

**Space Weather Summary**  
**30 June 1997 - 06 July 1997**

Solar activity was very low.

Solar wind data were received from the WIND spacecraft a few hours per day. Solar wind velocities ranged from 250 - 400 km/sec. Particle densities were generally in the 02 -10 p/cc range most of the period. However, densities briefly peaked to near 30 p/cc on 02 and 03 July. Bz hovered around zero during 30 June - 02 July. Bz became variable early 03 July ranging from plus 20 to minus 20 nT (GSM) before shifting north during late 03 - late 04 July. Bz became variable again late 04 July ranging from plus 20 nT to minus 15 nT. Bz hovered around zero during 05 - 06 July. Solar sector orientation was toward (phi angle near 315 degrees) during 01 - 02 July and away (phi angle near 135 degrees) during 04 - 06 July. Orientation was not discernible during the remaining days.

There were no significant proton enhancements observed at satellite altitudes.

The greater than 2 MeV electron flux was at normal levels.

The geomagnetic field was quiet to unsettled.

**Space Weather Forecast**  
**09 July 1997 - 04 August 1997**

Solar activity is expected to be very low.

No significant proton enhancements are expected at satellite altitudes.

The greater than 2 MeV electron flux is expected to be normal to moderate.

The geomagnetic field is expected to be quiet to unsettled.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>6</sup> hemi.)	X-ray Background	X-ray Flux			Flares				
					C	M	X	S	1	2	3	4
30 June	70	0	0	A5.7	0	0	0	1	0	0	0	0
01 July	70	0	0	<A1.0	0	0	0	0	0	0	0	0
02 July	70	12	10	<A1.0	0	0	0	0	0	0	0	0
03 July	69	12	0	<A1.0	0	0	0	0	0	0	0	0
04 July	70	12	0	<A1.0	0	0	0	0	0	0	0	0
05 July	70	11	0	<A1.0	0	0	0	0	0	0	0	0
06 July	68	11	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)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
30 June	7.9E+4	1.7E+4	4.3E+3		2.0E+6	
01 July	8.2E+4	1.9E+4	4.5E+3		3.0E+6	
02 July	8.6E+4	1.8E+4	4.7E+3		3.6E+6	
03 July	9.5E+4	1.8E+4	4.5E+3		1.8E+6	
04 July	1.6E+5	1.8E+4	4.7E+3		1.4E+6	
05 July	1.8E+5	1.8E+4	4.6E+3		2.1E+6	
06 July	1.6E+5	1.8E+4	4.5E+3		1.7E+6	

### *Daily Geomagnetic Data*

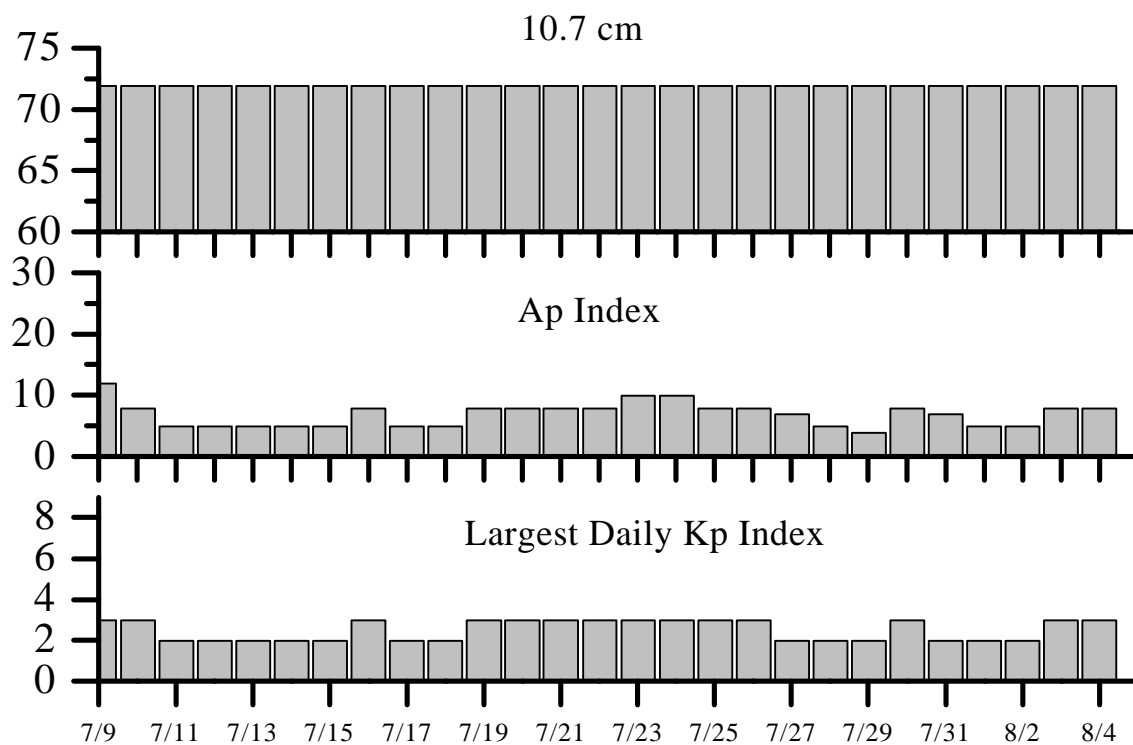
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
30 June	6	2-1-0-1-2-2-2-3	1	1-0-0-0-0-1-0-1	5	3-1-0-0-2-2-2-2
01 July	6	1-2-1-1-2-2-2-2	0	1-0-0-0-1-0-0-0	4	2-1-0-1-1-1-2-2
02 July	4	1-1-1-0-2-1-2-2	1	0-0-0-1-1-0-0-1	4	1-1-0-1-1-1-2-2
03 July	9	2-2-2-3-2-3-2-2	7	3-0-1-4-3-0-0-1	7	3-1-2-3-2-2-1-2
04 July	8	2-2-1-2-2-3-2-2	3	1-2-0-2-1-1-1-0	7	2-2-0-1-2-3-3-2
05 July	5	1-1-1-2-2-2-1-1	*	*-1-0-2-0-1-0-0	4	1-1-1-1-1-1-1-1
06 July	7	0-3-1-2-2-2-2-2	1	1-1-1-0-0-0-0-0	4	0-2-1-1-1-1-1-1

