SWO PRF 1257
05 October 1999

Space Weather Highlights
27 September – 03 October 1999

Solar activity was low. The visible disk was populated by a number of small, simply-structured sunspot groups which produced B- and C-class subflares. One event of note was an optically uncorrelated, long-duration C3 x-ray flare at 01/0813UT with a Type II radio sweep (est. velocity 600 km/sec).
Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Coronal hole effects were evident during 27 - 30 September. During this period velocities were elevated with a peak of 680 km/sec detected on 27 September, densities were in the 02 - 04 p/cc range, and IMF Bz was mostly south with maximum deflections to minus 11 nT (GSM). Phi data indicated an away (positive polarity) solar sector during this period as well.
No proton events were detected at geo-synchronous orbit during the period.
The greater than 2 MeV electron flux was at moderate to high levels during 28 September - 03 October.
The geomagnetic field was disturbed during 27 - 30 September due to coronal hole effects with active to minor storm levels detected globally. There were also major to (isolated) severe storm periods detected at high latitudes. Activity decreased to quiet to unsettled levels on 01 October, then increased to unsettled to active levels on 02 October. Activity decreased to quiet to unsettled levels on the final day of the summary period.

Space Weather Outlook
06 October - 01 November 1999

Solar activity is expected to be predominately low. Isolated M-class flare activity is possible during the first half of the period.
No significant proton events are expected at geo-synchronous orbit.
The greater than 2 MeV electron flux at geo-synchronous altitude is expected to be at moderate to high levels during 06 - 13 and 25 - 30 October. Otherwise, fluxes are expected to be in the normal to moderate range.
The geomagnetic field is expected to be disturbed during 06 - 11 and 24 - 27 October due to recurrent coronal hole effects.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	
27 September	124	49	220	B2.8	1	0	0	3	0	0	0	0
28 September	126	52	160	B2.8	2	0	0	0	0	0	0	0
29 September	125	84	140	B3.3	1	0	0	2	0	0	0	0
30 September	125	84	130	B4.0	1	0	0	1	0	0	0	0
01 October	122	67	60	B4.1	13	0	0	0	0	0	0	0
02 October	126	47	210	B4.9	9	0	0	1	0	0	0	0
03 October	135	117	370	B3.4	3	0	0	12	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2}-day-sr) >1MeV	>10MeV	>100MeV	Electron Fluence (electrons/cm^2-day-sr) >.6MeV	>2MeV	>4MeV
27 September	9.0E+5	1.3E+4	3.1E+3		3.7E+6	
28 September	1.2E+6	1.3E+4	3.0E+3		9.9E+7	
29 September	4.0E+5	1.3E+4	2.9E+3		1.6E+8	
30 September	3.1E+5	1.3E+4	2.9E+3		5.4E+7	
01 October	2.3E+5	1.3E+4	2.9E+3		1.4E+8	
02 October	1.2E+5	1.3E+4	3.0E+3		5.4E+7	
03 October	8.1E+4	1.3E+4	2.9E+3		4.1E+7	

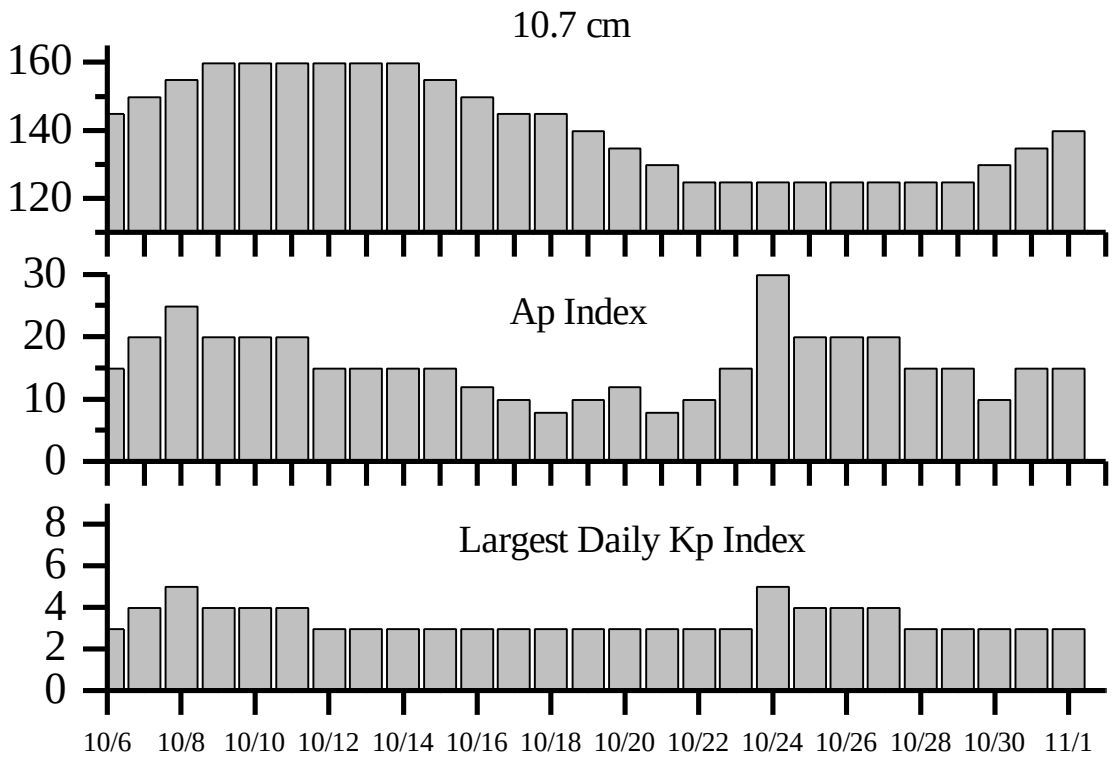
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
27 September	31	5-4-4-3-5-4-4-4	66	6-5-4-6-6-7-5-4	37	4-4-5-5-5-5-4-4
28 September	20	4-4-4-4-3-3-2-3	34	4-3-5-5-6-4-3-3	20	4-4-4-4-4-3-3-4
29 September	15	4-3-4-3-2-2-1-3	29	3-4-6-5-3-3-3-3	19	4-3-4-5-3-2-3-3
30 September	14	4-4-3-2-3-2-2-2	44	5-5-4-7-5-4-2-1	29	4-6-4-4-4-3-3-2
01 October	6	3-2-1-1-2-1-2-1	13	2-2-3-4-4-3-1-1	11	2-3-2-3-3-3-3-3
02 October	9	2-4-3-2-2-1-2-2	19	3-4-4-4-3-4-1-2	15	3-4-4-3-3-3-2-2
03 October	6	2-1-2-2-2-2-1-2	18	5-2-2-4-3-2-4-1	10	2-1-3-3-3-3-2-2

