	2	0	0	2	0	0	0	0
18 June	108	118	990	B2.0	2	0	0	1	0	0	0	0
19 June	113	90	890	B2.0	7	0	0	5	0	0	0	0
20 June	119	142	1080	B2.4	2	0	0	2	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
	14 June	5.5E+4	1.2E+4	2.8E+3		3.5E+6
15 June	6.4E+5	1.3E+4	3.1E+3		1.6E+6	
16 June	3.1E+5	1.3E+4	3.0E+3		5.6E+6	
17 June	2.3E+5	1.3E+4	2.9E+3		7.6E+6	
18 June	2.8E+5	1.3E+4	3.0E+3		1.4E+7	
19 June	1.6E+5	1.3E+4	2.9E+3		1.4E+7	
20 June	2.2E+5	1.3E+4	2.8E+3		2.0E+7	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	14 June	9	2-1-2-2-3-2-3-2	15	1-1-3-3-5-3-3-2	11
15 June	14	2-2-3-2-4-3-3-3	28	3-3-5-4-6-4-2-2	16	2-1-5-3-4-3-3-3
16 June	7	2-1-3-2-2-1-1-2	8	3-2-3-2-2-1-1-2	7	2-2-3-2-2-2-1-1
17 June	7	1-3-2-1-2-2-2-2	8	1-2-2-4-1-2-1-2	7	1-3-2-2-2-2-3-2
18 June	10	1-2-2-2-3-2-3-3	18	2-2-3-4-4-2-4-4	8	1-2-2-3-2-3-2-2
19 June	4	1-2-1-1-1-1-1-1	6	3-2-2-2-2-1-0-0	5	2-2-2-2-2-2-2-1
20 June	3	1-1-1-1-1-1-1-1	2	1-0-1-0-0-1-1-1	3	1-1-1-1-2-2-1-1