### *Alerts and Warnings Issued*

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
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***No Alerts Issued***





*Twenty-seven Day Outlook*

Date	Radio Flux	Planetary	Largest	Date	Radio Flux	Planetary	Largest
	10.7 cm	A Index	Kp Index		10.7 cm	A Index	Kp Index
09 Jul	72	12	3	23 Jul	72	10	3
10	72	8	3	24	72	10	3
11	72	5	2	25	72	8	3
12	72	5	2	26	72	8	3
13	72	5	2	27	72	7	2
14	72	5	2	28	72	5	2
15	72	5	2	29	72	4	2
16	72	8	3	30	72	8	3
17	72	5	2	31	72	7	2
18	72	5	2	01 Aug	72	5	2
19	72	8	3	02	72	5	2
20	72	8	3	03	72	8	3
21	72	8	3	04	72	8	3
22	72	8	3				



**Energetic Event**

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Max	Class	Flux	Imp Brtns	Location		Radio Flux		Intensity	
							Lat	CMD	245	2695	II	IV

**No Event Observed**

**Flare List**

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Lat	CMD	
30 June	0318	0320	0324	B1.4	SF	N29W01	8057	
	2112	2121	2130	B2.8				
01 July	No Flares Observed							
02 July	No Flares Observed							
03 July	No Flares Observed							
04 July	1717	1726	1738	A3.8				
05 July	No Flares Observed							
06 July	No Flares Observed							

**Region Summary**

Date	Location		Sunspot Characteristics					Flares				
	° Lat	° CMD	Area (10 <sup>6</sup> hemi)	Extent (heli)	Spot Class	Spot Count	Mag Class	X-ray			Optical	
								C	M	X	S	1

*Region 8056*

25 Jun	N17W18	276	0040	05	CRO	012	B											
26 Jun	N17W33	277	0040	07	DAO	013	B											
27 Jun	N17W47	278	0030	08	DRO	009	B											
28 Jun	N17W61	279	0010	06	BXO	004	B					1						
29 Jun	N19W70	275	0000	00	AXX	002	A	1				1						
30 Jun	N19W83	275																
												1	0	0	2	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 276

*Region 8057*

28 Jun	N30E12	206	0000	01	AXX	002	A					1						
29 Jun	N31W03	208	0000	00	AXX	002	A											
30 Jun	N31W16	208										1						
01 Jul	N31W29	208																
02 Jul	N31W42	208																
03 Jul	N31W55	208																
												0	0	0	2	0	0	0

Died on Disk.

Absolute heliographic longitude: 208



***Region Summary- continued.***

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

*Region 8058*

02 Jul	S19E44	121	0010	02	BXO	002	B										
03 Jul	S22E30	122	0000	01	AXX	002	A										
04 Jul	S22E17	122															
								0	0	0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 122

*Region 8059*

04 Jul	S30E02	137	0000	00	AXX	002	A										
05 Jul	S30W14	140	0000	00	AXX	001	A										
06 Jul	S32W23	136	0000	00	AXX	001	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 137



**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
<b>1995</b>									
July	23.8	14.5	0.61	28.1	17.0	73.9	76.9	08	12.4
August	25.1	14.3	0.57	25.4	15.4	73.8	76.0	09	12.1
September	16.5	11.8	0.72	22.0	13.4	72.0	74.8	13	11.8
October	31.6	21.1	0.67	19.7	12.1	77.9	73.8	16	11.4
November	15.7	09.0	0.57	18.5	11.4	74.2	73.2	09	10.7
December	16.2	10.0	0.62	17.6	10.8	72.6	72.8	09	10.0
<b>1996</b>									
January	17.6	11.5	0.55	16.8	10.4	74.5	72.4	09	09.8
February	09.1	04.4	0.48	16.2	10.1	71.5	72.2	10	09.8
March	12.1	09.2	0.76	15.4	09.7	70.7	72.1	11	09.9
April	08.5	04.8	0.60	13.6	08.6	69.3	71.6	11	09.7
May	11.8	05.5	0.47	12.9	08.1*	70.1	71.4	07	09.5
June	18.8	11.8	0.63	13.5	08.6*	69.6	71.8	05	09.4
July	13.2	08.2	0.67	13.4	08.5*	71.2	72.0	07	09.3
August	20.5	14.4	0.68	13.1	08.4*	72.4	72.1	09	09.4
September	02.9	01.6	0.62	13.3	08.5*	69.4	72.3*	15	09.3*
October	02.3	01.8	0.78	14.0	09.0*	69.2	72.6*	13	09.1*
November	26.7	18.6*	0.70*	15.4	10.0*	78.7	73.0*	08	09.1*
December	21.1	12.7*	0.60*	12.7	10.6*	77.8	73.3*	07	09.3*
<b>1997</b>									
January	09.0	06.5*	0.72*			74.0		09	
February	11.3	07.6*	0.67*			73.8		11	
March	14.4	08.8*	0.61*			73.5*		08*	
April	24.5	15.8*	0.64*			74.5*		10*	
May	28.6	18.5*	0.64			74.6*		08*	
June	22.1	13.1*	0.59			72.4*		08*	

\*Preliminary estimates.