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
27 Sep 0000	K= 4 Observed	26 Sep 21 - 24
27 Sep 0000	K= 4 Warning	27 Sep 00 - 12
27 Sep 0017	1- 245 MHz Noise Storm	26 Sep
27 Sep 0300	K= 5 Observed	27 Sep 00 - 03
27 Sep 0559	A = 20 Observed	27 Sep 0600
27 Sep 0636	K= 5 Warning	27 Sep 07 - 12
27 Sep 0941	K= 4 Warning CONTINUED to 27/1800Sep	27 Sep 00 - 12
27 Sep 0943	A = 30 Warning	27 Sep 12 - 21
27 Sep 1203	A = 30 Observed	27 Sep 1200
27 Sep 1500	K= 5 Observed	27 Sep 12 - 15
27 Sep 1805	K= 4 Warning	27/1800 – 28/0000 Sep
28 Sep 0016	A = 20 Watch	28 Sep
28 Sep 0040	1-245 MHz Bursts	27 Sep
28 Sep 0040	1-245 MHz Noise Storms	27 Sep
28 Sep 0300	K= 4 Observed	28 Sep 00 - 03
28 Sep 0300	K= 4 Warning	28 Sep 03 - 15
28 Sep 1200	A = 20 CONTINUED	27 Sep 0600
28 Sep 1200	A = 30 ENDED 28/0600 Sep	27 Sep 1200
28 Sep 1311	>2MeV Electron Event = 1000pfu	28 Sep 1335
29 Sep 0300	K= 4 Observed	29 Sep 00 - 03
29 Sep 0300	K= 4 Warning	29 Sep 03 - 15
29 Sep 900	K= 5 Observed	29 Sep 06 - 09
29 Sep 1200	CONTINUED A = 20 Observed	27 Sep 0600
29 Sep 1200	CONTINUED >2MeV Electron Event = 1000pfu	28 Sep 1335
30 Sep 300	K= 5 Observed	30 Sep 00- 03
30 Sep 300	K= 4 Warning	30 Sep 03- 15
30 Sep 558	K= 5 Observed	30 Sep 03- 06
30 Sep 558	K= 5 Warning	30 Sep 06- 12
30 Sep 1157	CONTINUED A = 20 Observed	27 Sep 06:00
30 Sep 1159	CONTINUED >2MeV Electron Event = 1000pfu	28 Sep 1335
01 Oct 0838	Type II Radio Emission 1 Oct 0812	
01 Oct 1201	CONTINUED >2MeV Electron Event = 1000pfu	28 Sep 1335
01 Oct 2110	A = 20 Watch	02 Oct
02 Oct 0600	K= 4 Observed	02 Oct 03- 06
02 Oct 0600	K= 4 Warning	02 Oct 06- 12
02 Oct 1200	CONTINUED >2MeV Electron Event =1000pfu	28 Sep 1335
03 Oct 1155	CONTINUED >2MeV Electron Event =1000pfu	28 Sep 1335

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
06 Oct	145	15	3	20 Oct	135	12	3
07	150	20	4	21	130	8	3
08	155	25	5	22	125	10	3
09	160	20	4	23	125	15	3
10	160	20	4	24	125	30	5
11	160	20	4	25	125	20	4
12	160	15	3	26	125	20	4
13	160	15	3	27	125	20	4
14	160	15	3	28	125	15	3
15	155	15	3	29	125	15	3
16	150	12	3	30	130	10	3
17	145	10	3	31	135	15	3
18	145	8	3	01 Nov	140	14	3
19	140	10	3				

Energetic Events

Date	Time (UT)			X-ray		Optical Information				Peak Radio Flux		Sweep Freq Intensity	
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat	CMD	Rgn #	245	2695	II	IV
No Events Observed													

