

Solar activity ranged from low to high levels with major flares observed during 28 – 29 November. The period began with activity at low levels due to occasional C-class subflares from a few active regions. Activity increased to moderate levels on 27 November due to an M2/1f flare at 27/2121 UTC from Region 9715 (N05, L = 137, Ekc/990 on 30 November). Activity rose to high levels during 28 – 29 November due to two major flares from Region 9715, the first being an M6/1b at 28/1635 UTC associated with a 450 sfu Tenflare, Type II and IV radio sweeps, and a partial-halo coronal mass ejection (CME). The second was an M5/1n at 29/1036 UTC with minor radio emission. These flares occurred as Region 9715 gradually developed into a large magnetically complex sunspot group with multiple magnetic delta configurations. Region 9715 began to decay on 01 December and produced isolated C-class flares during the rest of the period. Region 9704 (S18, L = 270, class/area Eki/610 on 22 November), which was the source for an impulsive X1 X-ray flare on 25 November, crossed the west limb on 26 November. Activity decreased to moderate levels on 30 November with isolated M-class flares from Regions 9714 (S09, L = 195, class/area Dao/240 on 01 December) and 9718 (S07, L = 086, class/area Eki/610 on 02 December). Activity rose to high levels on 01 December due to six low-level M-class flares, also from Regions 9714 and 9718 (for flare times and magnitudes, please refer to the Energetic Events or Optical Flare lists). Region 9714 produced two M-class flares (with associated post-flare loop prominence systems) on 02 December as it crossed the west limb. Region 9718 rotated into view on 27 November and was in a minor growth phase during the rest of the period. It was large and moderately complex with mixed magnetic polarities evident within its trailer spots. Other events of interest included a long-duration M4 X-ray flare at 01/1555 UTC from beyond the southeast limb.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the period. Wind speeds were high (peaks to 800 km/sec) at the start of the period following a CME passage that commenced early on 24 November. CME effects subsided during 25 November. There were no significant disturbances observed during the remainder of the period.

The greater than 10 MeV event that began at 22/2320 UTC ended at 27/2100 UTC. The peak for this event was 18,900 pfu at 24/0555 UTC. There were no proton events during the rest of the period.

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

Geomagnetic field activity was at mostly quiet levels during the period.

Space Weather Outlook

05 December - 31 December 2001

Solar activity is expected to range from low to moderate levels. Isolated low-level M-class flares are expected. There will be a chance for isolated major flare activity during 05 – 10 December and again during 21 – 31 December. Mostly low activity is expected during 11 – 20 December.

There will be a slight chance for a proton event during 05 – 10 and 25 – 31 December.

The greater than 2 MeV electron flux at geosynchronous orbit 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 during most of the period.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
26 November	175	122	890	C1.9	9	0	0	5	0	0	0	0
27 November	190	139	940	B8.1	9	1	0	9	2	0	0	0
28 November	199	180	1810	C1.3	14	1	0	15	3	0	0	0
29 November	216	204	2130	C1.1	18	2	0	15	2	0	0	0
30 November	226	158	2340	C1.4	6	3	0	9	1	0	0	0
01 December	221	208	2380	C1.9	4	6	0	22	2	2	0	0
02 December	245	271	2250	C1.6	5	2	0	14	1	0	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
26 November	1.8E+7	2.1E+6	3.0E+3		3.4E+6	
27 November	9.0E+6	9.6E+5	3.0E+3		2.0E+6	
28 November	6.5E+6	5.1E+5	3.0E+3		1.3E+6	
29 November	4.1E+6	1.9E+5	3.2E+3		7.6E+5	
30 November	3.4E+6	1.1E+5	3.1E+3		6.9E+5	
01 December	2.9E+6	5.1E+4	2.9E+3		6.1E+5	
02 December	2.7E+6	2.3E+4	3.0E+3		5.2E+5	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
26 November	4	1-0-3-1-1-1-0-1	*	*-*-*-*-*1-1-2	5	2-1-3-1-1-2-1-1
27 November	1	1-0-0-0-0-1-0-1	2	0-0-0-0-0-2-1-1	2	1-0-0-0-0-2-1-1
28 November	3	1-0-0-0-1-3-0-1	0	0-0-0-0-0-1-0-0	3	1-0-0-0-0-2-2-1
29 November	1	1-0-1-0-1-0-0-0	1	0-0-1-0-0-0-1-0	3	2-1-1-1-1-1-1-0
30 November	2	1-0-0-0-1-1-1-1	*	*-0-0-0-0-0-0-0	3	1-0-0-1-1-1-2-2
01 December	6	1-0-2-1-2-3-2-2	3	0-0-3-1-1-0-0-0	7	1-1-3-2-3-2-1-3
02 December	6	1-0-1-1-3-3-1-1	1	0-0-0-0-0-1-2-0	4	1-0-0-1-2-3-2-1

