

**Space Weather Highlights
29 June – 05 July 1998**

Solar activity was low during most of the period, but increased to moderate levels on 03 - 04 July. An optically uncorrelated M1-Class Flare occurred on 03/0112UT. Region 8256 (S24, L = 048, class/area Bxo/020 on 04 July) produced, an M1/SN at 04/0412UT and a C9/1N at 04/1639UT. Another flare of note was a C7/2F at 05/1144UT from Region 8264 (N16, L = 335, class/area Cao/200 on 05 July). These regions showed very little activity after 04 July.

Solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Velocities ranged from 300 - 450 km/sec during for most of the period then showed gradual increase 05 July, to close out the period at 550 km/sec. Particle densities were mostly in the 01 - 10 p/cc range, but were slightly enhanced during the 01 - 02 July period with a range of 02 - 12 p/cc range. Bz ranged from plus 08 to minus 08 nT (GSM) during most of the period, with a maximum southward Bz of minus 10 nT occurring on 01 July. Solar sector orientation was mostly away (phi angle near 135 degrees) during 29 June - 02 July, then shifted to mostly toward orientation (phi angle near 315 degrees) for the balance of the period.

There were no significant proton enhancements detected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude was at normal to moderate levels during most of the period.

The geomagnetic field was quiet to unsettled with brief active periods occurring on 29 June and 02 - 04 July at middle latitudes. High latitudes were quiet to unsettled with brief active periods on 30 June, 02 - 05 July and a single minor storm period on 02 July.

**Space Weather Forecast
08 July 1998 - 03 August 1998**

Solar activity is expected to be low during most of the period with a fair chance for isolated M-class flares.

No proton enhancements are expected at geosynchronous altitude.

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

The geomagnetic field is expected to be at quiet to unsettled levels with isolated active periods.



Daily Solar Data

Date	Radio Flux	Sun spot	Sunspot Area	X-ray Background	X-ray Flux			Flares				
	10.7 cm	No. (10^6 hemi.)			C	M	X	S	1	2	3	4
29 June	119	137	650	B3.7	2	0	0	3	1	0	0	0
30 June	121	127	780	B4.4	2	0	0	3	1	0	0	0
01 July	127	126	710	B5.3	4	0	0	4	0	0	0	0
02 July	120	109	650	B3.6	1	0	0	1	0	0	0	0
03 July	128	123	640	C1.4	5	1	0	4	0	0	0	0
04 July	129	129	640	B9.2	10	1	0	9	1	0	0	0
05 July	124	137	540	B4.2	6	0	0	3	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
29 June	3.4E+5	1.5E+4	3.8E+3		1.0E+7	
30 June	4.3E+5	1.6E+4	4.2E+3		1.2E+7	
01 July	9.9E+5	1.6E+4	4.2E+3		9.6E+6	
02 July	5.2E+5	1.6E+4	4.1E+3		2.4E+5	
03 July	2.9E+5	1.5E+4	4.0E+3		2.8E+5	
04 July	1.0E+6	1.8E+4	4.3E+3		1.1E+7	
05 July	6.9E+5	1.6E+4	3.8E+3		2.0E+6	

Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
29 June	6	1-0-1-1-2-0-4-0	3	0-1-1-0-3-0-1-0	4	1-1-1-1-2-2-2-1
30 June	3	1-1-0-1-1-1-1-1	6	2-1-1-0-0-1-1-4	5	2-1-1-1-2-2-2-1
01 July	6	1-0-1-1-1-1-3-3	3	0-1-1-0-0-1-2-2	8	1-1-1-1-2-3-3-3
02 July	9	4-1-2-1-1-1-2-3	14	3-1-2-4-5-0-1-2	10	4-1-3-2-2-2-2-3
03 July	11	4-2-1-2-2-1-3-3	8	4-3-1-1-1-0-2-2	11	4-3-1-1-2-2-3-3
04 July	11	2-4-3-1-2-1-2-3	17	2-4-4-1-4-3-3-2	12	2-3-3-1-3-3-3-3
05 July	12	3-3-2-3-3-2-3-2	14	3-4-2-2-3-2-3-3	15	4-4-2-3-3-3-4-3