Flare List

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Optical Rgn #
27 September	0906	0908	0917	C2.1	SF	S20W56	8704
	0955	0956	1000		SF	N22W18	8706
	1145	1156	1207	B7.6			
	2340	2340	2353	B8.2	SF	N18W03	
28 September	1522	1539	1559	C4.3			
	1734	1738	1741	C1.1			
29 September	1248	1250	1256		SF	S17E64	
	1515	1523	1530	B7.1			
	1555	1605	1618	C2.2			
	2016	2016	2023	B6.7	SF	N24E40	8710
30 September	0004	0012	0023	B8.0			
	0356	0403	0412	B8.3			
	0457	0507	0517	C1.1			
	1822	1823	1827		SF	N15E66	8714
	2342	2346	2350	B7.4			
01 October	0008	0017	0020	C7.7			
	0231	0237	0241	B7.7			
	0314	0319	0324	C1.0			
	0523	0529	0534	C1.6			
	0710	0725	0746	C4.1			
	0810	0813	0816	C3.6			
	0945	0949	0951	C5.4			
	1051	1056	1059	C1.4			
	1218	1224	1227	C1.4			
	1342	1346	1348	B6.9			
	1348	1353	1356	C1.0			
	1449	1459	1502	C6.0			
	1538	1557	1612	C1.2			
	1942	1957	2014	C1.1			
	2313	2326	2353	C2.2			
02 October	0145	0156	0203	C6.3			
	0309	0313	0321	C1.1			
	0557	0600	0606	B7.4			
	0659	0704	0714	C1.3			
	0754	0805	0815	C2.4			
	0933	0939	0958	C2.5			
	1355	1403	1415	B9.6			

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
02 October	1418	1434	1448	C2.8			
	1641	1646	1652	C1.5			
	1658	1703	1706	C1.5			
	1814	1818	1852	C3.6	SF	N23E74	8716
	2211	2214	2217	B6.4			
03 October	B0635	U0635	0638		SF	N19E68	8716
	0929	U0937	1008	C3.3	SF	N18E66	8716
	1153	1157	1202	B8.7			
	1254	1300	1307		SF	N20E71	8716
	1426	1428	1439	B8.9	SF	N13E79	8720
	1528	1537	1627	C3.0	SF	N15E70	8716
	1703	1704	1709	C2.8	SF	N13E76	8720
	1733	1738	1742		SF	N12E78	8720
	1907	1908	1918		SF	N20E63	8716
	2132	2135	2138		SF	S20E54	8719
	2205	2206	2217		SF	N13E74	8720
	2309	2311	2315		SF	S18E59	8721
	2333	2346	2353		SF	S18E58	8721

Region Summary

Date	Location (° Lat ° CMD)	Location Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8704												
17 Sep	S21E63	248	0070	03	HSX	001	A								
18 Sep	S21E52	246	0110	10	CSO	005	B								
19 Sep	S22E42	243	0180	12	CSO	007	B								
20 Sep	S22E28	244	0110	12	ESO	006	B								
21 Sep	S22E16	243	0130	12	ESO	009	B	1			1				
22 Sep	S22E01	245	0120	13	CSO	014	B								
23 Sep	S21W11	243	0100	09	CSO	008	B								
24 Sep	S20W25	244	0120	07	CSO	006	B								
25 Sep	S21W39	245	0110	06	CSO	003	B								
26 Sep	S20W52	245	0110	02	HSX	001	A								
27 Sep	S19W67	247	0100	02	HSX	001	A	1			1				
28 Sep	S19W81	247	0050	02	HSX	001	A								
29 Sep	S19W90	243	0030	01	HSX	001	A								
								2	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 245

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8705												
18 Sep	S11E28	270	0010	01	AXX	002	A								
19 Sep	S11E15	270													
20 Sep	S11E02	270													
21 Sep	S11W11	270													
22 Sep	S11W24	270													
23 Sep	S11W37	270													
24 Sep	S11W50	270													
25 Sep	S11W63	270													
26 Sep	S11W76	270													
27 Sep	S11W89	270													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 270

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8706												
19 Sep	N19E77	208	0080	02	HSX	001	A								
20 Sep	N20E66	206	0120	09	CSO	002	B								
21 Sep	N22E53	206	0110	08	CSO	003	B	1			1				
22 Sep	N19E38	208	0090	02	HSX	002	A	1				1			
23 Sep	N20E25	207	0110	05	CSO	005	B								
24 Sep	N19E11	208	0090	02	HSX	001	A				2				
25 Sep	N20W01	207	0090	02	HSX	001	A								
26 Sep	N20W15	208	0080	02	HSX	001	A								
27 Sep	N21W27	207	0080	06	CAO	003	B				1				
28 Sep	N20W41	207	0070	02	HSX	002	A								
29 Sep	N20W53	206	0060	02	HSX	001	A								
30 Sep	N20W66	206	0050	01	HSX	001	A								
01 Oct	N21W79	206	0020	02	HSX	001	A								
02 Oct	N21W92	206													
								2	0	0	4	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 207

