

**Space Weather Highlights**  
**26 May – 01 June 2008**

**SEC PRF 1709**  
**03 June 2008**

Solar activity was very low. No X-ray flares were observed during the period. Region 997 (S08, L=183, class/area, Axx/010 on 26 May). This region decayed to spotless plage on 27 May, and was still on the visible solar disk as the summary period ended.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during 26 - 27 May.

The geomagnetic field was at quiet to active levels during the summary period. On 26 - 27 May activity was at mostly quiet levels. At approximately 0130 UTC on 28 May a co-rotating interaction region (CIR) was observed at the ACE spacecraft. Shortly thereafter the onset of a coronal hole high speed stream was observed at 0500 UTC on 28 May. During this timeframe activity increased to quiet to unsettled levels. Solar wind speed values also increased to 552 km/s around 0130 UTC on 29 May, with interplanetary magnetic field (IMF) values ranging between +/- 8 nT. On 30 May activity increased to quiet to active levels, again, due to a coronal hole high speed stream. Wind speeds gradually increased to a maximum of 657 km/s at approximately 0730 UTC on 31 May, with IMF values ranging between +/- 6 nT. As wind speed values leveled off at around 600 km/s, the geomagnetic field declined to quiet to unsettled levels through the end of the summary period.

**Space Weather Outlook**  
**04 – 30 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 04 - 08 June and 19 - 23 June.

The geomagnetic field is expected to be at quiet levels 04 - 14 June. Activity is expected to increase to quiet to unsettled levels on 15 - 20 June, with isolated active periods possible on 17 June as a coronal hole high speed stream rotates into a geoeffective position. Conditions should decline to quiet levels on 21 - 24 June. On 25 - 29 June expect activity to increase again to quiet to unsettled levels due to a coronal hole high speed stream. Activity should decline to quiet levels on 30 June as the coronal hole high speed stream rotates out of a geoeffective position.



**Daily Solar Data**

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
26 May	68	12	10	<A1.0	0	0	0	0	0	0	0	0
27 May	68	0	0	<A1.0	0	0	0	0	0	0	0	0
28 May	68	0	0	<A1.0	0	0	0	0	0	0	0	0
29 May	68	0	0	<A1.0	0	0	0	0	0	0	0	0
30 May	67	0	0	<A1.0	0	0	0	0	0	0	0	0
31 May	67	0	0	<A1.0	0	0	0	0	0	0	0	0
01 June	67	0	0	<A1.0	0	0	0	0	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)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	26 May	8.4E+5	1.7E+4	3.7E+3		1.3E+8
27 May	1.1E+6	1.7E+4	3.9E+3		1.2E+8	
28 May	1.0E+6	1.7E+4	4.0E+3		6.4E+6	
29 May	7.5E+5	1.7E+4	3.7E+3		1.1E+7	
30 May	3.7E+6	1.7E+4	3.5E+3		9.1E+6	
31 May	3.2E+6	1.6E+4	3.4E+3		1.3E+7	
01 June	1.6E+6	1.7E+4	3.6E+3		1.5E+7	