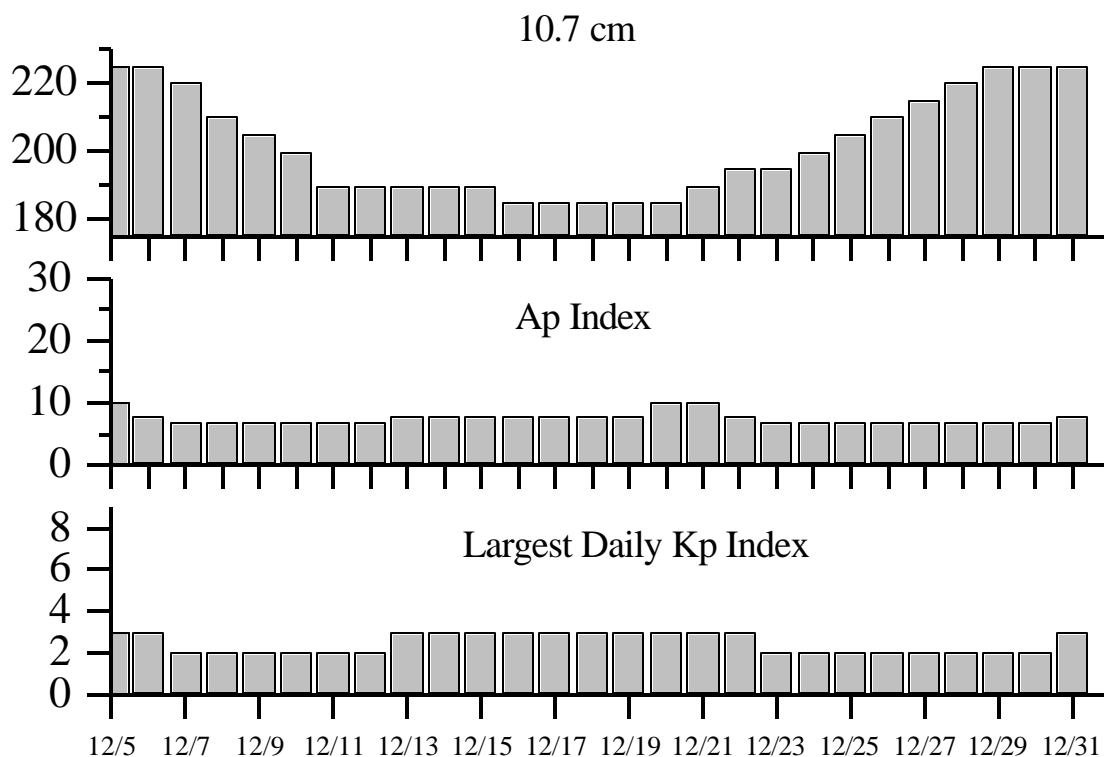


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
26 Nov 0100	CONTINUED Protons Event >10 MeV =10pfu	22 Nov 2320
27 Nov 0007	2 - 245 MHz Bursts	26 Nov
27 Nov 0100	CONTINUED Protons Event >10 MeV =10pfu	22 Nov 2320
28 Nov 0026	1 - 245 MHz Bursts	27 Nov
28 Nov 0100	CONTINUED Protons Event >10 MeV = 10pfu	22 Nov 2320
28 Nov 1624	ENDED Protons Event >10 MeV =10pfu	22 Nov 2320
28 Nov 1653	X-Ray event M6.9/1n	28 Nov 1635
28 Nov 1710	Type II Radio Emission	28 Nov 1547
28 Nov 1712	Type II Radio Emission	28 Nov 1636
28 Nov 1713	Type IV Radio Emission	28 Nov 1636
28 Nov 1746	10cm Radio Burst 450 F.U.	28 Nov 1637
29 Nov 0157	Type II Radio Emission	29 Nov 0152
29 Nov 1048	X-Ray event M5.5/1n	29 Nov 1036
29 Nov 1456	Type II Radio Emission	29 Nov 1407
29 Nov 1457	Type II Radio Emission	29 Nov 1409
29 Nov 2215	A = 20 Watch	02 Dec
30 Nov 0049	17 - 245 MHz Bursts	29 Nov
30 Nov 0049	1 - 245 MHz Noise Storms	29 Nov
01 Dec 0000	3- 245 MHz Bursts	30 Nov
02 Dec 0046	2- 245 MHz Bursts	01 Dec
02 Dec 1913	CANCELLED A = 20 Watch	02 Dec



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
05 Dec	225	10	3	19 Dec	185	8	3
06	225	8	3	20	185	10	3
07	220	7	2	21	190	10	3
08	210	7	2	22	195	8	3
09	205	7	2	23	195	7	2
10	200	7	2	24	200	7	2
11	190	7	2	25	205	7	2
12	190	7	2	26	210	7	2
13	190	8	3	27	215	7	2
14	190	8	3	28	220	7	2
15	190	8	3	29	225	7	2
16	185	8	3	30	225	7	2
17	185	8	3	31	225	8	3
18	185	8	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	$\frac{1}{2}$	Integ	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max			Class	Flux		Lat	CMD	245	2695
27 Nov	2109	2121	2132	M2.2	.017	1F	N03E26	9715				
28 Nov	1626	1635	1641	M6.9	.027	1B	N04E16	9715	12000	450	2	1
29 Nov	0142	0149	0151	M1.1	.003	SF	N04E12	9715	1200	25	2	
29 Nov	1012	1036	1043	M5.5	.055	1N	N04E10	9715		58		
30 Nov	0100	0106	0111	M3.5	.012	1N	S06E57	9718	2900	120		
30 Nov	1402	1418	1434	M1.5	.020			9720		37		
30 Nov	1955	2001	2004	M2.9	.009			9714				
01 Dec	0647	0651	0654	M2.2	.006	2N	S06E42	9718	52	180		
01 Dec	1430	1445	1456	M1.2	.013	SF	S10W78	9714				
01 Dec	1500	1555	1628	M4.8	.170							
01 Dec	1653	1656	1658	M2.9	.008	SF	S08W80	9714				
01 Dec	1729	1731	1733	M1.5	.004	1F	S07E36	9718				
01 Dec	1739	1749	1754	M1.8	.015	SF	N10E80	9724				
02 Dec	1409	1500	1548	M1.3	.057			9714				
02 Dec	2125	2206	2229	M2.0	.066			9714				

Flare List

Date	Time			X-ray Class.	Imp/ Brtns	Optical		Rgn
	Begin	Max	End			Location	Lat CMD	
26 November	0105	0106	0109	C3.3	SF	N03E53	9715	
	0311	0314	0316	C1.4				
	0355	0401	0413	C2.5				
	0817	0820	0822	C1.0	SF	S04E68	9716	
	1225	1225	1228		SF	N08E49	9715	
	1352	1353	1358	C4.3	SF	N06E43	9715	
	1811	1814	1816	C1.3				
	1917	1921	1925	C1.5				
	2126	2130	2134	C2.6	SF	S20W90	9704	
2319	2322	2324	C1.2					
27 November	0422	0432	0452	C2.2				
	0654	0703	0713	C2.7				
	1026	1027	1032	C7.9	SF	S05E84	9718	
	1034	1035	1042		SF	S06E84	9718	
	B1050	U1051	A1100	C8.1	SF	S06E85	9718	
	1340	U1340	A1352	C3.5	SF	S06E89	9718	
	1549	1549	1619	C6.9	SF	N05E35	9715	
	1714	1731	1754	C4.7				
	1837	1838	A1855	C2.0	SF	S07E82	9718	
	1907	1911	1915	C2.6				
	2006	2006	2023		SF	S07E83	9718	
	2024	2024	2027		SF	S08E82	9718	
2044	2120	2232		1F	S07E81	9718		
2116	2120	2138	M2.2	1F	N03E26	9715		
2244	2245	2250		SF	N04E32	9715		



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
28 November	0113	0114	0119		SF	S07E81	9718	
	0124	0126	0132	C3.1	SF	N04E23	9715	
	0157	0201	0214	C2.2				
	0200	0200	0203		SF	S06E83	9718	
	0216	0218	0220		SF	S07E81	9718	
	0310	0311	0316		SF	S06E78	9718	
	0410	0429	0437	C3.8	SF	S06E77	9718	
	0620	0624	0630	C3.6				
	1100	1103	1106	C2.6				
	1156	1205	1211	C2.7				
	1317	1322	1340	C2.3				
	1453	1457	1459	C3.2			9715	
	1538	1543	1546	C7.7				
	1632	1636	1652	M6.9	1B	N04E16	9715	
	1716	1720	1724	C2.3				
	1729	1729	1735		SF	S06E70	9718	
	1802	1803	1807	C3.6	SF	S20E71		
	1858	1902	1920		SF	S07E72	9718	
	1912	1912	1920		SF	N05E14	9715	
	1945	1946	1951	C1.7	SF	N04E15	9715	
	2004	2007	2010		SF	S07E70	9718	
	2014	2023	2030		SF	S07E70	9718	
	2106	2109	2117		SF	S06E70	9718	
	2146	2151	2154		SF	N04E17	9715	
	2229	2230	2245	C2.7	1F	N07E17	9715	
	2311	2319	A2319	C7.2	1F	N05E18	9715	
	29 November	0117	0122	0125	C1.9			
		0145	0148	0158	M1.1	SF	N04E12	9715
		0149	0149	0153		SF	S20E67	9720
		0307	0308	0312		SF	N10W26	9712
0319		0322	0324		SF	S18E76	9720	
0320		0320	0327		SF	N10W28	9712	
0357		0403	0410	C2.3			9715	
0517		0522	0531	C8.8	SF	N05E09	9715	
0800		0800	0803		SF	S18E72	9720	
0948		0952	0955	C2.7			9718	
1015		U1024	A1058	M5.5	1N	N04E10	9715	
1149		1152	1154	C6.5			9717	
1229		1248	1251	C6.0				
B1403	U1404	A1412	C7.6	SF	N05E03	9715		