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8707												
22 Sep	S07W08	254	0000	02	BXO	003	B								
23 Sep	S07W21	253	0000	00	AXX	001	A								
24 Sep	S07W34	253	0000	00	AXX	001	A								
25 Sep	S07W47	253													
26 Sep	S07W60	253													
27 Sep	S07W73	253													
28 Sep	S07W86	253													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		254													
			Region 8708												
22 Sep	S09E55	191	0040	05	CRO	009	B	1			6				
23 Sep	S10E42	190	0040	05	CRO	008	B								
24 Sep	S10E29	190	0040	05	DSO	008	B								
25 Sep	S11E18	188	0010	03	BXO	004	B								
26 Sep	S11E04	189	0000	00	AXX	001	A								
27 Sep	S11W09	189	0000	04	BXO	004	B								
28 Sep	S11W22	189													
29 Sep	S11W35	189													
30 Sep	S11W48	189													
01 Oct	S11W61	189													
02 Oct	S11W74	189													
								1	0	0	6	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		189													
			Region 8709												
24 Sep	S15E48	171	0000	03	BXO	002	B								
25 Sep	S15E35	171													
26 Sep	S15E22	171													
27 Sep	S15E09	171													
28 Sep	S15W04	171													
29 Sep	S15W17	171													
30 Sep	S15W30	171													
01 Oct	S15W43	171													
02 Oct	S15W56	171													
03 Oct	S15W69	171													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		171													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
	Region 8710														
26 Sep	N20E76	117	0030	01	HSX	001	A								
27 Sep	N19E64	116	0040	02	HSX	001	A								
28 Sep	N19E51	115	0030	04	CSO	003	B								
29 Sep	N19E38	115	0020	01	HSX	001	A				1				
30 Sep	N21E25	115	0020	01	HSX	001	A								
01 Oct	N21E13	114	0010	01	HSX	001	A								
02 Oct	N21E00	114	0010	01	AXX	001	A								
03 Oct	N22W13	114	0000	00	AXX	001	A								
								0	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		114													
	Region 8711														
28 Sep	N23W31	197	0010	04	BXO	006	B								
29 Sep	N22W45	198	0020	04	CSO	004	B								
30 Sep	N23W58	198	0010	05	BXO	004	B								
01 Oct	N22W71	198	0000	01	AXX	001	A								
02 Oct	N21W92	206													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		197													
	Region 8712														
29 Sep	S13W06	159	0010	05	BXO	004	B								
30 Sep	S13W21	161	0010	03	BXO	003	B								
01 Oct	S11W35	162	0000	00	AXX	001	A								
02 Oct	S11W48	162													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		159													
	Region 8713														
29 Sep	S13E62	091	0000	01	AXX	002	A								
30 Sep	S12E45	095	0020	01	HSX	002	A								
01 Oct	S13E34	093	0010	01	HSX	001	A								
02 Oct	S12E19	095	0020	01	HRX	001	A								
03 Oct	S12E06	095	0000	00	AXX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		095													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8714												
29 Sep	N11E72	081	0000	00	AXX	001	A								
30 Sep	N12E56	084	0020	01	HSX	001	A				1				
01 Oct	N13E44	083	0020	03	CSO	002	B								
02 Oct	N14E30	084	0020	01	HSX	001	A								
03 Oct	N14E17	084	0020	02	HSX	002	A								
								0	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		084													
			Region 8715												
30 Sep	N11E42	098	0000	02	AXX	002	B								
01 Oct	N11E29	098													
02 Oct	N11E16	098													
03 Oct	N11E03	098													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		098													
			Region 8716												
02 Oct	N21E70	044	0160	12	CSO	004	B	1			1				
03 Oct	N20E60	041	0200	07	CSO	005	B	2			5				
								3	0	0	6	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		041													
			Region 8717												
03 Oct	S26W59	160	0010	05	BXO	002	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		160													
			Region 8718												
03 Oct	S27E02	099	0010	04	BXO	003	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		099													
			Region 8719												
03 Oct	S20E50	051	0060	05	CSO	003	B				1				
								0	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		051													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
	Region 8720														
03 Oct	N14E65	036	0020	04	BXO	004	B	1			4				
								1	0	0	4	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 036															
	Region 8721														
03 Oct	S17E56	045	0050	12	CSO	006	B				2				
								0	0	0	2	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 045															

Recent Solar Indices (preliminary)