**Daily Geomagnetic Data**

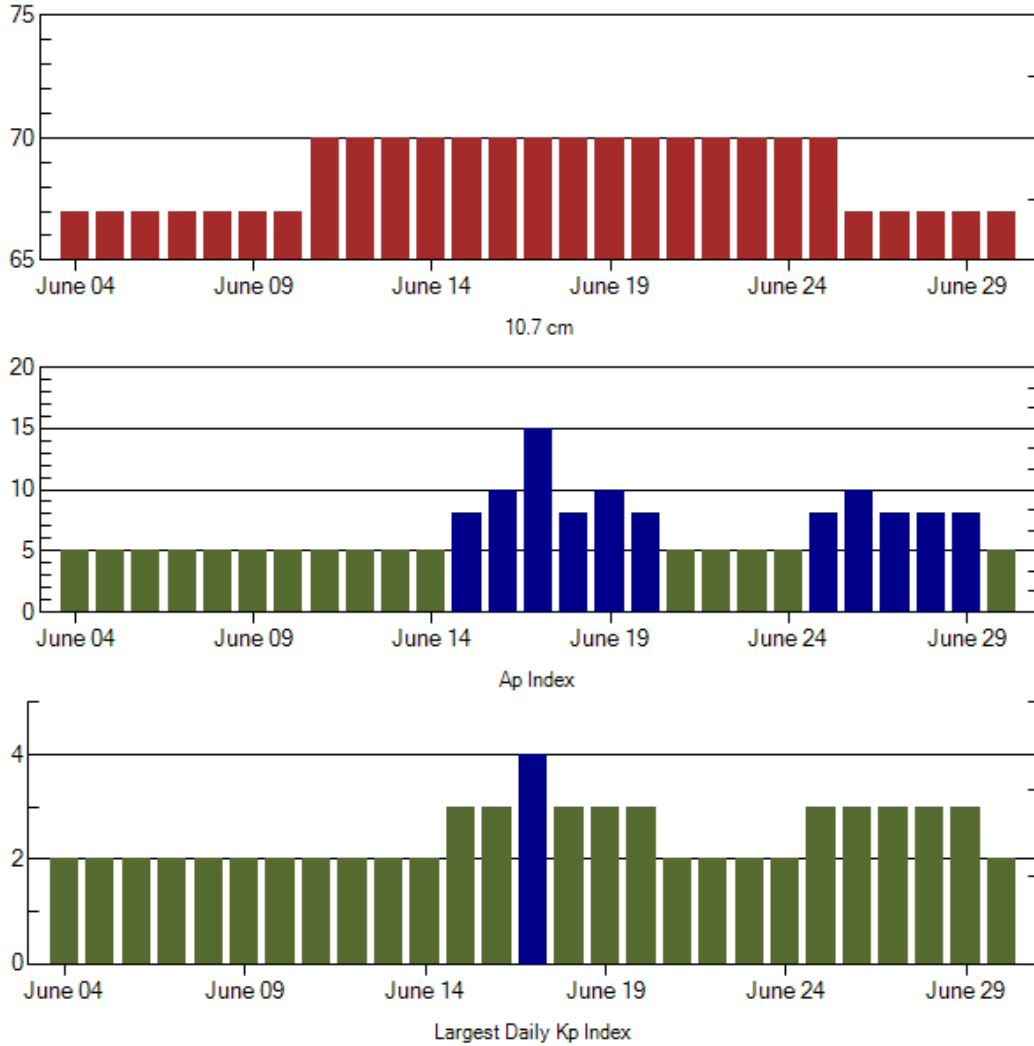
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	26 May	3	1-1-1-1-1-0-1-1	3	1-1-2-2-0-0-0-0	4
27 May	2	0-1-1-0-0-1-1-2	3	0-1-1-1-2-1-0-1	3	1-0-1-0-0-1-1-2
28 May	10	3-2-3-2-3-2-1-2	21	3-2-3-3-6-4-1-1	12	3-2-3-2-3-3-2-3
29 May	7	3-2-2-1-2-1-2-2	11	3-2-3-1-4-2-2-2	9	3-3-2-1-2-2-2-2
30 May	7	3-1-0-1-2-3-2-2	18	2-1-0-0-5-5-4-2	11	4-1-0-1-2-3-4-2
31 May	8	1-2-3-2-2-2-2-2	19	2-2-3-5-5-3-2-1	8	1-2-2-2-3-2-2-2
01 June	6	1-2-1-1-2-2-2-2	14	3-2-2-4-4-3-2-1	8	2-2-1-1-2-3-2-3

