

Space Weather Highlights
29 – 04 November 2007

SEC PRF 1679
06 November 2007

Solar activity was very low. No flares were detected. The visible disk remained spotless.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels throughout the period.

The period began with the geomagnetic field at quiet levels. By midday on 29 October, activity increased to unsettled to active levels, and remained so through late on 30 October. ACE solar wind data indicated the 29 - 30 October activity was the result of a recurrent coronal hole high-speed stream (HSS). The HSS was preceded by a co-rotating interaction region (CIR), which reached the ACE spacecraft at approximately 29/1800 UTC. IMF changes associated with the CIR included increased Bt (peak 8.4 nT at 29/2044 UTC) and increased Bz variability (minimum -9.0 nT at 29/1939 UTC). A density increase was also associated with the CIR (peak 6.1 p/cc at 29/2011 UTC). Solar wind velocities increased during 29 - 30 October and reached a peak of 609 km/sec at 30/0315 UTC. The HSS began to gradually subside late on 30 October.

Space Weather Outlook
07 November – 03 December 2007

Solar activity is expected to be very low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels.

Activity is expected to be at mostly quiet levels during 07 - 13 November. Activity is expected to increase to quiet to unsettled levels during 14 November. A further increase to unsettled to active levels is forecast for 15 - 16 November due to a recurrent coronal hole high-speed stream. Quiet to unsettled conditions are expected during 17 - 20 November. Activity is expected to increase to unsettled to active with a chance for minor storm levels during 21 – 22 November due to a recurrent coronal hole high-speed stream. Activity is expected to decrease to quiet to unsettled levels during 23 - 24 November as the high-speed stream subsides. Activity is expected to increase to unsettled to active levels on 25 - 26 November as another recurrent coronal hole high-speed stream becomes geoeffective. From 27 November- 03 December, mostly quiet conditions are expected.



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
29 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
30 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
31 October	67	0	0	<A1.0	0	0	0	0	0	0	0	0
01 November	67	0	0	<A1.0	0	0	0	0	0	0	0	0
02 November	68	0	0	<A1.0	0	0	0	0	0	0	0	0
03 November	68	0	0	<A1.0	0	0	0	0	0	0	0	0
04 November	68	0	0	<A1.0	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
29 October	2.0E+6	1.7E+4	3.9E+3		6.2E+8	
30 October	2.3E+6	1.7E+4	4.1E+3		1.0E+8	
31 October	1.6E+6	1.8E+4	4.4E+3		1.9E+8	
01 November	2.1E+6	1.8E+4	4.5E+3		2.8E+8	
02 November	2.3E+6	1.8E+4	4.4E+3		2.0E+8	
03 November	1.7E+6	1.8E+4	4.5E+3		1.4E+8	
04 November	3.0E+6	1.8E+4	4.4E+3		1.1E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
29 October	8	1-0-1-1-1-2-4-3	16	1-1-2-4-4-3-3-4	14	2-0-1-2-2-2-5-4
30 October	10	4-2-2-1-2-2-3-1	12	3-3-3-4-2-2-1-2	10	5-3-2-1-2-2-1-1
31 October	3	1-1-2-1-1-0-1-0	6	1-0-2-3-3-1-1-0	4	1-1-2-1-1-0-1-0
01 November	4	3-0-2-1-0-0-1-0	3	1-0-2-2-0-1-1-1	3	2-0-2-1-0-0-0-1
02 November	1	0-2-0-0-0-0-0-0	2	0-1-0-2-1-0-0-0	2	0-1-1-1-0-0-0-1
03 November	2	1-1-1-0-1-0-0-0	2	0-0-1-1-2-0-0-0	2	1-1-0-0-1-1-0-0
04 November	2	1-0-0-0-2-1-1-1	3	0-0-0-1-3-1-1-1	3	1-0-0-0-1-1-2-2