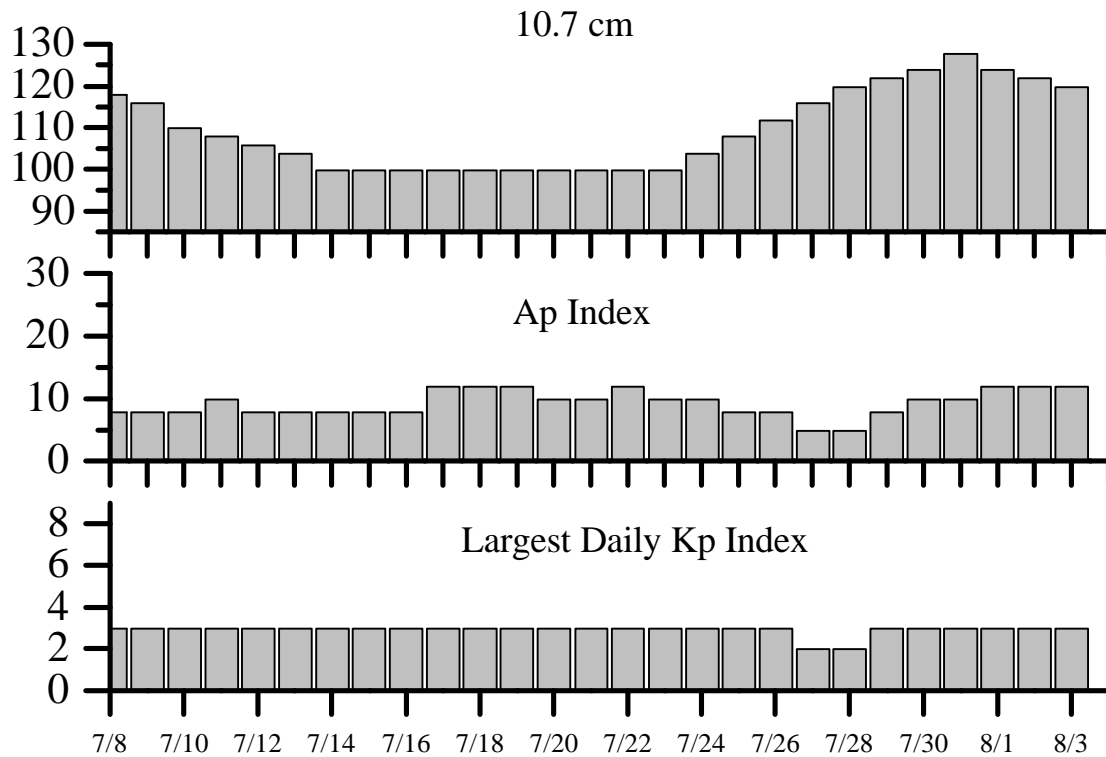


Alerts and Warnings Issued

<u>Date and Time of Issue (UT)</u>	<u>Type of Alert or Warning</u>	<u>Date and Time of Event (UT)</u>
29 Jun 0011	1-245 MHz Radio Burst	28 Jun
29 Jun 0011	245 MHz Radio Noise Storm	28 Jun
30 Jun 0011	4245 MHz Radio Burst	29 Jun
30 Jun 0011	245 MHz Radio Noise Storm	29 Jun
01 Jul 0033	1-245 MHz Radio Burst	30 Jun
01 Jul 0033	245 MHz Radio Noise Storm	30 Jun
01 Jul 1136	Type II Radio Emission	01 Jul 1029
01 Jul 1920	Type II Radio Emission	01 Jul 1844
02 Jul 0013	3-245 MHz Radio Bursts	01 Jul
02 Jul 0013	245 MHz Radio Noise Storm	01 Jul
02 Jul 0300	K=4 Observed	02 Jul 00- 03
03 Jul 0012	4- 245 MHz Radio Bursts	02 Jul
03 Jul 0012	245 MHz Radio Noise Storm	02 Jul
03 Jul 0234	Type IV Radio Emission	03 Jul 0101
03 Jul 0300	K=4 Observed	03 Jul 00- 03
04 Jul 0034	3-245 MHz Radio Bursts	03 Jul
05 Jul 0012	3-245 MHz Radio Bursts	04 Jul
05 Jul 0012	245 MHz Radio Noise Storm	04 Jul
05 Jul 0305	K=4 Observed	05 Jul 00- 03



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
08 July	118	8	3	22 July	100	12	3
09	116	8	3	23	100	10	3
10	110	8	3	24	104	10	3
11	108	10	3	25	108	8	3
12	106	8	3	26	112	8	3
13	104	8	3	27	116	5	2
14	100	8	3	28	120	5	2
15	100	8	3	29	122	8	3
16	100	8	3	30	124	10	3
17	100	12	3	31	128	10	3
18	100	12	3	01 Aug	124	12	3
19	100	12	3	02	122	12	3
20	100	10	3	03	120	12	3
21	100	10	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp Brtns	Location		Rgn #	Radio Flux		Intensity	
							Lat	CMD		245	2695	II	IV
03 Jul	0006	0112	0127	M1.2	.021					120	23		1
04 Jul	1200	1216	1233	M1.2	.017	SN	S23W44		8256		38		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location		Rgn #
	Begin	Max	End			Lat	CMD	
29 June	0617	0633	0648	C1.4	SF	N19W03		8253
	0930	0930	0933					
	1710	1711	1715					
	2216	2245	2323					
30 June	0140	0147	A0205	C5.0	1F	N16W15		8253
	B1806	U1807	1814	B5.2	SF	N19W22		8253
	2144	2149	2155	B6.6				
	2258	2300	2314	C1.3	SF	N19W26		8253
01 July	0004	0005	0028	C1.4	SF	N25E39		8259
	0951	0954	0957	B6.3				
	1014	1020	1022	C1.6				
	1054	1056	1104		SF	N25E32		8259
02 July	1742	1742	1748		SF	N16W46		8253
	1801	1814	1826	C3.6				8256
	1837	1839	1849	C6.8	SF	N15W45		8253
	0116	0122	0125	C1.4				
	0639	0647	0654	B7.3				
	B1241	U1241	1247	B8.1	SF	S26W14		8256
	2332	2338	2359	B9.1				
	03 July	0006	0112	0127	M1.2			
03 July	0518	0602	0620	C1.4				
	B1123	U1123	1132	C1.3	SF	S25W26		8256
	1740	1741	1751	C1.6	SF	S25W31		8256
	1830	1830	1833		SF	N15W72		8253
	2015	2015	2022	C2.1	SF	S25W29		8256
	2122	2125	2127	B7.3				
	2354	0055	0103	C1.7				
	04 July	0511	0519	0532		SF	S22W38	
04 July	0540	0543	0614	C9.4	SN	S24W40		8256
	0729	0739	0800		SF	S22W04		8260
	0822	0825	0830	C1.2	SF	S23W42		8256
	1006	1014	1029	C5.8	SF	S23W43		8256
	1053	1053	1101		SF	S23W42		8256
	1202	1204	1249	M1.2	SN	S23W44		8256
	1326	1327	1335		SF	S26W40		8256