**Alerts and Warnings Issued**

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
26 May 0957	ALERT: Electron 2MeV Integral Flux ≥1000pfu	26 May 0935
27 May 1002	ALERT: Electron 2MeV Integral Flux ≥1000pfu	27 May 0940
28 May 0652	WARNING: Geomagnetic K = 4	28 May 0655 - 1600
29 May 0448	WARNING: Geomagnetic K = 4	29 May 0500 - 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
04 June	67	5	2	18 June	70	8	3
05	67	5	2	19	70	10	3
06	67	5	2	20	70	8	3
07	67	5	2	21	70	5	2
08	67	5	2	22	70	5	2
09	67	5	2	23	70	5	2
10	67	5	2	24	70	5	2
11	70	5	2	25	70	8	3
12	70	5	2	26	67	10	3
13	70	5	2	27	67	8	3
14	70	5	2	28	67	8	3
15	70	8	3	29	67	8	3
16	70	10	3	30	67	5	2
17	70	15	4				



***Energetic Events***

Date	Time		X-ray		Optical Information			Peak		Sweep Freq
	Begin	Max	Max	Class	Flux	Imp/	Location	Radio Flux		Intensity
						Brtns	Lat CMD	245	2695	II
<i>No Events Observed</i>										

***Flare List***

Date	Time			Optical	Imp / Brtns	Location	Rgn
	Begin	Max	End	Class.		Lat CMD	
26 May	<i>No Flares Observed</i>						
27 May	<i>No Flares Observed</i>						
28 May	<i>No Flares Observed</i>						
29 May	<i>No Flares Observed</i>						
30 May	<i>No Flares Observed</i>						
31 May	<i>No Flares Observed</i>						
01 Jun	<i>No Flares Observed</i>						

***Region Summary***

Date	Location		Sunspot Characteristics												
	Helio		Area (10 <sup>6</sup> hemi)	Extent (helio)	Flares			X-ray				Optical			
	(° Lat ° CMD)	Lon			Spot Class	Spot Count	Mag Class	C	M	X	S	1	2	3	4
<i>Region 996</i>															
16 May	N13E59	255	0020	06	Bxo	002	B								
17 May	N10E46	255	0020	05	Bxo	002	B								
18 May	N10E32	256	0030	04	Bxo	004	B								
19 May	N09E18	256	0010	04	Bxo	003	B								
20 May	N10E05	256	0010	02	Bxo	002	B								
21 May	N10W08	256													
22 May	N10W21	256													
23 May	N10W34	256													
24 May	N10W47	256													
25 May	N10W60	256													
26 May	N10W73	256													
27 May	N10W86	255													
								0 0 0 0 0 0 0 0							

Crossed West Limb.

Absolute heliographic longitude: 256



**Region Summary – continued.**

Location		Sunspot Characteristics															
Date	( ° Lat ° CMD)	Helio Lon	Flares				X-ray				Optical						
			Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S	1	2	3	4		
<i>Region 997</i>																	
26 May	S08W01	183	0010	01	Axx	002	A										
27 May	S08W14	183															
28 May	S08W27	183															
29 May	S08W40	183															
30 May	S08W53	183															
31 May	S08W66	183															
01 Jun	S08W79	183															
										0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 183																	



