

Space Weather Highlights
28 April – 04 May 2008

SEC PRF 1705
06 May 2008

Solar activity was very low. Region 993 (S29, L=086, class/area, Bxo/010 on 04 May) formed on the visible solar disk on 04 May as a small, simple bi-polar sunspot group. This region displayed a new cycle magnetic configuration (positive polarity leader, negative polarity trailer).

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during 28 April – 01 May.

The geomagnetic field was at quiet to unsettled levels during 28 April until late in the UTC day on 30 April when activity levels increased to unsettled to active conditions. Mostly unsettled to active conditions persisted until early on 02 May as activity decreased to quiet to unsettled levels, and remained so through the end of the summary period. Solar wind speed measurements from the ACE spacecraft began the period at approximately 500 km/s with the IMF Bz ranging between +/- 5 nT; speeds then slowly declined to around 370 km/s by midday on 30 April. At approximately 30 April at 1500 UTC an increase was observed in solar wind data consistent with a glancing blow from a coronal mass ejection (CME) observed on 26 April. For the next several days wind speed remained elevated with a maximum of 525 km/s on 01 May at 0028 UTC and IMF Bz ranging between +/- 8 nT. Midday on 03 May a coronal hole high speed stream rotated into a geoeffective position elevating wind speeds to around 580 km/s. The period ended with wind speeds above 600 km/s.

Space Weather Outlook
07 May – 02 June 2008

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 during 07 – 08 May, 21 – 28 May, and 01 – 02 June.

Geomagnetic field activity is expected to be at quiet to unsettled levels 07 - 12 May. On 13 May, a recurrent coronal hole high speed stream is expected to increase activity levels to unsettled to active conditions. Activity levels are expected to decline to quiet to unsettled levels 14 - 18 May. Conditions should increase to unsettled to active, with a chance for minor storm levels at middle latitudes and major storm periods at high latitudes on 19 - 21 May, due to a recurrent coronal hole high speed stream. On 22 May, activity levels should abate to quiet to unsettled levels until 26 May. Recurrent high speed streams are expected to increase activity again to unsettled to active levels for 27 May - 02 June.



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
28 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
29 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
30 April	67	0	0	<A1.0	0	0	0	0	0	0	0	0
01 May	69	0	0	<A1.0	0	0	0	0	0	0	0	0
02 May	68	0	0	<A1.0	0	0	0	0	0	0	0	0
03 May	67	0	0	<A1.0	0	0	0	0	0	0	0	0
04 May	68	13	10	<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
	28 April	2.5E+6	1.7E+4	3.8E+3		3.7E+8
29 April	6.7E+5	1.7E+4	3.9E+3		2.3E+8	
30 April	1.2E+6	1.7E+4	3.9E+3		2.5E+8	
01 May	1.3E+6	1.7E+4	3.7E+3		1.4E+8	
02 May	3.4E+6	1.7E+4	3.8E+3		3.6E+7	
03 May	2.2E+6	1.6E+4	3.5E+3		2.3E+7	
04 May	1.3E+6	1.7E+4	3.7E+3		2.6E+7	

