

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

No proton events were observed at geosynchronous orbit.

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

Geomagnetic field activity was at mostly quiet levels throughout the summary period. ACE solar wind observations showed frequent minor variations in the interplanetary magnetic field (IMF). IMF Bz varied in the + 5 to -5 nT range while IMF Bt ranged from 1 - 5 nT. Solar wind velocities ranged from 249 - 441 km/sec during the period.

**Space Weather Outlook**  
**08 April - 04 May 2009**

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 increase to high levels during 10-14 April. Normal flux levels are expected during the rest of the period.

Geomagnetic field activity is expected to be at mostly quiet levels through 08 April. Activity is expected to increase to unsettled to active levels during 09 - 10 April due to a recurrent coronal hole high-speed stream. Activity is expected to decrease to quiet levels during 11 - 19 April. Activity is expected to increase to quiet to unsettled levels during 21 - 22 April. Activity is expected to decrease to mostly quiet levels during 23 April - 04 May.



**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	
30 March	71	0	0	<A1.0	0	0	0	0	0	0	0	0	0
31 March	71	0	0	<A1.0	0	0	0	0	0	0	0	0	0
01 April	71	0	0	<A1.0	0	0	0	0	0	0	0	0	0
02 April	71	0	0	<A1.0	0	0	0	0	0	0	0	0	0
03 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0	0
04 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0	0
05 April	70	0	0	<A1.0	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
	30 March	5.1e+05	1.9e+04	4.3e+03		5.1e+06
31 March	5.5e+05	1.9e+04	4.5e+03		4.9e+06	
01 April	7.7e+05	2.0e+04	4.6e+03		5.5e+06	
02 April	5.9e+05	2.0e+04	4.5e+03		3.2e+06	
03 April	5.1e+05	2.0e+04	4.6e+03		2.7e+06	
04 April	7.5e+05	2.0e+04	4.5e+03		2.9e+06	
05 April	4.7e+05	2.0e+04	4.4e+03		1.4e+06	

**Daily Geomagnetic Data**

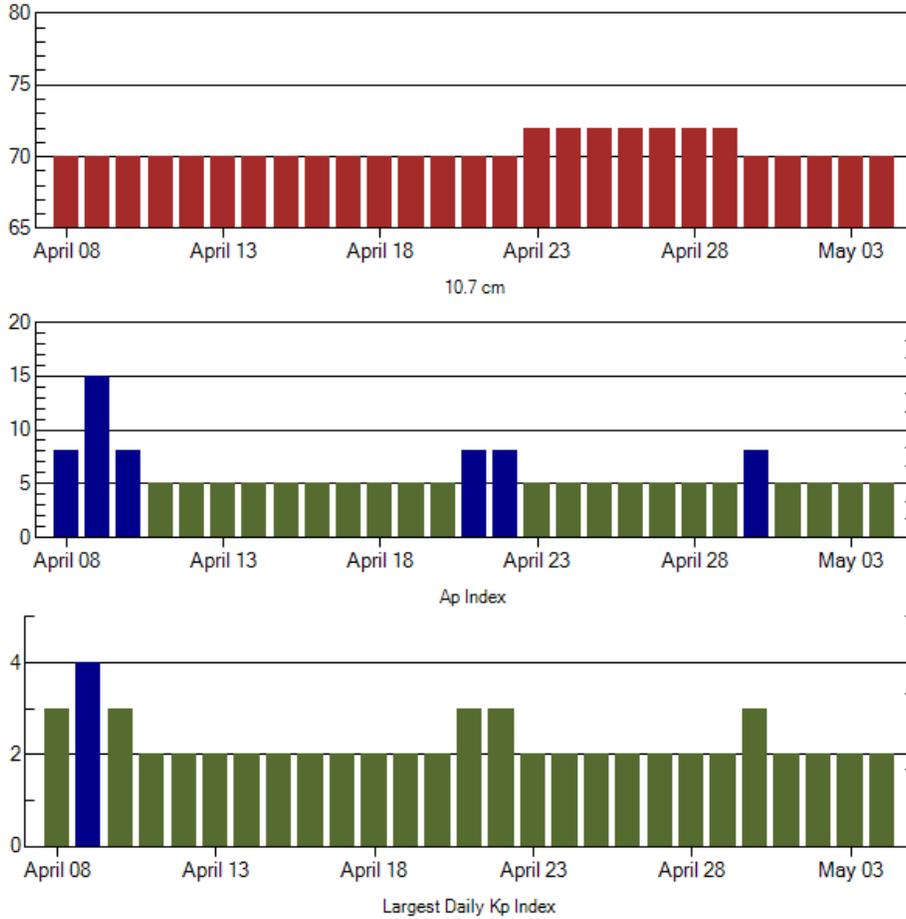
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	30 March	3	1-2-0-1-2-1-1-0	2	1-0-0-0-1-1-1-0	4
31 March	2	0-0-1-0-1-0-1-1	2	1-0-0-0-3-0-0-0	4	0-0-1-0-2-2-2-1
01 April	3	1-0-0-1-1-0-2-2	2	0-0-0-2-1-0-0-1	4	1-0-0-1-1-2-2-2
02 April	0	0-0-0-0-1-0-0-0	1	0-0-1-1-0-0-0-0	3	1-0-0-0-1-1-1-2
03 April	2	0-0-1-0-1-1-0-1	0	0-0-0-0-0-0-0-0	2	0-0-0-0-1-1-1-1
04 April	0	0-0-0-0-0-1-0-0	0	0-0-0-0-1-0-0-0	2	0-0-0-0-0-1-0-1
05 April	3	1-1-1-1-1-1-1-0	2	1-1-0-2-0-0-1-0	4	1-1-1-1-1-1-1-1

