

**Space Weather Highlights**  
**30 Aug – 05 Sep 1999**

Solar activity ranged from low to moderate levels. Activity reached moderate levels during the first day of the period due to an M3/2B flare at 30/1805UT with an associated Type II radio sweep from Region 8681 (N21, L=207, class/area Dai/280 on 30 August). Region 8681 emerged rapidly on 28 August and continued to grow through 30 August, then showed gradual decay during the rest of the period. Activity declined to low levels on 31 August and remained so during the remaining days with most active centers either stable or declining. Also noteworthy was a precipitous drop in the daily 10.7 cm solar radio flux, which fell from 218 to 112 SFU during the summary period.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Wind speeds were elevated during the first half of the period with peaks to 640 km/sec. IMF Bz was southward during much of the week with maximum southerly deflections from minus 05 to minus 09 nT. Phi data indicated that Earth was within an away (positive polarity) solar sector most of the week. Proton densities were in the 02 to 12 p/cc range.

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 most of the period.

The geomagnetic field was intermittently disturbed through 04 September with unsettled to major storm levels detected (the major storm periods were limited to high latitudes). This activity appeared to be due to the combination of elevated solar wind speeds and southward IMF Bz described above. Field activity declined to quiet to unsettled levels on 05 September.

**Space Weather Outlook**  
**08 Sep - 04 Oct 1999**

Solar activity is expected to range from low to moderate levels with a slight chance for major flares. An increasing trend is expected to commence around 16 September with the return of old Region 8674 (S24, L=246), which produced isolated major flares during its last rotation.

There will be an increased chance for a proton event at geo-synchronous orbit beginning around 16 September.

The greater than 2 MeV electron flux at geo-synchronous altitude is expected to be at moderate to high levels beginning around 13 September.

Geomagnetic field activity is expected vary from quiet to unsettled levels during most of the period. However, active periods will be possible around 12 - 16 September and again around 26 September - 01 October due to recurrent high speed solar wind streams.



**Daily Solar Data**

Date	Radio Flux 10.7 cm	Sun spot No. (10 <sup>6</sup> hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	
30 August	198	212	1310	C1.3	7	1	0	20	1	1	0	0
31 August	183	190	900	C1.2	5	0	0	5	1	0	0	0
01 September	163	137	740	B9.3	2	0	0	5	0	0	0	0
02 September	157	134	370	B6.6	2	0	0	0	0	1	0	0
03 September	139	116	240	B7.7	2	0	0	2	0	0	0	0
04 September	131	103	290	B4.9	1	0	0	0	0	0	0	0
05 September	122	101	230	B3.7	1	0	0	6	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
30 August	6.6E+5	1.5E+4	3.7E+3		8.2E+7	
31 August	5.4E+5	1.6E+4	3.8E+3		5.4E+7	
01 September	4.0E+5	1.6E+4	3.9E+3		5.5E+7	
02 September	1.9E+5	1.6E+4	3.9E+3		1.4E+8	
03 September	1.5E+5	1.5E+4	4.0E+3		7.5E+7	
04 September	1.8E+5	1.5E+4	4.0E+3		9.7E+7	
05 September	1.1E+5	1.5E+4	3.5E+3		1.3E+8	

**Daily Geomagnetic Data**

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
30 August	13	1-2-4-3-3-3-2-3	35	2-2-6-6-4-5-4-2	20	2-2-5-5-3-3-3-3
31 August	12	3-2-2-3-3-2-3-3	34	3-5-4-6-5-4-3-3	18	3-3-4-4-3-3-4-4
01 September	14	2-5-3-2-3-2-2-2	37	2-5-6-4-6-4-3-3	22	3-4-5-4-4-3-3-2
02 September	11	3-2-4-2-2-3-1-1	28	3-5-5-4-5-4-2-1	11	3-3-4-2-3-3-2-2
03 September	14	1-3-4-4-3-3-1-2	*	*-*-*-*-*-*-*	18	2-3-5-5-3-3-2-2
04 September	11	1-4-3-2-2-1-2-3	*	*-*-*-*-*-*-*	15	3-4-3-4-3-3-3-3
05 September	4	2-2-0-1-1-1-1-2	7	2-2-1-3-3-1-0-1	8	2-3-1-2-3-2-2-2