Daily Geomagnetic Data

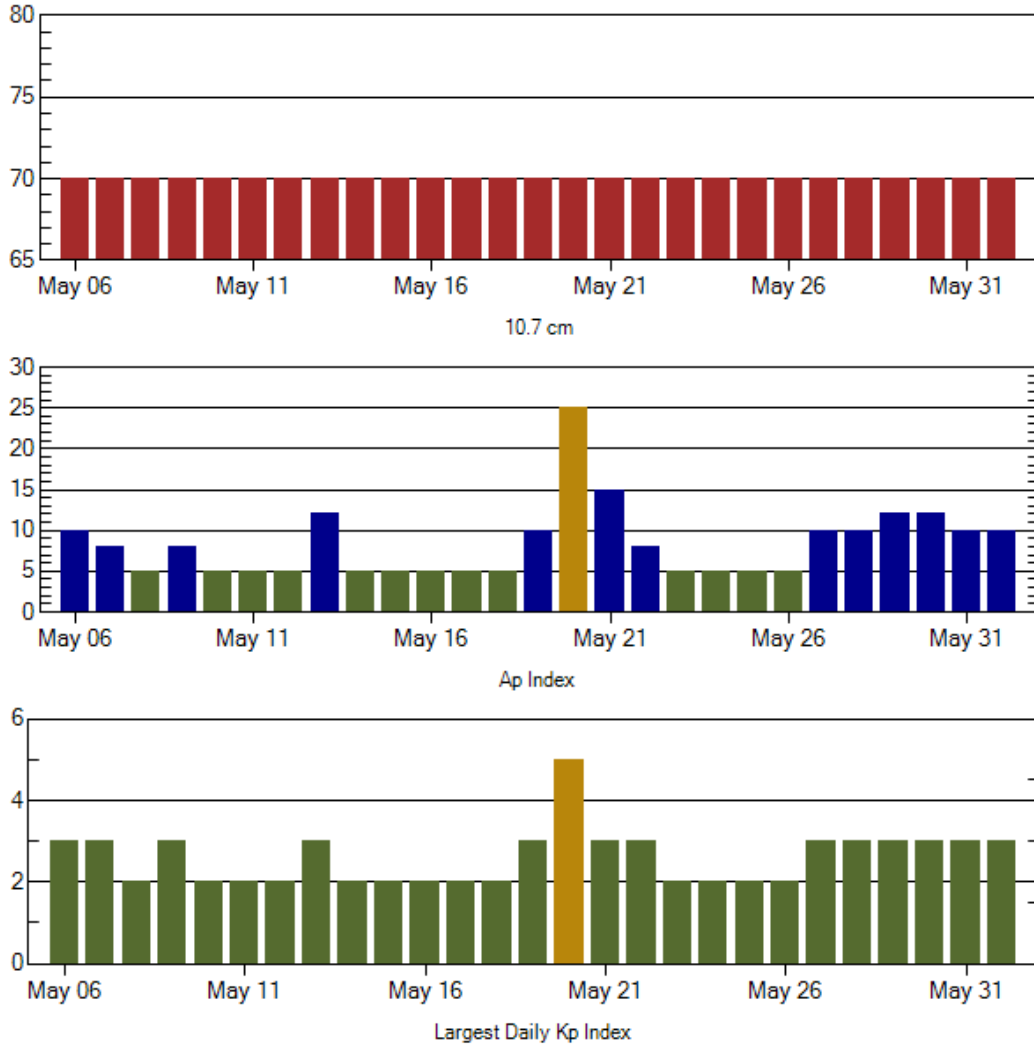
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	28 April	9	1-1-2-3-1-2-3-3	*	2-0-4-4-*-2-1	11
29 April	4	3-2-1-0-1-0-1-0	3	2-2-1-0-1-0-0-0	8	3-3-1-1-1-3-2-1
30 April	4	0-1-0-1-1-2-3-1	5	0-0-0-2-1-3-3-1	8	1-0-0-1-1-3-4-2
01 May	6	0-1-1-1-1-1-3-3	8	1-2-2-1-0-2-2-4	9	0-1-2-0-1-3-3-4
02 May	7	4-3-2-1-1-0-0-1	13	3-3-3-2-5-1-0-1	12	4-4-3-0-3-2-0-2
03 May	9	3-2-2-2-2-2-3-2	13	2-2-2-3-5-2-2-2	12	3-3-2-3-3-2-3-2
04 May	6	0-2-2-2-2-2-2-2	9	1-2-3-4-2-1-1-2	8	1-2-3-3-1-2-2-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
28 Apr 0606	ALERT: Electron 2MeV Integral Flux ≥1000pfu	28 Apr 0535
29 Apr 0521	ALERT: Electron 2MeV Integral Flux ≥1000pfu	29 Apr 0505
30 Apr 0514	ALERT: Electron 2MeV Integral Flux ≥1000pfu	30 Apr 0500
01 May 1042	ALERT: Electron 2MeV Integral Flux ≥1000pfu	01 May 1020
01 May 2254	ALERT: Geomagnetic K = 4	01 May 2254
02 May 0056	WARNING: Geomagnetic K = 4	02 May 0056 – 1600
02 May 0107	ALERT: Geomagnetic K = 4	02 May 0107
03 May 0350	WARNING: Geomagnetic K = 4	03 May 0351 – 1600



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 May	70	8	3	21 May	70	15	3
08	70	5	2	22	70	8	3
09	70	8	3	23	70	5	2
10	70	5	2	24	70	5	2
11	70	5	2	25	70	5	2
12	70	5	2	26	70	5	2
13	70	12	3	27	70	10	3
14	70	5	2	28	70	10	3
15	70	5	2	29	70	12	3
16	70	5	2	30	70	12	3
17	70	5	2	31	70	10	3
18	70	5	2	01 June	70	10	3
19	70	10	3	02	70	10	3
20	70	25	5				



Energetic Events

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

Flare List

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
28 April	<i>No Flares Observed</i>						
29 April	<i>No Flares Observed</i>						
30 April	<i>No Flares Observed</i>						
01 May	<i>No Flares Observed</i>						
02 May	<i>No Flares Observed</i>						
03 May	<i>No Flares Observed</i>						
04 May	<i>No Flares Observed</i>						

