

Space Weather Highlights 21-27 Jun 1999

Solar activity ranged from low to moderate levels during the week. Region 8598 (N23, L=328, class/area Fki/650 on 25 June), the week's dominant flare producer, provided isolated M-class flares including an M1/2N parallel-ribbon flare at 23/0709UT with a Type IV radio sweep and moderate centimetric radio bursts. This region also produced an M2/2N at 26/0512UT with minor radio emission. Region 8598 was positioned within a cluster of five regions that also included Region 8592 (N22, L=352, class/area Fao/200 on 20 June) which produced an M1/1N flare at 22/1829UT with an associated 760 SFU Tenflare, and Type II and IV radio sweeps. This region also produced an M1/2N parallel-ribbon flare with an associated Type IV radio sweep and a 240 SFU Tenflare. Another event of note was a long-duration C4 X-ray flare at 24/1412UT associated with a 15-degree filament disappearance, a Hyder flare, and a partial-halo CME. The presence of numerous small- to medium-sized groups provided the highest daily sunspot numbers observed so far this cycle. The daily 10.7 cm solar radio flux also exceeded 200 SFU for the second time this cycle.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Phi data indicated a shift to a toward (negative polarity) solar sector during 23 - 24 June. Otherwise, no significant changes were noted in the solar wind flow through 25 June. Two shocks were detected on 26 June. The first occurred at approximately 26/0215UT and was followed by a minor velocity increase, a brief density increase to 34 p/cc, and periods of southward IMF Bz with deflections to minus 12 nT (GSM). The second shock was detected at approximately 26/1925UT and was accompanied by a velocity increase from 340 to 430 km/sec and enhanced particle densities, but IMF Bz remained mostly northward following the shock. IMF Bz eventually turned mostly southward during the latter half of 27 June with maximum deflections to minus 13 nT (GSM). Both shocks were followed by sudden impulses at Earth (see the geomagnetic activity discussion below).

There were no proton enhancements at geo-synchronous orbit during the period.

The greater than 2 MeV electron flux at geo-synchronous orbit was at normal levels.

The geomagnetic field was mostly quiet through 25 June, then increased to unsettled to minor storm levels during 26 - 27 June with the minor storm levels limited to high latitudes. Two sudden impulses were detected on 26 June. The first occurred at 26/0326UT (16 nT) and the other at 26/2020UT (38 nT).

Space Weather Outlook 30 June 1999-26 July 1999

Solar activity is expected to range from low to moderate levels. Isolated M-class flares may occur at any time during the period. There will also be a slight chance for a major flare sometime during the period.

There will be a slight chance for a proton event at geo-synchronous altitude.

The greater than 2 MeV electron flux at geo-synchronous altitude is expected to be at normal to moderate levels during most of the period.

Geomagnetic field activity is expected to be quiet to unsettled during most of the period. However, active levels may occur during 30 June - 01 July.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10 ⁶ hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	
21 June	146	148	1050	C1.8	5	0	0	5	1	0	0	0
22 June	162	160	1010	B7.0	3	1	0	7	1	0	0	0
23 June	168	169	1000	B9.4	7	2	0	5	1	1	0	0
24 June	185	229	1530	B8.9	13	0	0	21	3	0	0	0
25 June	201	260	1970	C1.1	1	0	0	16	0	0	0	0
26 June	200	310	1850	B8.7	9	1	0	18	2	1	0	0
27 June	207	341	1700	C1.3	6	1	0	7	0	1	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
21 June	1.3E+5	1.5E+4	3.2E+3		8.2E+5	
22 June	2.3E+5	1.8E+4	2.9E+3		5.3E+5	
23 June	7.8E+5	2.3E+4	2.9E+3		2.2E+5	
24 June	4.0E+5	1.6E+4	3.0E+3		2.0E+5	
25 June	6.8E+5	1.7E+4	2.9E+3		2.0E+5	
26 June	3.4E+7	3.3E+4	2.7E+3		1.4E+5	
27 June	1.7E+6	1.4E+4	2.4E+3		1.3E+5	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
21 June	1	0-0-0-1-1-1-3-0	0	0-0-0-0-0-0-0-0	4	0-0-0-1-2-2-2-1
22 June	3	0-0-1-1-1-1-1-2	1	0-0-0-1-0-0-0-1	4	1-0-1-1-1-2-2-2
23 June	5	1-1-2-1-1-1-2-2	3	1-2-1-2-1-0-0-0	6	1-1-2-2-2-2-2-3
24 June	4	1-1-0-1-2-2-2-1	5	1-1-2-1-3-1-1-1	6	2-1-2-2-2-2-2-2
25 June	2	1-1-0-0-0-1-1-1	2	2-1-0-1-0-0-0-0	5	2-1-0-1-1-3-2-2
26 June	14	1-3-3-3-3-2-4-3	27	1-3-5-5-5-4-3-3	17	2-3-4-4-4-3-4-3
27 June	15	1-2-2-3-4-3-3-4	26	1-4-2-3-5-5-5-3	21	2-3-3-3-5-4-5-4