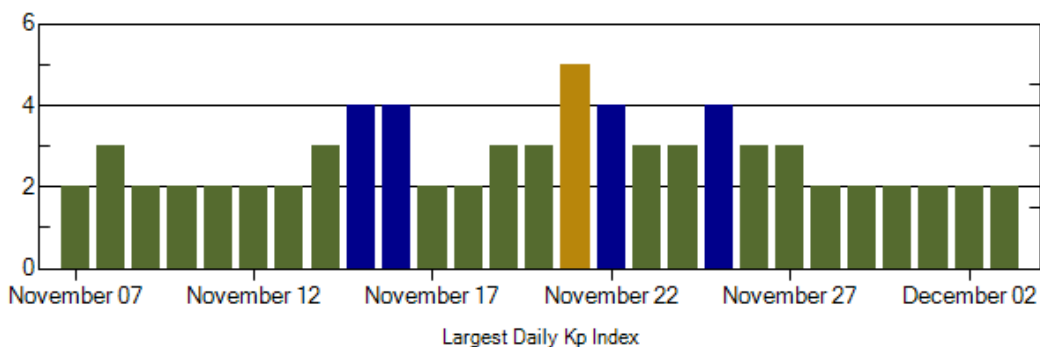
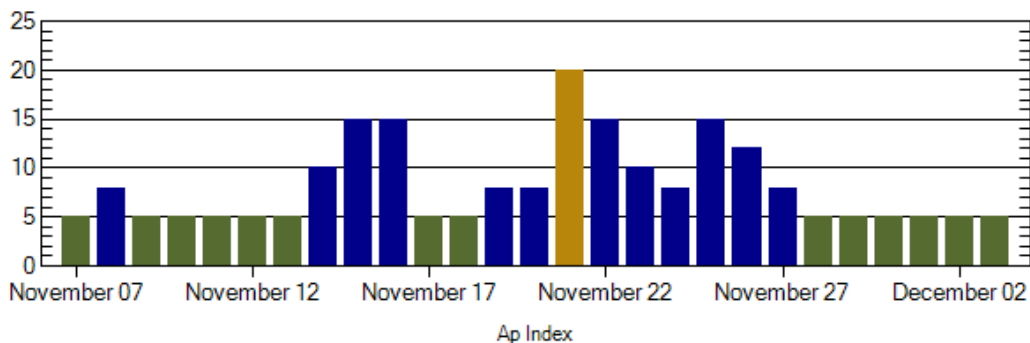
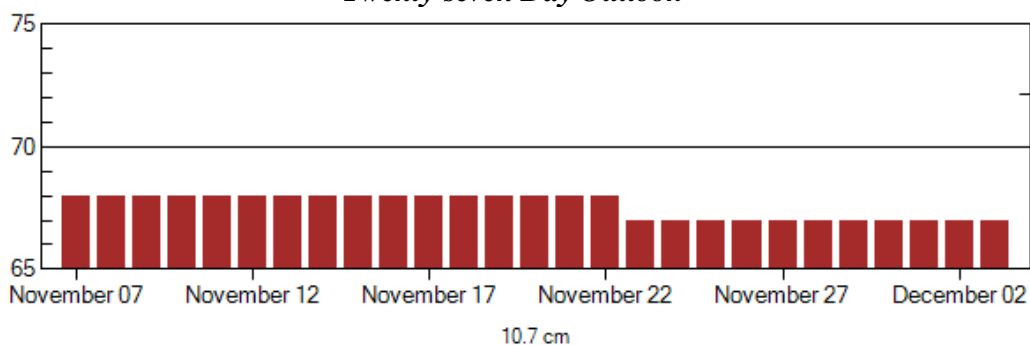


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
29 Oct 0504	ALERT: Electron 2MeV Integral Flux >1000pfu	29 Oct 0500
29 Oct 2057	WARNING: Geomagnetic K-index =4	29 Oct 2057 – 30/1600
29 Oct 2134	ALERT: Geomagnetic K=4	29 Oct 2132
30 Oct 1202	ALERT: Electron 2MeV Integral Flux >1000pfu	30 Oct 1140
31 Oct 0828	ALERT: Electron 2MeV Integral Flux >1000pfu	31 Oct 0805
01 Nov 0559	ALERT: Electron 2MeV Integral Flux >1000pfu	01 Nov 0500
02 Nov 0656	ALERT: Electron 2MeV Integral Flux >1000pfu	02 Nov 0640
03 Nov 0505	ALERT: Electron 2MeV Integral Flux >1000pfu	03 Nov 0500
04 Nov 0852	ALERT: Electron 2MeV Integral Flux >1000pfu	04 Nov 0835



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
07 Nov	68	5	2	21 Nov	68	20	5
08	68	8	3	22	68	15	4
09	68	5	2	23	67	10	3
10	68	5	2	24	67	8	3
11	68	5	2	25	67	15	4
12	68	5	2	26	67	12	3
13	68	5	2	27	67	8	3
14	68	10	3	28	67	5	2
15	68	15	4	29	67	5	2
16	68	15	4	30	67	5	2
17	68	5	2	01 Dec	67	5	2
18	68	5	2	02	67	5	2
19	68	8	3	03	67	5	2
20	68	8	3				