Region Summary

Date	Location		Sunspot Characteristics					Flares		X-ray		Optical	
	Helio		Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S	1	2
	(° Lat ° CMD)	Lon											
<i>Region 991</i>													
19 Apr	S09E29	282	0020	02	Bxo	003	B						
20 Apr	S10E15	283	0020	01	Axx	002	A						
21 Apr	S10E02	283											
22 Apr	S10W11	283											
23 Apr	S10W24	283											
24 Apr	S10W37	283											
25 Apr	S10W50	283											
26 Apr	S10W63	283											
27 Apr	S10W76	282											
28 Apr	S10W89	282											

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 283



Region Summary – continued

Location		Sunspot Characteristics														
		Flares						X-ray			Optical					
Date	(° Lat ° CMD)	Helio	Area	Extent	Spot	Spot	Mag	C M X			S 1 2					
		Lon	(10 ⁻⁶ hemi)	(helio)	Class	Count	Class									
<i>Region 992</i>																
22 Apr	N13W01	272	0040	03	Cso	003	B									
23 Apr	N13W17	275	0040	04	Cso	003	B									
24 Apr	N13W32	277	0010	01	Axx	001	A									
25 Apr	N13W47	279														
26 Apr	N13W60	279														
27 Apr	N13W73	279														
28 Apr	N13W86	279														
								0	0	0	0	0	0	0	0	0
Crossed West Limb.																
Absolute heliographic longitude: 272																
<i>Region 993</i>																
04 May	S29E27	086	0010	03	Bxo	003	B									
								0	0	0	0	0	0	0	0	
Still on Disk.																
Absolute heliographic longitude: 086																



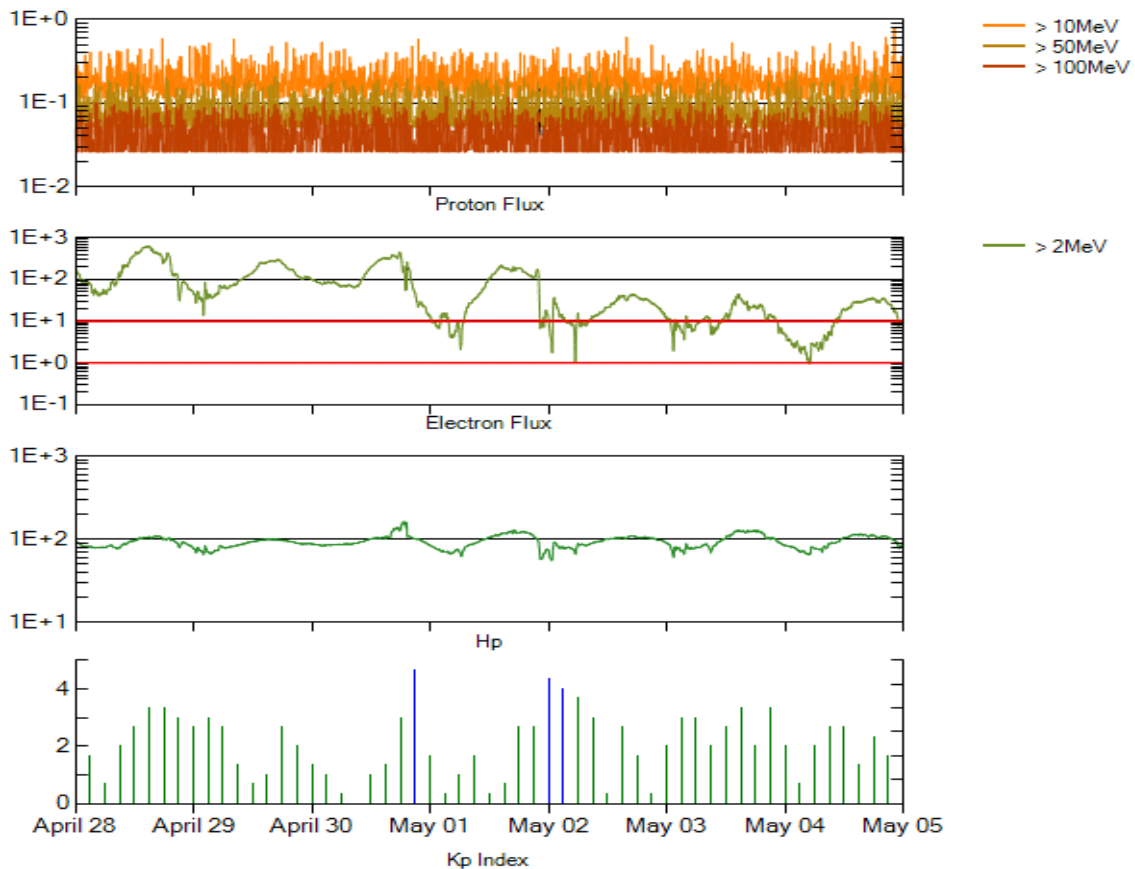
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	SEC	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2006									
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	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
July	15.6	10.0	0.64	11.6	7.0	71.6	72.5	8	7.4
August	9.9	6.2	0.63	10.2	6.1	69.2	71.8	7	7.6
September	4.8	2.4	0.50	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.1	65.5	71.5	9	7.9
November	2.5	1.7	0.68			69.7		5	
December	16.2	10.1	0.62			78.6		4	
2008									
January	5.1	3.4	0.67			72.1		6	
February	3.8	2.1	0.55			71.2		9	
March	15.9	9.3	0.58			72.9		10	
April	4.9	2.9	0.59			70.3		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 28 April 2008

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.