Flare List-continued

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
04 July	1446	1452	1514	C5.5	SF	S23W45		8256
	1635	1639	1710	C9.7	1N	S23W46		8256
	1852	1856	1902	C2.3	SF	S23W44		8256
	1917	1925	1951	C1.7	SF	S24W47		8256
	2224	2232	2238	C2.2				
	2253	2259	2306	C1.3				
	2307	2318	2324	C3.4				
05 July	0342	0346	0354	B7.8				
	0613	0618	0623	C1.2				
	0852	0858	0904	C1.1				
	1025	1031	1036	C1.9				
	1129	1140	1252	C7.3	2F	N16E24		8264
	B1219	U1219	A1316	C1.7	SF	N17E25		8264
	1641	1642	1658	B7.4	SF	S24W59		8256
	1805	1806	1816	C1.6	SF	S22W56		8256

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

Region 8253

22 Jun	N18E76	084	0030	01	HSX	001	A	1									
23 Jun	N18E66	081	0090	04	CAO	003	B	2									
24 Jun	N18E54	079	0240	05	DAO	009	B	2									
25 Jun	N18E39	081	0270	07	DAC	012	BG	2									
26 Jun	N17E26	081	0230	08	DSO	021	B										
27 Jun	N17E12	082	0220	08	DSC	024	B	2	1			1					
28 Jun	N18W01	082	0200	09	DSI	028	B	1				1					
29 Jun	N18W15	083	0150	10	DSO	020	B	1									
30 Jun	N17W29	083	0120	09	CSO	008	B	1				1					
01 Jul	N18W43	084	0100	08	CSO	005	B	1									
02 Jul	N16W59	087	0090	03	HSX	002	A										
03 Jul	N17W74	089	0090	02	HSX	001	A										
04 Jul	N17W86	088	0020	01	HSX	001	A										
								13	1	0	0	3	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 082



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 8255</i>																	
24 Jun	S22E64	069	0000	00	AXX	001	A										
25 Jun	S23E51	069	0020	02	BXO	006	B										
26 Jun	S22E39	068	0070	08	CSO	009	B										
27 Jun	S22E26	068	0080	08	DAO	007	B										
28 Jun	S22E13	068	0080	08	CAO	004	B										
29 Jun	S22W03	071	0060	02	HSX	002	A										
30 Jun	S23W16	070	0060	04	CSO	004	B										
01 Jul	S22W30	071	0060	03	CSO	005	B										
02 Jul	S23W44	072	0070	02	HSX	003	A										
03 Jul	S23W56	071	0040	02	HSX	002	A										
04 Jul	S23W69	071	0050	02	HSX	001	A										
05 Jul	S23W82	070	0030	02	HSX	001	A										

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 071

<i>Region 8256</i>																	
25 Jun	S26E68	052	0010	01	AXX	002	A										
26 Jun	S25E58	049	0060	10	CSO	004	B										
27 Jun	S25E46	048	0070	12	ESO	003	B										
28 Jun	S24E33	048	0050	12	CSO	005	B										
29 Jun	S24E20	048	0040	12	CAO	007	B	1						1			
30 Jun	S24E04	050	0010	05	BXO	003	B	1									
01 Jul	S23W08	049	0020	03	BXO	008	B	1									
02 Jul	S24W19	047	0010	05	BXO	003	B										
03 Jul	S24W33	048	0020	09	BXO	015	B	3									
04 Jul	S23W47	049	0070	07	DRO	018	B	7	1					1			
05 Jul	S24W60	048	0030	08	CRO	011	B	1									

14 1 0 0 2 0 0 0

Still on Disk.

Absolute heliographic longitude: 050



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 8257

26 Jun	N29W19	126	0010	03	BXO	003	B										
27 Jun	N29W32	126	0010	05	BXO	005	B										
28 Jun	N29W46	127	0010	07	BXO	005	B										
29 Jun	N29W59	127	0000	09	BXO	002	B										
30 Jun	N28W68	122	0030	00	AXX	001	A										
01 Jul	N28W81	122															
02 Jul	N28W94	122															
																	0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 126

Region 8258

26 Jun	S14E64	043	0040	01	HSX	001	A										
27 Jun	S16E54	040	0070	09	CSO	002	B										
28 Jun	S14E39	042	0060	02	HSX	001	A										
29 Jun	S14E24	044	0050	02	HSX	001	A										
30 Jun	S13E11	043	0060	02	HSX	001	A										
01 Jul	S14W02	043	0060	02	HSX	001	A										
02 Jul	S14W16	044	0050	03	HSX	001	A										
03 Jul	S14W29	044	0060	02	HSX	001	A										
04 Jul	S14W43	045	0050	01	HSX	001	A										
05 Jul	S14W56	044	0040	01	HSX	001	A										
																	0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 043