**Alerts and Warnings Issued**

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
No Alerts Issued		



### 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 Apr	70	8	3	22 Apr	70	8	3
09	70	15	4	23	72	5	2
10	70	8	3	24	72	5	2
11	70	5	2	25	72	5	2
12	70	5	2	26	72	5	2
13	70	5	2	27	72	5	2
14	70	5	2	28	72	5	2
15	70	5	2	29	72	5	2
16	70	5	2	30	70	8	3
17	70	5	2	01 May	70	5	2
18	70	5	2	02	70	5	2
19	70	5	2	03	70	5	2
20	70	5	2	04	70	5	2
21	70	8	3				



***Energetic Events***

Date	Time			X-ray		Optical Information			Peak		Sweep Freq
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity
									245	2695	II

*No Events Observed*

***Flare List***

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

***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

*No active regions.*



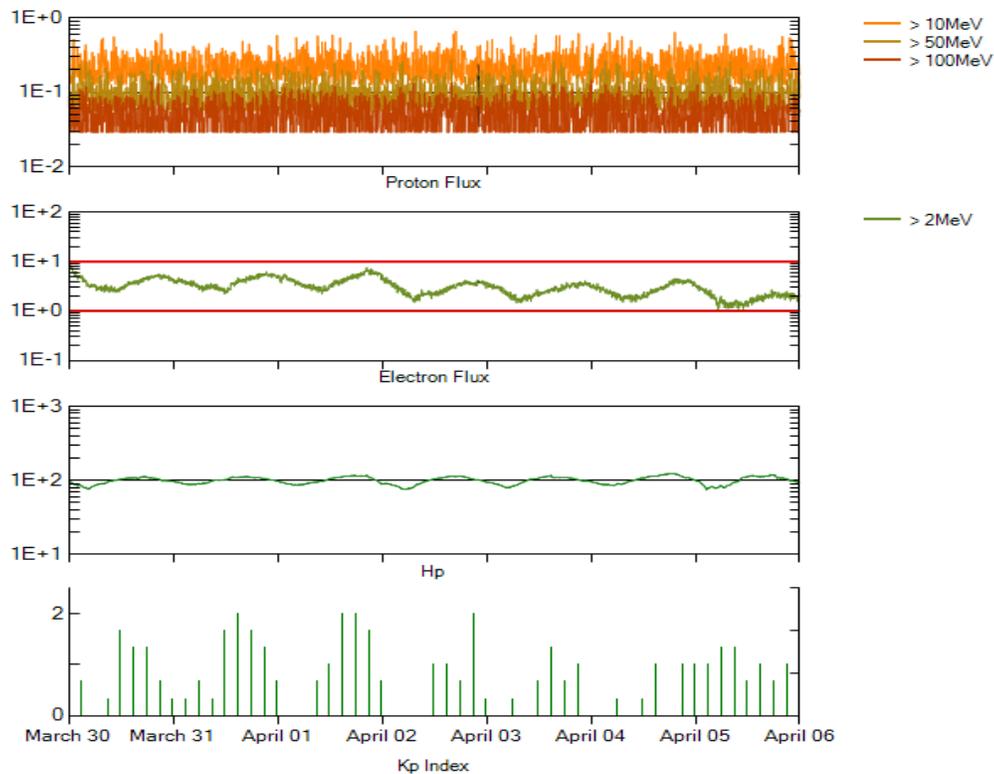
**Recent Solar Indices (preliminary)**  
**Of the observed monthly mean values**