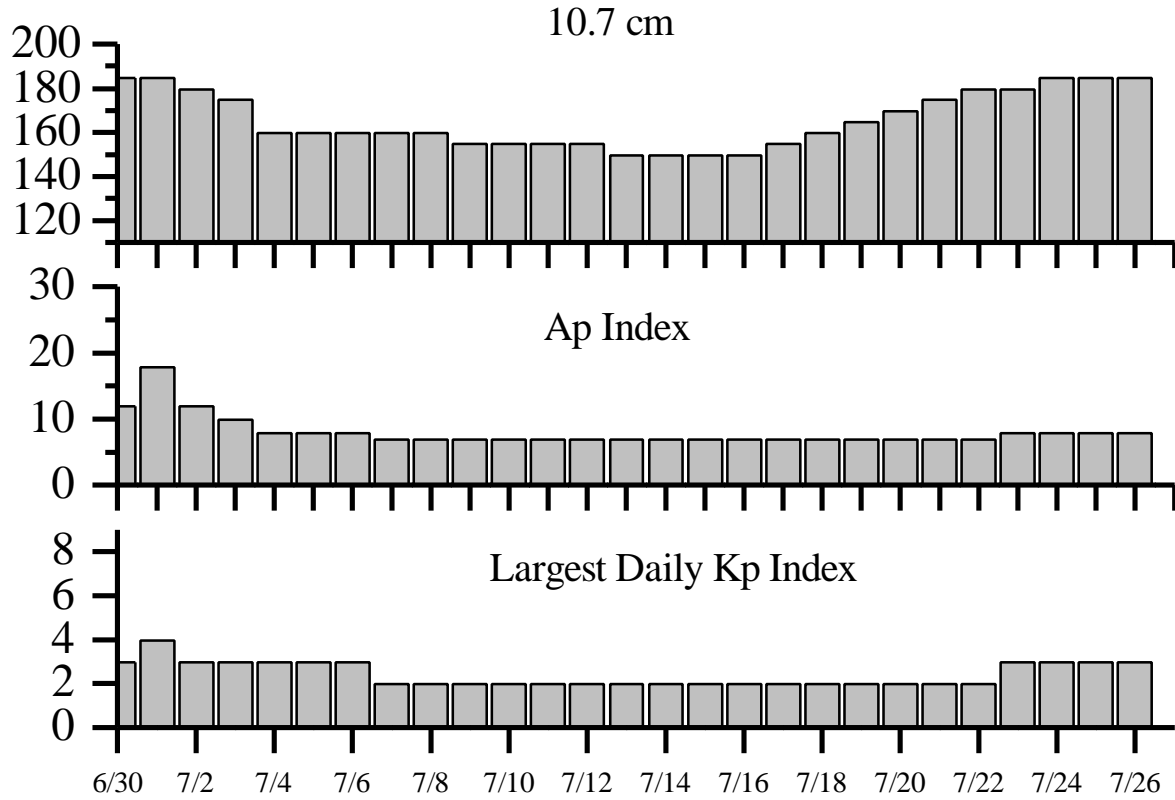


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
22 Jun 1848	10cm Radio Burst 760 F.U.	22 Jun 1820
22 Jun 1910	Type II Radio Emission	22 Jun 1824
22 Jun 1918	Type IV Radio Emission	22 Jun 1828
23 Jun 0621	Type II Radio Emission	23 Jun 0545
23 Jun 0747	Type IV Radio Emission	23 Jun 0651
23 Jun 1313	Type IV Radio Emission	23 Jun 1223
26 Jun 0352	Sudden Impulse Observed at Boulder 16 nT	26 Jun 0326
26 Jun 1203	K= 4 Observed	26 Jun 09 - 12
26 Jun 2034	Sudden Impulse observed at Boulder 38 nT	26 Jun 2020
27 Jun 0903	10cm Radio Burst 250 s.f.u.	27 Jun 0836
27 Jun 0927	Type IV Radio Emission	27 Jun 0836
27 Jun 1500	K= 4 Observed	27 Jun 12 - 15
27 Jun 1800	K= 4 Observed	27 Jun 15 - 18
27 Jun 1930	K= 4 Warning valid	27/1930 – 28/1200
27 Jun 2100	K= 4 Observed	27 Jun 18 - 21