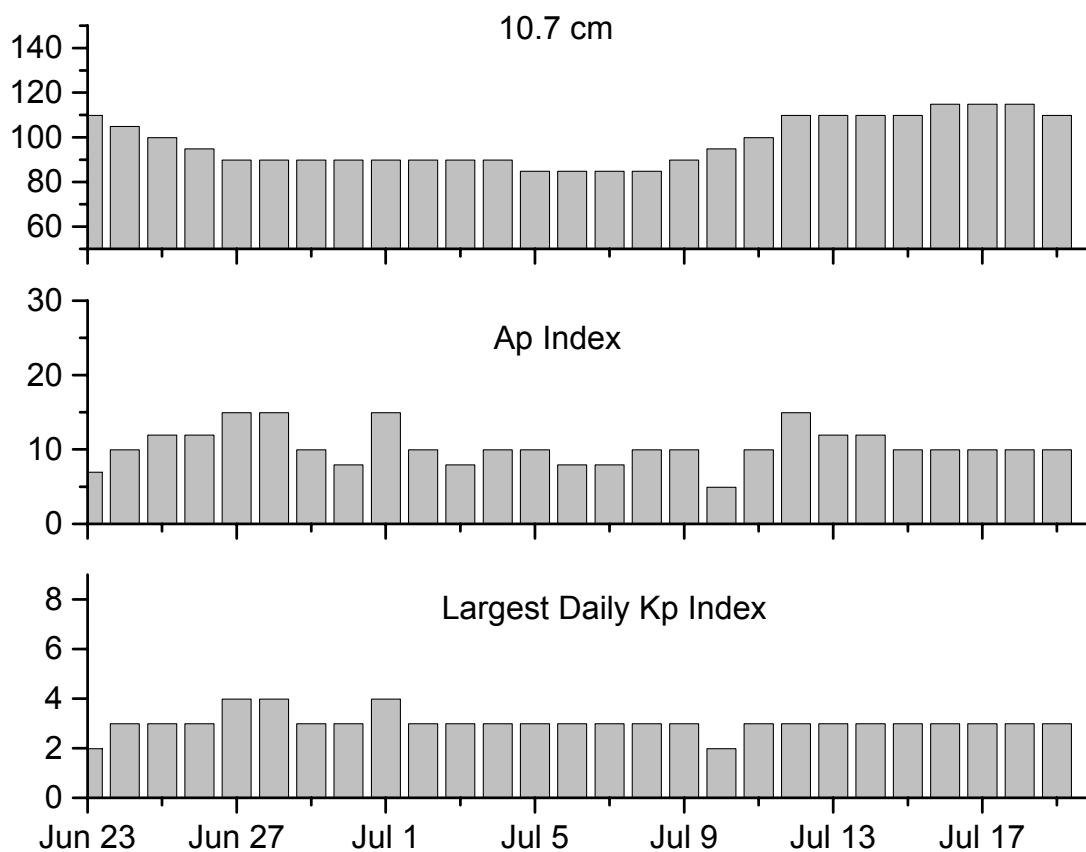


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
14 Jun 0013	1 - 245 MHz Radio Burst	13 Jun
14 Jun 1709	ALERT: Geomagnetic K= 4	14 Jun 1707
14 Jun 1853	WARNING: Geomagnetic K= 4	14 Jun 1900 - 15 Jun 1500
15 Jun 0012	1 - 245 MHz Radio Noise Storm	14 Jun
15 Jun 0655	ALERT: Geomagnetic K= 4	15 Jun 0645
15 Jun 1449	EXTENDED WARNING: Geomagnetic K= 4	14 Jun 1900 – 16 Jun 1500
16 Jun 0009	2 - 245 MHz Radio Bursts	15 Jun
16 Jun 0009	1 - 245 MHz Radio Noise Storm	15 Jun
16 Jun 0538	ALERT: Type II Radio Emission	16 Jun 0424
17 Jun 0008	1 - 245 MHz Radio Burst	16 Jun
18 Jun 0040	8 - 245 MHz Radio Bursts	17 Jun
18 Jun 0040	1 - 245 MHz Radio Noise Storm	17 Jun
19 Jun 0015	5 - 245 MHz Radio Bursts	18 Jun
19 Jun 0015	1 - 245 MHz Radio Noise Storm	18 Jun
20 Jun 0016	3 - 245 MHz Radio Bursts	19 Jun
20 Jun 0016	1 - 245 MHz Radio Noise Storm	19 Jun



## 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
23 Jun	110	7	2	07 Jul	85	8	3
24	105	10	3	08	85	10	3
25	100	12	3	09	90	10	3
26	95	12	3	10	95	5	2
27	90	15	4	11	100	10	3
28	90	15	4	12	110	15	4
29	90	10	3	13	110	12	3
30 Jun	90	8	3	14	110	12	3
01 Jul	90	15	4	15	110	10	3
02	90	10	3	16	115	10	3
03	90	8	3	17	115	10	3
04	90	10	3	18	115	10	3
05	85	10	3	19	110	10	3
06	85	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	
14 June	0256	0300	0304	B6.2			634
	0338	0356	0412	C1.7			
	0838	0846	0852	C1.5			634
	1335	1339	1342	B5.7			
15 June	0001	0007	0014	B6.9			635
	1958	2000	2007	C1.1	1f	N10E40	634
	2359	0003	0009	B3.5			635
16 June	0415	0434	0455	C2.8			
	2257	2302	2319	B4.2			635
17 June	0238	0241	0253	C1.2	Sf	N09E24	634
	0323	0328	0335	B3.6			
	0857	0901	0904	B4.7			635
	1249	1255	1301	B5.1			635
	1427	1431	1433	B3.1			
	1616	1619	1621	B3.4			
	1805	1809	1811	B5.2			
	1938	1938	1944	B4.5	Sf	N12E17	634
	2230	2234	2236	C1.0			
18 June	2253	2256	2258	B3.3			635
	0126	0129	0131	B3.6			
	0235	0238	0241	B3.2			635
	0815	0828	0844	B8.3			634
	1322	1336	1351	B3.3			635
	1534	1557	1610	B4.6			634
	1619	1626	1630	C1.8			635
	1828	1837	1843	B9.7			635
	2352	2352	0003	C1.3	Sf	N13E08	634
	19 June	0500	0513	0518	B8.3		
0616		0623	0630	C1.8			635
0808		0816	0823	C1.0			635
0827		0827	0834	C2.4	Sf	S11E22	635
1017		1041	1052	C1.2			635
1108		1132	1137	C1.0			635
1304		1308	1320	B4.0			635
1357		1405	1414	B5.4			635
1425		1430	1434	B9.9			635