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
<b>2007</b>									
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	8.1	5.0	78.6	70.5	4	7.8
<b>2008</b>									
January	5.1	3.4	0.67	6.9	4.2	72.1	70.0	6	7.7
February	3.8	2.1	0.55	5.9	3.6	71.2	69.6	9	7.6
March	15.9	9.3	0.58	5.3	3.3	72.9	69.5	10	7.4
April	4.9	2.9	0.59	5.3	3.3	70.3	69.6	9	7.1
May	5.7	2.9	0.51	5.7	3.5	68.4	69.7	6	6.9
June	4.2	3.1	0.74	5.2	3.2	65.9	69.2	7	6.8
July	1.0	0.5	0.50	4.5	2.7	65.8	68.8	6	6.6
August	0.0	0.5	**	4.4	2.6	66.4	68.6	5	6.2
September	1.5	1.1	0.73	3.7	2.2	67.1	68.4	5	5.8
October	5.2	2.9	0.56			68.3		6	
November	6.8	4.1	0.60			68.6		3	
December	1.3	0.8	0.62			69.2		2	
<b>2009</b>									
January	2.8	1.5	0.54			69.8		3	
February	2.5	1.4	0.56			70.0		4	
March	0.7	0.7	1.00			69.2		4	

**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.

\*\*SWPC sunspot number was less than RI value, so a ratio could not be done.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 30 March 2009*

**GOES-11 designated Primary Electron Satellite and GOES-10 Secondary: December 1, 2008 the GOES-12 Electron sensor began experiencing periods of noise and sensor is unreliable.**

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.

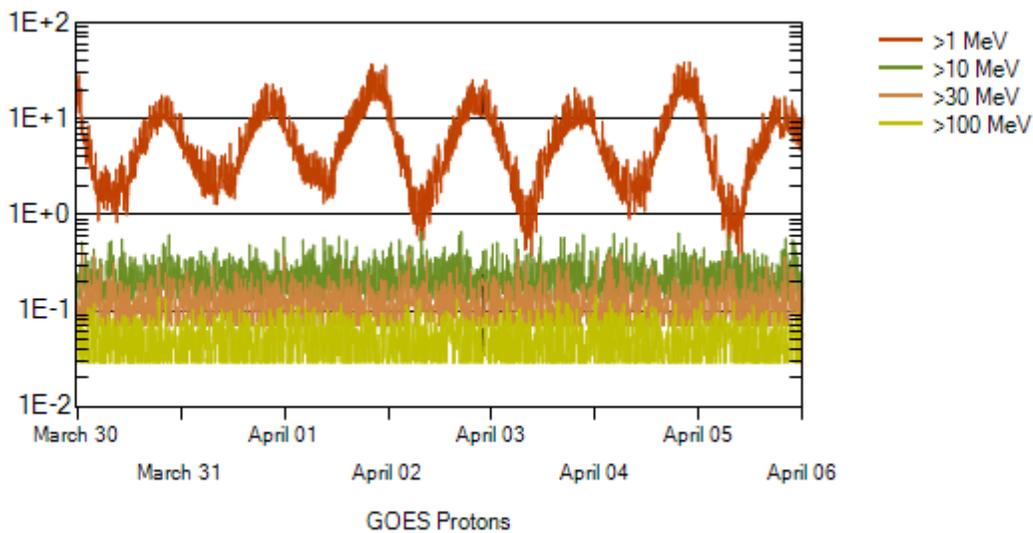
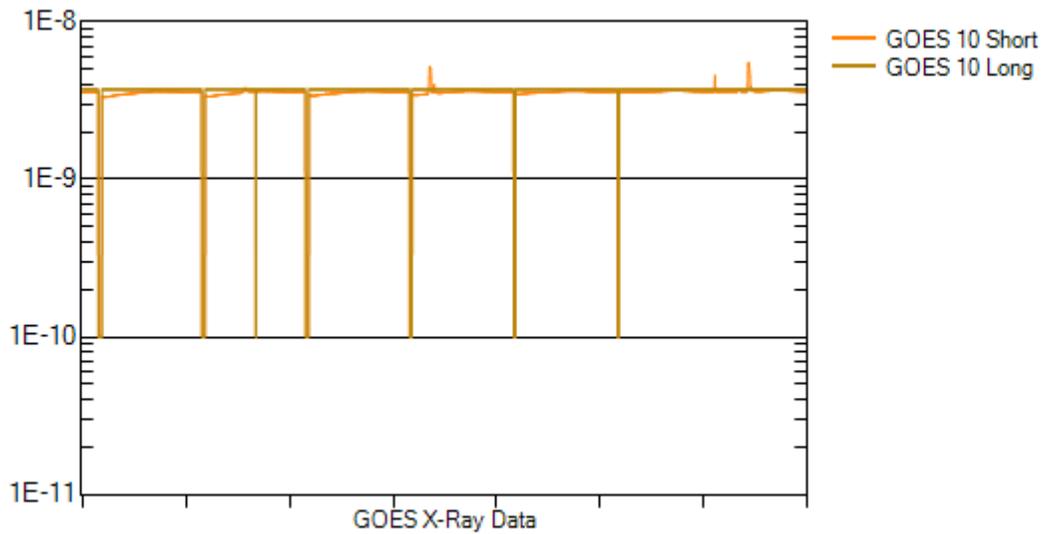
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-11 (W135).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-11. 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 SWPC 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*