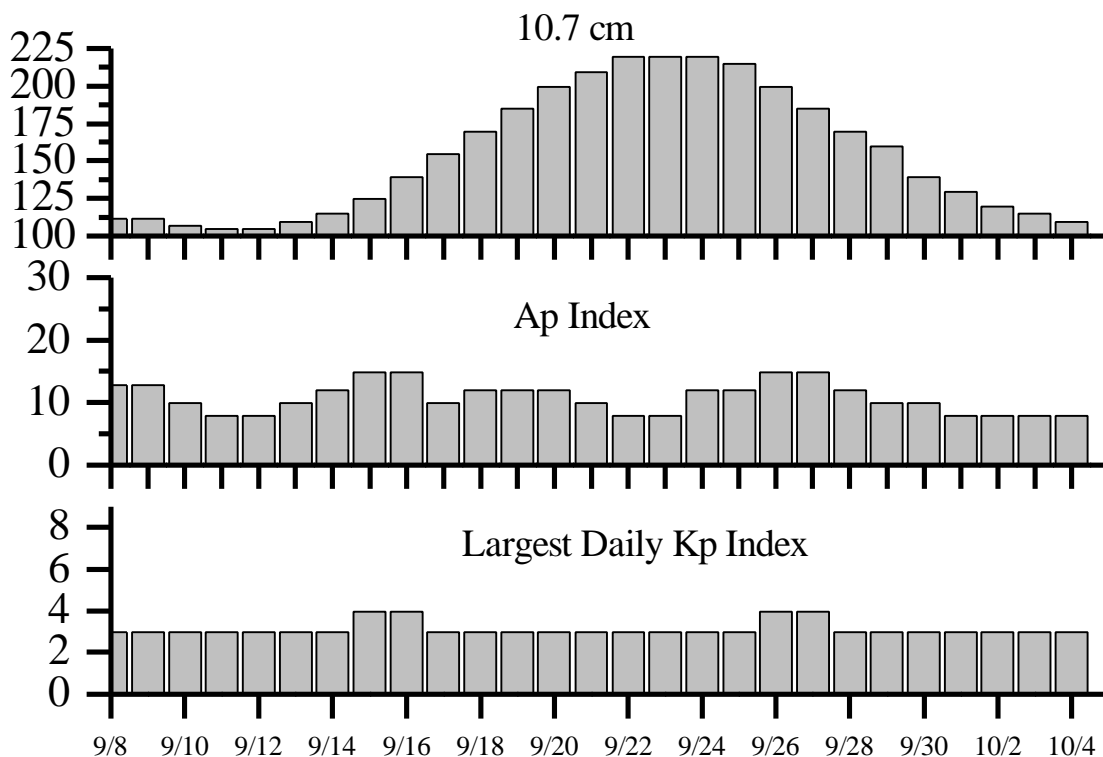


### *Alerts and Warnings Issued*

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
30 Aug 0909	K=4 Observed	30 Aug 06 - 09
30 Aug 1200	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 1200
30 Aug 1200	K= 5 Observed	30 Aug 09 - 12
30 Aug 1859	Type II Radio Emission	30 Aug 1803
31 Aug 1200	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 1200
31 Aug 1200	K= 4 Observed	31 Aug 09 - 12
31 Aug 1200	K= 4 Warning	31/1200 – 01/1200
01 Sep 0900	A = 20 Observed	01 Sep 0900
01 Sep 0900	K= 5 Observed	01 Sep 06 - 09
01 Sep 0900	K= 5 Warning	01 Sep 09 - 15
01 Sep 1200	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 1200
02 Sep 0300	K= 4 Observed	02 Sep 00 - 03
02 Sep 0300	K= 4 Warning	02 Sep 03 - 15
02 Sep 1204	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 1200
03 Sep 602	K= 4 Warning	03 Sep 06 - 15
03 Sep 604	K= 4 Observed	03 Sep 03 - 06
03 Sep 901	K= 5 Observed	03 Sep 06 - 09
03 Sep 901	K= 5 Warning	03 Sep 09 - 15
03 Sep 1220	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 1200
03 Sep 1500	A = 20 Observed	03 Sep 1500
03 Sep 1559	Type IV Radio Emission	03 Sep 0001
04 Sep 600	K= 4 Observed	04 Sep 03-06
04 Sep 600	K= 4 Warning	04 Sep 06 - 15
04 Sep 1158	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 12:00
04 Sep 1449	A = 20 Watch	06 Sep
05 Sep 1154	CONTINUED >2MeV Electron Event =1000pfu	28 Aug 1200



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 Sep	112	13	3	22 Sep	220	8	3
09	112	13	3	23	220	8	3
10	107	10	3	24	220	12	3
11	105	8	3	25	215	12	3
12	105	8	3	26	200	15	4
13	110	10	3	27	185	15	4
14	115	12	3	28	170	12	3
15	125	15	4	29	160	10	3
16	140	15	4	30	140	10	3
17	155	10	3	01 Oct	130	8	3
18	170	12	3	02	120	8	3
19	185	12	3	03	115	8	3
20	200	12	3	04	110	8	3
21	210	10	3				



### *Energetic Events*

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
30 Aug	1723	1805	1821	M3.8	.052	2B	N18W16	8681	58		2	

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
30 August	0127	0148	0200	C4.4				
	0355	0358	0401	C1.9				
	B0931	U0936	A0959		SF	S18W53	8673	
	B1022	U1022	1030	C2.1	SF	S21W43	8673	
	1137	1137	1148		SF	S23W42	8674	
	B1137	U1142	1146		SF	S21W43	8673	
	1138	U1152	A1234	C5.6	SF	N19W13	8681	
	1239	1248	1257	C6.5				
	1437	1445	1514	C9.4	1N	S28W45	8674	
	1529	1531	1538		SF	N22W09	8681	
	1543	1549	1612	C2.1	SF	N20W15	8681	
	1625	1627	1640		SF	N19W13	8681	
	1701	1703	1716		SF	S23W49	8674	
	1710	1711	1719		SF	N22W13	8681	
	1726	1728	1813		SF	S21W58	8673	
	1743	1806	1941	M3.8	2B	N18W16	8681	
	1746	1746	1756		SF	S21W48	8674	
	1801	1802	1805		SF	N27W03	8676	
	1816	1820	1834		SF	N28W01	8676	
	1841	1850	1854		SF	N27W03	8676	
1856	1909	1945		SF	N28W01	8676		
2056	2057	2108		SF	N27W03	8676		
2127	2127	2131		SF	N08E09	8677		
2230	2231	2233		SF	S22W50	8674		
2345	2349	2357		SF	S22W50	8674		
31 August	0029	0037	0049	C7.3	SF	N21W18	8681	
	0545	0551	0600	C8.8	SF	N19W20	8681	
	1125	1127	1135		SF	N19W25	8681	
	1257	1302	1306	C6.9				
	1649	1649	1655		SF	N22W26	8681	
	1722	1731	1822	C3.5	SF	N19W25	8681	
	2223	2230	2244	C2.0				
	2356	0032	A0103	C2.7	1F	N08W07	8677	
1418	1423	1438		SF	N22W37	8681		