*Flare List – continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
19 June	1511	1517	1529	B3.9			635
	1547	1547	1555	B8.8	Sf	S11E19	635
	1823	1827	1839	B5.9			635
	1901	1906	1908	B8.6	Sf	S11E16	635
	1933	1934	1942	C3.0	Sf	S11E16	635
	1945	1948	1955		Sf	S10E19	635
	2133	2138	2142	C1.3			635
20 June	0352	0357	0403	B6.9			635
	0455	0517	0522	B7.1			635
	0846	0846	0851	B5.2	Sf	S12E07	635
	1326	1328	1347	C2.0	Sf	S08E00	635
	1632	1637	1640	C1.0			635



### 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

#### Region 628

07 Jun	S09E13	213	0010	03	Bxo	002	B										
08 Jun	S09E00	213	0030	03	Cao	008	B										
09 Jun	S09W11	211	0010	03	Bxo	002	B										
15 Jun	S09W89	211															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude:213

#### Region 629

07 Jun	S04E22	204	0010	04	Bxo	002	B										
08 Jun	S04E09	204	0010	01	Hsx	001	A										
09 Jun	S04W03	203	0020	03	Bxo	007	B										
10 Jun	S05W17	204	0020	04	Cao	002	B										
11 Jun	S05W30	204															
12 Jun	S05W43	204															
13 Jun	S05W56	204															
14 Jun	S05W69	204															
15 Jun	S05W82	204															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude:203

#### Region 630

07 Jun	N13E56	170	0010	01	Axx	002	A										
08 Jun	N13E43	170	0010	01	Axx	001	A										
09 Jun	N14E30	170															
15 Jun	N14W48	170															
16 Jun	N14W61	170															
17 Jun	N14W74	170															
18 Jun	N14W87	170															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude:170



**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 631*

09 Jun	S11E42	158	0010	03	Bxo	004	B												
10 Jun	S10E29	158	0040	05	Cao	004	B												
11 Jun	S10E15	159	0030	06	Dso	010	B												
12 Jun	S10E02	158	0020	05	Cso	006	B												
13 Jun	S10W10	157	0020	04	Cao	005	B												
14 Jun	S13W22	156	0000	02	Axx	002	A												
15 Jun	S10W38	159	0010	04	Bxo	003	B												
16 Jun	S10W53	161	0020	04	Cso	004	B												
17 Jun	S10W66	161	0030	06	Cao	004	B												
18 Jun	S11W81	162	0010	01	Axx	001	A												

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude:158

*Region 632*

10 Jun	S12E66	121	0100	02	Hax	001	A												
11 Jun	S11E53	121	0080	02	Hax	001	A												
12 Jun	S11E38	122	0070	02	Hsx	002	A												
13 Jun	S11E26	121	0070	02	Hsx	001	A												
14 Jun	S11E13	121	0070	02	Hsx	001	A												
15 Jun	S12E00	121	0090	02	Hsx	001	A												
16 Jun	S12W14	122	0060	02	Hsx	001	A												
17 Jun	S12W27	122	0070	02	Hsx	001	A												
18 Jun	S12W40	121	0060	02	Hsx	001	A												
19 Jun	S12W52	120	0050	02	Hax	001	A												
20 Jun	S12W65	120	0060	02	Hax	001	A												

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude:121

*Region 633*

13 Jun	S05E37	110	0010	02	Axx	002	A												
14 Jun	S06E24	110	0010	04	Bxo	003	B												
15 Jun	S06E11	110																	
16 Jun	S07W03	111	0010	03	Bxo	007	B												
17 Jun	S08W15	110	0000	00	Axx	001	A												
18 Jun	S08W28	110																	
19 Jun	S08W41	110																	
20 Jun	S08W54	110																	

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude:111





**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 634</i>																	
13 Jun	N12E73	074	0120	07	Dao	007	B	1	1								
14 Jun	N13E60	074	0350	12	Eho	013	B	1									
15 Jun	N11E48	073	0370	15	Eki	025	Bg	1					1				
16 Jun	N12E33	075	0380	15	Eki	025	Bg										
17 Jun	N12E20	075	0390	16	Fki	028	Bg	1				2					
18 Jun	N12E07	074	0420	15	Eki	036	Bg	1				1					
19 Jun	N12W05	073	0360	14	Eki	017	Bgd										
20 Jun	N12W18	073	0370	14	Eki	015	Bgd										
								5	1	0	3	1	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 073