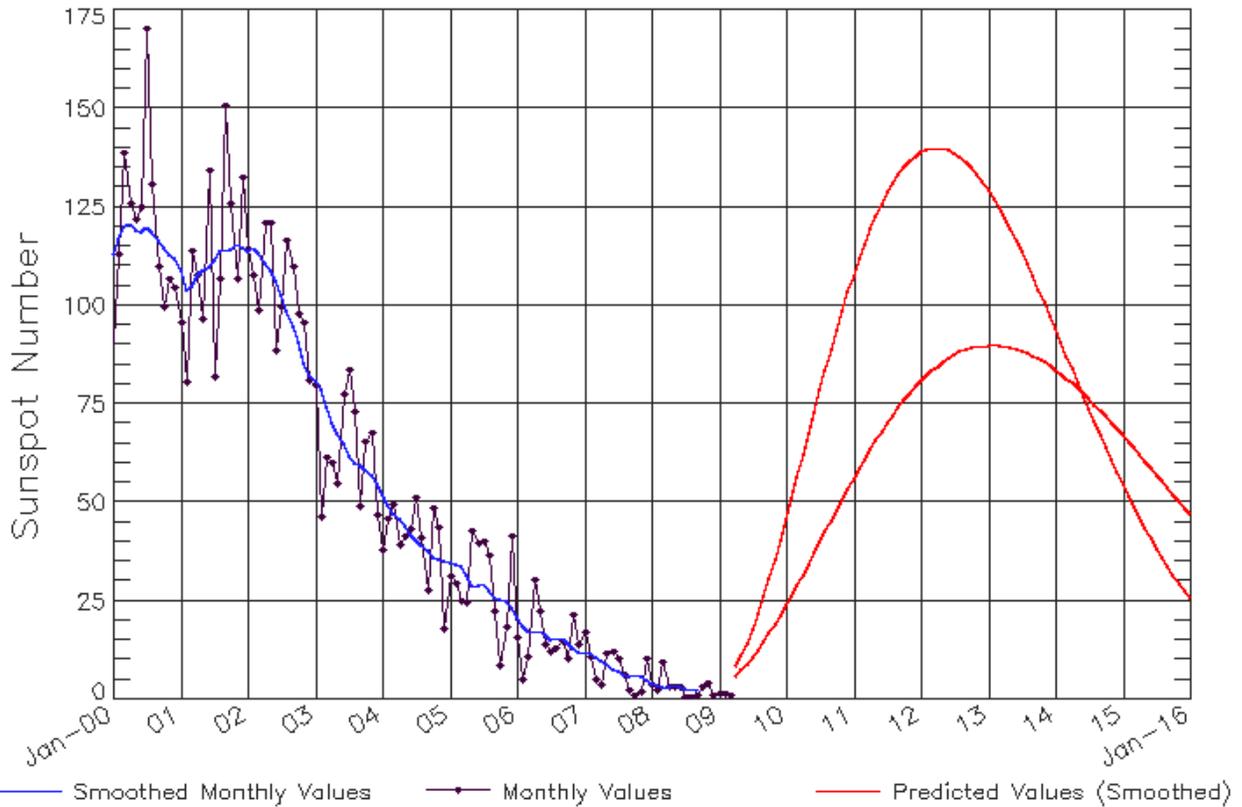
X-ray plot contains five-minute averaged x-ray flux ( $\text{watts/m}^2$ ) as measured by GOES 10 (W060) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