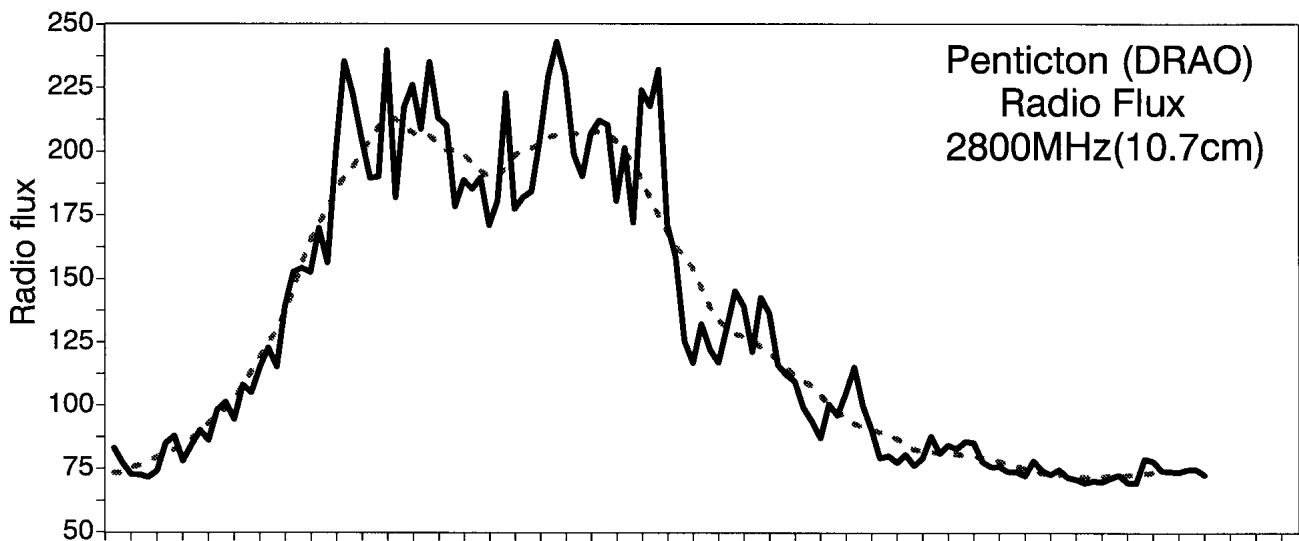
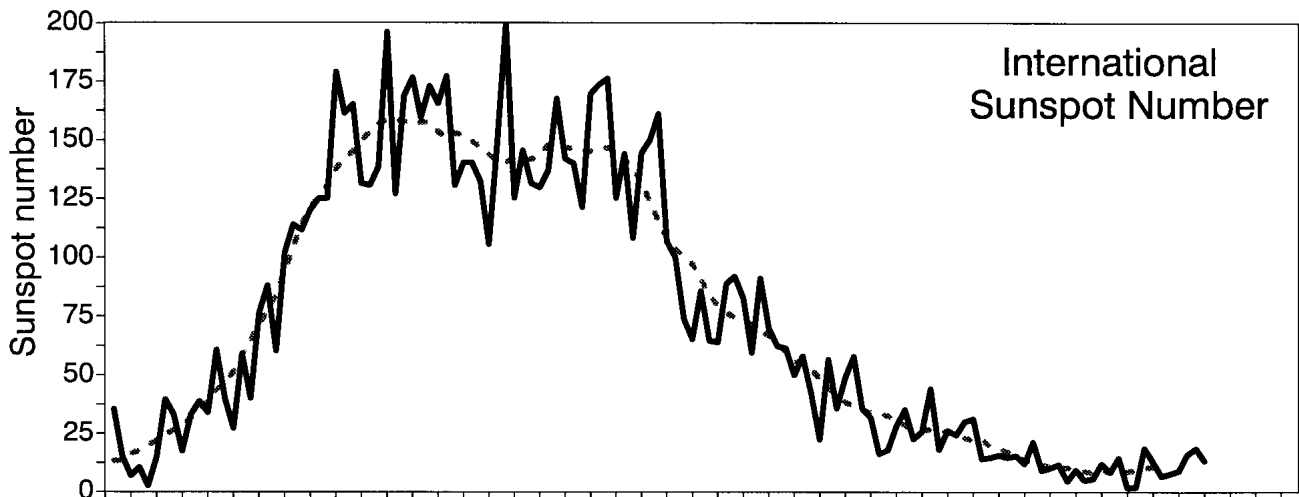
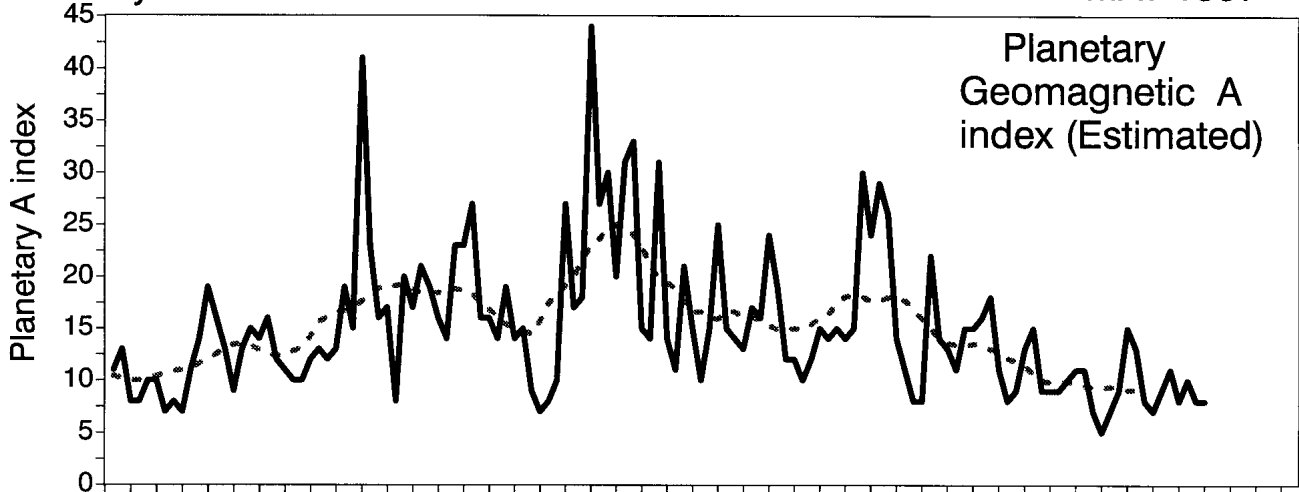
The lowest smoothed sunspot indices number for Cycle 21, RI = 12.3, occurred September 1986. The highest smoothed sunspot number for Cycle 22, RI=158.5, occurred July 1989.