Energetic Events

Energy Events												
Date	Time			X-ray		Optical Information				Peak		Sweep Freq
	$\frac{1}{2}$			Integ		Imp/	Location		Rgn	Radio Flux		Intensity
	Begin	Max	Max	Class	Flux	Brtns	Lat	CMD	#	245	2695	II IV
	<i>No Events Observed</i>											

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
29 October	No Flares Observed						
30 October	No Flares Observed						
31 October	No Flares Observed						
01 November	No Flares Observed						
02 November	No Flares Observed						
03 November	No Flares Observed						
04 November	No Flares Observed						

Region Summary

August Summary																
Date	Location		Sunspot Characteristics													
	Helio		Flares					X-ray				Optical				
			Area	Extent	Spot	Spot	Mag	X-ray			Optical					
	(° Lat ° CMD)	Lon	(10 ⁻⁶ hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4	

No active regions

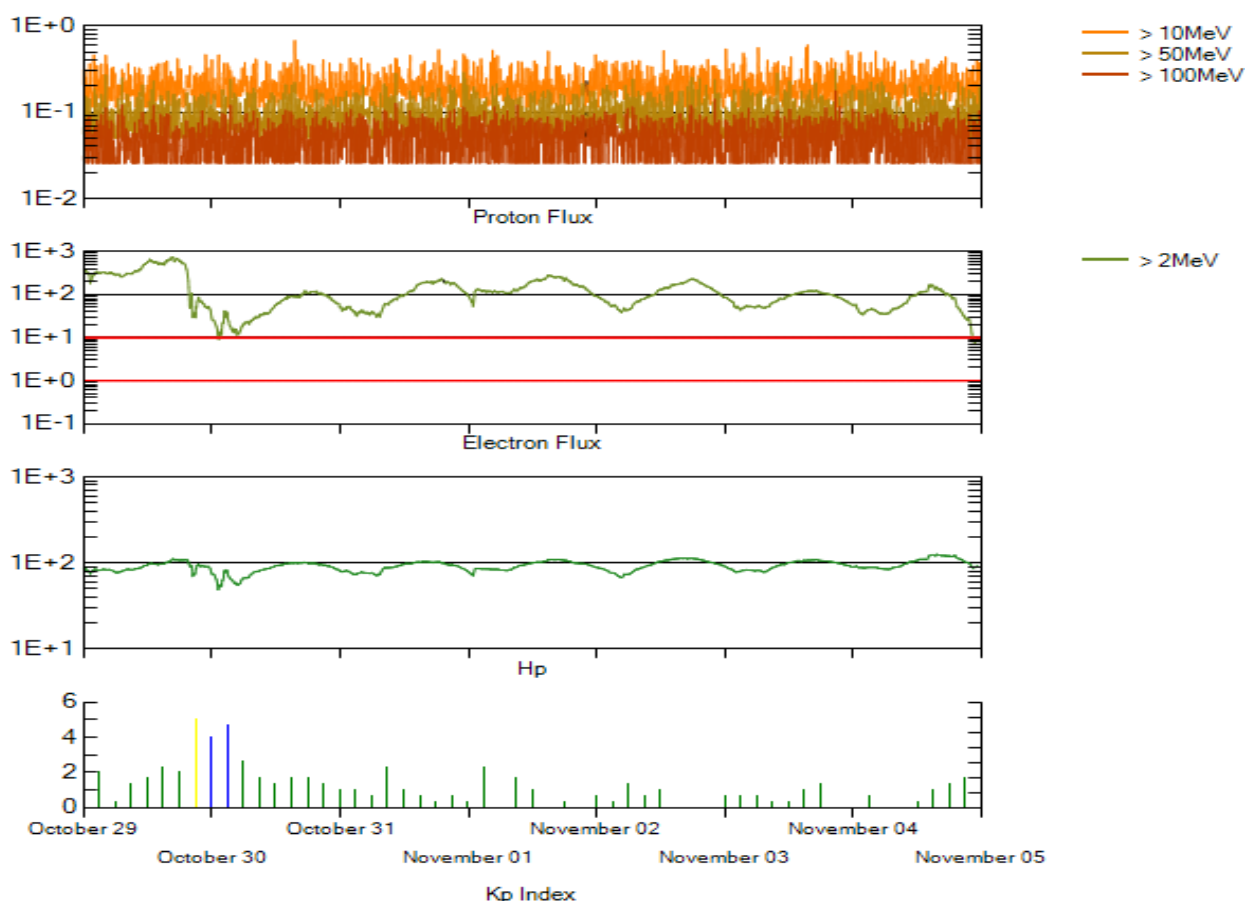


Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed	values	Ratio	Smooth	values	*Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2005									
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57	27.6	15.6	79.0	80.3	9	8.7
September	25.2	14.5	0.58	27.7	15.6	77.8	80.2	8	8.7
October	15.7	10.4	0.66	25.2	14.2	74.3	79.4	8	8.6
November	31.5	21.5	0.68	22.3	12.7	86.4	78.5	9	8.5