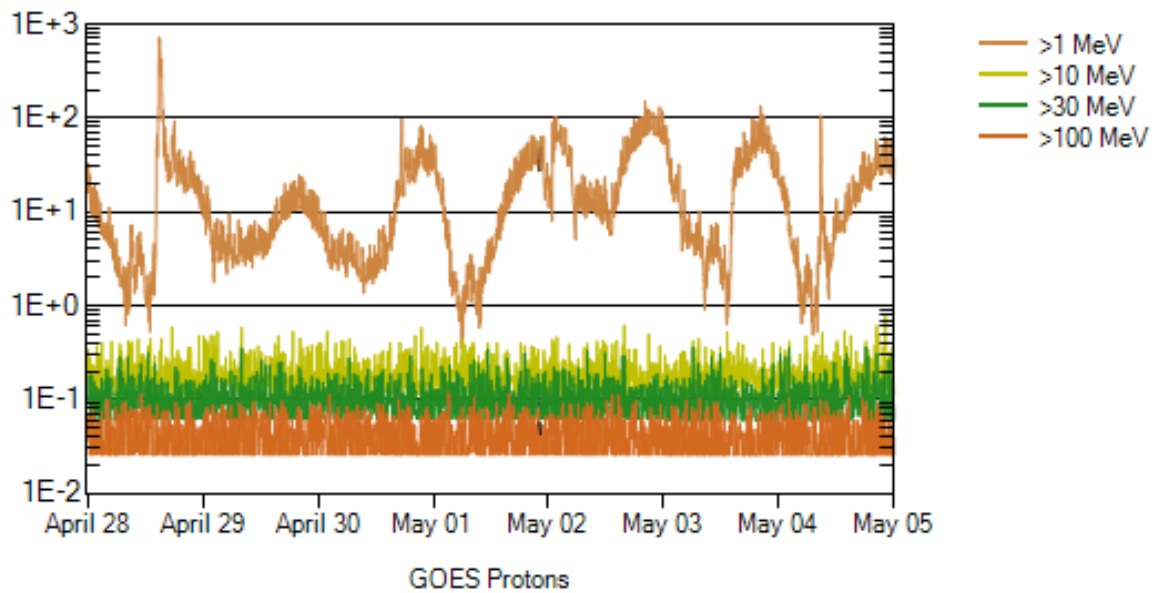
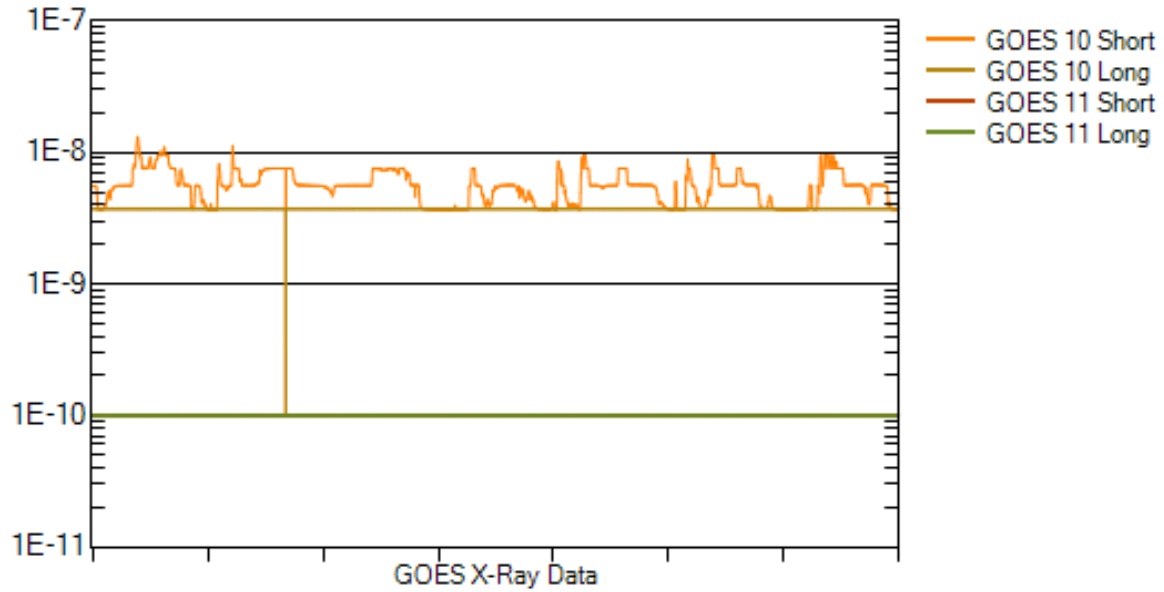
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