\*\* From June 1991 onward, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



Cycle 22 Indices

June 1997



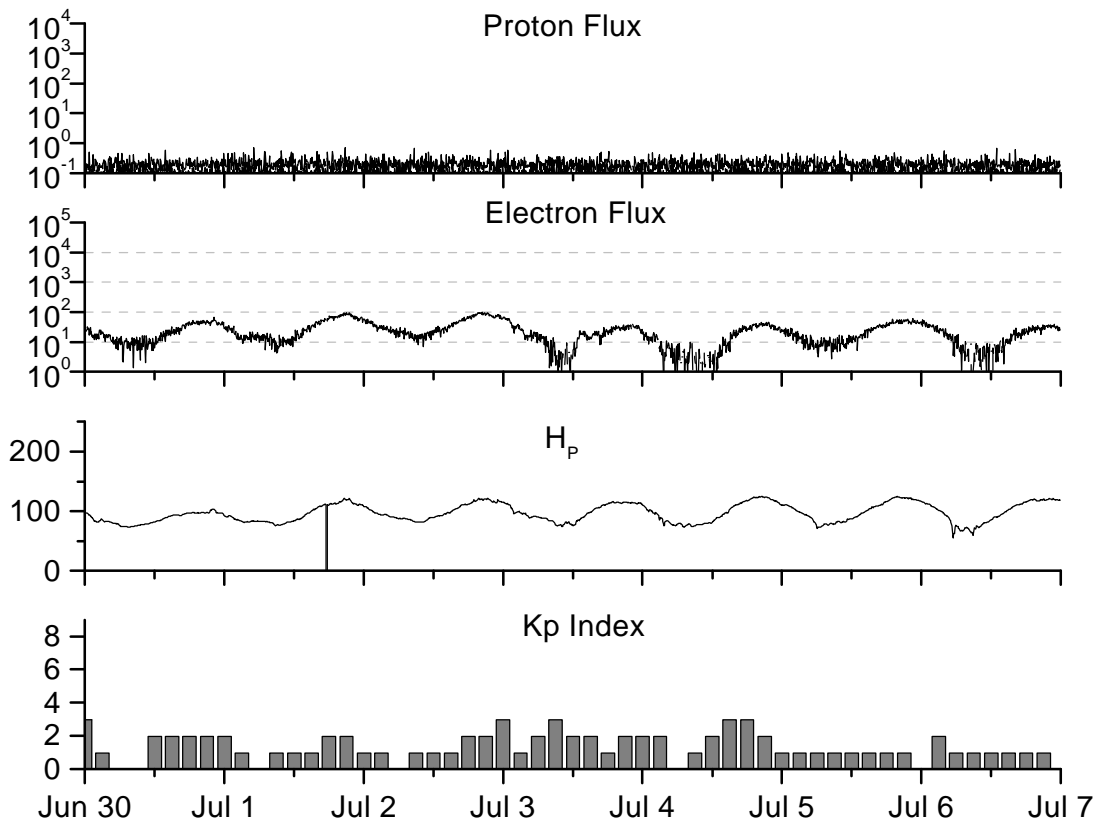
Sep '88 Mar '89 Sep '89 Mar '90 Sep '90 Mar '91 Sep '91 Mar '92 Sep '92 Mar '93 Sep '93 Mar '94 Sep '94 Mar '95 Sep '95 Mar '96 Sep '96 Mar '97 Sep '97

Solid — — Monthly average

Dashed — — Smoothed average

SEC/Hirman/Nelson/Borst





## Weekly Geosynchronous Satellite Environment Summary

### *Week Beginning 30 June 1997*

*Protons* plot contains the five minute averaged integral proton flux (protons/  $\text{cm}^2$ -sec-sr) as measured by GOES-9 (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/  $\text{cm}^2$ -sec-sr) with energies greater than 2 MeV at GOES-9.