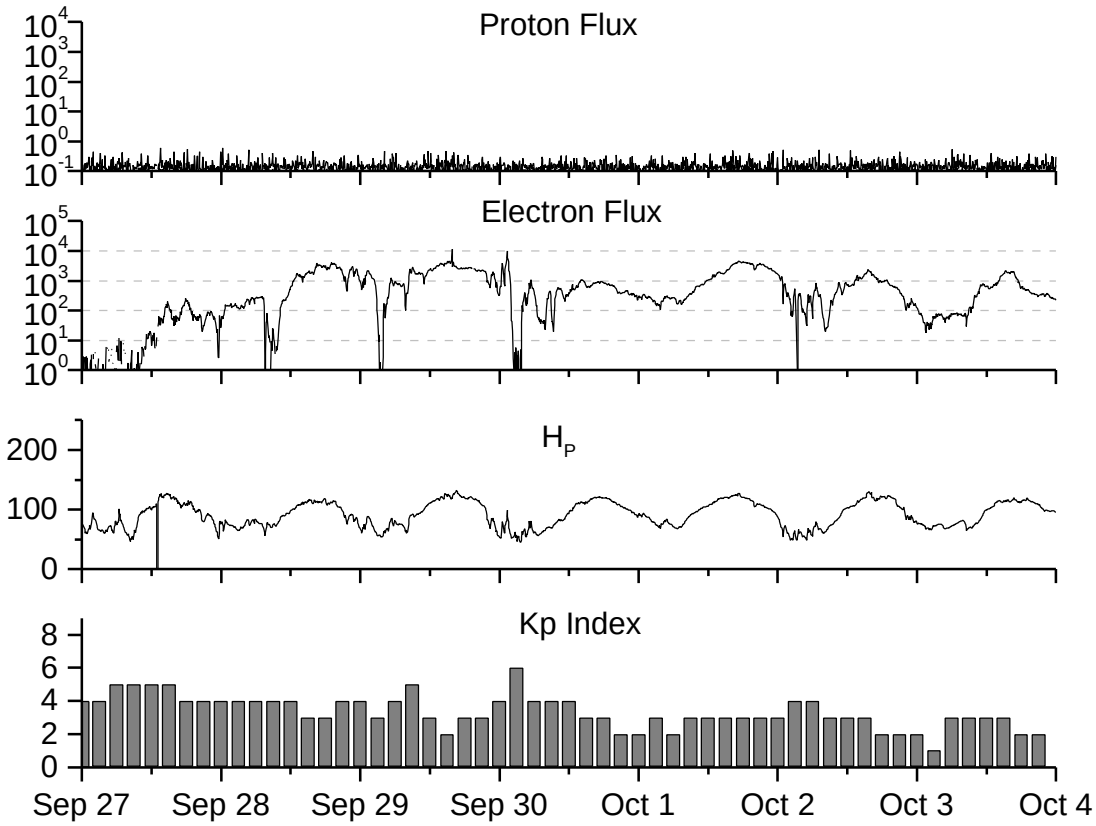
of the observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed		Ratio	Smooth		Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
				1997					
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	8.6
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	9.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	4	9.5
				1998					
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	8	9.9
February	54.4	40.3	0.74	67.4	48.9	93.4	101.7	8	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	108.9	10	11.3
May	74.3	56.3	0.76	81.4	59.4	106.7	112.0	18	11.6
June	93.6	70.7	0.76	85.9	62.5	108.4	115.8	10	11.9
July	98.3	66.6	0.68	90.3	65.5	114.0	120.0	11	12.2
August	118.6	92.2	0.78	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.5	138.3	126.8	13	12.6
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.8
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.4
December	120.8	81.9	0.68	108.8	77.9	150.1	134.3	8	11.9
				1999					
January	94.3	62.4	0.66	116.5	82.6	142.6	139.0	10	11.7
February	93.4	66.3	0.71	120.2	84.6	142.0	142.6	12	11.6
March	100.5	68.8	0.68	120.5	83.8	126.3	144.0	14	11.6
April	92.9	63.9	0.69			117.2		12	
May	140.5	106.3	0.76			148.6		8	
June	208.3	137.4	0.66			169.8		7	
July	169.2	113.5	0.67			165.6		10	
August	136.1	93.7	0.69			170.8		15	
September	107.4	70.9	0.66			135.7		18	

NOTE: All smoothed values after September 1998 and monthly values after March 1999 are preliminary estimates.

The lowest smoothed sunspot 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 27 September 1999

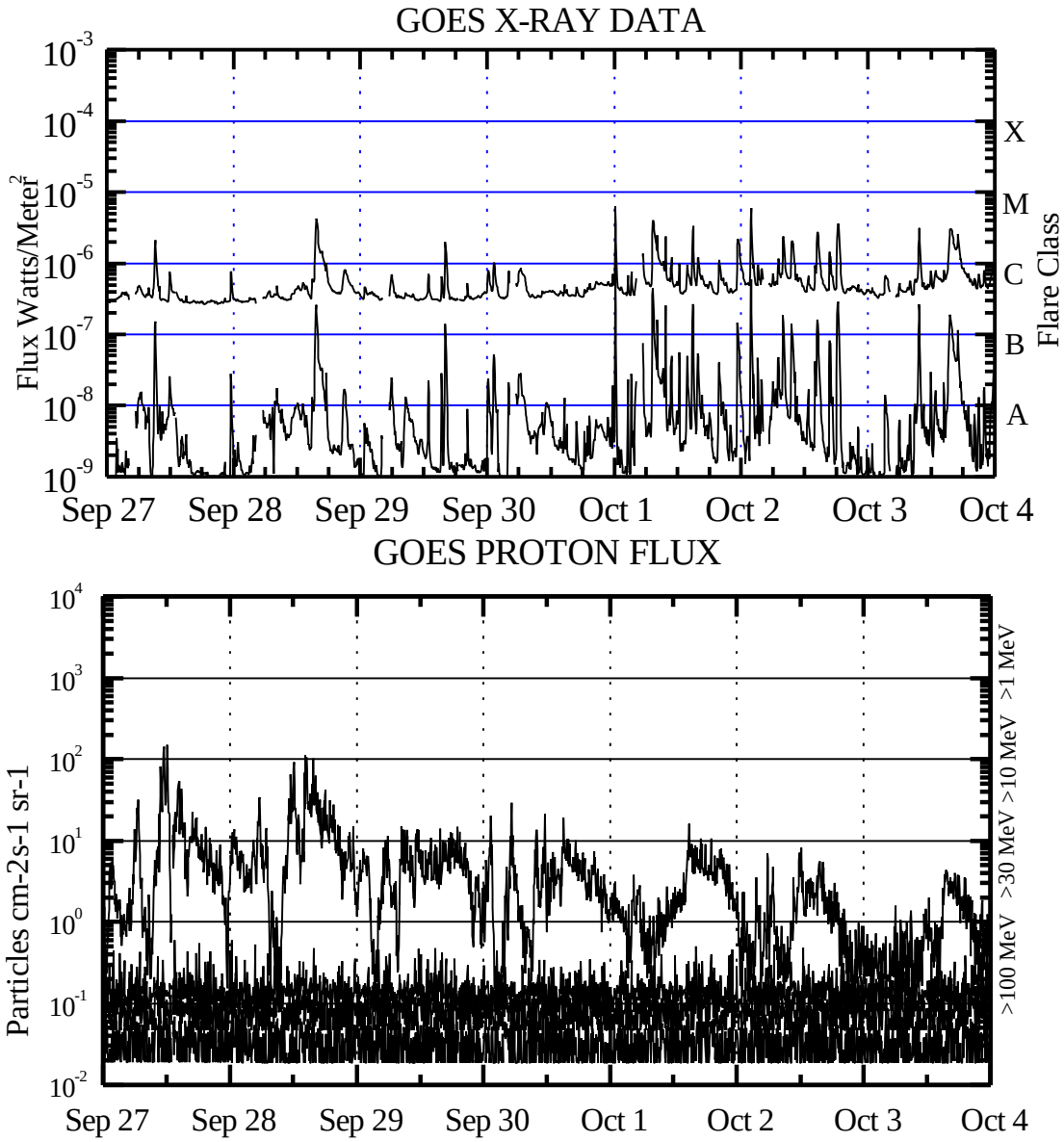
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec –sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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