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
29 November	1518	1520	1522	C2.4	SF	N04E05	9715
	1613	1620	1621	C3.1	SF	N04E06	9715
	1626	1626	1635	C2.5	SF	N04E06	9715
	1704	1704	1713	C3.5	SF	N05E05	9715
	1722	1725	1729	C1.8			
	1802	1808	1829	C5.6	1F	N06E08	9715
	1833	1838	1840		SF	N04E08	9715
	1949	1949	2001	C3.7	SF	S06E58	9718
	2047	2047	2054	C2.7	SF	N06E02	9715
	2120	2126	2130	C3.0			
	2135	2139	2144	C2.2			
	2324	2328	2338	C1.7			
	30 November	0102	0105	0120	M3.5	1N	S06E57
0133		0133	0147		SF	S07E54	9718
0407		0434	0437	C4.6	SF	S07E52	9718
0542		0545	0551		SF	N11W44	9712
0916		0924	0936	C4.8	SF	S05E52	9718
1046		1047	1053		SF	N05W03	9715
1135		1136	1140	C1.6	SF	N05W03	9715
1210		1255	1303	C2.9			9718
1402		1418	1434	M1.5			9720
1845		1847	1850	C2.1	SF	N03W04	9715
1906		1908	1910	C3.1	SF	N01W08	9715
1921		1924	1927		SF	N02W06	9715
1955		2001	2004	M2.9			9714
01 December	0102	0105	0115		SF	S10W72	9714
	0156	0157	0201	C4.1	SF	N02W10	9715
	0305	0306	0311		SF	S09W73	9714
	0325	0328	0331		SF	S10W72	9714
	0420	0435	0640		2F	S09W74	9714
	0640	0641	0651		SF	S10W75	9714
	0649	0650	0734	M2.2	2N	S06E42	9718
	0652	0709	0810		1F	S09W75	9714
	0826	0835	0904		SF	S12W75	9714
	0949	0949	0953		SF	S10W76	9714
	1125	1126	1135		SF	S10W75	9714
	1144	1149	1200	C4.9			
	1206	1206	1209		SF	S12W79	9714
1215	1216	1239	C5.0	SF	N01W16	9715	
1432	1435	1438	M1.2	SF	S10W78	9714	
1434	1435	1446		SF	N02E29	9717	



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
01 December	1500	1555	1628	M4.8				
	1653	1655	1705	M2.9	SF	S08W80	9714	
	1725	1726	1732		SF	S08W82	9714	
	1729	1731	1741	M1.5	1F	S07E36	9718	
	1742	1744	1752	M1.8	SF	N10E80	9724	
	1743	1743	1749		SF	N01E22	9717	
	1745	1750	1757		SF	S07E35	9718	
	1835	1838	1841		SF	S08W82	9714	
	1922	1923	1931		SF	S09W82	9714	
	1954	2006	2019		SF	S09W83	9714	
	2048	2101	2108		SF	S06E33	9718	
	2300	2301	2308	C8.7	SF	S08W79	9714	
	02 December	0043	0045	0056		SF	S09W84	9714
		0241	0243	0246	C3.0	SF	S09W83	9714
0330		0333	0346	C3.8	1F	N04E17	9717	
0808		0814	0825	C4.8				
1057		1101	1116		SF	N03E13	9717	
1131		1139	1155	C3.5	SF	S06E24	9718	
1219		1221	1241		SF	N04W30	9715	
1409		1500	1548	M1.3			9714	
1444		1456	1505		SF	N07W31	9715	
1533		1534	1619		SF	N04E09	9717	
1637		1637	1643		SF	S05E20	9718	
1841		1855	1943	C4.6	SF	N07W33	9715	
1951		1954	2005		SF	N02E12	9717	
2014		2015	2025		SF	N06W33	9715	
2050		2055	2118		SF	N06W32	9715	
2125		2206	2229	M2.0			9714	
2225	2226	2229		SF	N07W35	9715		
2225	2226	2228		SF	S05W21	9716		



Region Summary

Date	Location		Sunspot Characteristics					Flares															
	Helio		Area (10 ⁻⁶)	Extent hemi)	Spot (helio)	Spot Class	Mag Count	X-ray		Optical													
	(° Lat ° CMD)	Lon						Class	C	M	X	S	1	2	3	4							
<i>Region 9704</i>																							
14 Nov	S18E70	268	0150	02	HAX	003	A																
15 Nov	S18E56	269	0270	05	CKO	006	B	1															
16 Nov	S18E41	271	0430	07	CKO	014	B																
17 Nov	S18E28	270	0500	09	DKI	024	B		1			4		1									
18 Nov	S18E16	269	0570	08	DKI	027	BGD	2				4											
19 Nov	S16E02	270	0610	07	DKI	028	BGD	3				5											
20 Nov	S18W10	270	0540	09	DKI	030	BGD	4				4											
21 Nov	S17W24	271	0560	10	DKI	030	BGD	9				13											
22 Nov	S18W38	271	0610	14	EKI	024	BGD	3	2			5	1	1									
23 Nov	S17W51	271	0620	10	DKI	026	BGD	2				1											
24 Nov	S17W63	270	0550	12	EKI	018	BGD	11				16		3									
25 Nov	S18W74	268	0430	10	DAI	008	BG	8		1		10											
26 Nov	S20W88	269	0250	09	DAO	003	B	1				1											
								44	3	1	65	5	1	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 270

Region 9710

18 Nov	S10E46	239	0050	02	CAO	004	B															
19 Nov	S12E32	240	0050	06	DAO	012	B															
20 Nov	S11E18	242	0090	07	DAO	012	B															
21 Nov	S11E05	242	0090	10	DSO	018	B															
22 Nov	S11W08	241	0100	11	EAO	015	B					1										
23 Nov	S11W22	242	0070	12	CAO	010	B															
24 Nov	S11W37	244	0040	06	CSO	006	B					1										
25 Nov	S09W53	247	0030	05	CSO	003	B															
26 Nov	S10W66	247	0020	01	HRX	001	A															
27 Nov	S08W81	249	0020	01	HSX	001	A															
28 Nov	S08W94	249																				
								0	0	0	2	0	0	0	0	0						

Crossed West Limb.

Absolute heliographic longitude: 242



Region Summary - continued.