<i>Region 635</i>																	
14 Jun	S08E70	064	0130	07	Cso	008	B										
15 Jun	S10E65	056	0390	17	Fki	018	Bg										
16 Jun	S10E51	057	0550	18	Fki	026	Bg										
17 Jun	S11E38	057	0440	15	Eki	022	Bg										
18 Jun	S12E25	056	0500	17	Fki	040	Bgd	1									
19 Jun	S12E12	056	0480	20	Fki	042	Bgd	6				5					
20 Jun	S12W01	056	0600	20	Fkc	079	Bgd	2				2					
								9	0	0	7	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 056

<i>Region 636</i>																	
20 Jun	S10E30	025	0050	05	Cao	007	B										
								0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 025

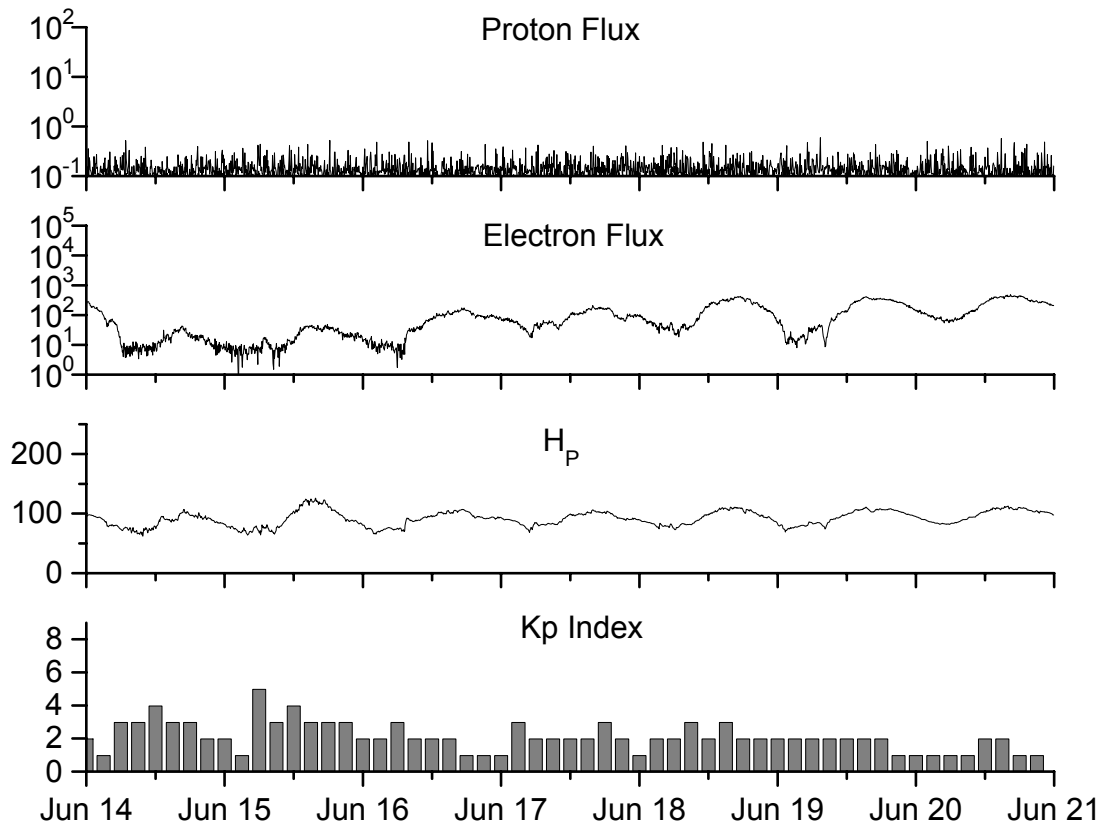


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>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 14 June 2004*