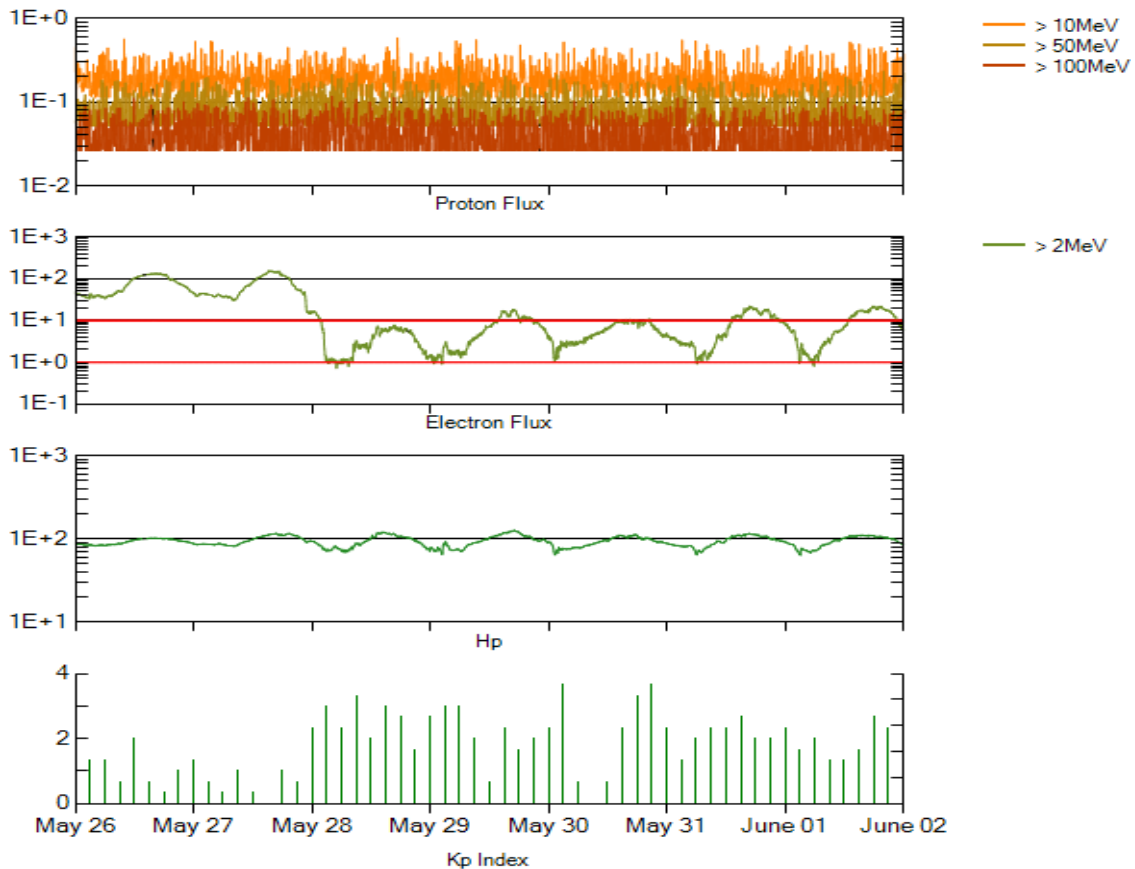
**Recent Solar Indices (preliminary)**  
**Of the observed monthly mean values**

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
<b>2006</b>									
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
<b>2007</b>									
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	9.4	5.7	69.7	71.1	5	7.8
December	16.2	10.1	0.62			78.6		4	
<b>2008</b>									
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	
May	5.7	2.9	0.51			68.4		6	