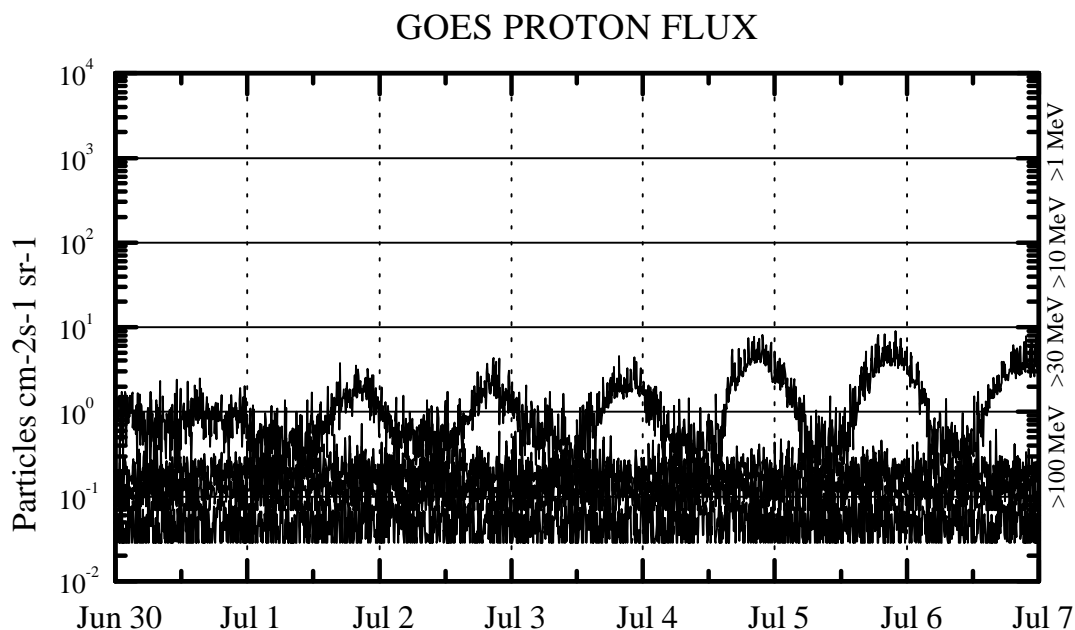
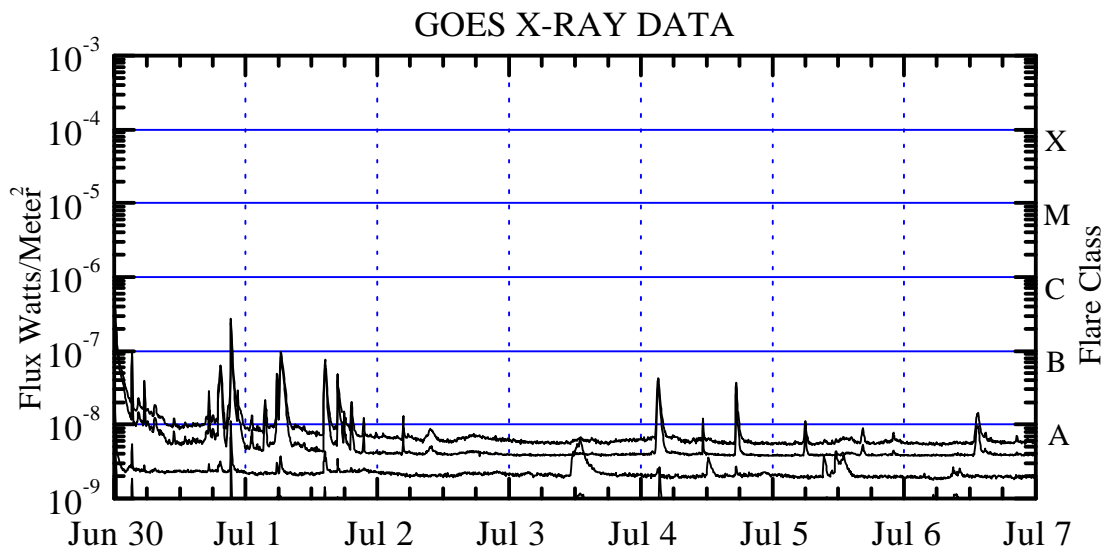
*H<sub>p</sub>* plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> Space Weather Squadron) 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. 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<sub>p</sub> 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<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H<sub>parallel</sub> is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.