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

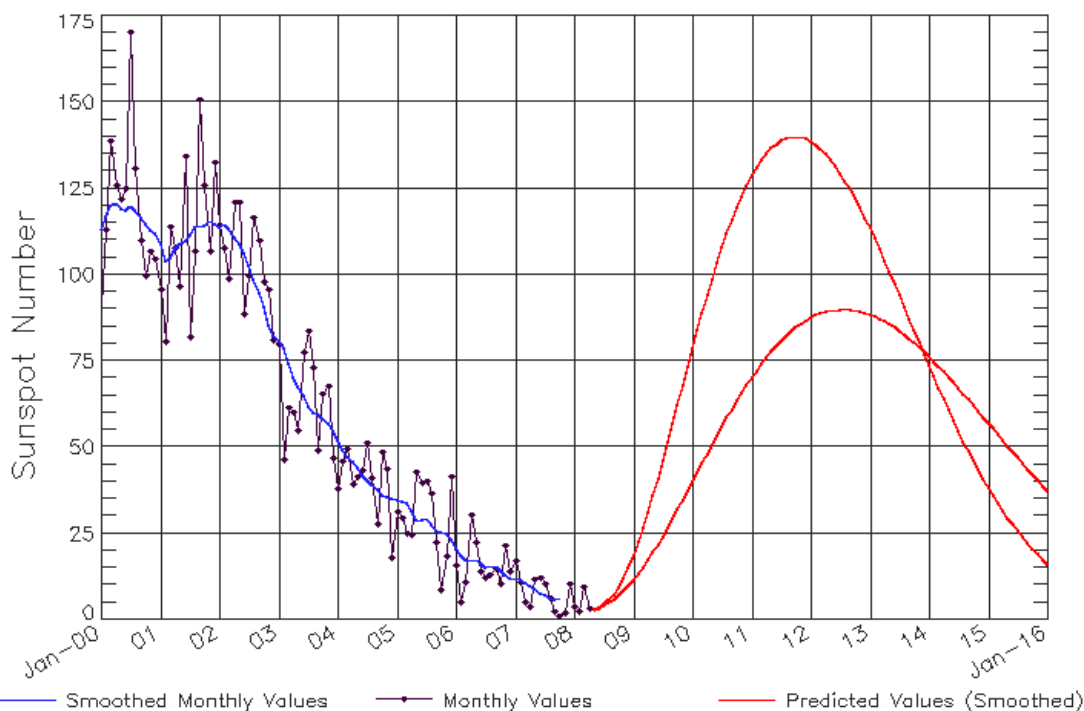
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 10 (W060) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-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 (protons/cm²-sec-sr) at greater than 10 MeV.