*Flare List – continued.*

Date	Time			X-ray	Optical		Rgn Lat CMD #
	Begin	Max	End		Imp / Class.	Location Brtns	
01 September	0855	0857	0903		SF	N21W18	8675
	1225	1226	1228		SF	N19W44	8681
	1741	1742	1746		SF	N22W21	8675
	1859	1900	1945	C6.6	SF	S28W75	8674
02 September	1742	1753	1908	C5.3	2F	N21W34	8675
	2335	2348	2357	C2.1			
03 September	0339	0428	0524	C1.7			
	2005	2006	2018		SF	N17E03	8682
	2047	2049	2102	C1.3	SF	N21W50	8675
04 September	0207	0216	0229	B9.1			
	0501	0507	0511	C1.0			
05 September	0022	0022	0041		SF	N09W34	8687
	B0533	U0534	A0619	C2.0	SF	N17W62	8681
	1126	1126	1131		SF	N22W83	8681
	1238	1238	1245		SF	S25W59	8686
	1318	1318	1323		SF	S25W59	8686
	1354	1354	1403		SF	S38W64	8679



### Region Summary

Date	Location		Sunspot Characteristics				Flares												
	° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical								
								C	M	X	S	1	2	3	4				
<i>Region 8673</i>																			
19 Aug	S17E81	254	0100	03	HSX	001	A												
20 Aug	S19E66	256	0280	05	HHX	002	A						1						
21 Aug	S19E55	253	0400	16	FHO	016	B												
22 Aug	S20E43	252	0490	10	DKO	013	B												
23 Aug	S19E32	250	0540	16	FKI	028	B						1						
24 Aug	S20E18	251	0430	12	CKO	014	B							2					
25 Aug	S21E08	248	0410	19	FKO	018	B	1					3						
26 Aug	S19W08	251	0410	16	FKO	013	B	1					4						
27 Aug	S19W24	253	0440	11	CHO	014	BG	2					7	1					
28 Aug	S23W38	254	0370	05	CHO	003	B												
29 Aug	S19W51	254	0290	04	HHX	002	A							2					
30 Aug	S19W64	254	0270	03	HHX	002	A	1						4					
31 Aug	S20W76	253	0170	03	HAX	002	A												
01 Sep	S19W94	257	0210	03	HRX	001	A												
								5	0	0	24	1	0	0	0	0			

Crossed West Limb.

Absolute heliographic longitude: 248

<i>Region 8674</i>																			
20 Aug	S24E66	256	0180	11	EKO	005	B	1	3				6	1					
21 Aug	S25E60	248	0400	22	FAO	010	B	1	2				2	2					
22 Aug	S25E48	247	0440	22	FAI	018	B	5					7						
23 Aug	S25E35	247	0470	22	FAI	027	B												
24 Aug	S25E23	246	0390	22	FAI	029	BG	3					2	2					
25 Aug	S24E11	245	0340	22	FAI	023	BG	1	1				2	1					
26 Aug	S25W03	246	0440	23	FAI	053	BG	4					8						
27 Aug	S24W16	245	0770	25	FKC	072	BGD	1	2				2	1	2				
28 Aug	S24W28	244	0730	23	FKC	087	BGD	1	1	1			4	1	1				
29 Aug	S23W39	242	0700	23	FAC	069	BGD	1					3						
30 Aug	S24W51	241	0480	23	FAI	045	BGD	1	1				5	1					
31 Aug	S23W61	238	0250	17	FAI	022	BG												
01 Sep	S24W73	236	0150	12	EAO	009	BG	1					1						
02 Sep	S26W87	237	0060	09	CAO	006	B												
								20	10	1	42	9	3	0	0				

Crossed West Limb.

Absolute heliographic longitude: 246



**Region Summary-continued**

Date	Location		Sunspot Characteristics				Flares										
	° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
								C	M	X	S	1	2	3	4		
<i>Region 8675</i>																	
24 Aug	N21E75	194	0040	02	HSX	001	A						1				
25 Aug	N18E66	190	0040	02	HSX	002	A										
26 Aug	N18E53	190	0060	05	CAO	005	B										
27 Aug	N19E40	189	0080	07	DAO	010	B						6				
28 Aug	N20E27	189	0130	07	DSO	018	B	2					5				
29 Aug	N20E14	189	0210	09	DSI	028	B	2					4				
30 Aug	N19E01	189	0170	09	DSI	021	B										
31 Aug	N20W12	189	0100	10	DSO	020	B										
01 Sep	N19W25	188	0100	10	DSO	016	BG						2				
02 Sep	N19W42	192	0070	07	DSO	016	B	1						1	1		
03 Sep	N19W55	192	0040	05	CSO	004	B	1					1				
04 Sep	N20W69	193	0050	02	HSX	001	A										
05 Sep	N21W82	193	0070	02	HAX	001	A	1					2				
								7	0	0	0	21	1	1	0	0	

Still on Disk.