December	22.2	13.6	0.61	20.7	12.1	84.3	77.9	15	8.5
2007									
January	26.6	16.9	0.64	19.7	12.0	83.5	77.5	6	8.4
February	17.2	10.6	0.62	18.9	11.6	77.8	76.9	6	8.4
March	9.7	4.8	0.49	17.5	10.8	72.3	76.0	8	8.4
April	6.9	3.7	0.54	16.0	9.9	72.4	75.2	9	8.5
May	19.4	11.7	0.60			74.5		9	
June	20.0	12.0	0.60			73.7		7	
July	15.6	10.0	0.64			71.6		8	
August	9.9	6.2	0.63			69.2		7	
September	4.8	2.4	0.50			67.1		8	
October	1.3	0.9	0.70			65.5		9	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 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 23, RI= 120.8, occurred April 2000. *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 29 October 2007

Protons plot contains the five-minute averaged integral proton flux (protons/cm²–sec –sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

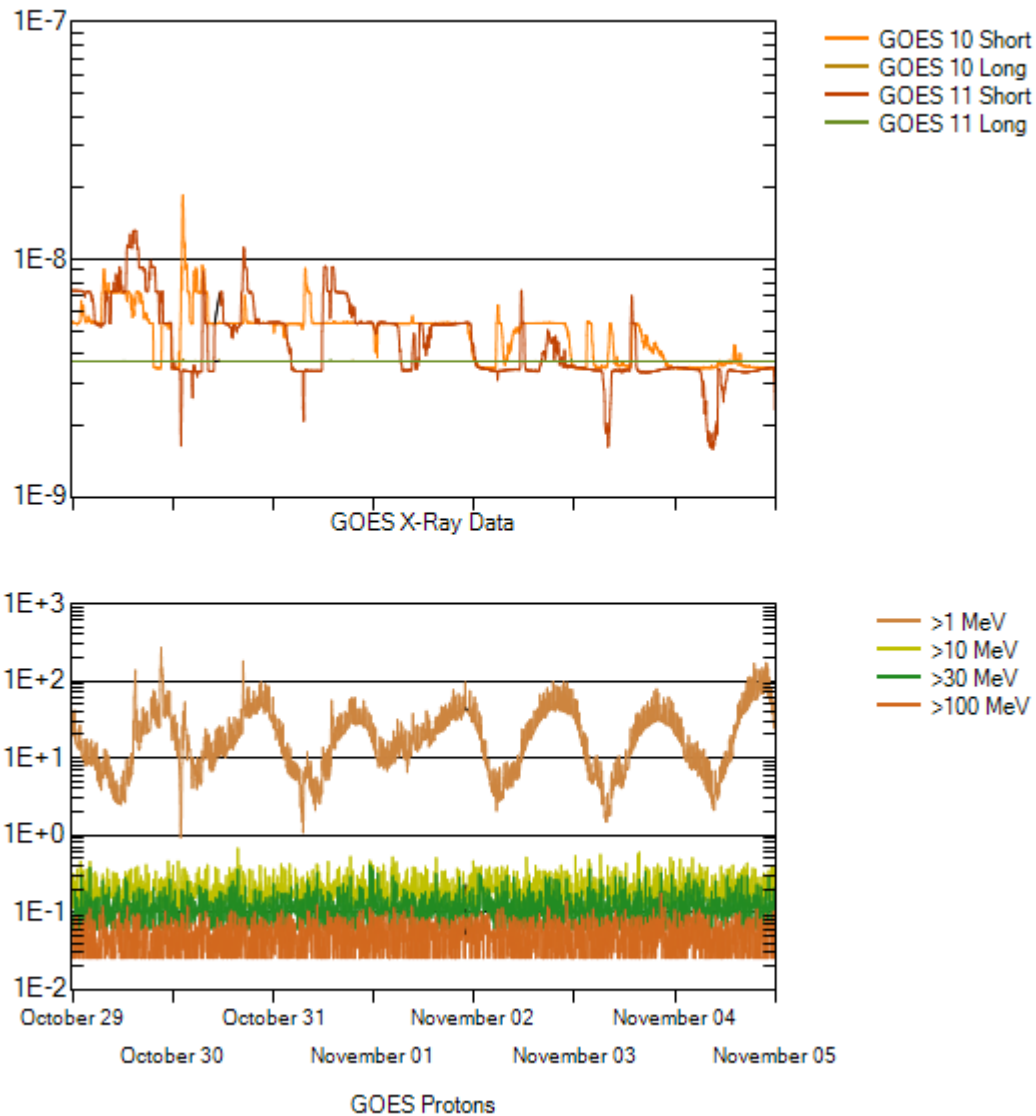
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²–sec –sr) with energies greater than 2 MeV at GOES-12 (W075).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. 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 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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 SEC 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. 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