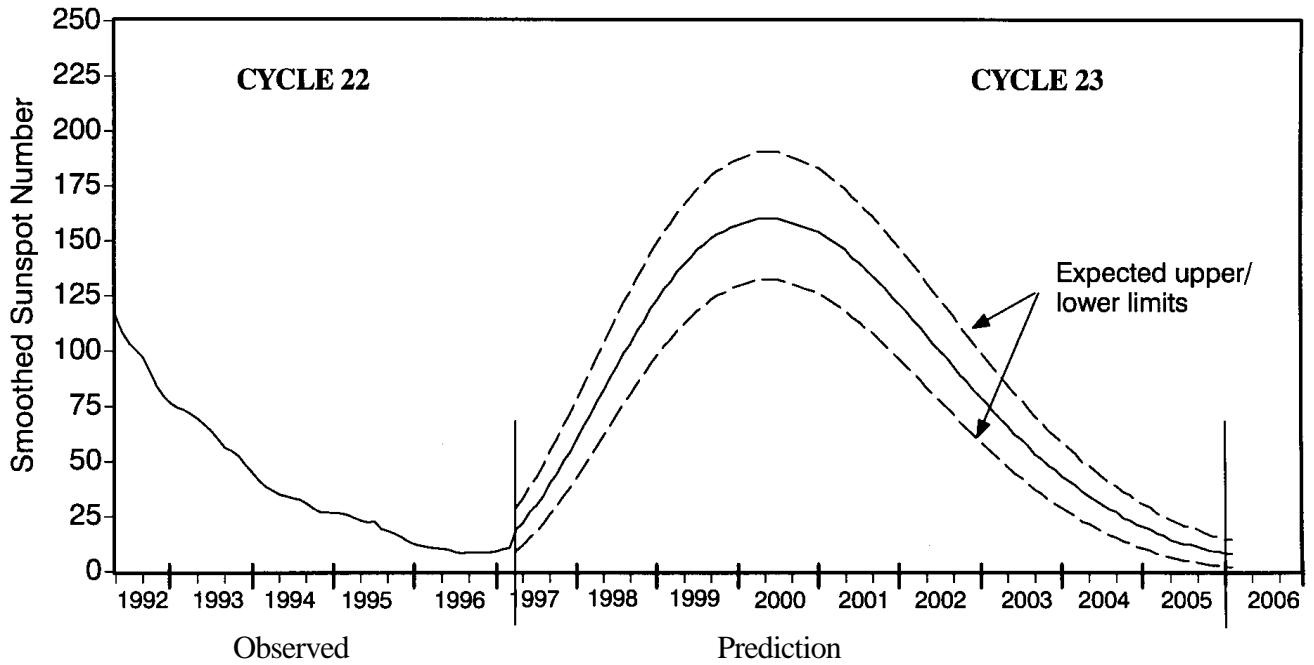
*Weekly GOES Satellite X-ray and Proton Plots*

Proton plot contains the five minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-9 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

X-ray plot contains five minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 8 and 9 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



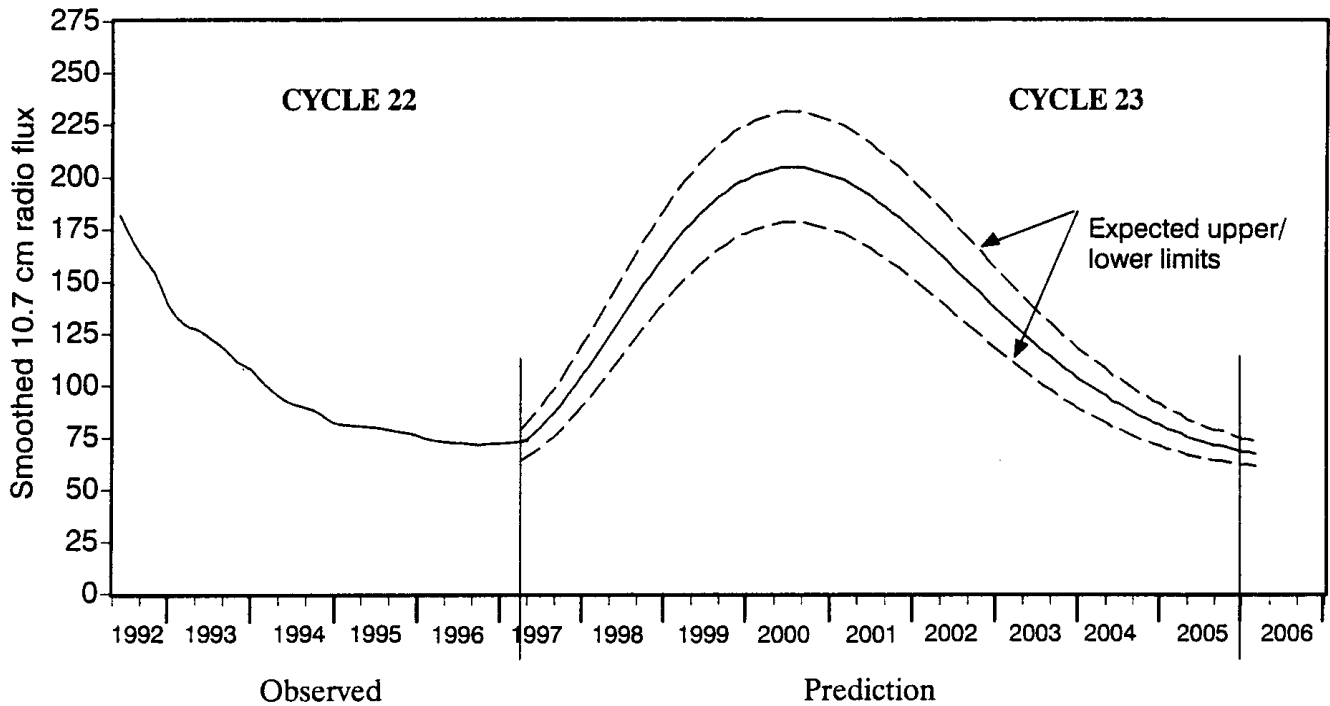
## SEC Prediction of Smoothed Sunspot Number