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 Jun	185	12	3	14 Jul	150	7	2
01 Jul	185	18	4	15	150	7	2
02	180	12	3	16	150	7	2
03	175	8	3	17	155	7	2
04	160	8	3	18	160	7	2
05	160	8	3	19	165	7	2
06	160	8	3	20	170	7	2
07	160	7	2	21	175	7	2
08	160	7	2	22	180	7	2
09	155	7	2	23	180	8	3
10	155	7	2	24	185	8	3
11	155	7	2	25	185	8	3
12	155	7	2	26	185	8	3
13	150	7	2				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Integ Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
			Max				Lat	CMD	245	2695	II	IV
22 Jun	1737	1829	1854	M1.7	.030	1N	N22E37		150	760	2	1
23 Jun	0649	0709	0735	M1.7	.032	2N	N23E42		220	88		2
23 Jun	2306	2316	2325	M1.1	.009							
26 Jun	0508	0512	0514	M2.3	.004	2N	N23E03			63		

Flare List

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
21 June	0005	0005	0018	C3.4	SF	N14E75	8594
	0058	0118	0152	C4.9	1F	S12W51	8583
	0140	0144	0149		SF	N36W24	8585
	0913	0915	0918	C1.6	SF	N13E69	8594
	1129	1132	1142	C1.2			
	1815	1815	1819		SF	N13E66	8594
	1824	1824	1828		SF	N12E65	8594
	2304	2309	2318	C1.2			
22 June	0257	0257	0301	C1.4	SF	S20E83	8599
	0708	0713	0812	C1.6	SF	S19E79	8599
	1150	1215	1237	C2.6			
	1419	1419	1428		SF	S18E74	8599
	1538	1544	1550		SF	S18E72	8599
	1611	1618	1624		SF	S18E71	8599
	1746	1746	1806		SF	N26E55	8598
	1818	1857	A185	M1.7	1N	N22E37	8592
23 June	1856	1901	1917		SF	S18E71	8599
	0040	0045	0057	C7.9	1F	S12W78	8583
	B0659	0707	0819	M1.7	2N	N23E42	8598
	1228	1230	1323	C2.3	SF	N23E28	8592
	1555	1559	1601	C1.3			
	1718	1720	1725		SF	N24E46	8698
	1736	1737	1745		SF	N22E46	8598
	B1753	U1801	A1814	C2.8	SF	N23E45	8598
	1829	1834	1842	C2.5			
	1851	1857	1902	C2.8			
	2044	2055	2102	C5.1			
2112	2122	2157		SF	N23E44	8598	
2306	2316	2325	M1.1				