Date	Location		Sunspot Characteristics					Flares															
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶)	Extent hemi)	Spot (helio)	Spot Class	Mag Count	X-ray			Optical												
		Lon						Class	C	M	X	S	1	2	3	4							
<i>Region 9712</i>																							
21 Nov	N13E71	176	0050	06	CSO	004	B																
22 Nov	N12E58	175	0090	05	DSO	007	B																
23 Nov	N11E43	177	0080	05	DAO	011	B																
24 Nov	N11E30	177	0090	07	DAO	015	B																
25 Nov	N12E16	178	0080	08	DAO	018	B																
26 Nov	N12E03	178	0080	07	DSO	020	B																
27 Nov	N11W10	178	0100	07	DAO	020	B																
28 Nov	N12W24	178	0140	07	DAO	019	B																
29 Nov	N12W37	178	0070	05	DAO	012	B														2		
30 Nov	N12W53	181	0030	05	CSO	003	B														1		
01 Dec	N12W65	180	0020	04	CSO	003	B																
02 Dec	N12W78	180	0000	01	AXX	001	A																
													0	0	0	3	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 178

Region 9713

22 Nov	N08E03	230	0040	05	DSO	010	B
23 Nov	N08W11	231	0040	07	DSO	009	B
24 Nov	N08W25	232	0005	04	BXO	005	B
25 Nov	N08W38	232					
26 Nov	N08W51	232					

0 0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 230



Region Summary - continued.

Date	Location		Sunspot Characteristics					Flares															
	Helio		Area (10 ⁻⁶)	Extent hemi)	Spot (helio)	Spot Class	Mag Count	X-ray			Optical												
	(° Lat ° CMD)	Lon						Class	C	M	X	S	1	2	3	4							
<i>Region 9714</i>																							
22 Nov	S11E36	197	0050	05	DAO	004	B																
23 Nov	S11E21	199	0020	04	CSO	005	B																
24 Nov	S11E08	199	0020	05	CSO	005	B																
25 Nov	S11W01	195	0020	06	BXO	004	B							1									
26 Nov	S09W11	192	0040	04	CSO	007	B																
27 Nov	S10W26	194	0040	05	DAO	008	B																
28 Nov	S09W41	195	0070	07	DAO	010	B																
29 Nov	S08W54	195	0090	09	DSO	005	B																
30 Nov	S09W69	197	0100	09	CSO	004	B		1														
01 Dec	S10W84	199	0240	10	DAO	007	B	1	2		15	1	1										
02 Dec	S09W95	197	0120	04	DAO	003	B	1	2		2												
								2	5	0	18	1	1	0	0								

Still on Disk.

Absolute heliographic longitude: 195

<i>Region 9715</i>																							
23 Nov	N07E80	140	0040	03	HSX	001	A																
24 Nov	N06E69	138	0100	08	CSO	004	B						2										
25 Nov	N06E58	136	0250	11	EAO	008	B						4										
26 Nov	N06E44	137	0460	12	EKI	027	BG	2					3										
27 Nov	N05E30	138	0500	12	EKI	029	BG	1	1		2	1											
28 Nov	N05E17	137	0600	12	EKC	043	BGD	5	1		4	3											
29 Nov	N05E04	137	0910	15	EKC	053	BGD	9	2		9	2											
30 Nov	N05W11	139	0990	16	EKC	025	BGD	3			5												
01 Dec	N05W23	138	0890	11	EKC	031	BGD	2			2												
02 Dec	N04W37	139	0800	10	DKC	045	BGD	1			6												
								23	4	0	37	6	0	0	0								

Still on Disk.

Absolute heliographic longitude: 137



Region Summary - continued.

Date	Location		Sunspot Characteristics					Flares															
	(° Lat ° CMD)	Helio Lon	Area (10 ⁻⁶)	Extent (hemi)	Spot (helio)	Spot Class	Mag Count	X-ray			Optical												
								Class	C	M	X	S	1	2	3	4							
<i>Region 9716</i>																							
25 Nov	S04E73	121	0040	01	HAX	001	A																
26 Nov	S05E57	124	0040	06	CSO	004	B	1			1												
27 Nov	S05E42	126	0060	04	CSO	004	B																
28 Nov	S05E28	126	0070	05	CSO	005	B																
29 Nov	S06E16	125	0060	05	CAO	008	B																
30 Nov	S05E01	127	0050	04	CAO	003	B																
01 Dec	S04W10	125	0030	07	CSO	004	B																
02 Dec	S04W23	125	0040	09	DAO	008	B				1												
								1	0	0	2	0	0	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 127

<i>Region 9717</i>																							
27 Nov	N06E78	090	0160	03	HAX	001	A																
28 Nov	N04E65	089	0230	08	CAO	002	B																
29 Nov	N04E53	088	0280	14	EKO	004	B	1															
30 Nov	N05E40	088	0320	13	EKO	003	B																
01 Dec	N04E27	088	0270	14	EAO	003	B				2												
02 Dec	N05E13	089	0230	14	EAO	006	B	1			3	1											
								2	0	0	5	1	0	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 089

<i>Region 9718</i>																							
27 Nov	S06E84	084	0060	02	HAX	006	A	3			7	1											
28 Nov	S07E70	084	0410	10	DAI	005	B	1			10												
29 Nov	S07E58	083	0440	11	EKI	013	B	1			1												
30 Nov	S07E42	086	0500	12	EKO	012	B	3	1		3	1											
01 Dec	S07E30	085	0540	12	EKI	016	BG		2		2	1	1										
02 Dec	S06E17	085	0600	12	EKI	030	BG	1			2												
								9	3	0	25	3	1	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 085



Region Summary - continued.

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

Region 9719

28 Nov	N03E03	151	0020	01	HSX	001	A
29 Nov	N03W10	151	0030	06	CAO	007	B
30 Nov	N04W24	152	0060	06	DSO	006	B
01 Dec	N03W38	153	0040	05	DSO	004	B
02 Dec	N04W51	153	0040	07	DSO	006	B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 151

Region 9720

28 Nov	S18E72	082	0150	09	DAO	004	B
29 Nov	S18E54	087	0120	10	DAO	009	B
30 Nov	S18E46	082	0150	12	EAO	009	B
01 Dec	S18E33	082	0070	11	EAO	010	B
02 Dec	S18E20	082	0040	09	CAO	012	B

0 1 0 3 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 082

Region 9721

28 Nov	N10E78	076	0120	01	HAX	001	A
29 Nov	N12E70	071	0130	08	CAO	003	B
30 Nov	N13E57	071	0140	10	DSO	003	B
01 Dec	N13E43	072	0160	09	DAO	004	B
02 Dec	N13E30	072	0170	16	CAO	007	B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 072

Region 9722

01 Dec	S16W19	134	0030	04	DSO	004	B
02 Dec	S15W34	136	0040	05	DSO	004	B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 134



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares										
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶)	Extent hemi)	Spot (helio)	Spot Class	Mag Count	X-ray			Optical						
		Lon						Class	C	M	X	S	1	2	3	4	
<i>Region 9723</i>																	
01 Dec	S09E45	070	0020	01	HSX	001	A										
02 Dec	S06E31	071	0020	04	CSO	003	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 071																	
<i>Region 9724</i>																	
01 Dec	N09E74	041	0070	03	HSX	001	A	1		1							
02 Dec	N09E59	043	0050	02	HSX	001	A										
								0	1	0	1	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 043																	
<i>Region 9725</i>																	
02 Dec	S11W45	147	0030	03	DSO	003	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 147																	
<i>Region 9726</i>																	
02 Dec	S15E69	033	0070	03	DSO	002	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 033																	