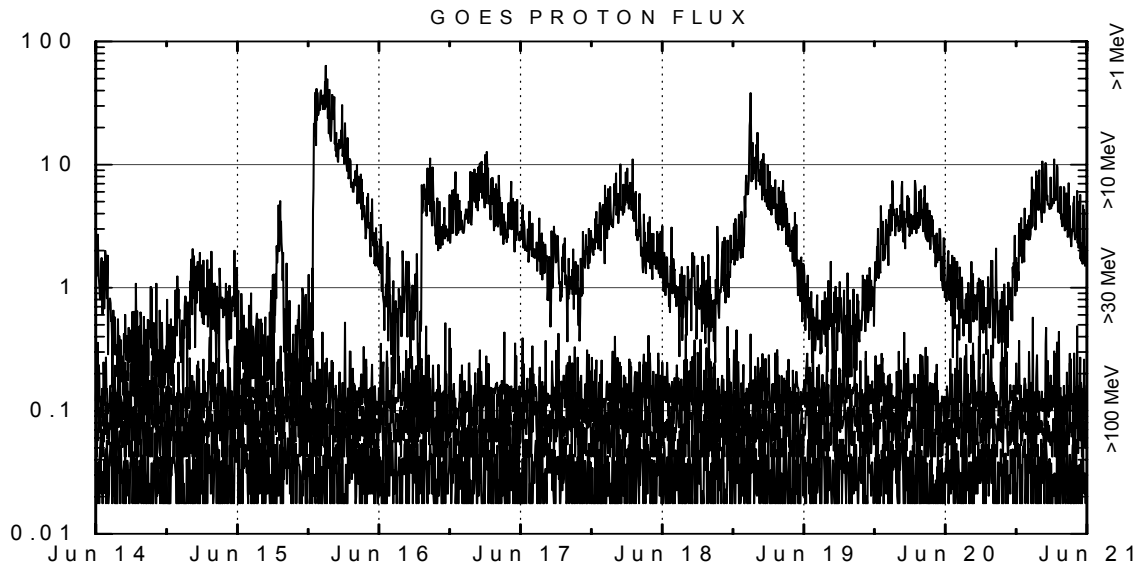
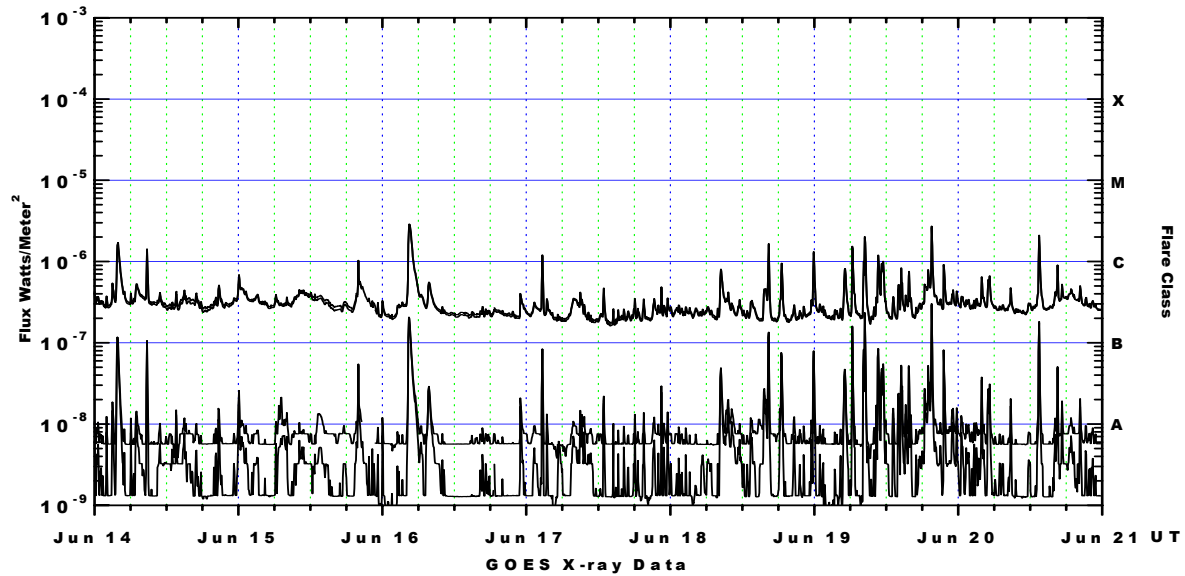
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W98) for each of three energy thresholds: greater than 10, 50, and 100 MeV. *Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr)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