Region 8259

27 Jun	N25E73	021	0010	02	AXX	002	A										
28 Jun	N27E63	018	0090	09	CSO	003	B										
29 Jun	N27E52	016	0060	10	CSO	005	B										
30 Jun	N27E37	017	0040	10	CRO	005	B										1
01 Jul	N27E25	016	0040	12	CSO	008	B										1
02 Jul	N28E15	013	0030	05	CAO	005	B										
03 Jul	N27E03	012	0010	03	BXO	006	B										
04 Jul	N28W10	012	0010	03	BXO	003	B										
05 Jul	N25W24	012	0010	09	BXO	004	B										
																	2 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 012



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 8260</i>																
27 Jun	S21E74	020	0040	01	HSX	001	A									
28 Jun	S22E64	017	0190	16	FAO	005	B									
29 Jun	S20E56	012	0280	15	EAC	016	B									
30 Jun	S22E44	010	0210	16	CAO	013	B									
01 Jul	S22E30	011	0100	18	CAO	015	B									
02 Jul	S24E12	016	0050	13	CAO	010	B									
03 Jul	S23E01	014	0030	13	CRO	009	B									
04 Jul	S23W14	016	0030	13	CSO	015	B									
05 Jul	S23W25	013	0050	09	CRO	016	B									
								0	0	0	0	0	0	0	0	0
Still on Disk.																
Absolute heliographic longitude: 014																
<i>Region 8261</i>																
28 Jun	N32E16	065	0000	04	BXO	002	B									
29 Jun	N32E03	065														
								0	0	0	0	0	0	0	0	0
Died on Disk.																
Absolute heliographic longitude: 065																
<i>Region 8262</i>																
29 Jun	N18E04	064	0010	03	BXO	004	B									
30 Jun	N18W09	064														
								0	0	0	0	0	0	0	0	0
Died on Disk.																
Absolute heliographic longitude: 064																
<i>Region 8263</i>																
30 Jun	S19E67	347	0150	02	HAX	001	A									
01 Jul	S20E53	348	0150	02	HSX	001	A									
02 Jul	S21E40	348	0170	03	HHX	001	A									
03 Jul	S21E28	347	0170	02	HSX	001	A									
04 Jul	S21E15	347	0210	02	HSX	001	A									
05 Jul	S21E02	346	0200	03	HSX	001	A									
								0	0	0	0	0	0	0	0	0
Still on Disk.																
Absolute heliographic longitude: 346																



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 8264</i>																	
30 Jun	N18E74	340	0100	02	HSX	001	A										
01 Jul	N17E66	337	0200	13	CSO	003	B										
02 Jul	N16E52	336	0180	10	CAO	004	B										
03 Jul	N17E43	332	0220	13	CAO	008	B										
04 Jul	N16E27	335	0200	07	CAO	009	B										
05 Jul	N17E15	333	0170	10	CAO	010	B	2						1			
								2	0	0	0	0	0	1	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 333																	
<i>Region 8265</i>																	
05 Jul	N20E44	304	0010	03	BXO	002	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 304																	
<i>Region 8266</i>																	
05 Jul	N24E73	275	0000	00	AXX	001	A										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 275																	



**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
1996									
July	13.2	08.2	0.62	13.4	08.4	71.2	72.0	07	09.3
August	20.5	14.4	0.70	13.1	08.3	72.4	72.1	09	09.4
September	02.9	01.6	0.55	13.3	08.4	69.4	72.3	15	09.3
October	02.3	00.9	0.39	14.0	08.8	69.2	72.6	13	09.1
November	26.7	17.9	0.67	15.4	09.8	78.7	73.0	08	09.1
December	21.1	13.3	0.63	16.2	10.4	77.8	73.3	07	09.3
1997									
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2
March	14.4	08.7	0.60	20.4	13.5	73.5	75.1	08	08.9
April	24.5	15.5	0.63	24.0	16.5	74.5	76.8	10	08.6
May	28.6	18.5	0.65	26.4	18.3	74.6	78.4	08	08.6
June	22.1	12.7	0.57	29.0	20.3	71.7	80.1	07	08.7*
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	25.1*	79.0	83.4*	07	08.3*
September	52.8	51.3	0.88	40.5	28.4*	96.2	85.7*	10	08.2*
October	33.6	22.8	0.68	45.4	31.9*	84.9	88.6*	11	08.3*
November	53.5	39.0	0.73	49.3	35.1*	99.5	91.4*	11	08.7*
December	57.9	41.2	0.71	54.2	39.1*	98.8	94.2*	05*	09.3*
1998									
January	51.8	32.3*	0.62*			93.5*		07*	
February	54.4	40.7*	0.75*			93.6*		07*	
March	81.8	54.8*	0.67*			109.4*		11*	
April	73.6	53.3*	0.72*			108.3*		10*	
May	74.3	56.9*	0.77*			106.6*		18*	
June	93.6	70.5*	0.75*			108.4*		11*	

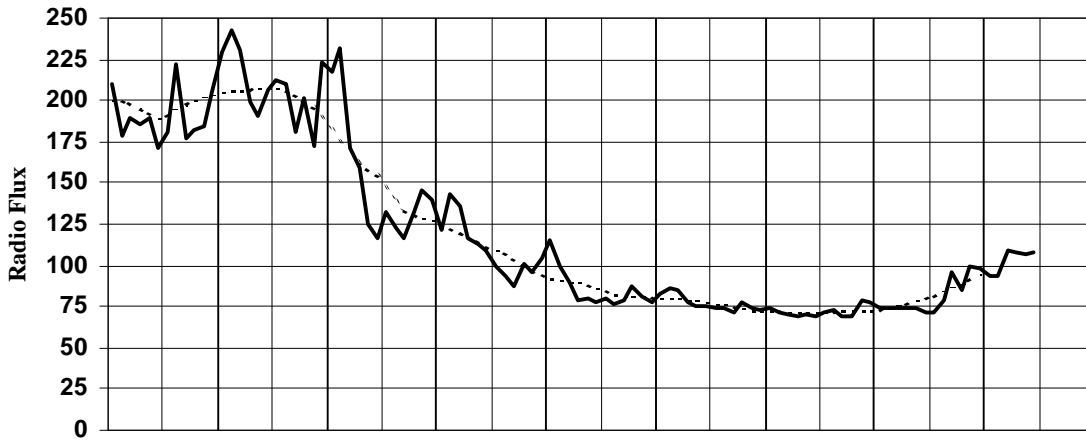
*Preliminary estimates.