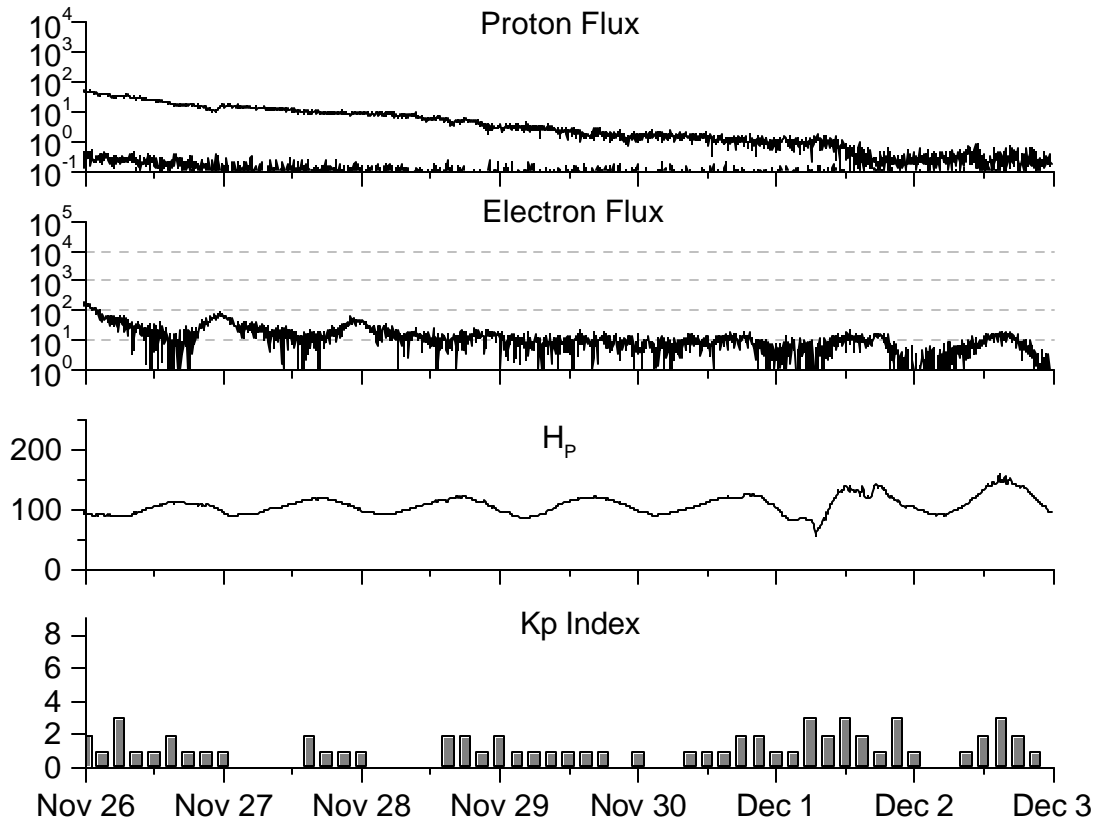


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
1999									
December	123.5	86.4	0.69	165.9	111.1	169.8	173.4	10	13.8
2000									
January	140.8	90.1	0.64	168.0	112.9	158.1	175.5	13	14.5
February	161.9	112.9	0.70	172.1	116.7	173.2	176.8	15	15.0
March	203.6	138.5	0.68	175.4	119.9	208.2	178.4	09	15.0
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72	166.2	114.4	167.7	175.6	18	14.6
November	149.9	106.5	0.71	162.7	112.7	178.8	173.6	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.0	08	14.4
2001									
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	174.8	12	12.5
June	196.7	134.0	0.68			173.7		12	
July	124.6	82.2	0.66			131.3		11	
August	159.4	106.8	0.67			163.2		13	
September	229.1	150.7	0.66			233.3		12	
October	197.4	125.6	0.64			208.2		18	
November	178.6	106.5	0.60			212.5		14	

NOTE: All smoothed values after June 1999 and monthly values after December 2000 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 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 26 November 2001

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.

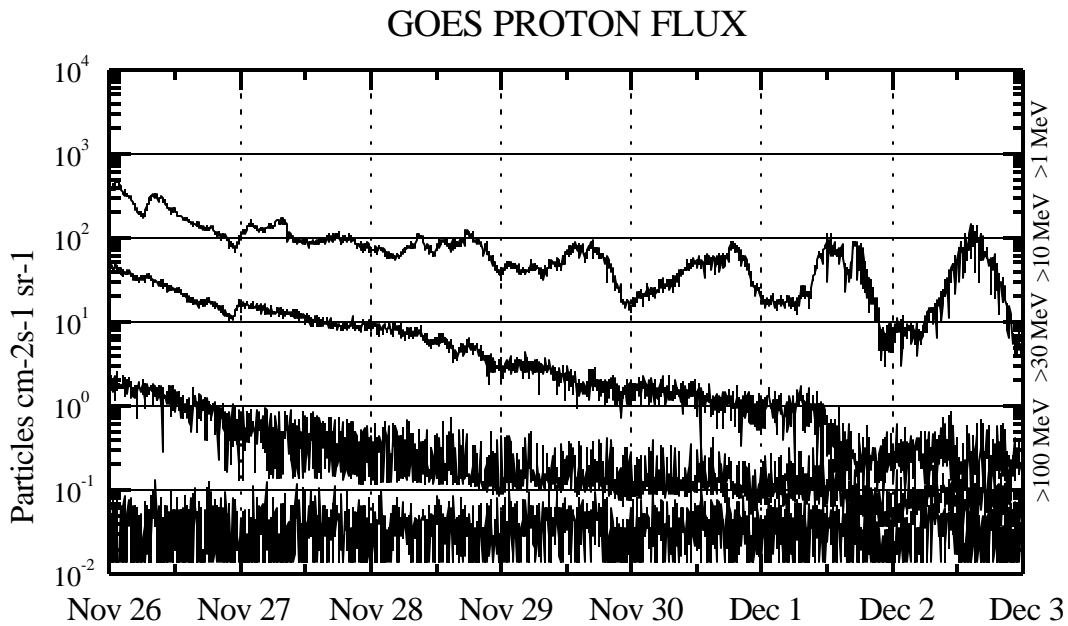
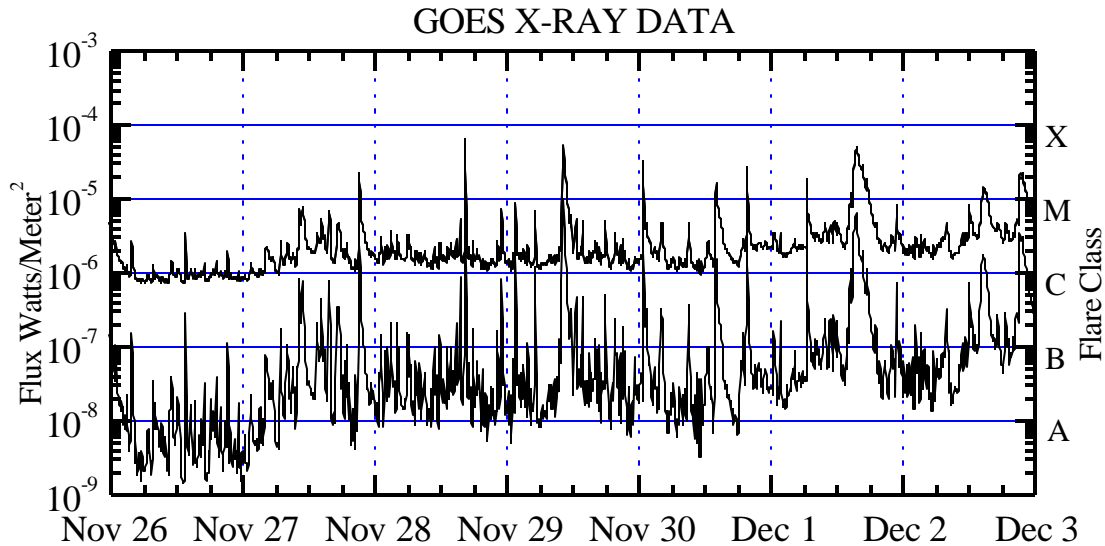
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-8.