ISES Solar Cycle Sunspot Number Progression

Data Through 30 Apr 08



Updated 2008 May 6

NOAA/SWPC Boulder, CO USA

SEC Prediction of Smoothed Sunspot Number

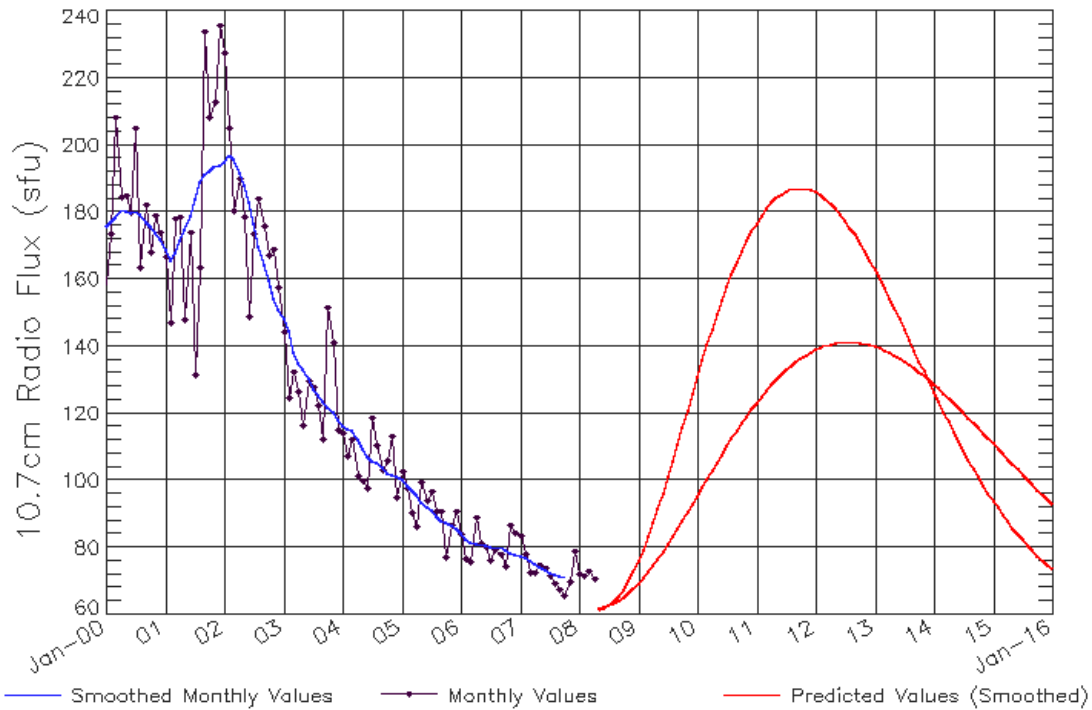
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo
2006	21 (***)	19 (***)	17 (***)	17 (***)	17 (***)	16 (***)	15 (***)	16 (***)	16 (***)	14 (***)	13 (***)	12 (***)
2007	12 (***)	12 (***)	11 (***)	10 (***)	9 (***)	8 (***)	7 (***)	6 (***)	6 (***)	6 (***)	6/6 (1)	5/5 (3)
2008	4/4 (5)	4/4 (7)	4/4 (8)	5/4 (9)	6/5 (10)	6/5 (11)	7/6 (12)	9/6 (13)	10/7 (14)	12/8 (15)	12/8 (15)	15/10 (15)
2009	19/12 (15)	23/13 (15)	27/15 (15)	31/17 (15)	36/20 (15)	41/22 (15)	46/24 (15)	52/27 (15)	57/29 (15)	62/32 (15)	68/35 (15)	73/37 (15)
2010	79/40 (15)	84/43 (15)	89/45 (15)	94/48 (15)	99/51 (15)	103/53 (15)	108/56 (15)	112/60 (15)	116/61 (15)	119/63 (15)	123/66 (15)	126/68 (15)
2011	129/70 (15)	131/72 (15)	133/74 (15)	135/76 (15)	137/78 (15)	138/79 (15)	139/81 (15)	140/82 (15)	140/84 (15)	140/85 (15)	140/86 (15)	139/87 (15)
2012	139/88 (15)	138/88 (15)	136/89 (15)	135/89 (15)	133/90 (15)	131/90 (15)	129/90 (15)	127/90 (15)	125/90 (15)	122/90 (15)	119/89 (15)	116/89 (15)
2013	114/89 (15)	110/88 (15)	107/87 (15)	104/86 (15)	101/86 (15)	97/85 (15)	94/84 (15)	91/83 (15)	87/81 (15)	84/80 (15)	80/79 (15)	77/78 (15)
2014	74/76 (15)	70/75 (15)	67/73 (15)	64/72 (15)	61/70 (15)	58/69 (15)	55/67 (15)	52/65 (15)	49/64 (15)	46/62 (15)	44/60 (15)	41/59 (15)
2015	38/57 (15)	36/55 (15)	34/54 (15)	32/52 (15)	30/50 (15)	28/49 (15)	26/47 (15)	24/45 (15)	22/44 (15)	21/42 (15)	19/40 (15)	18/39 (15)

Note: Hi is for the larger solar cycle prediction, Lo is for the smaller solar cycle prediction