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 Mar 09



Updated 2009 Apr 6

NOAA/SWPC Boulder, CO USA

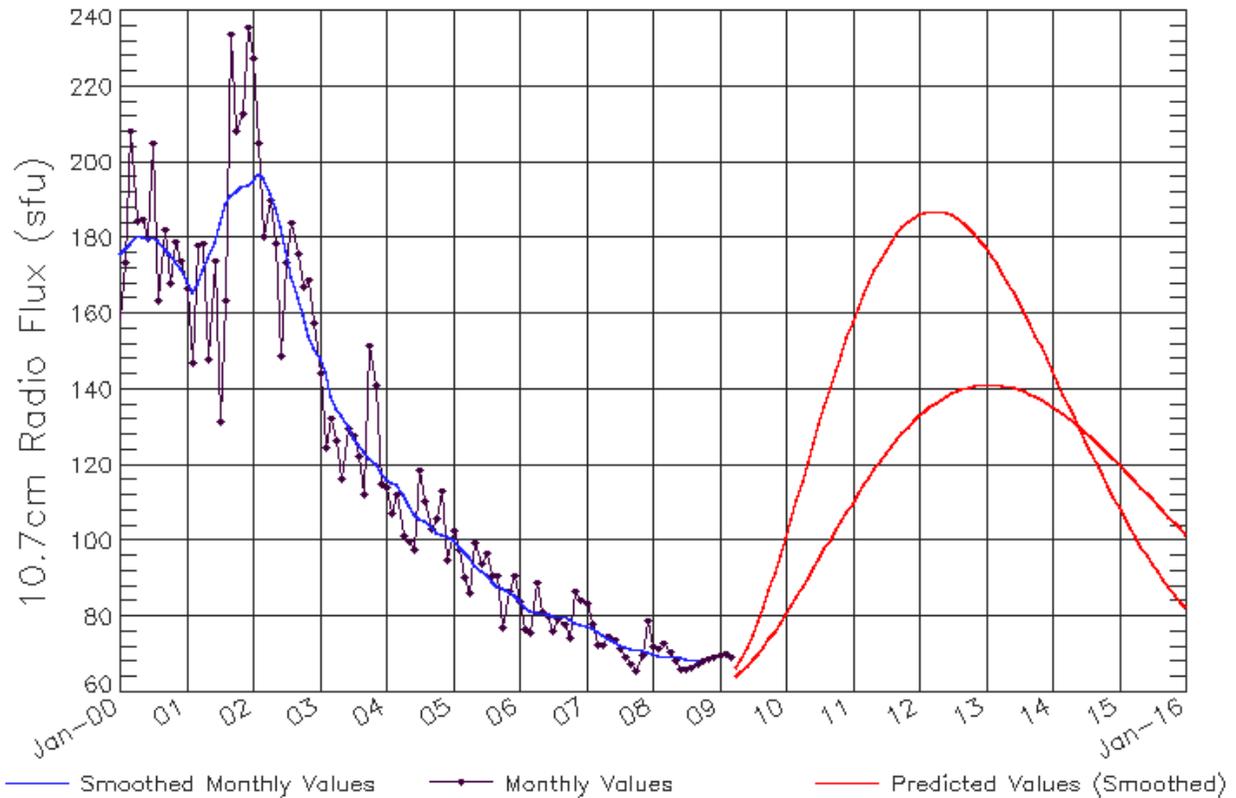
## SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Hi/Lo											
2006	20 (***)	18 (***)	17 (***)	17 (***)	17 (***)	16 (***)	15 (***)	15 (***)	15 (***)	14 (***)	12 (***)	12 (***)
2007	12 (***)	11 (***)	10 (***)	9 (***)	8 (***)	7 (***)	7 (***)	6 (***)	5 (***)	6 (***)	5 (***)	5 (***)
2008	4 (***)	3 (***)	3 (***)	3 (***)	3 (***)	3 (***)	2 (***)	2 (***)	2 (***)	2/2 (1)	3/2 (3)	4/3 (5)
2009	5/3 (7)	6/4 (8)	8/5 (9)	10/7 (10)	12/8 (11)	16/9 (12)	19/11 (13)	23/13 (14)	28/15 (15)	31/17 (15)	36/19 (15)	41/21 (15)
2010	46/24 (15)	51/26 (15)	57/29 (15)	62/32 (15)	68/34 (15)	73/37 (15)	78/40 (15)	84/43 (15)	89/45 (15)	94/48 (15)	99/51 (15)	103/53 (15)
2011	108/56 (15)	112/59 (15)	116/61 (15)	119/63 (15)	123/66 (15)	126/68 (15)	129/70 (15)	131/72 (15)	133/74 (15)	135/76 (15)	137/78 (15)	138/79 (15)
2012	139/81 (15)	140/82 (15)	140/84 (15)	140/85 (15)	140/86 (15)	139/87 (15)	139/88 (15)	138/88 (15)	136/89 (15)	135/89 (15)	133/90 (15)	131/90 (15)
2013	129/90 (15)	127/90 (15)	125/90 (15)	122/90 (15)	119/89 (15)	116/89 (15)	114/89 (15)	110/88 (15)	107/87 (15)	104/86 (15)	101/86 (15)	97/85 (15)
2014	94/84 (15)	91/83 (15)	87/81 (15)	84/80 (15)	80/79 (15)	77/78 (15)	74/76 (15)	70/75 (15)	67/73 (15)	64/72 (15)	61/70 (15)	58/69 (15)
2015	55/67 (15)	52/65 (15)	49/64 (15)	46/62 (15)	44/60 (15)	41/59 (15)	38/57 (15)	36/55 (15)	34/54 (15)	32/52 (15)	30/50 (15)	28/49 (15)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Mar 09