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 Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_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 more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



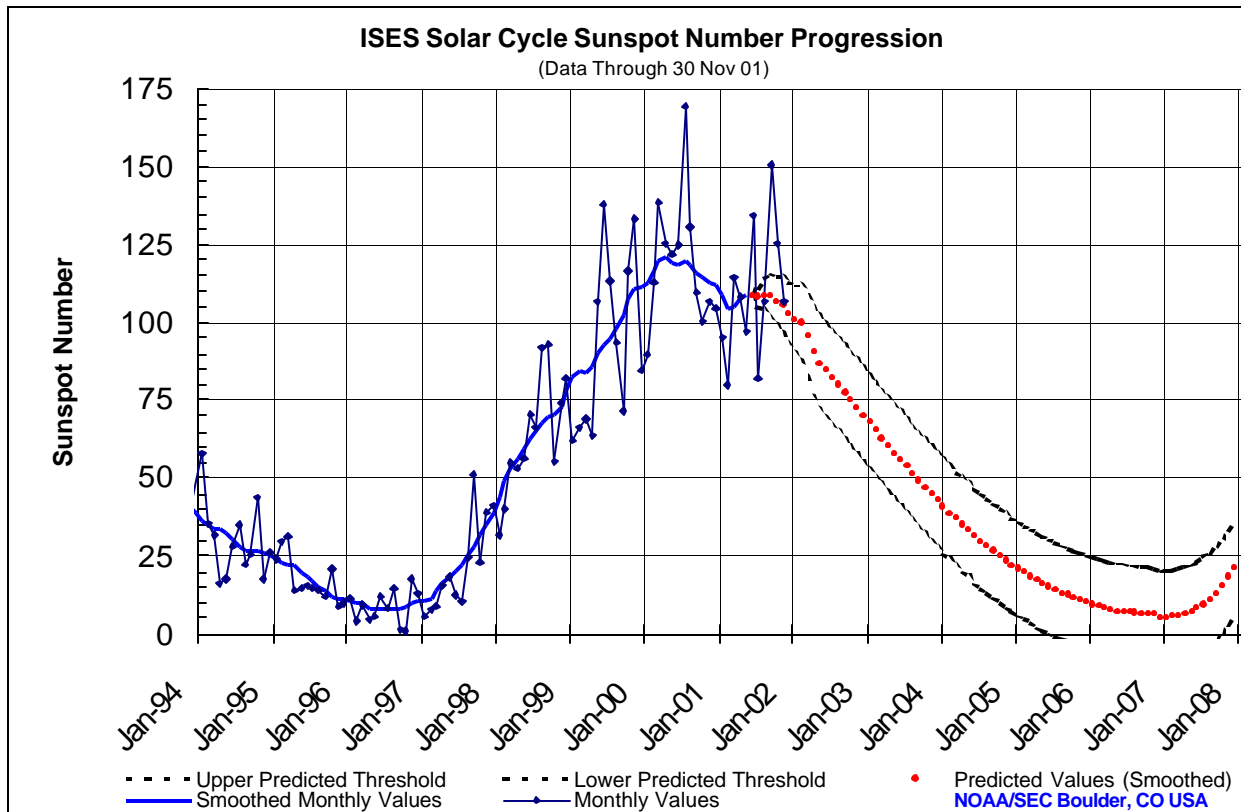


Weekly GOES Satellite X-ray and Proton Plots

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.