Absolute heliographic longitude: 189

*Region 8676*

24 Aug	N26E72	197	0000	06	BXO	002	B										
25 Aug	N26E61	195	0010	06	BXO	004	B						1				
26 Aug	N25E43	200	0020	10	BXO	004	B										
27 Aug	N25E34	195	0010	06	BXO	007	B										
28 Aug	N26E20	196	0010	04	BXO	004	B	1					1				
29 Aug	N26E08	195	0020	04	BXO	006	B						2				
30 Aug	N27W04	194	0010	03	BXO	004	B		1				5				
31 Aug	N27W35	212	0000	00		000											
01 Sep	N27W48	212	0000	00		000											
02 Sep	N27W61	212	0000	00		000											
03 Sep	N27W74	212	0000	00		000											
04 Sep	N27W87	212	0000	00		000											
								1	1	0	9	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 194





**Region Summary-continued**

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

*Region 8677*

25 Aug N07E71	185	0060	02	HSX	001	A												
26 Aug N07E60	183	0080	06	CAO	006	B												
27 Aug N07E46	183	0090	06	CSO	006	B												
28 Aug N08E33	183	0070	03	CSO	005	B												
29 Aug N08E20	183	0070	04	CSO	005	B												
30 Aug N07E07	183	0070	04	CSO	003	B							1					
31 Aug N07W07	184	0060	04	CSO	002	B								1				
01 Sep N08W21	184	0040	02	HSX	001	A	1											
02 Sep N08W35	185	0040	02	HSX	001	A												
03 Sep N08W48	185	0030	02	HSX	001	A												
04 Sep N09W61	185	0040	02	HSX	001	A												
05 Sep N10W74	185	0040	02	HSX	001	A												
							1	0	0	1	1	0	0	0				

Still on Disk.

Absolute heliographic longitude: 183

*Region 8679*

26 Aug S34E58	185	0050	06	CSO	002	B												
27 Aug S31E44	185	0050	04	CAO	002	B												
28 Aug S34E31	185	0040	05	CAO	004	B												
29 Aug S34E22	181	0020	08	BXO	009	B												
30 Aug S33E09	181	0010	05	BXO	004	B												
31 Aug S30E00	177	0010	02	BXO	003	B												
01 Sep S36W17	180	0010	01	AXX	001	A												
02 Sep S36W28	178	0000	00	AXX	001	A												
03 Sep S36W41	178																	
04 Sep S36W54	178																	
05 Sep S36W67	178												1					
							0	0	0	1	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 177



**Region Summary-continued**

Location		Sunspot Characteristics					Flares							
Date	( ° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
							C	M	X	S	1	2	3	4
<i>Region 8681</i>														
28 Aug	N21E08	208	0050	08	DSO	023	B			1	1			
29 Aug	N21W04	207	0220	10	DAI	029	B	1			7	1		
30 Aug	N21W17	207	0280	10	DAI	028	BG	2	1		5		1	
31 Aug	N22W31	208	0260	13	EAI	030	BG	3			5			
01 Sep	N21W43	206	0190	11	EAI	019	BG				2			
02 Sep	N21W57	207	0160	10	DAO	013	B							
03 Sep	N20W73	210	0120	05	CAO	004	B							
04 Sep	N21W87	211	0130	05	CAO	003	B							
								6	1	1	20	1	1	0 0
Crossed West Limb.														
Absolute heliographic longitude: 207														
<i>Region 8682</i>														
29 Aug	N18E65	138	0040	02	HSX	001	A							
30 Aug	N18E51	139	0020	03	CSO	002	B							
31 Aug	N19E37	140	0010	01	HSX	001	A							
01 Sep	N18E26	137	0020	09	CSO	005	B							
02 Sep	N18E11	139	0010	04	CRO	003	B							
03 Sep	N18W02	139	0010	07	BXO	006	B				1			
04 Sep	N17W14	138	0040	07	DSO	011	B							
05 Sep	N18W28	139	0060	09	DSO	015	B							
								0	0	0	1	0	0	0 0
Still on Disk.														
Absolute heliographic longitude: 139														
<i>Region 8683</i>														
30 Aug	S10E37	153	0000	00	AXX	001	A							
								0	0	0	0	0	0	0 0
Still on Disk.														
Absolute heliographic longitude: 153														



**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 8684*

30 Aug	S12E49	141	0000	01	AXX	002	A											
31 Aug	S12E35	142	0010	02	BXO	004	B											
01 Sep	S12E22	142																
02 Sep	S12E09	142																
03 Sep	S12W04	142																
04 Sep	S12W17	142																
05 Sep	S14W27	138	0000	00	AXX	001	A											

Still on Disk.

Absolute heliographic longitude: 142

*Region 8685*

31 Aug	S08E66	111	0020	01	BXO	002	B											
01 Sep	S08E53	111																
02 Sep	S08E40	111																
03 Sep	S08E28	109	0000	01	AXX	002	A											
04 Sep	S08E15	109																
05 Sep	S08E02	109																

Still on Disk.

Absolute heliographic longitude: 109

*Region 8686*

31 Aug	S24E05	172	0010	02	BXO	004	B											
01 Sep	S24W09	172	0020	05	CSO	005	B											
02 Sep	S24W23	173	0010	05	BXO	008	B											
03 Sep	S25W36	173	0020	06	CRO	008	B											
04 Sep	S25W49	173	0010	07	BXO	005	B											
05 Sep	S25W64	175	0010	04	BXO	002	B											

Still on Disk.

Absolute heliographic longitude: 172

*Region 8687*

02 Sep	N11W07	157	0020	04	CRO	006	B											
03 Sep	N10W21	158	0010	05	BXO	006	B											
04 Sep	N11W33	157	0020	05	BXO	010	B											
05 Sep	N10W48	159	0030	06	CSO	005	B											

Still on Disk.