Updated 2009 Apr 6

NOAA/SWPC Boulder, CO USA

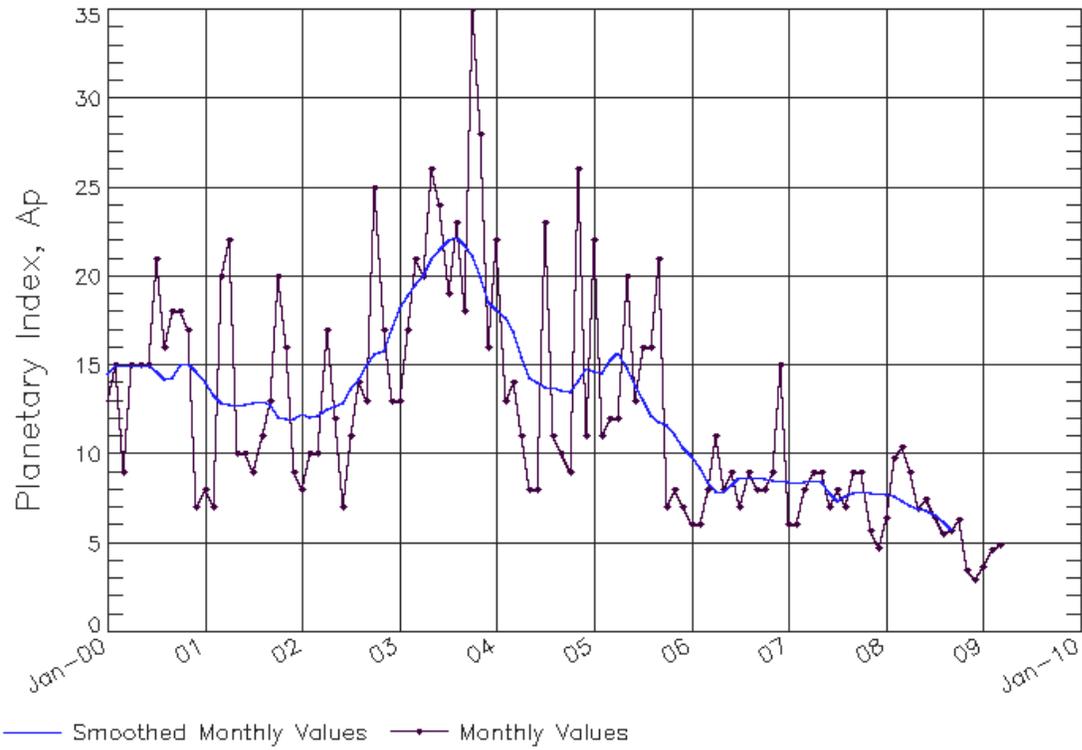
## SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Hi/Lo											
2006	84	82	81	80	80	80	80	80	80	79	78	77
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2007	77	76	76	75	74	73	72	71	71	71	71	70
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2008	70	69	69	69	69	69	68	68	68	<b>68/62</b>	<b>68/62</b>	<b>68/62</b>
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(3)	(5)
2009	<b>69/62</b>	<b>70/62</b>	<b>71/63</b>	<b>72/63</b>	<b>74/64</b>	<b>76/64</b>	<b>79/65</b>	<b>81/66</b>	<b>85/70</b>	<b>87/74</b>	<b>91/76</b>	<b>96/78</b>
	(7)	(9)	(11)	(13)	(15)	(17)	(19)	(21)	(22)	(23)	(23)	(23)
2010	<b>101/81</b>	<b>106/83</b>	<b>111/85</b>	<b>116/88</b>	<b>121/90</b>	<b>126/93</b>	<b>131/95</b>	<b>136/98</b>	<b>140/100</b>	<b>145/103</b>	<b>149/105</b>	<b>154/108</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2011	<b>158/110</b>	<b>161/112</b>	<b>165/115</b>	<b>168/117</b>	<b>171/119</b>	<b>174/121</b>	<b>177/123</b>	<b>179/125</b>	<b>181/127</b>	<b>183/128</b>	<b>184/130</b>	<b>185/132</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2012	<b>186/133</b>	