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
24 June	0141	0155	0217	C2.4				
	0258	0303	0307	C2.0				
	0410	0415	0422	C2.1				
	0446	0447	0451		SF	N26E36	8598	
	0500	0504	0520		SF	N24E38	8598	
	0606	0612	0705	C3.7	SF	N26E28	8598	
	0633	0649	0705		SF	N23E40	8598	
	0649	0649	0703		SF	N26E35	8598	
	0709	0711	0713		SF	N26E35	8598	
	0722	0722	0727		SF	N24E37	8598	
	0738	0745	0804		SF	N22E42	8598	
	0809	0812	0847	C6.5	1F	N23E38	8598	
	0909	0914	0917	C2.2	SF	N22E21	8596	
	B1321	1342	1444	C4.1	1F	N29W1	8595	
	1534	1535	A1551	C2.3	SF	N24E34	8598	
	1539	1540	A1551		SF	N19E65	8602	
	1720	1723	1727	C1.8				
	1737	1738	1809	C1.8	SF	N22E08	8592	
	1832	1840	1917	C3.3	1F	N20E26	8598	
	1834	1840	1847		SF	N15E27	8594	
	1920	1924	1929		SF	N22E30	8598	
	1930	1934	1944		SF	N22E30	8598	
	1939	1941	1944		SF	N17E36	8598	
	2002	2003	2011		SF	S17E56	8603	
	2002	2005	2012	C3.3	SF	N14E24	8594	
	2103	2107	2116		SF	N24E29	8598	
	2239	2239	2242		SF	S17E39	8599	
	2256	2303	2314	C3.4	SF	S16E65	8603	
	25 June	0010	0011	0017		SF	N22E30	8598
		0028	0032	0036		SF	N22E29	8598
		0154	0203	0205		SF	N23E28	8598
		0337	0401	0413		SF	N15E21	8594
0606		0609	0621		SF	N16E31	8606	
1330		1348	1452		SF	N11W65	8604	
1330		1332	1351		SF	N22E19	8598	
1400		1402	1413		SF	N23E21	8598	
1526		1526	1529		SF	N11W65	8604	
1534		1535	1545		SF	N11W65	8604	
1713		1714	1718		SF	N11W65	8604	
1726		1728	1730		SF	N11W64	8591	
1731		1737	1742		SF	N11W66	8604	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
25 Jun	1850	1855	1858		SF	N22E20	8598
	1959	2000	2005		SF	N25E11	8598
	2152	2157	2203	C2.4			
26 June	2343	2347	2352		SF	N11W69	8604
	0110	0118	A014	C2.7	SF	N17E51	8602
	0201	0203	0217	C2.7	SF	S18E53	8603
	0353	0356	0402	C1.7			
	0431	0431	0436		SF	N23E13	8598
	0440	0441	0445		SF	N12W70	8604
	0510	0512	0528	M2.3	2N	N23E03	8598
	0650	0723	0819	C7.0	1F	N25E00	8598
	1149	1152	1158	C3.1			
	B1240	U1241	1248	C2.2	SF	N21W03	8596
	1330	1335	1342		SF	S17E47	8603
	1332	1335	1347	C3.0	SF	N22E09	8598
	1333	1334	1343		SF	N17E14	8606
	1603	1606	1612		SF	N17E39	8602
	1604	1607	1624		SF	N22W04	8596
	1644	1651	1705	C4.1	1N	N24W08	8596
	1717	1717	1723		SF	N25E08	8598
	1951	1951	1957		SF	N22E06	8598
	2031	2036	2110	C4.2	SF	N20E38	8602
	2202	2202	2207		SF	S18E44	8603
2243	2245	2303		SF	N11E26	8610	
2324	2326	2329		SF	S16E43	8603	
2324	2324	2333		SF	N16E35	8602	
2350	2352	2355		SF	S16E43	8603	
27 June	0055	0137	0212	C2.7			
	0225	0228	0254	C2.5	SF	N19E35	8602
	0320	0330	0357	C2.3	SF	N18E35	8602
	0837	0841	0942	M1.0	2N	N23W2	8592
	1438	1445	1453		SF	S26E67	8611
	1441	1443	1502		SF	N18E28	8602
	1507	1524	1538	C2.0	SF	S25E65	8611
	1835	1838	1928	C3.4	SF	N24W12	8598
	2046	2049	2114	C3.2	SF	S25E63	8611



Region Summary

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 8580</i>																		
09 Jun	S19E67	128	0240	03	HAX	002	A											
10 Jun	S19E54	127	0260	04	HKX	004	A											
11 Jun	S20E42	126	0300	03	HKX	002	A											
12 Jun	S20E28	126	0250	03	HKX	002	A											
13 Jun	S20E15	126	0270	04	CKO	006	B											
14 Jun	S20E02	126	0230	04	CAO	007	B											
15 Jun	S21W11	126	0230	04	CAO	010	B											1
16 Jun	S20W24	126	0230	05	CAO	006	B											1
17 Jun	S21W37	125	0270	05	CAO	008	B											
18 Jun	S21W51	126	0220	02	HSX	002	A											
19 Jun	S21W63	125	0180	02	HSX	001	A											
20 Jun	S20W76	125	0170	03	HSX	001	A											
21 Jun	S21W94	130	0040	02	HSX	001	A											
								0	0	0	2	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 126

<i>Region 8583</i>																		
11 Jun	S12E68	100	0080	02	HSX	002	A											
12 Jun	S13E56	098	0150	09	DSO	008	B	1	1			6	1	1				
13 Jun	S13E44	097	0140	10	DAO	012	B					4						
14 Jun	S13E31	097	0210	10	DAI	015	B					1						
15 Jun	S12E17	098	0150	10	DSI	019	B	1				2						
16 Jun	S13E03	099	0130	08	DSO	016	B											
17 Jun	S13W10	098	0090	07	DSO	013	B											
18 Jun	S13W23	098	0020	07	CAO	006	B											
19 Jun	S13W36	098	0020	06	CSO	003	B											
20 Jun	S11W51	100	0000	02	BXO	002	B											1
21 Jun	S11W64	100						1										1
22 Jun	S11W77	100																
23 Jun	S11W90	100						1										1
								4	1	0	14	3	1	0	0			

Crossed West Limb.