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.

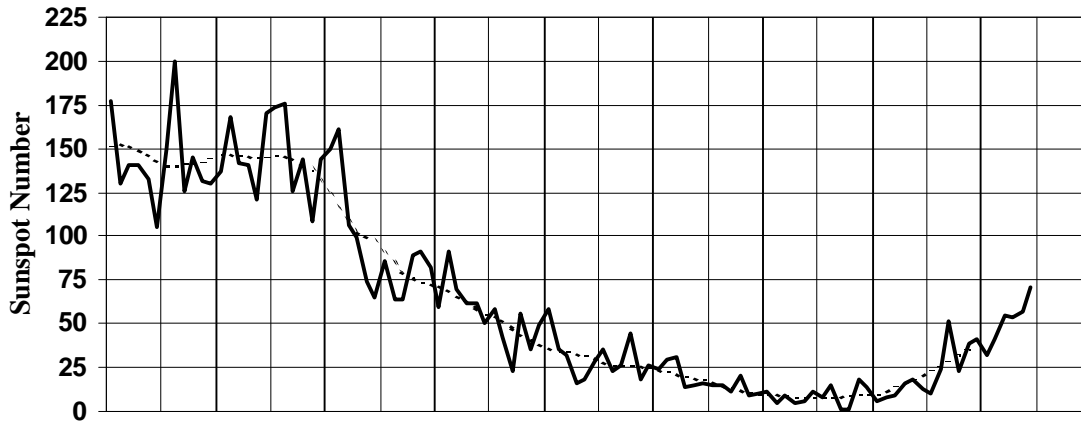
** From June 1991 onward, the 10.7-cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



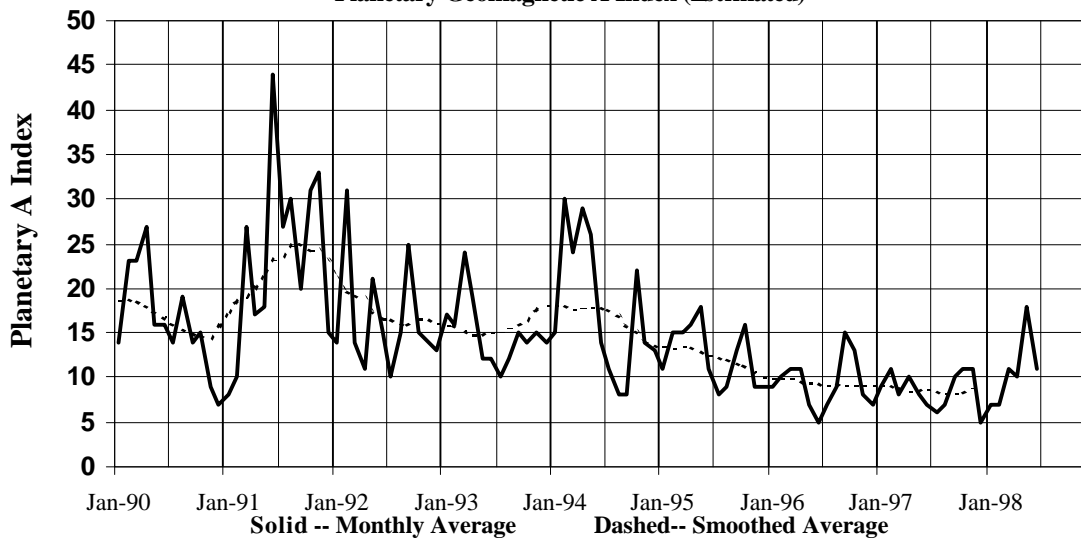
Penticton (DRAO) Radio Flux 2800MHz (10.7cm)