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10	10	10	9	8	9	9	8	9	9	10	11
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1997	<b>19</b>	<b>22</b>	<b>27</b>	<b>30</b>	<b>34</b>	<b>40</b>	<b>44</b>	<b>50</b>	<b>54</b>	<b>60</b>	<b>66</b>	<b>71</b>
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(20)
1998	<b>77</b>	<b>82</b>	<b>88</b>	<b>93</b>	<b>99</b>	<b>103</b>	<b>109</b>	<b>113</b>	<b>119</b>	<b>123</b>	<b>128</b>	<b>131</b>
	(21)	(22)	(22)	(23)	(24)	(24)	(25)	(25)	(26)	(26)	(27)	(27)
1999	<b>136</b>	<b>139</b>	<b>142</b>	<b>146</b>	<b>148</b>	<b>151</b>	<b>153</b>	<b>154</b>	<b>156</b>	<b>157</b>	<b>158</b>	<b>159</b>
	(27)	(28)	(28)	(29)	(29)	(29)	(29)	(29)	(29)	(29)	(29)	(29)
2000	<b>160</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>159</b>	<b>158</b>	<b>157</b>	<b>156</b>	<b>155</b>	<b>154</b>	<b>152</b>	<b>150</b>
	(30)	(30)	(30)	(30)	(29)	(29)	(29)	(29)	(29)	(29)	(29)	(28)
2001	<b>148</b>	<b>146</b>	<b>142</b>	<b>140</b>	<b>137</b>	<b>134</b>	<b>131</b>	<b>128</b>	<b>124</b>	<b>121</b>	<b>118</b>	<b>114</b>
	(28)	(28)	(28)	(27)	(27)	(27)	(27)	(26)	(26)	(26)	(25)	(25)
2002	<b>111</b>	<b>107</b>	<b>103</b>	<b>100</b>	<b>97</b>	<b>93</b>	<b>89</b>	<b>86</b>	<b>82</b>	<b>79</b>	<b>76</b>	<b>72</b>
	(24)	(24)	(24)	(23)	(23)	(22)	(22)	(21)	(21)	(21)	(20)	(20)
2003	<b>69</b>	<b>66</b>	<b>62</b>	<b>60</b>	<b>57</b>	<b>53</b>	<b>51</b>	<b>48</b>	<b>46</b>	<b>43</b>	<b>41</b>	<b>39</b>
	(19)	(19)	(18)	(18)	(17)	(17)	(17)	(16)	(16)	(15)	(15)	(14)
2004	<b>36</b>	<b>34</b>	<b>32</b>	<b>30</b>	<b>28</b>	<b>27</b>	<b>24</b>	<b>23</b>	<b>21</b>	<b>20</b>	<b>19</b>	<b>17</b>
	(14)	(14)	(13)	(13)	(12)	(12)	(11)	(11)	(11)	(10)	(10)	(9)
2005	<b>16</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>8</b>	<b>**</b>	<b>**</b>
	(9)	(9)	(8)	(8)	(8)	(8)	(7)	(7)	(7)	(6)	(***)	(***)