Hp 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.

Kp 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 Kp values derived from a more extensive network of magnetometers.

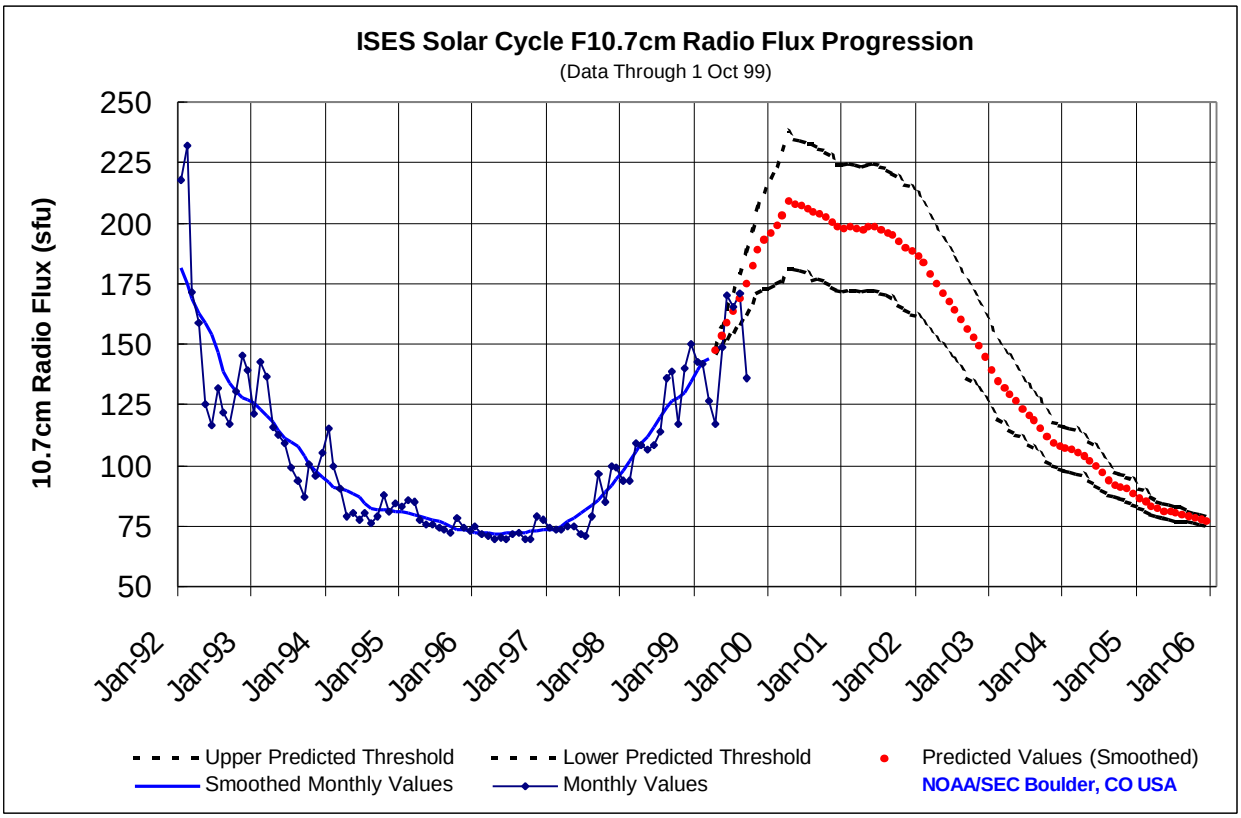
The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are " global " parameters that are applicable to a first order approximation over large areas. Hparallel 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