Absolute heliographic longitude: 099



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares																
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical												
		Lon						C	M	X	S	1	2	3	4								
<i>Region 8585</i>																							
12 Jun	N38E77	077	0090	07	DSO	003	B																
13 Jun	N38E67	074	0140	08	DAO	004	B																
14 Jun	N39E54	074	0190	08	DAO	007	B																
15 Jun	N38E40	075	0140	09	DSO	007	B																
16 Jun	N37E28	074	0180	07	DSO	006	B	1				2	1										
17 Jun	N37E16	072	0190	08	CAO	006	B	1				2											
18 Jun	N38E04	071	0140	06	CSO	004	B	2				2	1										
19 Jun	N38W09	071	0170	10	ESO	008	B																
20 Jun	N38W19	068	0150	07	CSO	005	B																
21 Jun	N38W31	067	0150	06	CSO	005	B						1										
22 Jun	N38W44	066	0150	06	CSO	004	B																
23 Jun	N38W55	064	0100	03	HSX	002	A																
24 Jun	N36W68	064	0120	03	HSX	003	A																
25 Jun	N35W80	063	0120	02	HAX	001	A																
26 Jun	N37W92	062	0120	03	HAX	001	A																
								4	0	0	0	7	2	0	0	0	0						

Crossed West Limb.

Absolute heliographic longitude: 071

<i>Region 8588</i>																							
15 Jun	S22E20	095	0000	01	AXX	002	A																
16 Jun	S21E06	096	0010	04	BXO	004	B																
17 Jun	S22W06	094	0030	05	CSO	006	B																
18 Jun	S22W17	092	0010	01	AXX	002	A						1										
19 Jun	S21W28	090	0010	03	BXO	003	B																
20 Jun	S21W41	090																					
21 Jun	S21W54	090																					
22 Jun	S21W67	090																					
								0	0	0	0	1	0	0	0	0	0						

Crossed West Limb.

Absolute heliographic longitude: 096



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 8589</i>																		
16 Jun	N28E04	098	0010	00	AXX	001	A											
17 Jun	N27W13	101	0030	03	CAO	003	B											
18 Jun	N27W25	100	0040	06	CAO	008	B											
19 Jun	N27W37	099	0080	07	DSO	009	B											
20 Jun	N28W51	100	0090	08	DAO	004	B											
21 Jun	N28W64	100	0070	08	DSO	003	B											
22 Jun	N28W77	099	0080	08	CSO	002	B											
								0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 098

<i>Region 8590</i>																		
17 Jun	S22W15	103	0010	03	BXO	003	B											
18 Jun	S22W28	103																
19 Jun	S22W41	103																
20 Jun	S22W54	103																
21 Jun	S22W67	103																
22 Jun	S22W80	103																
								0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 103

<i>Region 8591</i>																		
17 Jun	N12E14	074	0010	02	BXO	003	B											
18 Jun	N13W01	076	0010	03	BXO	002	B											
19 Jun	N15W14	076	0000	01	AXX	001	A											
20 Jun	N15W27	076											1					
21 Jun	N15W40	076																
22 Jun	N15W53	076																
								0	0	0	1	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 076



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares											
	° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 8592</i>																		
19 Jun	N23E71	351	0100	03	HSX	002	A	1										
20 Jun	N22E63	346	0200	20	FAO	006	B	1	1			2						
21 Jun	N22E45	351	0170	09	DAO	008	B											
22 Jun	N24E30	352	0100	06	CSO	008	B		1				1					
23 Jun	N22E18	351	0060	02	CSO	002	B	1				1						
24 Jun	N22E04	352	0060	03	CSO	003	B	1				1						
25 Jun	N23W08	351	0060	02	HSX	001	A											
26 Jun	N22W21	351	0050	02	HSX	001	A											
27 Jun	N22W33	350	0040	02	HSX	001	A			1						1		
								4	3	0	4	1	1	0	0			

Still on Disk.

Absolute heliographic longitude: 352

<i>Region 8593</i>																		
20 Jun	N19W61	110	0000	03	BXO	002	B											
21 Jun	N20W76	112	0000	00	AXX	001	A											
22 Jun	N21W89	111	0000	00	AXX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 110

<i>Region 8594</i>																		
20 Jun	N14E84	325	0400	03	HHX	001	A											
21 Jun	N14E67	329	0260	07	DAO	007	B	2				4						
22 Jun	N14E56	326	0280	16	FAO	011	B											
23 Jun	N14E40	329	0240	09	DAO	010	B											
24 Jun	N14E26	330	0200	08	DAI	013	B	1				2						
25 Jun	N14E14	329	0210	08	DAO	019	B					1						
26 Jun	N13E00	330	0120	09	DAI	020	B											
27 Jun	N13W13	330	0120	09	DAI	022	B											
								3	0	0	7	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 330