## SEC Prediction of Smoothed 10.7 cm Radio Flux

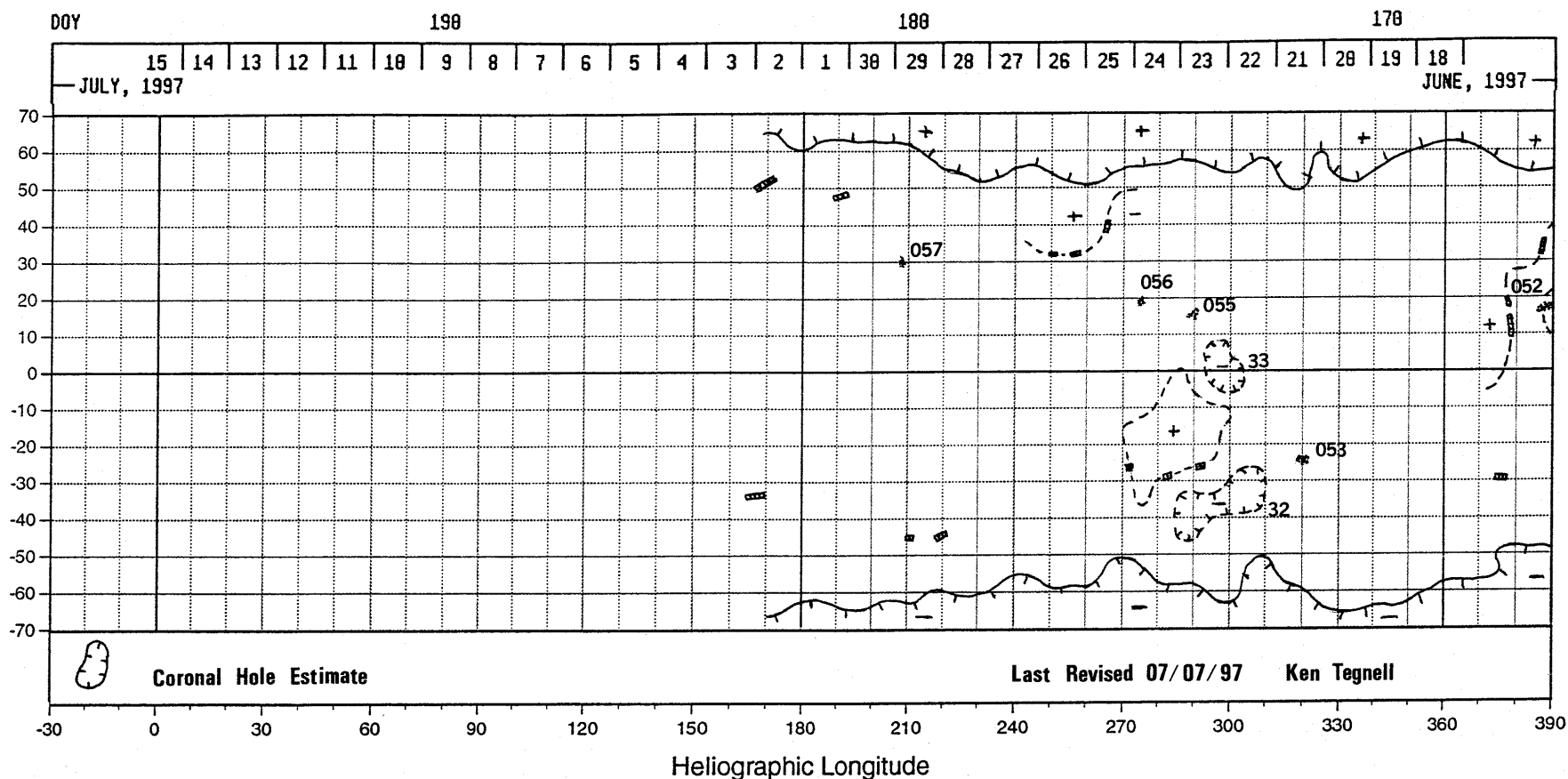


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	72 (***)	72 (***)	72 (***)	72 (***)	72 (***)	71 (***)	72 (***)	72 (**)	72 (***)	73 (***)	73 (***)	73 (***)
1997	<b>77</b> (9)	<b>80</b> (10)	<b>84</b> (11)	<b>87</b> (11)	<b>91</b> (12)	<b>96</b> (13)	<b>100</b> (14)	<b>105</b> (15)	<b>109</b> (15)	<b>114</b> (16)	<b>119</b> (17)	<b>124</b> (18)
1998	<b>129</b> (18)	<b>134</b> (19)	<b>139</b> (20)	<b>144</b> (20)	<b>149</b> (21)	<b>153</b> (21)	<b>158</b> (22)	<b>162</b> (22)	<b>167</b> (23)	<b>171</b> (23)	<b>175</b> (23)	<b>178</b> (24)
1999	<b>182</b> (24)	<b>185</b> (25)	<b>188</b> (25)	<b>191</b> (25)	<b>193</b> (25)	<b>196</b> (26)	<b>198</b> (26)	<b>199</b> (26)	<b>201</b> (27)	<b>202</b> (27)	<b>203</b> (28)	<b>204</b> (28)
2000	<b>205</b> (30)	<b>205</b> (30)	<b>205</b> (30)	<b>205</b> (30)	<b>204</b> (30)	<b>203</b> (28)	<b>202</b> (27)	<b>201</b> (27)	<b>200</b> (26)	<b>199</b> (26)	<b>197</b> (26)	<b>195</b> (26)
2001	<b>193</b> (25)	<b>292</b> (25)	<b>188</b> (25)	<b>186</b> (25)	<b>183</b> (24)	<b>181</b> (24)	<b>178</b> (24)	<b>175</b> (24)	<b>172</b> (23)	<b>169</b> (23)	<b>166</b> (23)	<b>163</b> (22)
2002	<b>160</b> (22)	<b>156</b> (22)	<b>153</b> (21)	<b>150</b> (21)	<b>147</b> (21)	<b>144</b> (21)	<b>140</b> (20)	<b>137</b> (20)	<b>134</b> (19)	<b>131</b> (19)	<b>128</b> (18)	<b>125</b> (18)
2003	<b>122</b> (17)	<b>119</b> (17)	<b>116</b> (17)	<b>114</b> (16)	<b>111</b> (16)	<b>108</b> (15)	<b>106</b> (15)	<b>103</b> (14)	<b>101</b> (14)	<b>99</b> (14)	<b>97</b> (13)	<b>95</b> (13)
2004	<b>92</b> (12)	<b>91</b> (12)	<b>89</b> (12)	<b>87</b> (11)	<b>85</b> (11)	<b>84</b> (11)	<b>82</b> (10)	<b>81</b> (10)	<b>79</b> (10)	<b>78</b> (9)	<b>77</b> (9)	<b>75</b> (9)
2005	<b>74</b> (8)	<b>73</b> (8)	<b>72</b> (8)	<b>71</b> (7)	<b>71</b> (7)	<b>70</b> (7)	<b>69</b> (7)	<b>68</b> (6)	<b>68</b> (6)	<b>67</b> (6)	<b>**</b> (***)	<b>**</b> (***)





# Carrington Rotation 1924



*Ha Synoptic Chart* - a partial and preliminary map of the sun in absolute heliographic coordinates (solar latitude and longitude). The Carrington Rotation serial number appearing at the top of the chart is a continuation of the sequence begun by R. Carrington on 09 November 1852. Dates along the top of the chart are the times of central meridian passage of the solar longitudes directly below those dates. Features on the map are as follows: filaments (cross-hatched areas), filament channels (solid lines outside an active area), plage corridors (solid lines inside an active area), 01 and estimated neutral lines (dashed lines) are lines of magnetic polarity change (neutral lines), plagues (dotted areas whose dot density is roughly equal to brightness), strong active regions (stippled areas overlaid with diagonal lines; source of x-ray flares class M2 or greater, or two or more class M1 flares), large sunspots (large dots), coronal holes (solid lines with tick marks directed toward center of coronal hole, from 1083 nm spectroheliograms), SWO region number showing the last 3 digits of a 4-digit number.