**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 26 May 2008*

Protons plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

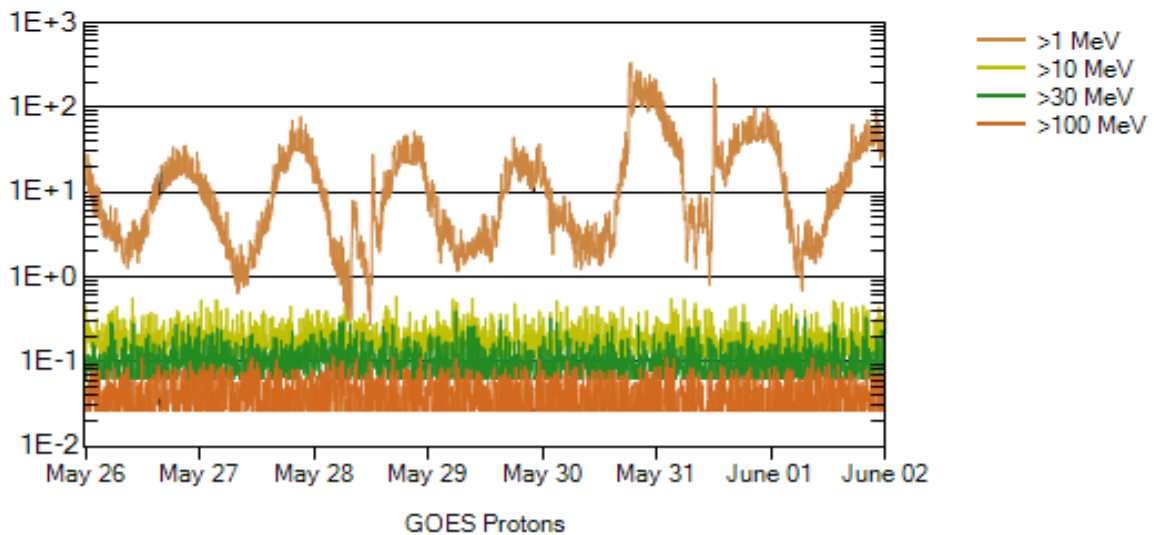
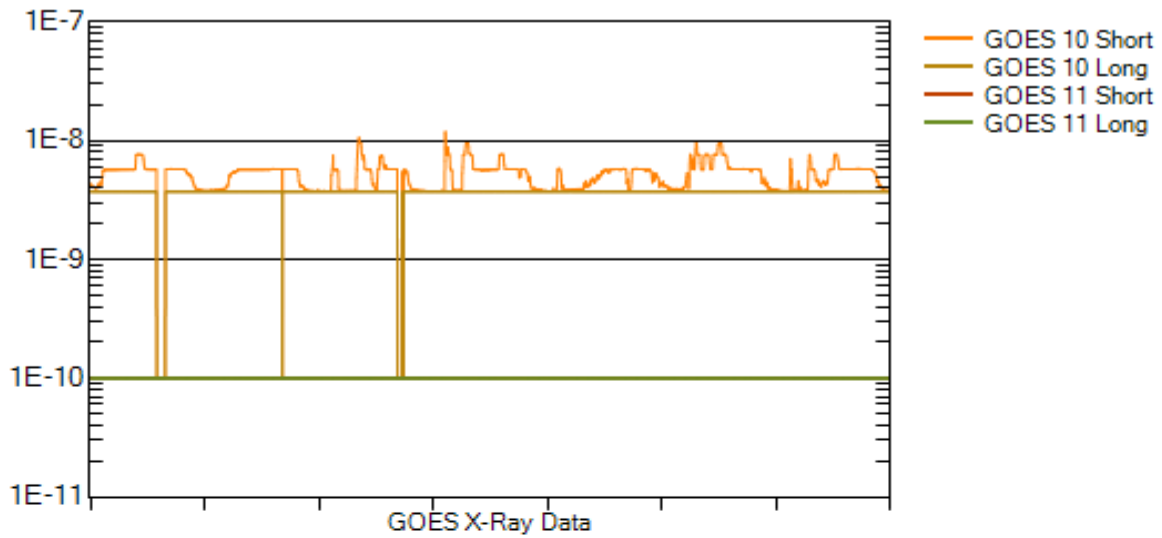
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

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 ( $\text{watts/m}^2$ ) 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.