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 30 Apr 08



Updated 2008 May 6

NOAA/SWPC Boulder, CO USA

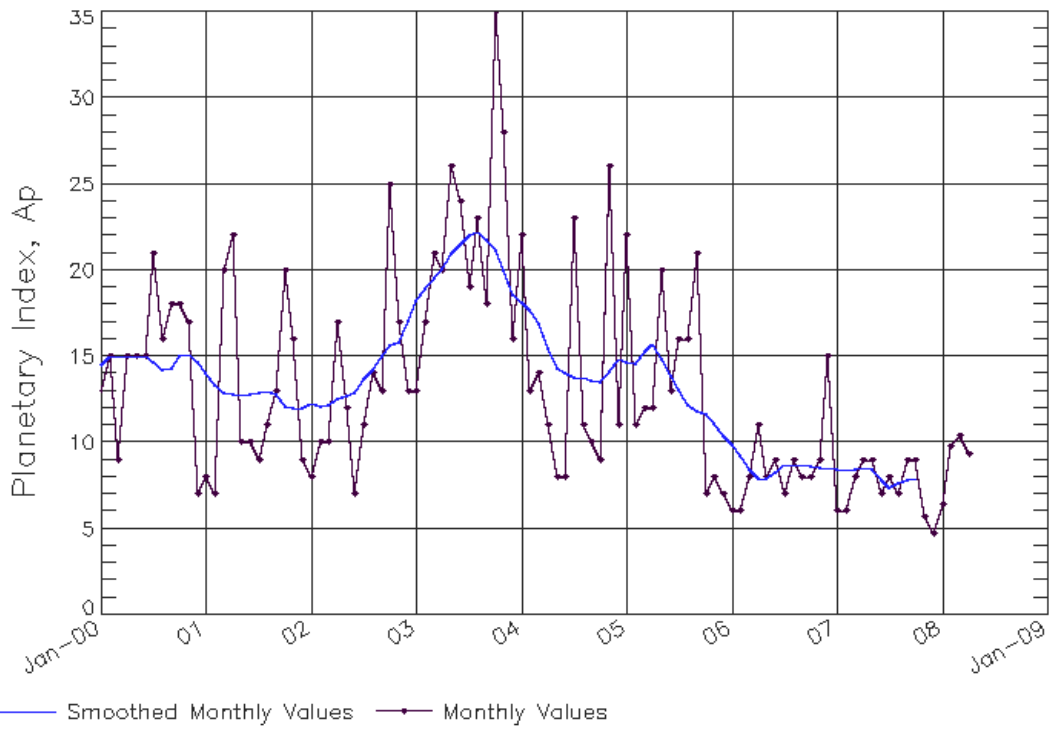
SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo	Hi/Lo
2006	84 (***)	83 (***)	82 (***)	81 (***)	81 (***)	81 (***)	80 (***)	80 (***)	80 (***)	79 (***)	79 (***)	78 (***)
2007	78 (***)	77 (***)	76 (***)	75 (***)	74 (***)	73 (***)	73 (***)	72 (***)	72 (***)	72 (***)	71/65 (1)	70/64 (3)
2008	69/63 (5)	68/63 (7)	68/62 (9)	68/62 (11)	68/62 (13)	68/61 (15)	68/61 (17)	68/61 (19)	69/61 (21)	70/64 (22)	70/66 (23)	73/68 (23)
2009	76/69 (23)	79/71 (23)	83/73 (23)	87/75 (23)	92/77 (23)	96/79 (23)	101/81 (23)	106/83 (23)	111/86 (23)	116/88 (23)	121/90 (23)	126/93 (23)
2010	131/95 (23)	136/98 (23)	140/100 (23)	145/103 (23)	149/105 (23)	154/108 (23)	158/110 (23)	161/112 (23)	165/115 (23)	168/117 (23)	171/119 (23)	174/121 (23)
2011	177/123 (23)	179/125 (23)	181/127 (23)	183/128 (23)	184/130 (23)	185/132 (23)	186/133 (23)	187/134 (23)	187/135 (23)	187/136 (23)	187/137 (23)	187/138 (23)
2012	186/139 (23)	185/140 (23)	184/140 (23)	183/141 (23)	181/141 (23)	179/141 (23)	177/141 (23)	175/141 (23)	173/141 (23)	171/141 (23)	168/141 (23)	166/140 (23)
2013	163/140 (23)	160/139 (23)	157/139 (23)	154/138 (23)	151/137 (23)	148/136 (23)	145/136 (23)	142/135 (23)	139/134 (23)	136/132 (23)	133/131 (23)	129/130 (23)
2014	126/129 (23)	123/127 (23)	120/126 (23)	117/125 (23)	115/123 (23)	112/122 (23)	109/120 (23)	106/119 (23)	104/117 (23)	101/116 (23)	99/114 (23)	96/113 (23)
2015	94/111 (23)	92/110 (23)	90/108 (23)	88/106 (23)	86/105 (23)	84/103 (23)	82/102 (23)	81/100 (23)	79/99 (23)	78/97 (23)	76/96 (23)	75/94 (23)