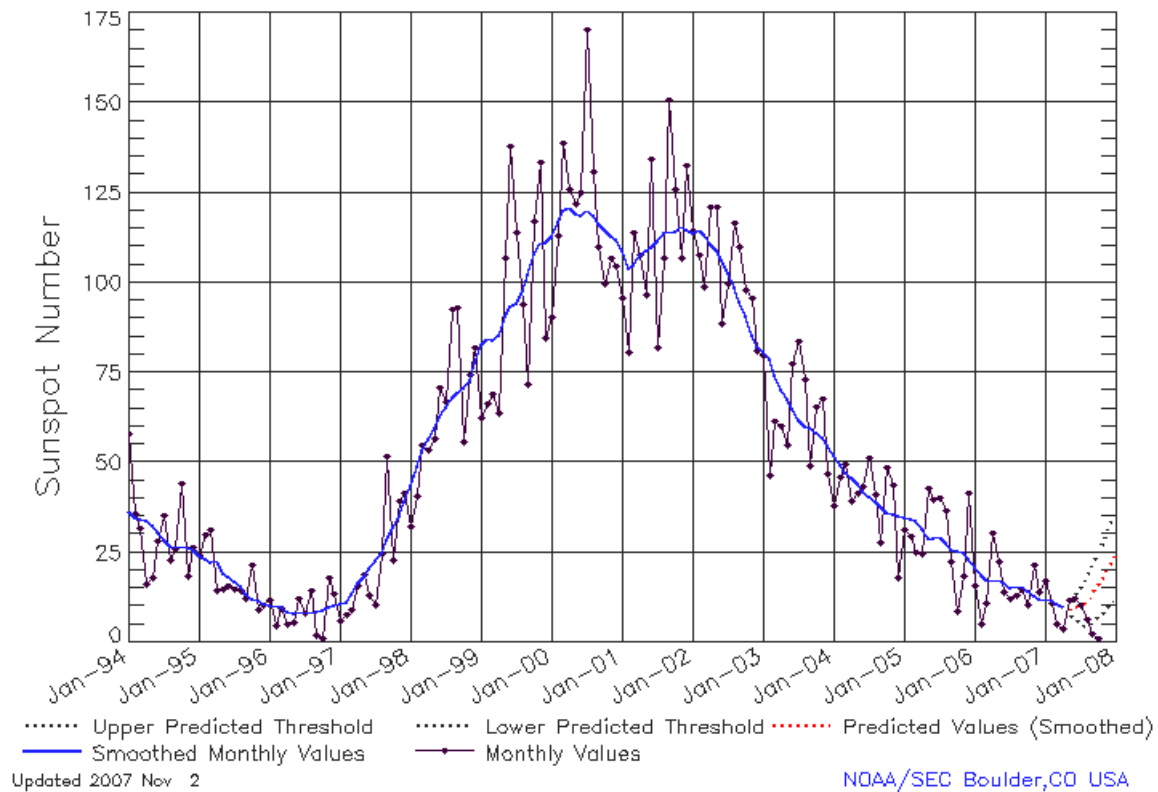
X-ray plot contains five-minute averaged x-ray flux (watts/m^2) as measured by GOES 10 (W060) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 (W135) for each of the energy thresholds: >1 , >10 , >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.