Absolute heliographic longitude: 157



***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 8688</i>																						
03 Sep	S24E14	123	0010	05	BXO	005	B															
04 Sep	S24W01	125	0000	02	BXO	002	B															
05 Sep	S24W14	125	0000	00		000																
								0	0	0	0	0	0	0	0	0	0	0				
Still on Disk.																						
Absolute heliographic longitude: 125																						
<i>Region 8689</i>																						
05 Sep	N18W05	116	0020	03	BXO	006	B															
								0	0	0	0	0	0	0	0	0	0	0				
Still on Disk.																						
Absolute heliographic longitude: 116																						

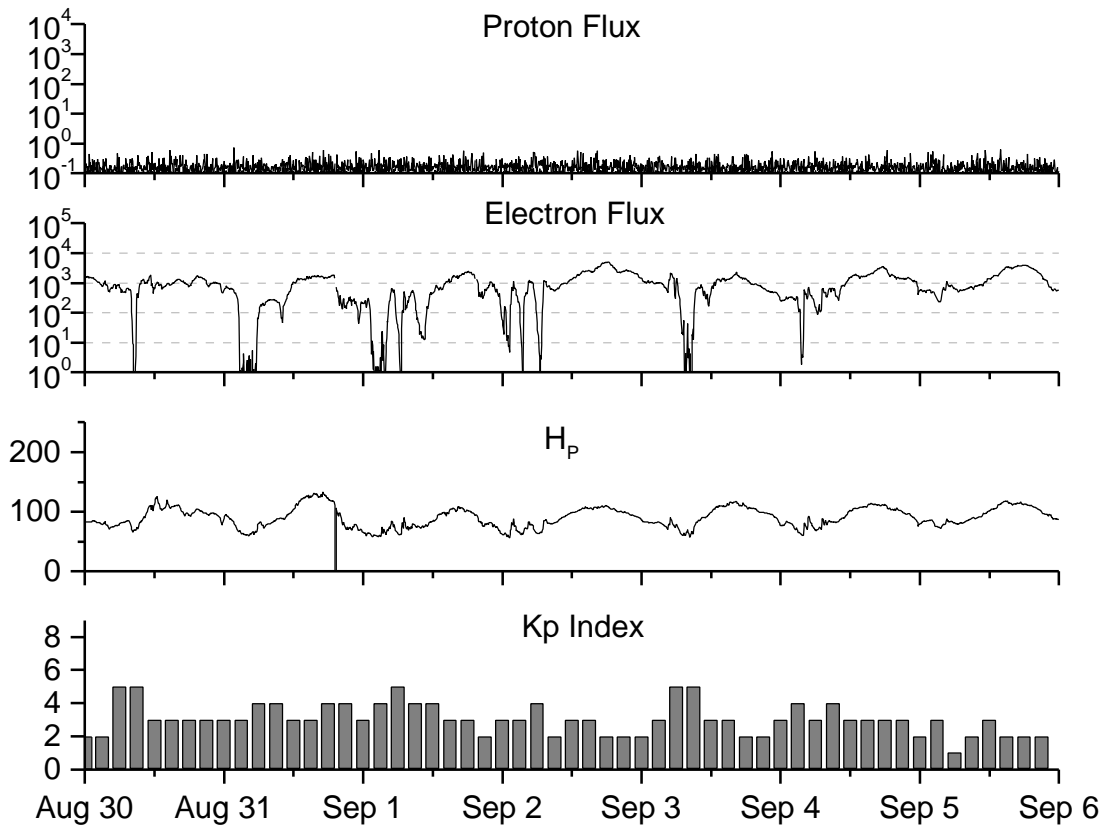


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	<u>Observed values</u>		<u>Ratio</u>	<u>Smooth values</u>		<u>*Penticton</u>	<u>Smooth</u>	<u>Planetary</u>	<u>Smooth</u>
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
<b>1997</b>									
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
<b>1998</b>									
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	55.5	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.9	0.69	108.8	77.9	150.1	134.3	08	11.9
<b>1999</b>									
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			126.3		14	
April	92.9	63.9	0.69			117.2		12	
May	140.5	106.3	0.76			148.6		08	
June	208.3	137.4	0.66			170.0		07	
July	169.2	113.5	0.67			165.6		10	
August	136.1	93.7	0.69			170.8		15	