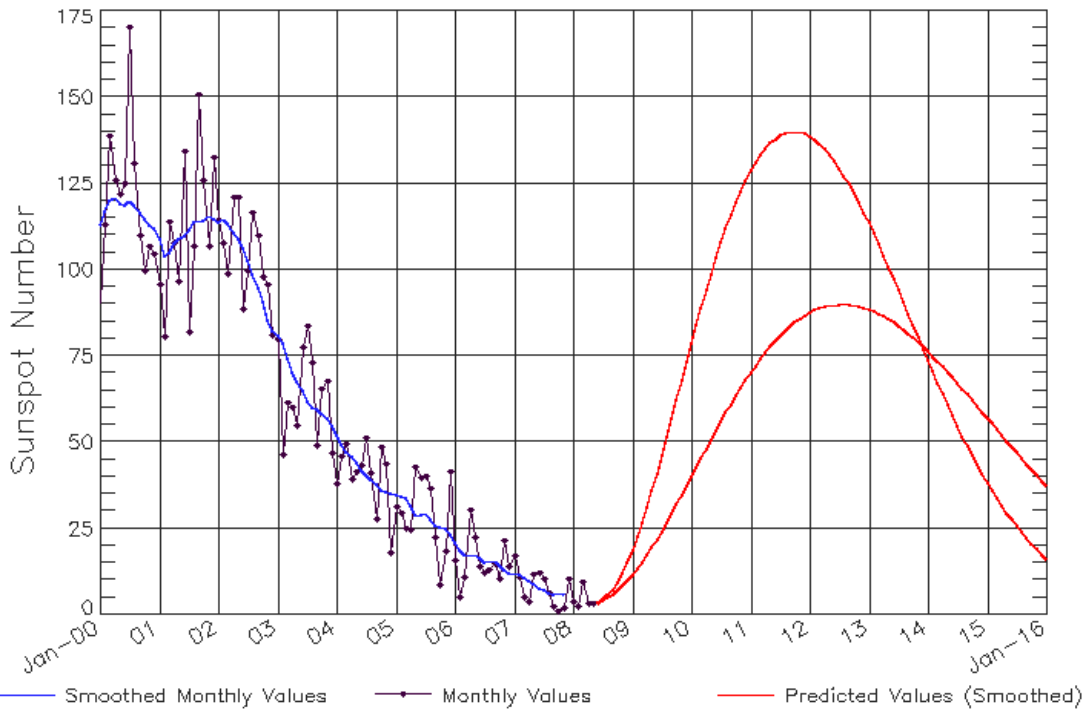
Proton plot contains the five-minute averaged integral proton flux ( $\text{protons/cm}^2\text{-sec-sr}$ ) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ( $\text{protons/cm}^2\text{-sec-sr}$ ) at greater than 10 MeV.





## ISES Solar Cycle Sunspot Number Progression

Data Through 31 May 08



Updated 2008 Jun 1

NOAA/SWPC Boulder, CO USA

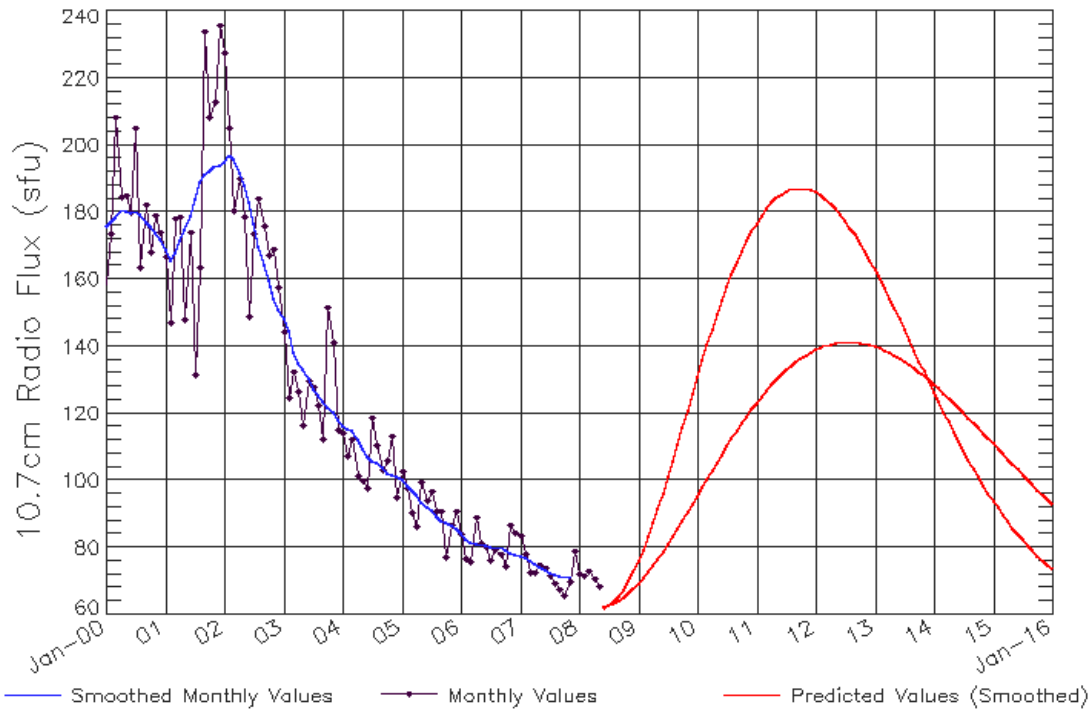
### SEC Prediction of Smoothed Sunspot Number