ISES Solar Cycle Sunspot Number Progression

Data Through 31 Oct 07



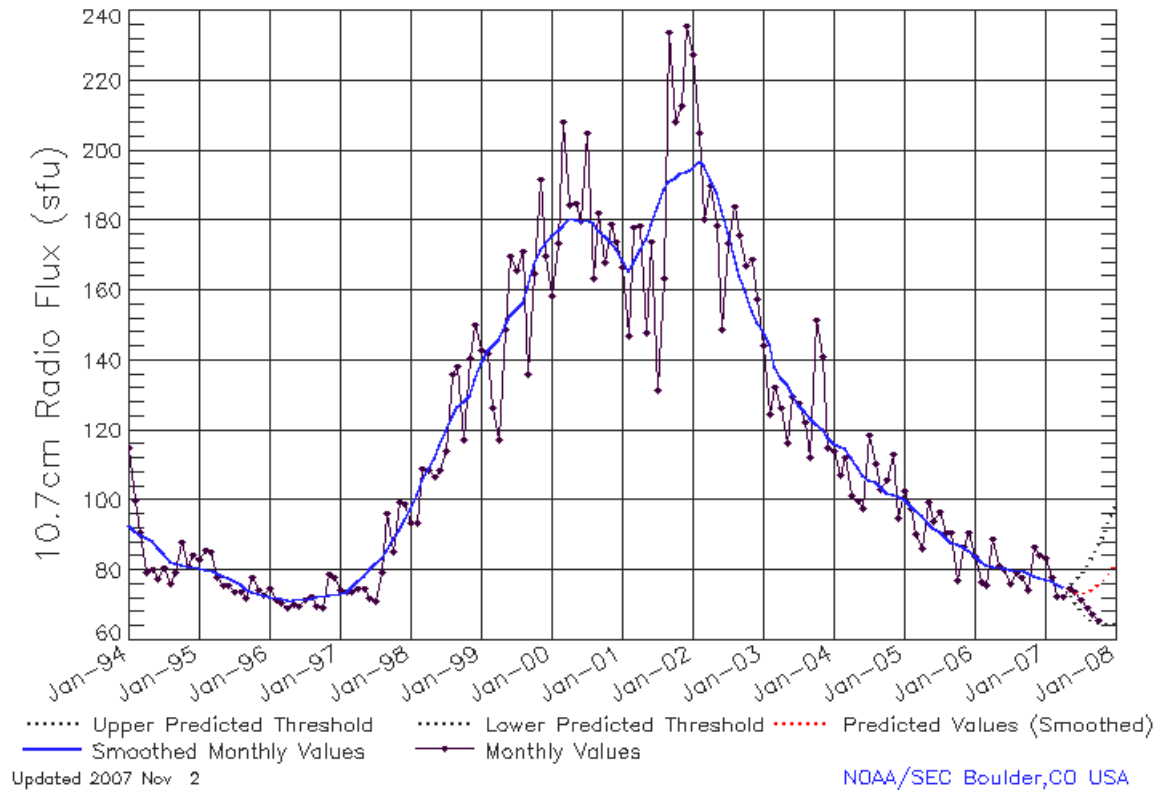
SEC Prediction of Smoothed Sunspot Number

	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	98	102	108	111	111
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2000	113	117	120	121	119	119	120	119	116	115	113	112
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2001	109	104	105	108	109	110	112	114	114	114	116	115
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2002	114	115	113	111	109	106	103	99	95	91	85	82
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2003	81	79	74	70	68	65	62	60	60	58	57	55
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2004	52	49	47	46	44	42	40	39	38	36	35	35
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2005	35	34	34	32	29	29	29	28	26	26	25	23
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2006	21	19	17	17	17	16	15	16	16	14	13	12
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2007	12	12	11	10	9	10	10	11	13	16	19	21
	(**)	(**)	(**)	(**)	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Oct 07