**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 30 August 1999*

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

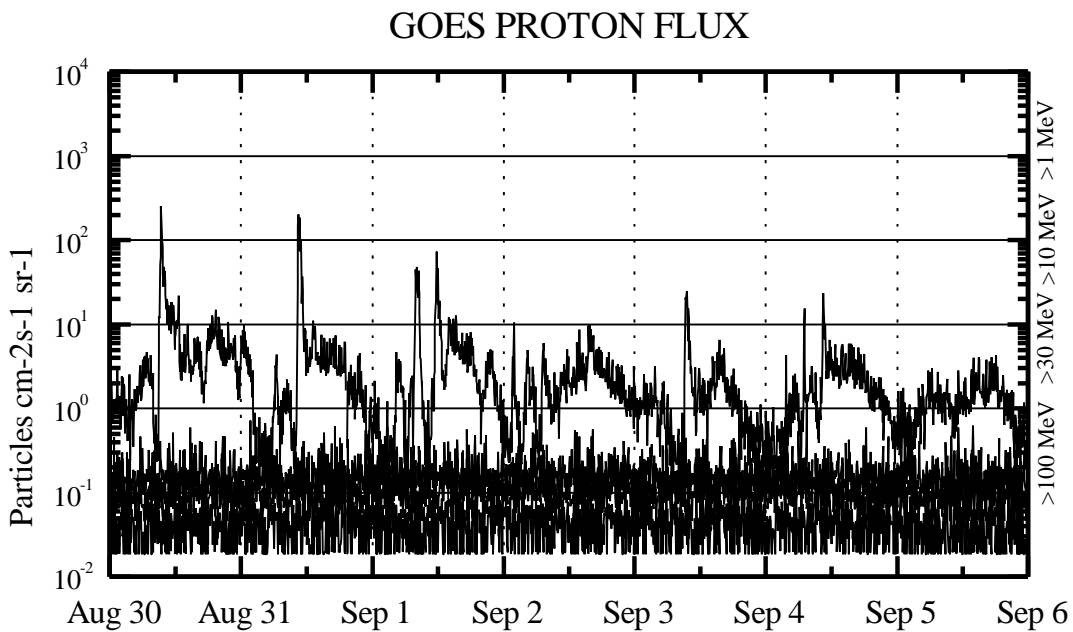
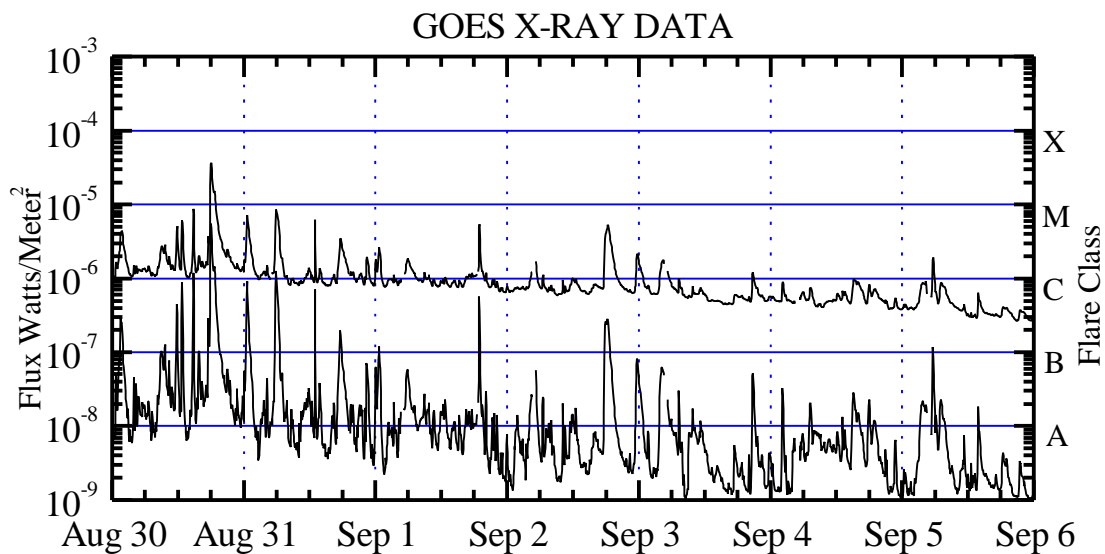
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup> -sec -sr) with energies greater than 2 MeV at GOES-8.

*H<sub>p</sub>* 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<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> 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<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.



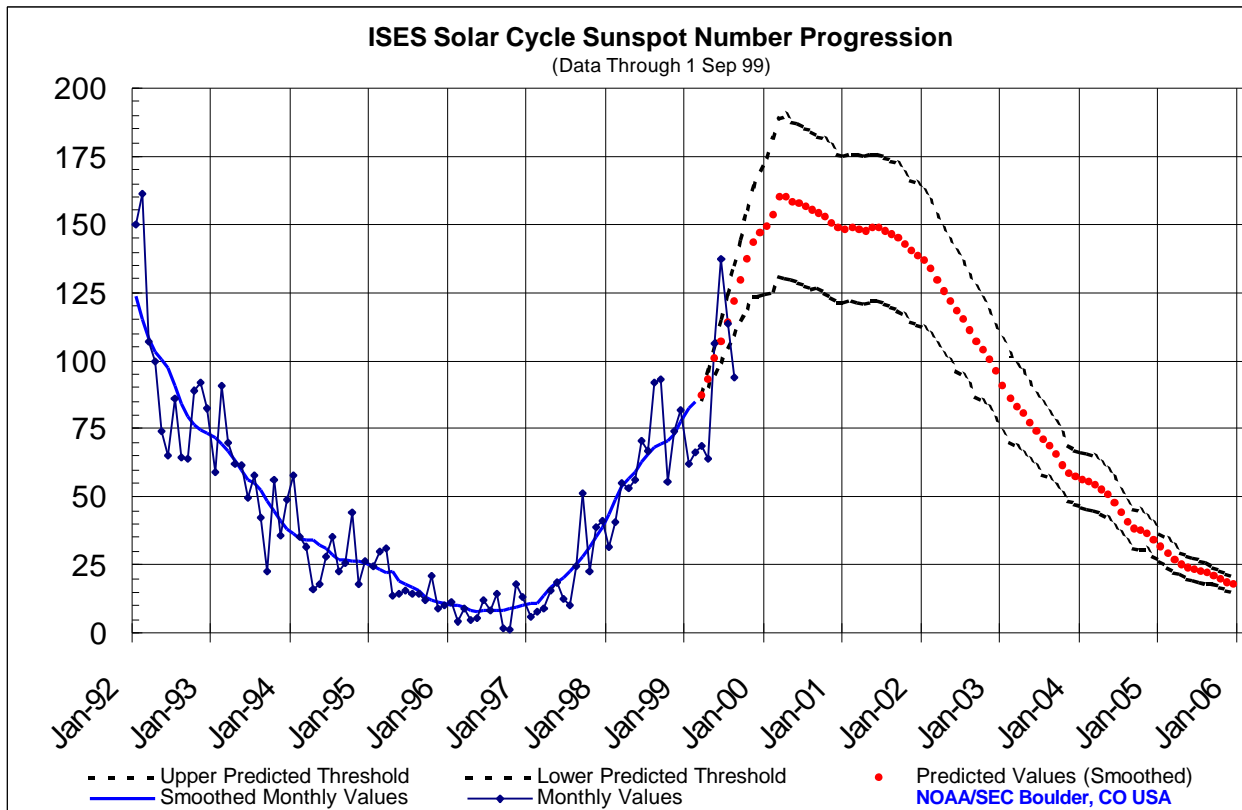


*Weekly GOES Satellite X-ray and Proton Plots*

X-ray plot contains five minute averaged x-ray flux ( watts / m<sup>2</sup> ) as measured by GOES 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/cm<sup>2</sup> –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<sup>2</sup>-sec-sr) at greater than 10 MeV.