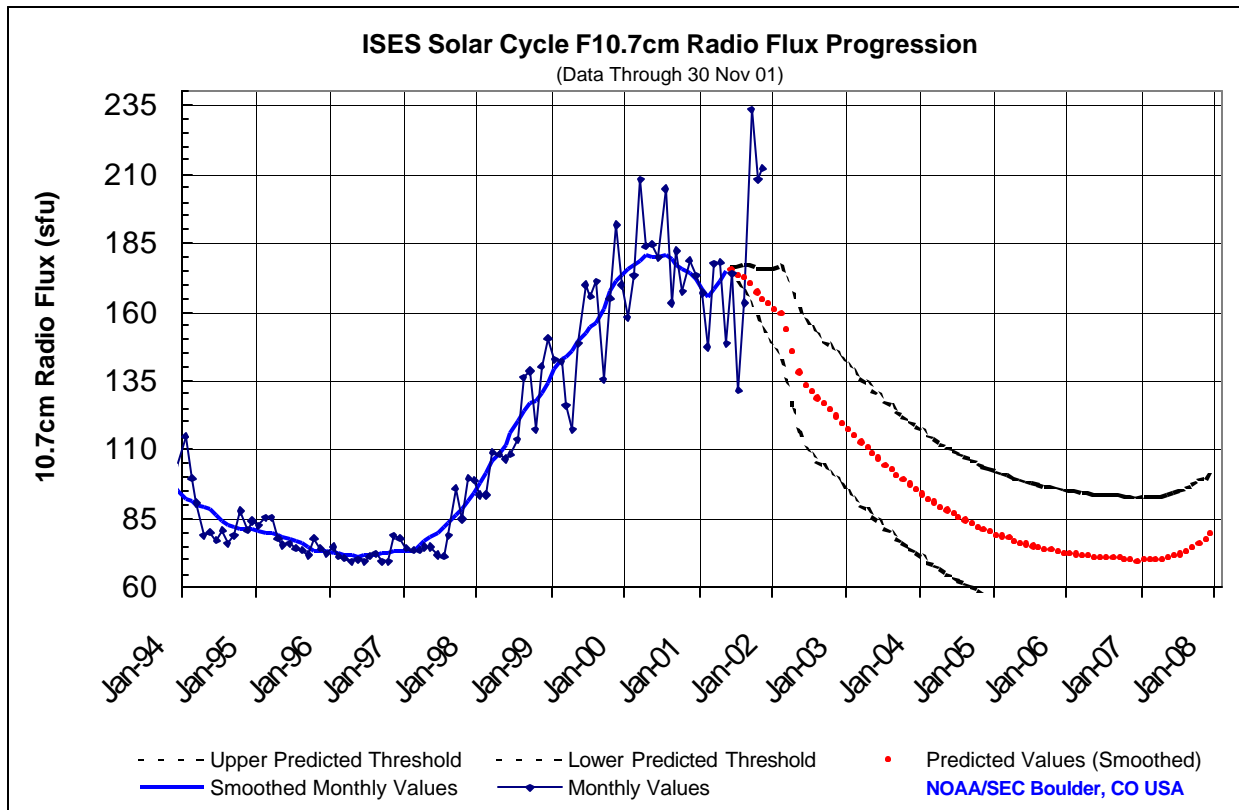




SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	44 (***)	49 (***)	53 (***)	57 (***)	59 (***)	63 (***)	66 (***)	68 (***)	70 (***)	71 (***)	73 (***)	78 (***)
1999	83 (***)	85 (***)	84 (***)	86 (***)	91 (***)	93 (***)	94 (***)	97 (***)	102 (***)	108 (***)	111 (***)	111 (***)
2000	113 (***)	117 (***)	120 (***)	121 (***)	119 (***)	119 (***)	120 (***)	119 (***)	116 (***)	114 (***)	113 (***)	112 (***)
2001	109 (***)	104 (***)	105 (***)	108 (***)	109 (***)	109 (1)	108 (3)	109 (5)	108 (7)	107 (8)	105 (9)	103 (10)
2002	101 (11)	100 (12)	96 (13)	90 (14)	87 (15)	85 (15)	82 (15)	80 (15)	77 (15)	75 (15)	73 (15)	70 (15)
2003	68 (15)	65 (15)	63 (15)	61 (15)	58 (15)	56 (15)	54 (15)	51 (15)	49 (15)	47 (15)	45 (15)	43 (15)
2004	41 (15)	39 (15)	37 (15)	35 (15)	33 (15)	31 (15)	30 (15)	28 (15)	27 (15)	25 (15)	24 (15)	22 (15)
2005	21 (15)	20 (15)	18 (15)	17 (15)	16 (15)	15 (15)	14 (15)	13 (15)	12 (15)	12 (15)	11 (15)	10 (15)
2006	10 (15)	9 (15)	8 (15)	8 (15)	8 (15)	7 (15)	7 (15)	7 (15)	7 (15)	6 (15)	6 (15)	5 (15)
2007	5 (15)	6 (15)	6 (15)	6 (15)	7 (15)	8 (15)	10 (15)	11 (15)	13 (15)	16 (15)	18 (15)	21 (15)





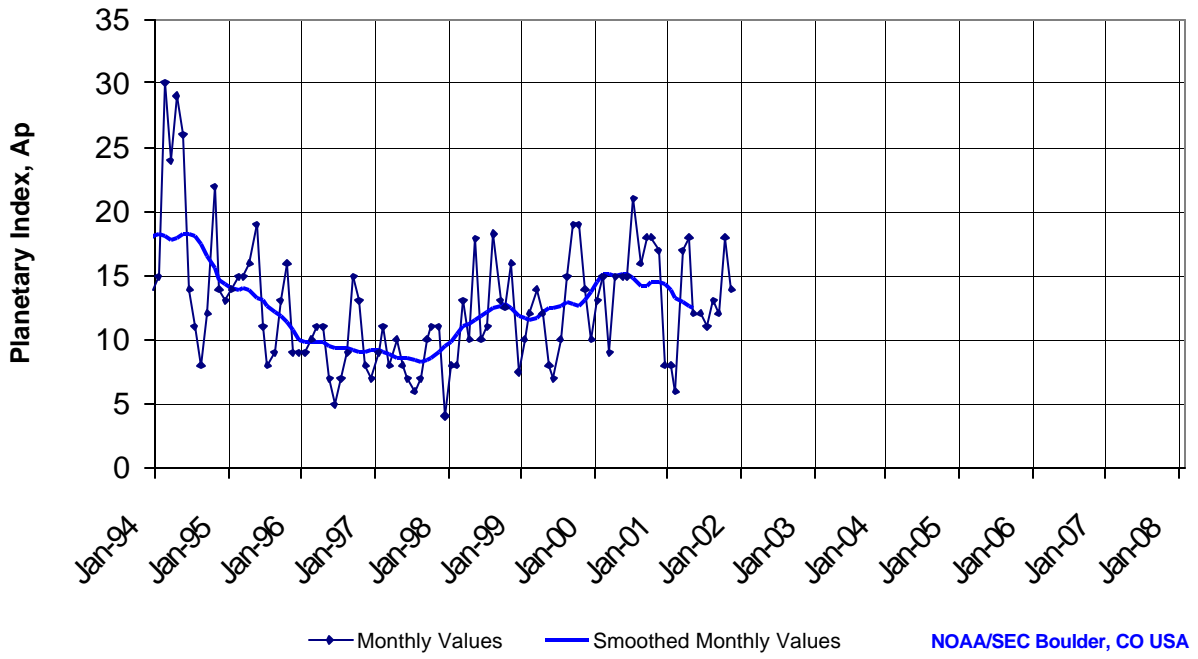
SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	98 (***)	102 (***)	106 (***)	109 (***)	112 (***)	116 (***)	120 (***)	124 (***)	127 (***)	128 (***)	130 (***)	134 (***)
1999	139 (***)	143 (***)	144 (***)	146 (***)	150 (***)	153 (***)	154 (***)	156 (***)	161 (***)	167 (***)	172 (***)	173 (***)
2000	175 (***)	176 (***)	178 (***)	181 (***)	180 (***)	180 (***)	180 (***)	180 (***)	177 (***)	176 (***)	174 (***)	172 (***)
2001	169 (***)	166 (***)	168 (***)	172 (***)	175 (***)	175 (1)	173 (3)	172 (5)	170 (7)	167 (9)	165 (11)	162 (13)
2002	161 (15)	159 (17)	153 (19)	145 (21)	138 (22)	133 (23)	131 (23)	129 (23)	126 (23)	124 (23)	122 (23)	120 (23)
2003	117 (23)	115 (23)	113 (23)	111 (23)	109 (23)	107 (23)	104 (23)	103 (23)	101 (23)	99 (23)	97 (23)	95 (23)
2004	94 (23)	92 (23)	91 (23)	89 (23)	88 (23)	87 (23)	85 (23)	84 (23)	83 (23)	82 (23)	81 (23)	80 (23)
2005	79 (23)	78 (23)	78 (23)	77 (23)	76 (23)	75 (23)	75 (23)	74 (23)	74 (23)	73 (23)	73 (23)	73 (23)
2006	72 (23)	72 (23)	71 (23)	71 (23)	71 (23)	71 (23)	71 (23)	71 (23)	70 (23)	70 (23)	70 (23)	70 (23)
2007	70 (23)	70 (23)	70 (23)	70 (23)	71 (23)	71 (23)	72 (23)	73 (23)	74 (23)	76 (23)	77 (23)	79 (23)