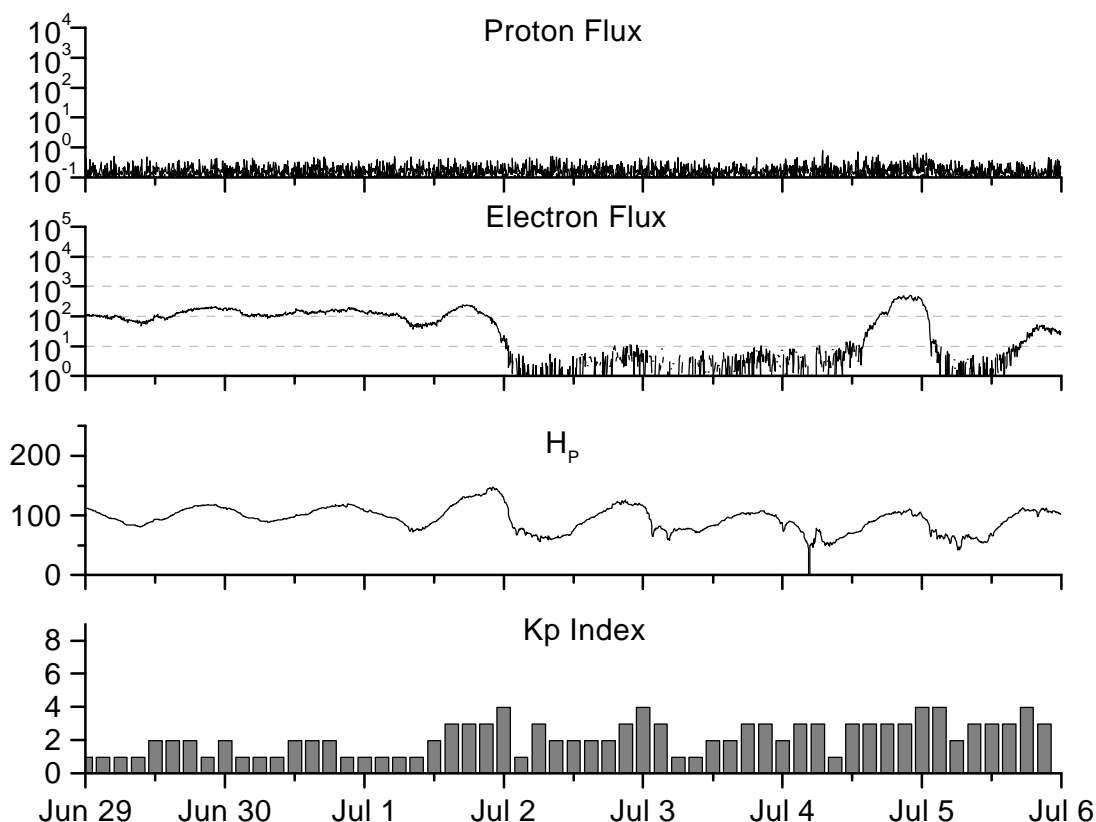


International Sunspot Number



Planetary Geomagnetic A Index (Estimated)





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 29 June 1998

Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

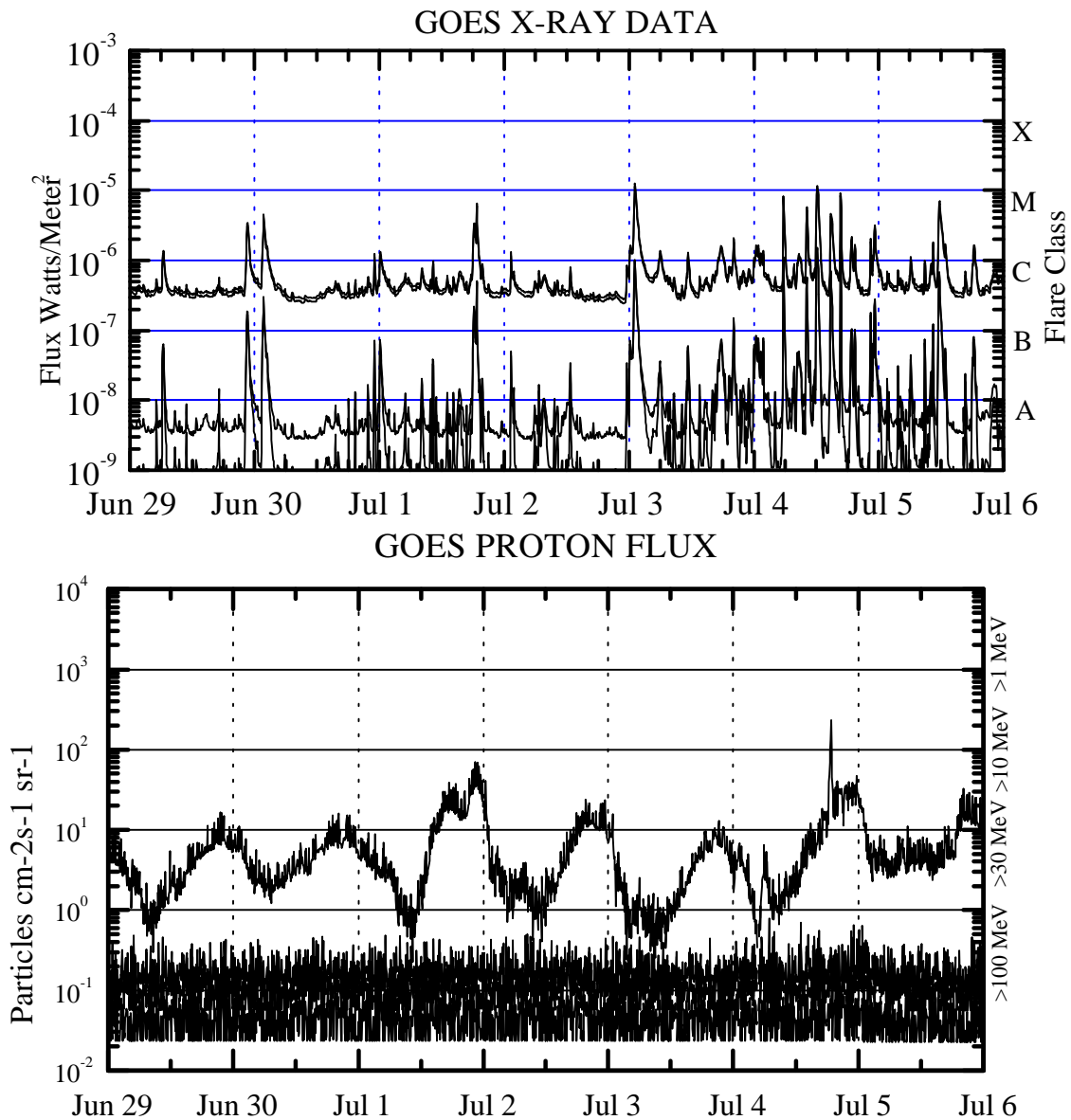
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. 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_{parallel} is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