ISES Solar Cycle Ap Progression

Data Through 30 Apr 08



Updated 2008 May 6

NOAA/SWPC Boulder, CO USA




Cosmic-Ray Ground-Level Events

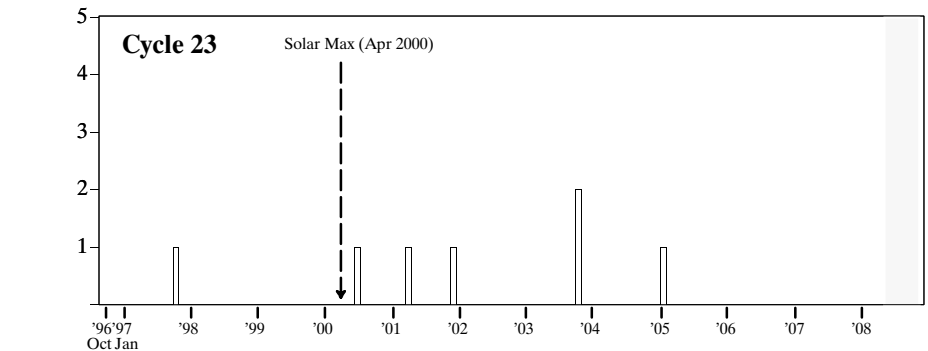
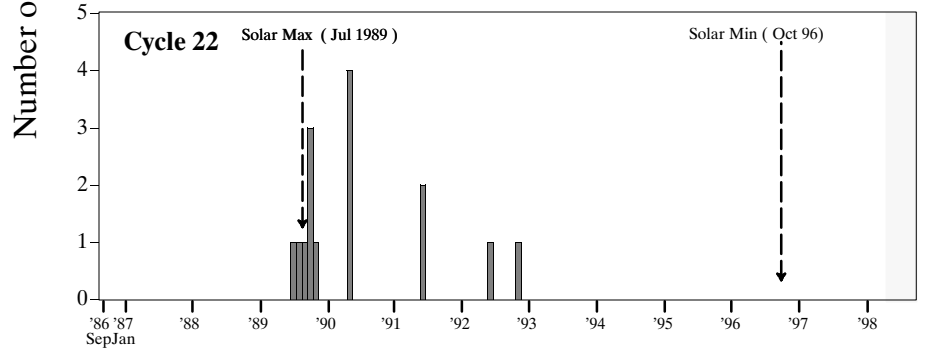
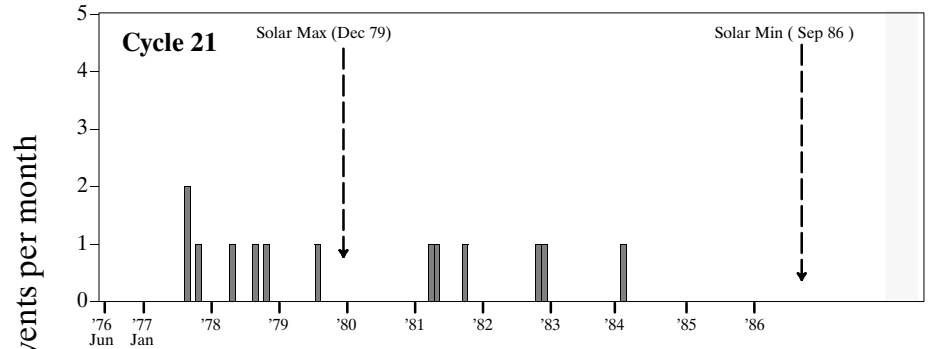
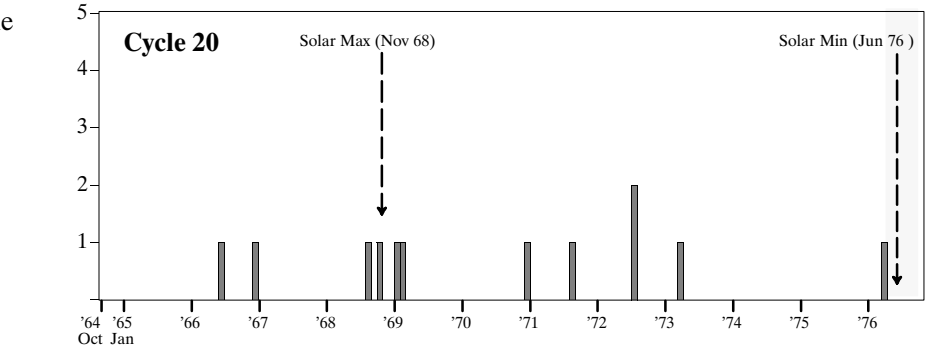
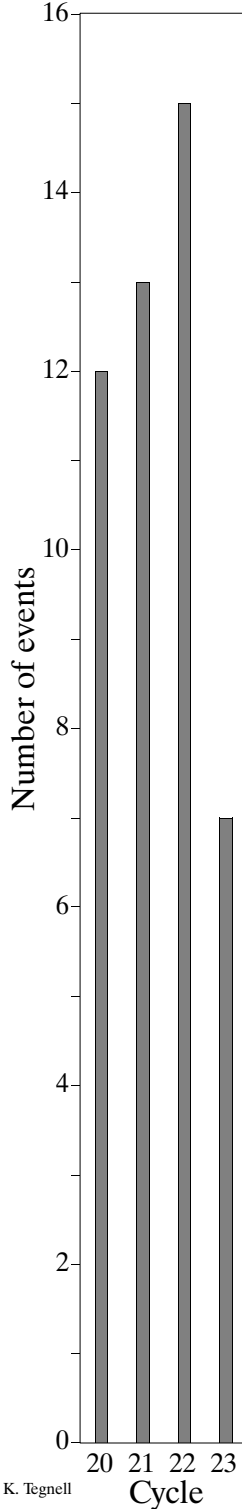


Space
Environment
Center

April 2008
(Month 139)

 Preliminary data

Comparison of Cycles
at current month in cycle



N.Cohen