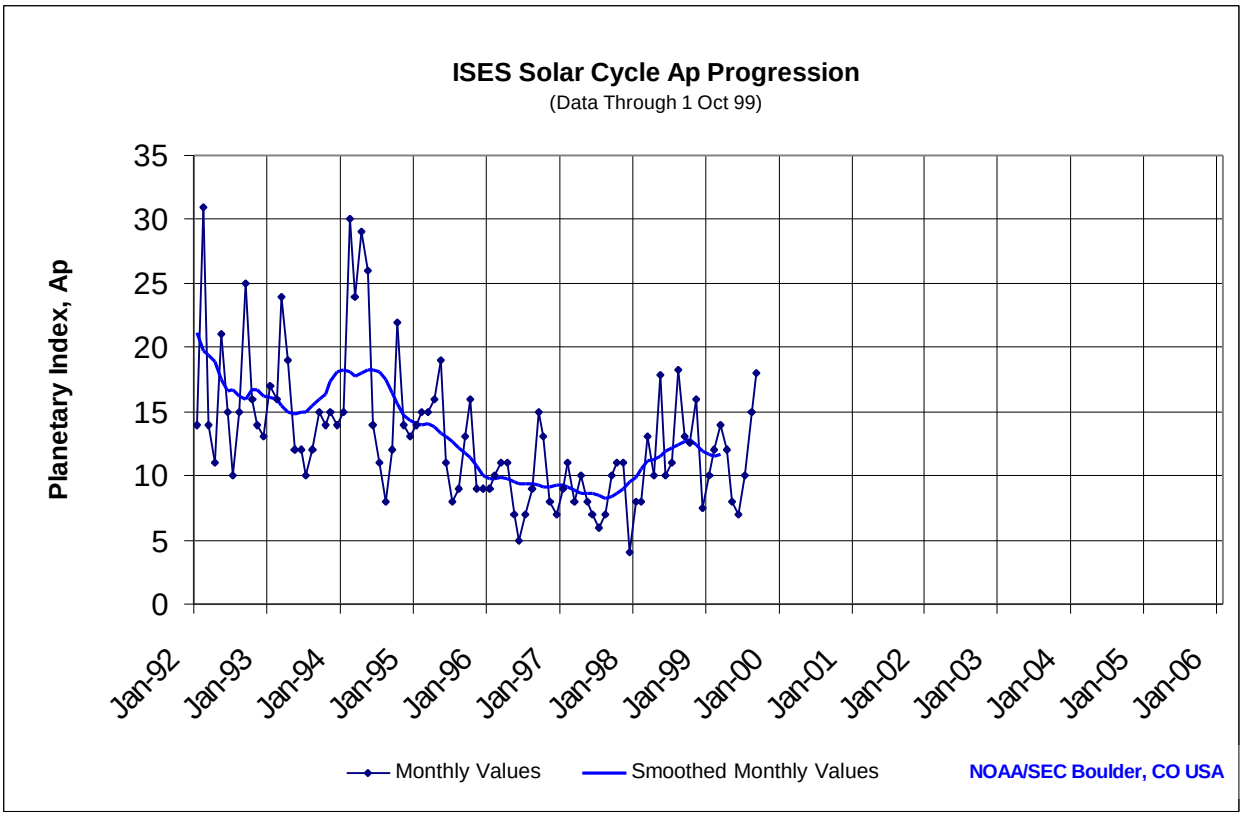
X-ray plot contains five minute averaged x-ray flux (watts / $m^{2)}$ as measured by GOES 8 and 10 in two wavelength bands, .05 -. 4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

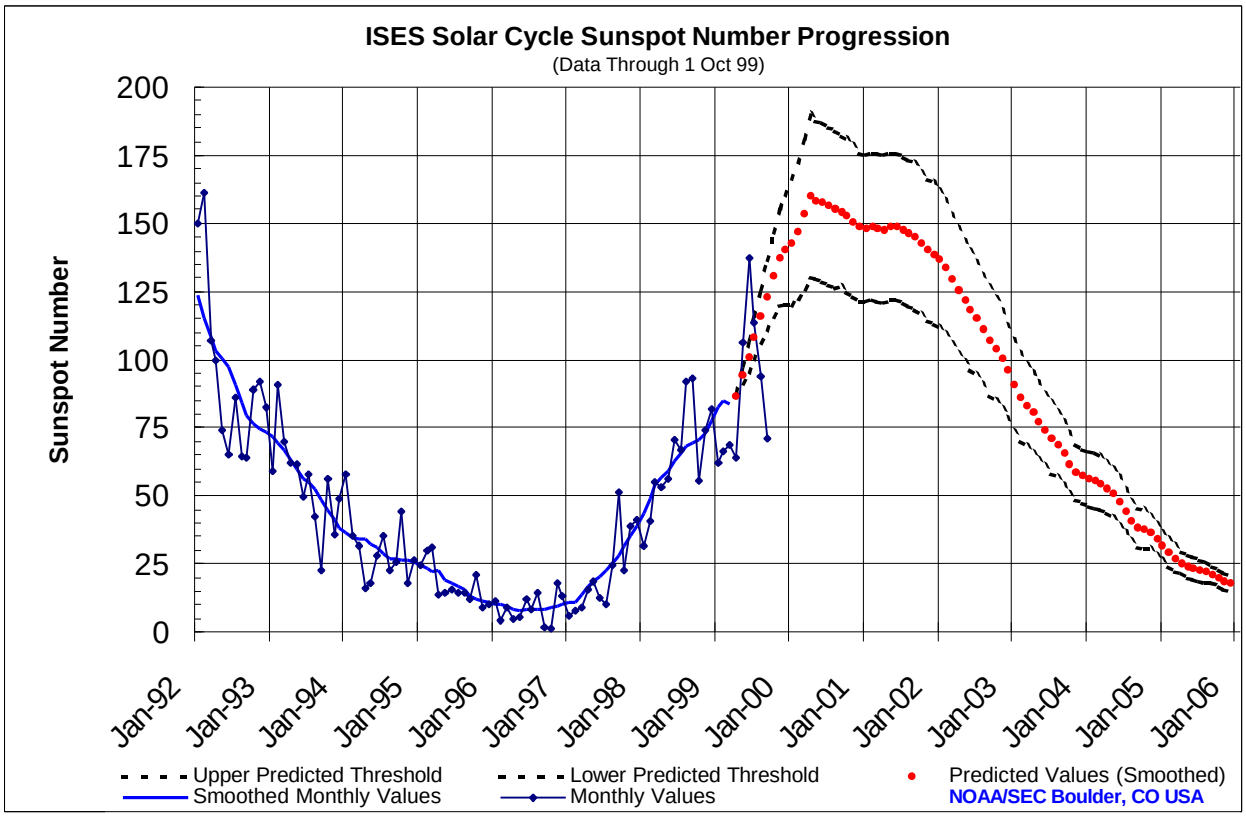
Proton plot contains the five minute averaged integral proton flux (protons/cm2 –sec –sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.