ISES Solar Cycle Ap Progression

(Data Through 30 Nov 01)





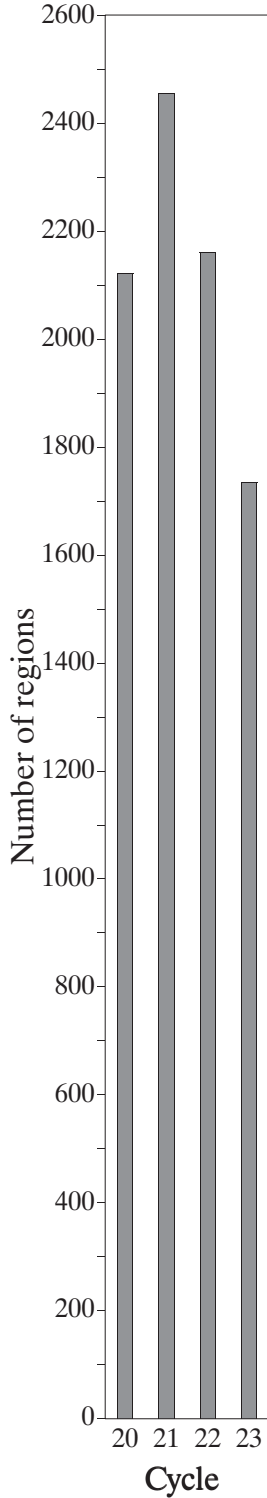
Space Environment Center

Active Regions

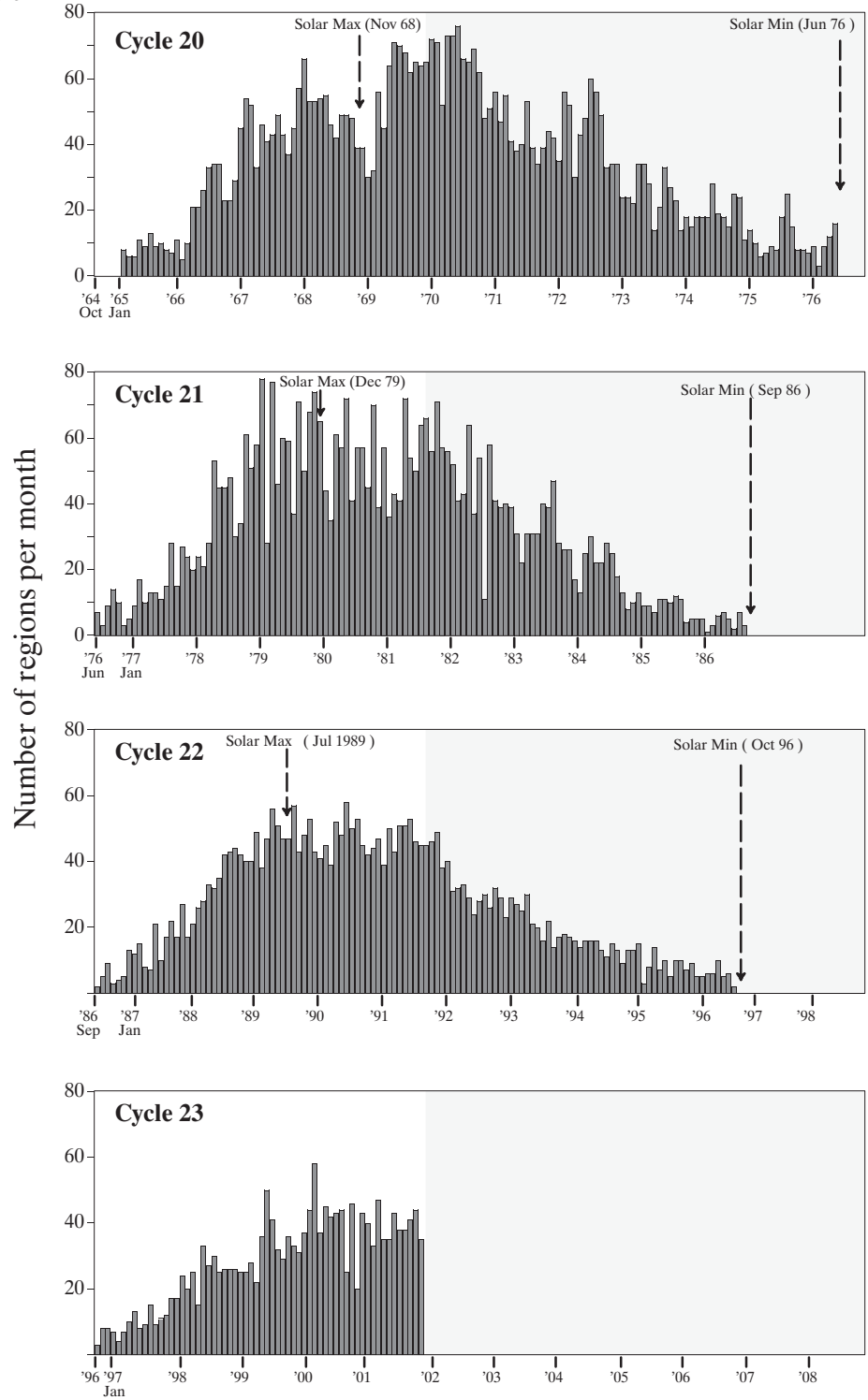
November 2001
(Month 62)



Comparison of Cycles at current month in cycle



Preliminary data

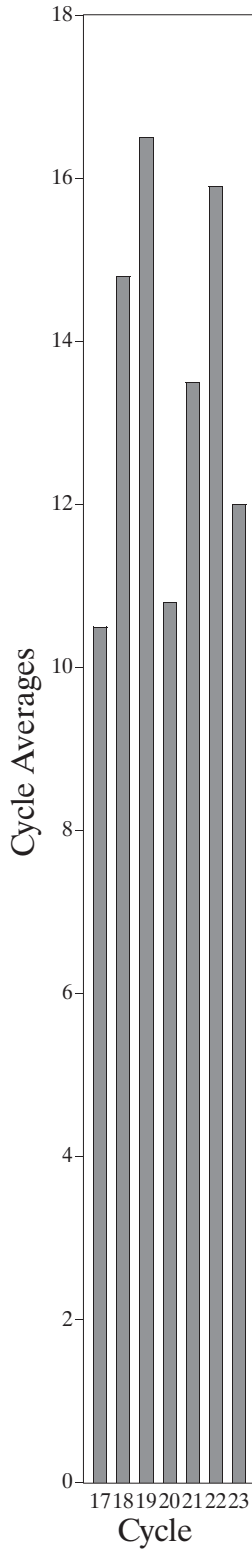


Geomagnetic Activity (A_p)



Space Environment Center

Comparison of Cycles at current month in cycle



November 2001
(Month 62)

█ Preliminary data