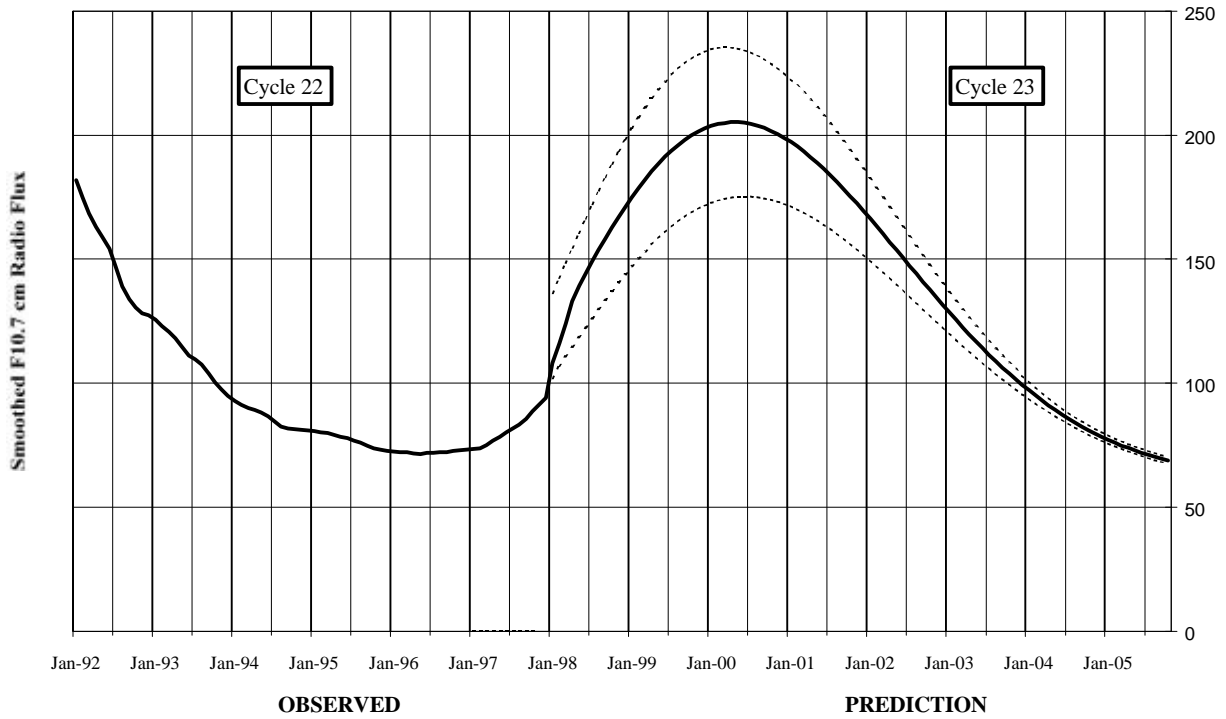
Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five minute averaged x-ray flux (watts/m²) as measured by GOES 8 and 9 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-9 (W135) 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.



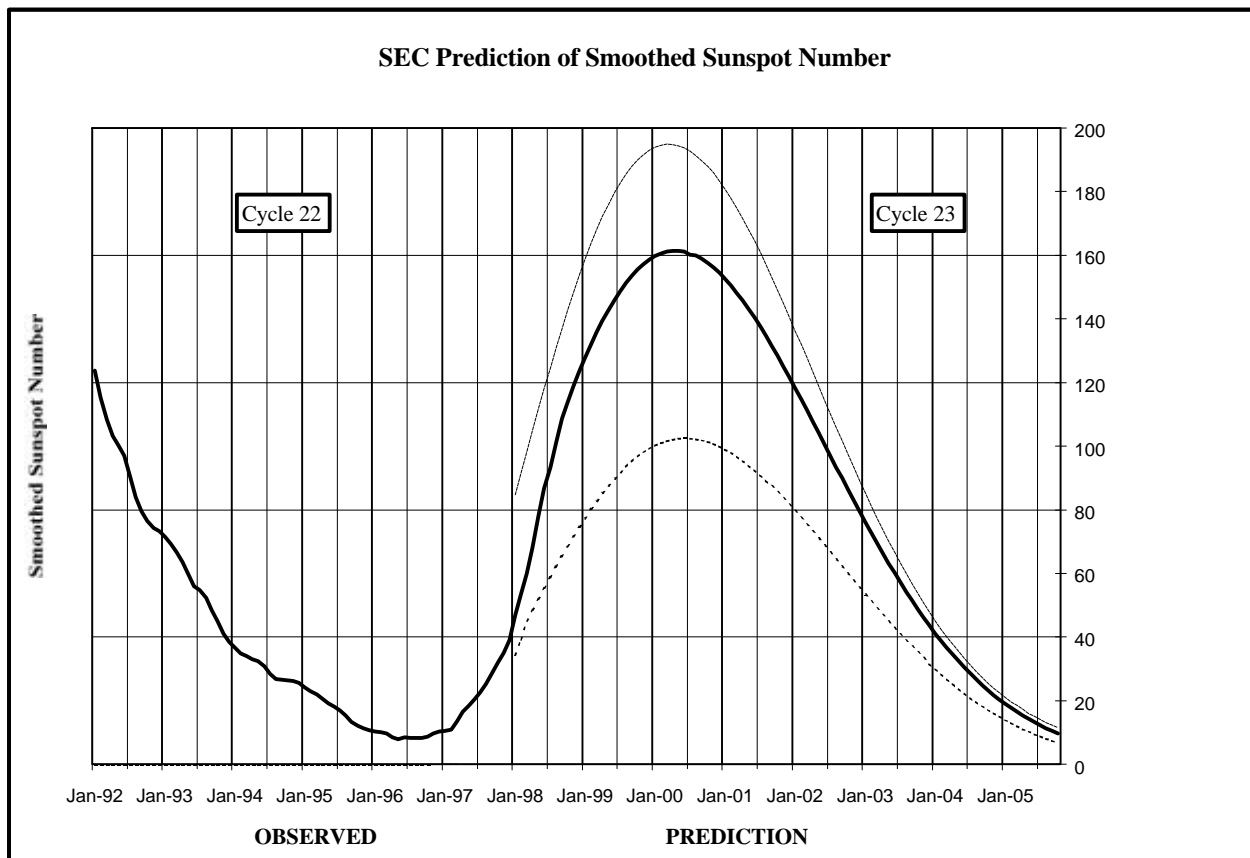
SEC Prediction of Smoothed F10.7 cm Radio Flux



SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	72 (***)	72 (***)	72 (***)	72 (***)	71 (***)	72 (***)	72 (***)	72 (***)	72 (***)	73 (***)	73 (***)	73 (***)
1997	73 (***)	74 (***)	75 (***)	77 (***)	78 (***)	80 (***)	82 (***)	83 (***)	86 (***)	89 (***)	91 (***)	94 (***)
1998	108 (18)	116 (19)	124 (20)	133 (20)	139 (21)	144 (21)	149 (22)	154 (22)	158 (23)	163 (23)	167 (23)	171 (24)
1999	175 (24)	179 (25)	182 (25)	186 (25)	189 (25)	191 (26)	194 (26)	196 (26)	198 (27)	200 (27)	202 (28)	203 (28)
2000	204 (30)	205 (30)	205 (30)	205 (30)	205 (30)	205 (28)	205 (27)	204 (27)	203 (26)	202 (26)	201 (26)	199 (26)
2001	197 (25)	195 (25)	193 (25)	191 (25)	189 (24)	186 (24)	184 (24)	181 (24)	178 (23)	175 (23)	173 (23)	170 (22)
2002	166 (22)	163 (22)	160 (21)	157 (21)	154 (21)	151 (21)	147 (20)	144 (20)	141 (19)	138 (19)	135 (18)	132 (18)
2003	129 (17)	126 (17)	123 (17)	120 (16)	117 (16)	114 (15)	112 (15)	109 (15)	106 (14)	104 (14)	102 (14)	99 (13)
2004	97 (13)	95 (13)	93 (12)	91 (12)	89 (11)	87 (10)	86 (9)	84 (9)	83 (8)	81 (7)	80 (9)	78 (9)
2005	77 (8)	76 (8)	75 (8)	74 (7)	73 (7)	72 (7)	71 (7)	70 (6)	70 (6)	69 (2)	68 (2)	68 (2)





SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10 (***)	10 (***)	10 (***)	9 (***)	8 (***)	9 (***)	9 (***)	8 (***)	9 (***)	9 (***)	10 (***)	11 (***)
1997	11 (***)	11 (***)	14 (***)	17 (***)	18 (***)	20 (***)	23 (***)	25 (***)	29 (***)	32 (***)	35 (***)	34 (***)
1998	47 (21)	54 (22)	60 (22)	68 (23)	78 (24)	87 (24)	94 (25)	101 (25)	109 (26)	114 (26)	119 (27)	124 (27)
1999	128 (27)	132 (28)	136 (28)	139 (29)	143 (29)	146 (29)	149 (29)	151 (29)	154 (29)	156 (29)	157 (29)	159 (29)
2000	160 (30)	161 (30)	161 (30)	161 (30)	161 (29)	161 (29)	160 (29)	160 (29)	159 (29)	158 (29)	156 (29)	155 (28)
2001	153 (28)	151 (28)	148 (28)	146 (27)	143 (27)	141 (27)	138 (27)	135 (26)	132 (26)	128 (26)	125 (25)	122 (25)
2002	119 (24)	115 (24)	111 (24)	108 (23)	104 (23)	101 (22)	97 (22)	94 (21)	90 (21)	86 (21)	83 (20)	80 (20)
2003	76 (19)	73 (19)	70 (18)	66 (18)	63 (17)	60 (17)	57 (17)	54 (16)	52 (16)	49 (15)	46 (15)	44 (14)
2004	41 (14)	39 (14)	37 (13)	35 (13)	32 (12)	31 (12)	29 (11)	27 (11)	25 (11)	23 (10)	22 (10)	20 (9)
2005	19 (9)	18 (9)	17 (8)	15 (8)	14 (8)	13 (8)	12 (7)	11 (7)	11 (7)	10 (6)	9 (5)	8 (4)