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	98	102	106	109	112	116	120	124	127	128	130	134
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1999	139	143	144	**147**	**154**	**159**	**164**	**169**	**175**	**182**	**189**	**193**
	(***)	(***)	(***)	(1)	(3)	(6)	(8)	(10)	(13)	(15)	(18)	(20)
2000	**196**	**199**	**203**	**209**	**208**	**207**	**206**	**204**	**204**	**202**	**200**	**198**
	(23)	(24)	(27)	(28)	(27)	(27)	(27)	(28)	(27)	(27)	(27)	(26)
2001	**198**	**198**	**198**	**197**	**198**	**198**	**197**	**196**	**195**	**192**	**190**	**188**
	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)
2002	**187**	**184**	**179**	**175**	**171**	**167**	**164**	**160**	**156**	**153**	**149**	**145**
	(25)	(25)	(24)	(23)	(22)	(22)	(21)	(20)	(20)	(19)	(18)	(17)
2003	**140**	**135**	**132**	**130**	**126**	**123**	**120**	**118**	**115**	**112**	**110**	**108**
	(17)	(16)	(15)	(15)	(14)	(12)	(12)	(11)	(11)	(10)	(9)	(9)
2004	**107**	**106**	**105**	**104**	**102**	**100**	**97**	**94**	**92**	**91**	**90**	**88**
	(9)	(9)	(9)	(8)	(8)	(8)	(7)	(6)	(5)	(5)	(5)	(5)
2005	**87**	**85**	**83**	**82**	**81**	**81**	**80**	**80**	**79**	**78**	**78**	**77**
	(4)	(4)	(4)	(3)	(3)	(3)	(3)	(3)	(2)	(2)	(2)	(2)


ISES Solar Cycle Ap Progression
(Data Through 1 Oct 99)
Planetary Index, Ap
35
30
25
20
15
10
5
0
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Monthly Values
Smoothed Monthly Values
NOAA/SEC Boulder, CO USA



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	8	8	8	9	10	10
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1997	11	11	14	17	18	20	23	25	28	32	35	39
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1998	44	49	53	57	59	63	66	68	70	71	73	78
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1999	83	85	84	**87**	**94**	**101**	**108**	**116**	**123**	**131**	**137**	**140**
	(***)	(***)	(***)	(1)	(3)	(6)	(8)	(10)	(13)	(15)	(18)	(20)
2000	**143**	**147**	**153**	**160**	**159**	**158**	**156**	**155**	**154**	**153**	**151**	**148**
	(23)	(25)	(28)	(30)	(29)	(29)	(29)	(29)	(28)	(28)	(28)	(27)
2001	**148**	**149**	**148**	**148**	**149**	**149**	**147**	**146**	**145**	**143**	**140**	**139**
	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(26)	(26)	(26)
2002	**137**	**134**	**130**	**125**	**122**	**118**	**115**	**111**	**107**	**104**	**100**	**96**
	(25)	(25)	(24)	(23)	(22)	(22)	(21)	(20)	(20)	(19)	(18)	(17)
2003	**91**	**86**	**83**	**81**	**77**	**74**	**71**	**69**	**66**	**62**	**59**	**57**
	(17)	(16)	(15)	(15)	(14)	(13)	(13)	(12)	(12)	(11)	(10)	(10)
2004	**56**	**56**	**55**	**53**	**51**	**48**	**44**	**41**	**38**	**38**	**36**	**34**
	(10)	(10)	(10)	(9)	(9)	(9)	(8)	(7)	(7)	(7)	(6)	(6)
2005	**31**	**29**	**27**	**25**	**24**	**23**	**23**	**22**	**21**	**20**	**19**	**18**
	(5)	(5)	(5)	(4)	(4)	(4)	(4)	(4)	(3)	(3)	(3)	(3)