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio Lon	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<i>Region 8595</i>																		
21 Jun	N26E18	018	0010	03	BXO	004	B											
22 Jun	N26E03	019	0010	02	BXO	003	B											
23 Jun	N23W08	017	0020	02	CRO	005	B											
24 Jun	N23W21	017						1					1					
25 Jun	N23W34	017																
26 Jun	N23W47	017																
27 Jun	N23W60	017																
									1	0	0	0	1	0	0	0	0	0
Still on Disk.																		
Absolute heliographic longitude: 019																		
<i>Region 8596</i>																		
21 Jun	N23E53	343	0040	03	DAO	003	B											
22 Jun	N22E40	342	0040	04	CSO	005	B											
23 Jun	N20E27	342	0020	01	HSX	001	A						1					
24 Jun	N21E13	343	0020	01	HRX	001	A	1					1					
25 Jun	N21E00	343	0010	04	BXO	004	B											
26 Jun	N22W12	342	0010	01	HSX	001	A	2	1			2	1	1				
								3	1	0	4	1	1	0	0			
Still on Disk.																		
Absolute heliographic longitude: 343																		
<i>Region 8597</i>																		
21 Jun	N21E65	331	0140	06	CSO	002	B											
22 Jun	N20E54	328	0120	02	HAX	002	A											
									0	0	0	0	0	0	0	0	0	0
Still on Disk.																		
Absolute heliographic longitude: 326																		
<i>Region 8598</i>																		
21 Jun	N26E69	327	0110	03	HAX	002	A											
22 Jun	N25E56	326	0110	15	EAO	007	B						1					
23 Jun	N23E43	326	0270	16	FAI	017	B	1	1			3		1				
24 Jun	N23E28	328	0360	17	FAI	029	B	4				13	2					
25 Jun	N23E13	330	0650	19	FKI	039	B					7						
26 Jun	N23E02	328	0530	19	FAI	050	BG	2	1			4	1	1				
27 Jun	N22W11	328	0530	21	FKI	065	BG	1				1						
								8	2	0	29	3	2	0	0			
Still on Disk.																		
Absolute heliographic longitude: 328																		



Region Summary-continued

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

Region 8599

21 Jun	S16E76	320	0060	02	HAX	002	A											
22 Jun	S16E64	318	0100	06	DAC	005	B	2			6							
23 Jun	S17E52	317	0110	07	CAO	007	B											
24 Jun	S17E39	317	0120	09	CAO	008	B				1							
25 Jun	S16E27	316	0110	10	DSO	010	B											
26 Jun	S16E13	317	0090	12	EAO	011	B											
27 Jun	S16E00	317	0070	13	CAO	016	B											
								2	0	0	7	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 317

Region 8600

22 Jun	N19W22	044	0020	03	BXO	002	B											
23 Jun	N19W37	046	0020	02	CRO	003	B											
24 Jun	N19W49	045	0020	05	BXO	006	B											
25 Jun	N18W64	047	0000	00	AXX	001	A											
26 Jun	N17W80	050	0010	00	AXX	001	A											
27 Jun	N20W88	045	0000	02	AXX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 044

Region 8601

23 Jun	S15W36	045	0020	03	BXO	004	B											
24 Jun	S14W51	047	0010	02	AXX	003	A											
25 Jun	S15W63	046	0010	06	BXO	003	B											
26 Jun	S15W76	046																
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 045

Region 8602

23 Jun	N19E75	294	0100	05	CAO	006	B											
24 Jun	N19E57	297	0350	10	DAO	009	B				1							
25 Jun	N18E48	295	0320	12	CAO	016	B											
26 Jun	N17E35	295	0330	09	DKI	021	B	2			4							
27 Jun	N18E22	295	0350	08	DKO	025	B	2			3							
								4	0	0	8	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 295



Region Summary-continued

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

Region 8603

23 Jun	S16E75	294	0040	05	CSO	002	B											
24 Jun	S15E61	295	0160	13	EAO	009	B	1				2						
25 Jun	S15E54	289	0320	20	FAI	018	B											
26 Jun	S16E43	287	0300	18	FAI	024	B	1				5						
27 Jun	S15E30	287	0360	18	FAI	039	B											
								2	0	0	7	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 287

Region 8604

24 Jun	N12W54	050	0030	04	CSO	004	B											
25 Jun	N12W68	051	0100	06	CAO	006	B					6						
26 Jun	N11W82	052	0150	08	CAO	005	B					1						
27 Jun	N14W92	049	0060	07	CAO	002	B											
								0	0	0	7	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 050