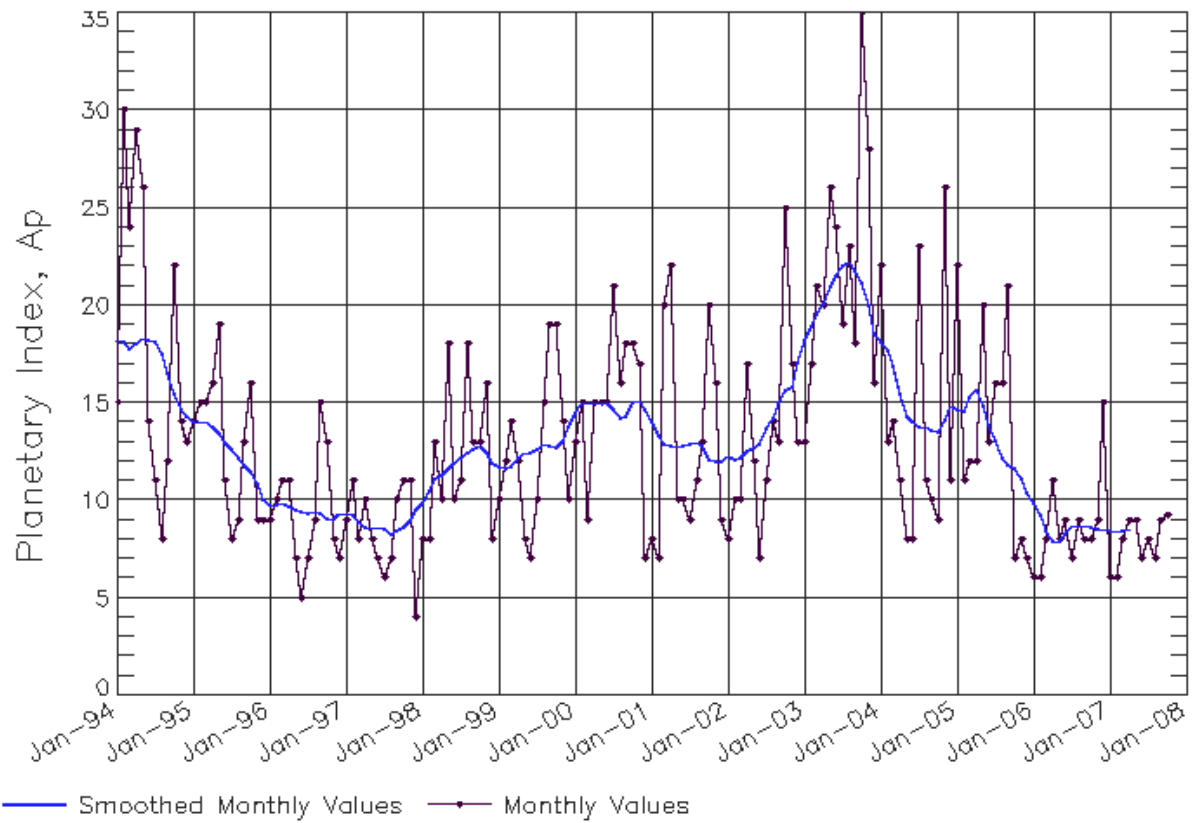
SEC Prediction of Smoothed F10.7cm Radio Flux

	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	176 (***)	177 (***)	178 (***)	181 (***)	180 (***)	180 (***)	180 (***)	179 (***)	177 (***)	176 (***)	174 (***)	172 (***)
2001	169 (***)	166 (***)	168 (***)	172 (***)	175 (***)	179 (***)	184 (***)	189 (***)	191 (***)	192 (***)	194 (***)	194 (***)
2002	195 (***)	197 (***)	196 (***)	192 (***)	188 (***)	183 (***)	176 (***)	170 (***)	164 (***)	159 (***)	154 (***)	151 (***)
2003	148 (***)	145 (***)	138 (***)	135 (***)	133 (***)	130 (***)	127 (***)	125 (***)	124 (***)	122 (***)	120 (***)	118 (***)
2004	116 (***)	116 (***)	115 (***)	112 (***)	109 (***)	107 (***)	106 (***)	105 (***)	104 (***)	102 (***)	102 (***)	101 (***)
2005	100 (***)	99 (***)	97 (***)	96 (***)	93 (***)	92 (***)	91 (***)	89 (***)	88 (***)	87 (***)	87 (***)	85 (***)
2006	84 (***)	83 (***)	82 (***)	81 (***)	81 (***)	81 (***)	80 (***)	80 (***)	80 (***)	79 (***)	79 (***)	78 (***)
2007	78 (***)	77 (***)	76 (***)	75 (***)	75 (1)	74 (3)	74 (5)	74 (7)	75 (9)	76 (13)	78 (13)	80 (14)



ISES Solar Cycle Ap Progression

Data Through 31 Oct 07



Updated 2007 Nov 2

[NOAA/SEC Boulder, CO USA](#)