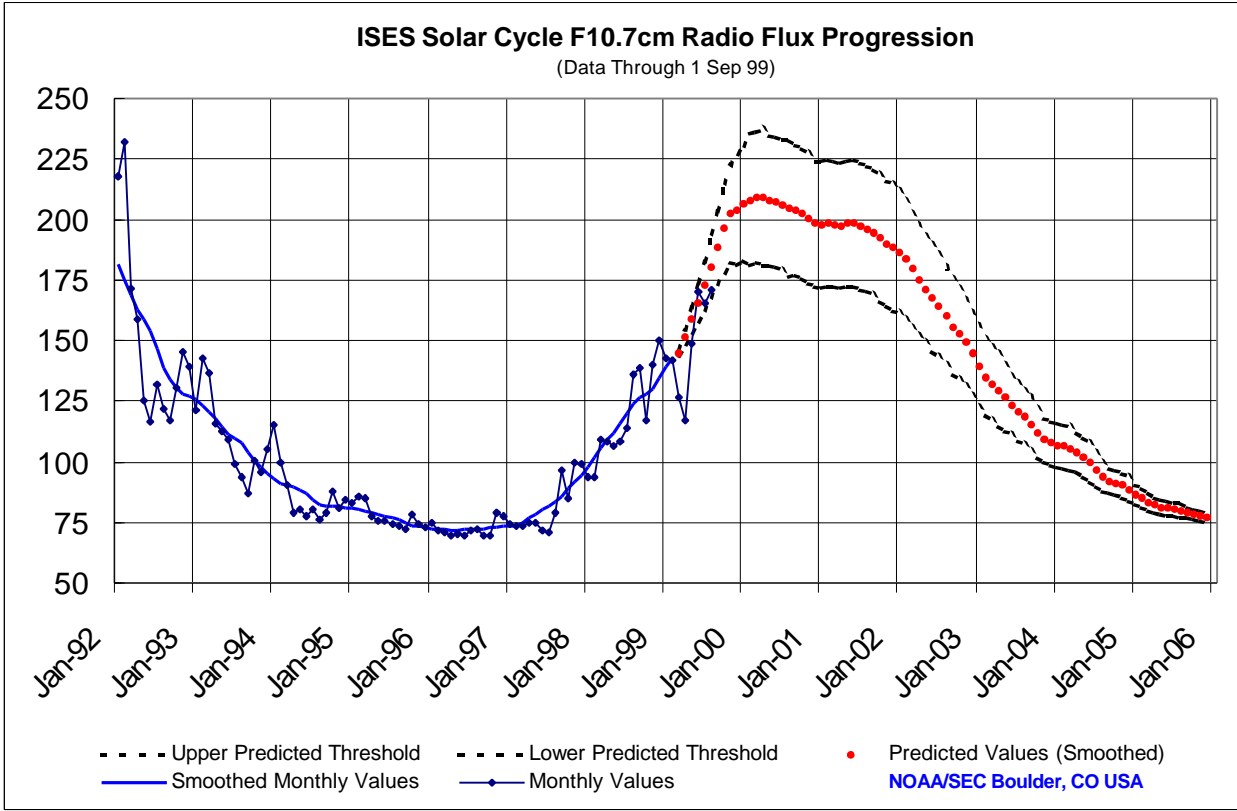


### SEC Prediction of Smoothed Sunspot Number

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10	10	10	10	9	8	9	8	8	8	9	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	<b>87</b>	<b>93</b>	<b>101</b>	<b>107</b>	<b>114</b>	<b>122</b>	<b>130</b>	<b>137</b>	<b>144</b>	<b>147</b>
	(***)	(***)	(1)	(3)	(5)	(8)	(10)	(13)	(15)	(18)	(20)	(23)
2000	<b>149</b>	<b>154</b>	<b>160</b>	<b>160</b>	<b>159</b>	<b>158</b>	<b>156</b>	<b>155</b>	<b>154</b>	<b>153</b>	<b>151</b>	<b>148</b>
	(25)	(28)	(29)	(30)	(29)	(29)	(29)	(29)	(28)	(28)	(28)	(27)
2001	<b>148</b>	<b>149</b>	<b>148</b>	<b>148</b>	<b>149</b>	<b>149</b>	<b>147</b>	<b>146</b>	<b>145</b>	<b>143</b>	<b>140</b>	<b>139</b>
	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(26)	(26)	(26)
2002	<b>137</b>	<b>134</b>	<b>130</b>	<b>125</b>	<b>122</b>	<b>118</b>	<b>115</b>	<b>111</b>	<b>107</b>	<b>104</b>	<b>100</b>	<b>96</b>
	(25)	(25)	(24)	(23)	(22)	(22)	(21)	(20)	(20)	(19)	(18)	(17)
2003	<b>91</b>	<b>86</b>	<b>83</b>	<b>81</b>	<b>77</b>	<b>74</b>	<b>71</b>	<b>69</b>	<b>66</b>	<b>62</b>	<b>59</b>	<b>57</b>
	(17)	(16)	(15)	(15)	(14)	(13)	(13)	(12)	(12)	(11)	(10)	(10)
2004	<b>56</b>	<b>56</b>	<b>55</b>	<b>53</b>	<b>51</b>	<b>48</b>	<b>44</b>	<b>41</b>	<b>38</b>	<b>38</b>	<b>36</b>	<b>34</b>
	(10)	(10)	(10)	(9)	(9)	(9)	(8)	(7)	(7)	(7)	(6)	(6)
2005	<b>31</b>	<b>29</b>	<b>27</b>	<b>25</b>	<b>24</b>	<b>23</b>	<b>23</b>	<b>22</b>	<b>21</b>	<b>20</b>	<b>19</b>	<b>18</b>
	(5)	(5)	(5)	(4)	(4)	(4)	(4)	(4)	(3)	(3)	(3)	(3)