Region 8605

24 Jun	S25W32	028	0020	04	CRO	004	B											
25 Jun	S24W48	031	0000	00	AXX	001	A											
26 Jun	S24W61	031																
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 028

Region 8606

24 Jun	N17E33	323	0060	05	DAO	007	B											
25 Jun	N17E21	322	0060	07	DAO	011	B					1						
26 Jun	N17E08	322	0100	07	DAI	013	B					1						
27 Jun	N17W06	323	0090	07	DAO	016	B											
								0	0	0	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 323

Region 8607

26 Jun	N22W53	023	0020	03	CRO	003	B											
27 Jun	N23W68	025	0000	01	AXX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 023



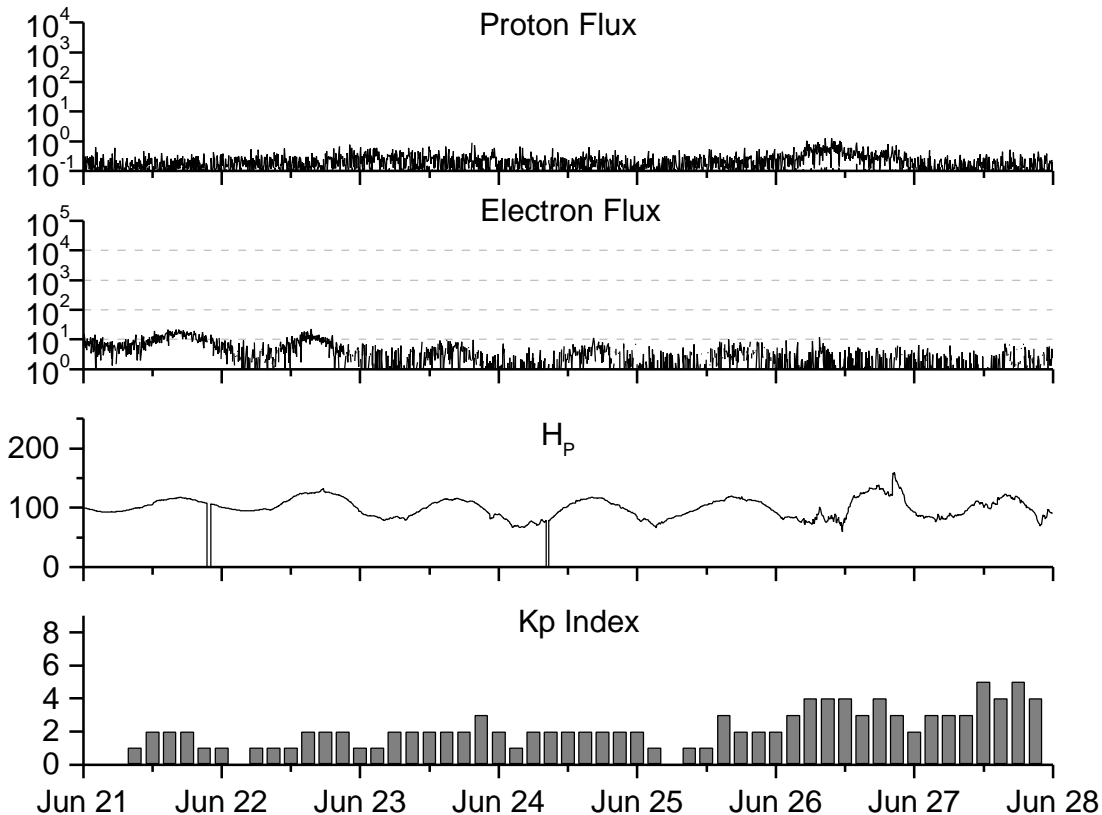
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
1997									
June	22.1	12.7	0.57	29.0	20.3	71.7	80.1	07	08.6
July	17.0	10.4	0.61	32.4	22.6	71.1	81.8	06	08.5
August	36.7	24.4	0.66	35.9	25.0	79.0	83.4	07	08.3
September	52.8	51.3	0.88	40.5	28.3	96.2	85.7	10	08.4
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	08.6
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
1998									
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.4	138.4	126.8	13	12.5
October	77.0	55.6	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	73.6	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.6	0.68			150.1		08	
1999									
January	94.3	62.4	0.66			142.6		10	
February	93.4	66.1	0.70			142.0		11	
March	100.5	69.1	0.70			126.3		13	
April	92.9	63.9	0.69			117.3		12	
May	140.5	106.3	0.76			148.4		10	

NOTE: All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates.