<b>187/134</b>	<b>187/135</b>	<b>187/136</b>	<b>187/137</b>	<b>187/138</b>	<b>186/139</b>	<b>185/140</b>	<b>184/140</b>	<b>183/141</b>	<b>181/141</b>	<b>179/141</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2013	<b>177/141</b>	<b>175/141</b>	<b>173/141</b>	<b>171/141</b>	<b>168/141</b>	<b>166/140</b>	<b>163/140</b>	<b>160/139</b>	<b>157/139</b>	<b>154/138</b>	<b>151/137</b>	<b>148/136</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2014	<b>145/136</b>	<b>142/135</b>	<b>139/134</b>	<b>136/132</b>	<b>133/131</b>	<b>129/130</b>	<b>126/129</b>	<b>123/127</b>	<b>120/126</b>	<b>117/125</b>	<b>115/123</b>	<b>112/122</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2015	<b>109/120</b>	<b>106/119</b>	<b>104/117</b>	<b>101/116</b>	<b>99/114</b>	<b>96/113</b>	<b>94/111</b>	<b>92/110</b>	<b>90/108</b>	<b>88/106</b>	<b>86/105</b>	<b>84/103</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)



# ISES Solar Cycle Ap Progression

Data Through 31 Mar 09



Updated 2009 Apr 6

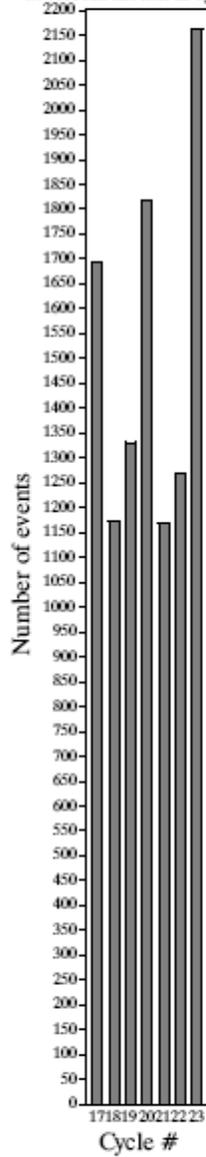
NOAA/SWPC Boulder, CO USA



# Quiet ( $A_p \leq 7$ ) Geomagnetic Conditions



Comparison of Cycles at current month in cycle



February 2009  
(Month 149)