	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 (***)	5/5 (1)
2008	4/4 (3)	4/4 (5)	4/4 (7)	5/4 (8)	6/5 (9)	6/5 (10)	7/6 (11)	9/6 (12)	10/7 (13)	12/8 (14)	15/9 (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)	112/59 (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 31 May 08



Updated 2008 Jun 1

NOAA/SWPC Boulder, CO USA

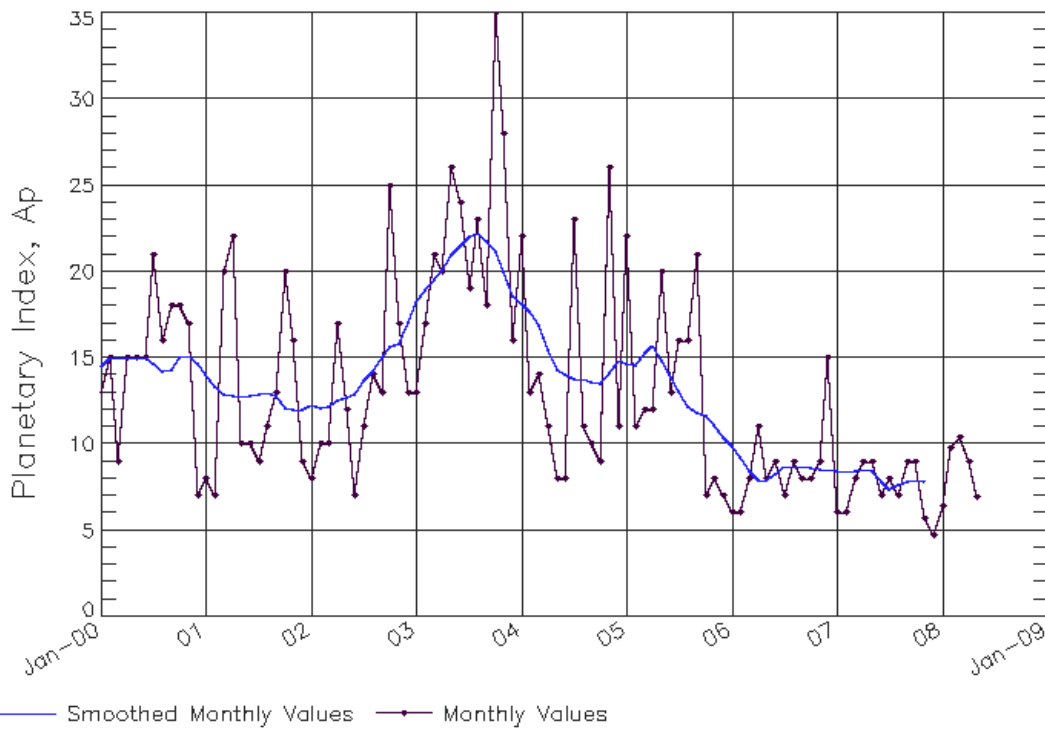
**SEC Prediction of Smoothed F10.7cm Radio Flux**

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



# ISES Solar Cycle Ap Progression

Data Through 31 May 08



Updated 2008 Jun 1

NOAA/SWPC Boulder, CO USA



# Severe Storm ( $A_p \geq 100$ ) Geomagnetic Conditions



Space  
Environment  
Center

Comparison of Cycles  
at current month in cycle