The lowest smoothed sunspot indices 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 June 1999

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

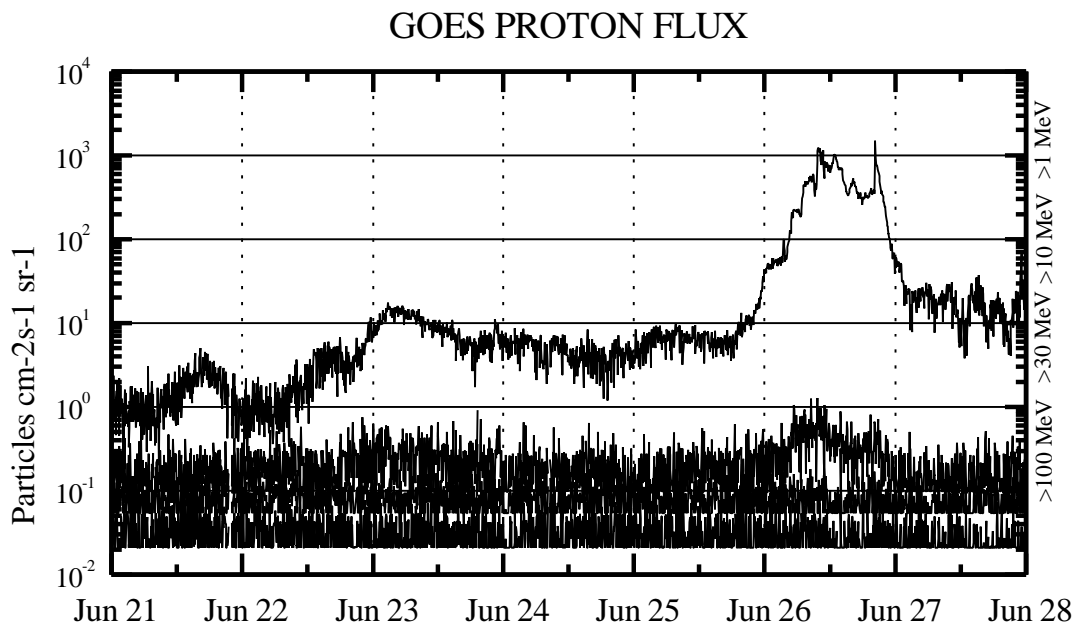
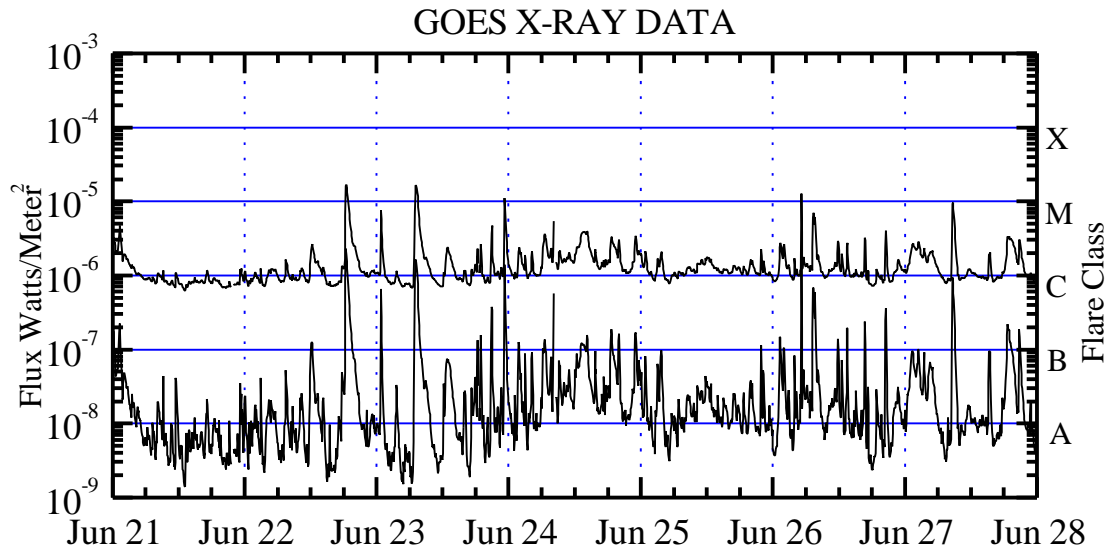
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm² -sec -sr) with energies greater than 2 MeV at GOES-8.

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are " global " parameters that are applicable to a first order approximation over large areas. H_p is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five minute averaged x-ray flux (watts / m²) as measured by GOES 8 and 10 in two wavelength bands, .05 -.4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five minute averaged integral proton flux (protons/cm² –sec –sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