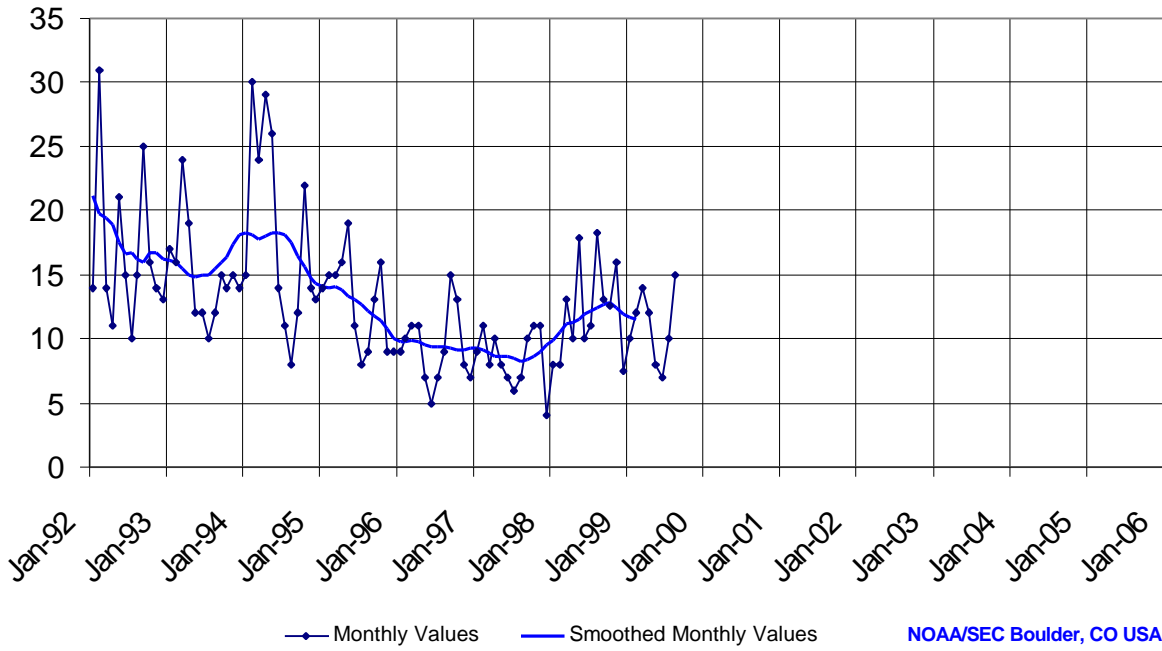
### SEC Prediction of Smoothed F10.7cm Radio Flux

	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 (***)	<b>145</b> (1)	<b>151</b> (3)	<b>159</b> (5)	<b>165</b> (8)	<b>173</b> (10)	<b>181</b> (13)	<b>188</b> (15)	<b>196</b> (18)	<b>202</b> (20)	<b>204</b> (23)
2000	<b>207</b> (24)	<b>208</b> (27)	<b>209</b> (27)	<b>209</b> (28)	<b>208</b> (27)	<b>207</b> (27)	<b>206</b> (27)	<b>204</b> (28)	<b>204</b> (27)	<b>202</b> (27)	<b>200</b> (27)	<b>198</b> (26)
2001	<b>198</b> (26)	<b>198</b> (26)	<b>198</b> (26)	<b>197</b> (26)	<b>198</b> (26)	<b>198</b> (26)	<b>197</b> (26)	<b>196</b> (26)	<b>195</b> (26)	<b>192</b> (26)	<b>190</b> (26)	<b>188</b> (26)
2002	<b>187</b> (25)	<b>184</b> (25)	<b>179</b> (24)	<b>175</b> (23)	<b>171</b> (22)	<b>167</b> (22)	<b>164</b> (21)	<b>160</b> (20)	<b>156</b> (20)	<b>153</b> (19)	<b>149</b> (18)	<b>145</b> (17)
2003	<b>140</b> (17)	<b>135</b> (16)	<b>132</b> (15)	<b>130</b> (15)	<b>126</b> (14)	<b>123</b> (12)	<b>120</b> (12)	<b>118</b> (11)	<b>115</b> (11)	<b>112</b> (10)	<b>110</b> (9)	<b>108</b> (9)
2004	<b>107</b> (9)	<b>106</b> (9)	<b>105</b> (9)	<b>104</b> (8)	<b>102</b> (8)	<b>100</b> (8)	<b>97</b> (7)	<b>94</b> (6)	<b>92</b> (5)	<b>91</b> (5)	<b>90</b> (5)	<b>88</b> (5)
2005	<b>87</b> (4)	<b>85</b> (4)	<b>83</b> (4)	<b>82</b> (3)	<b>81</b> (3)	<b>81</b> (3)	<b>80</b> (3)	<b>80</b> (3)	<b>79</b> (2)	<b>78</b> (2)	<b>78</b> (2)	<b>77</b> (2)



### ISES Solar Cycle Ap Progression

(Data Through 1 Sep 99)



NOAA/SEC Boulder, CO USA