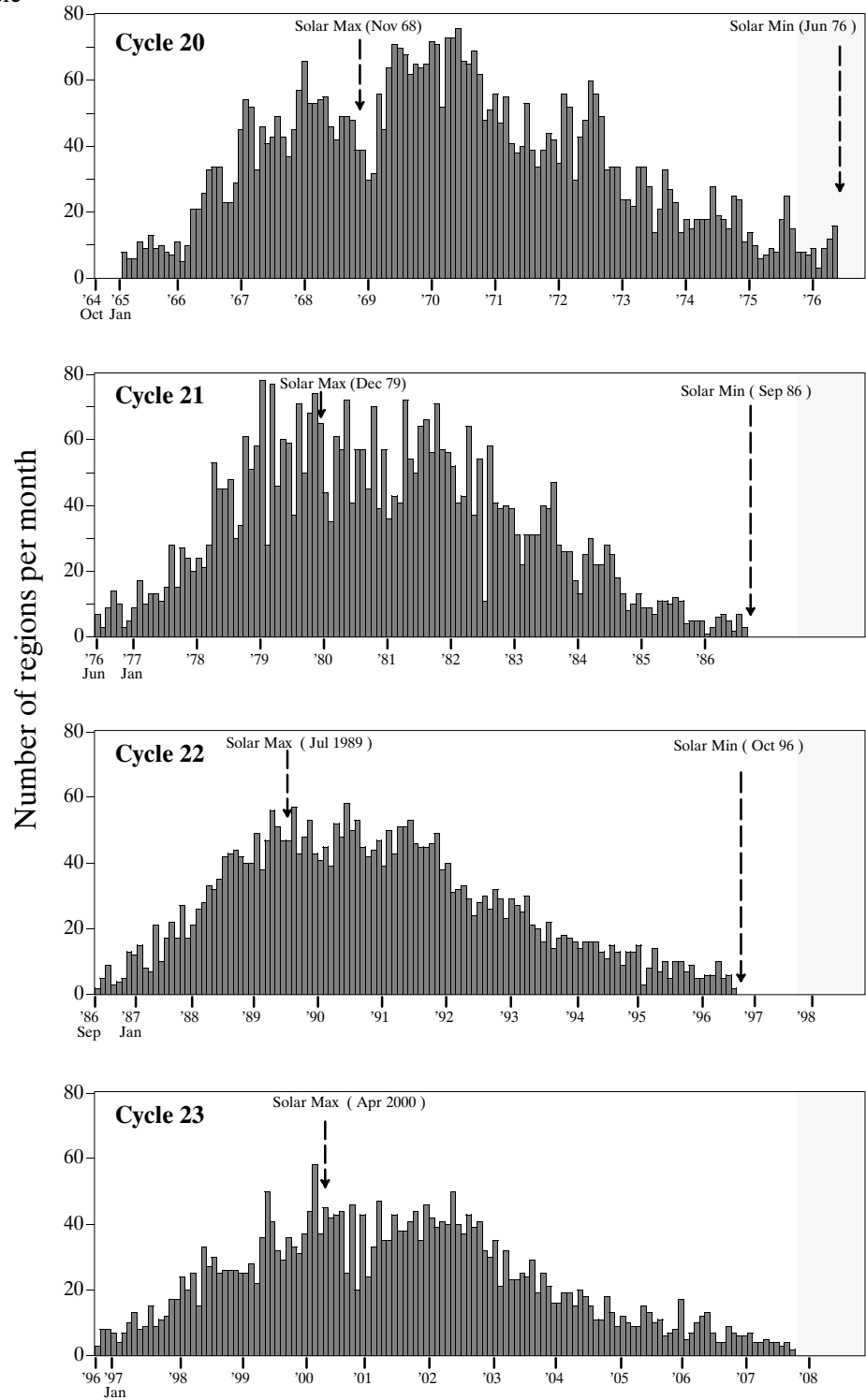
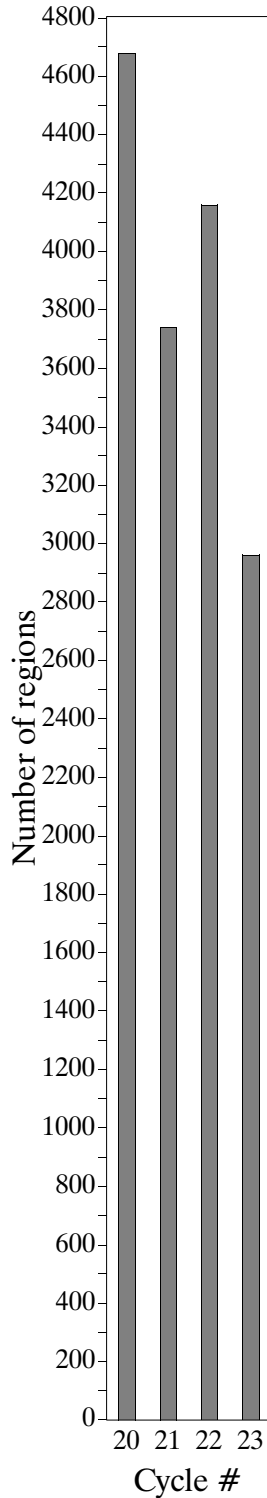
Space
Environment
Center

Active Regions



September 2007
(Month 132)

Comparison of Cycles
at current month in cycle



K. Tegnell/N.Cohen