

Space Weather Highlights **29 August – 04 September 2005**

SWO PRF 1566
06 September 2005

Solar activity was at very low to low levels. The most active region on the disk was Region 806 (S17, L=021, class/area, Dai/070 on 29 August). It produced the largest event of the period, a C6.5/Sf at 29/2154 UTC. Region 803 (N11, L=057, class/area, Dai/130 on 27 August) produced a long duration C2.0 at 31/1151 UTC. Associated with this event was a full-halo CME with a plane-of-sky speed of about 1500 km/s. The region decayed to spotless plage by 01 September. The remainder of the disk and limb was quiet and stable.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. Solar wind speed ranged from a low of about 325 km/s late on 30 August to a high of about 830 km/s mid-day on 04 September. Just after 31/1000 UTC, wind speed, density and temperature all increased. At the same time, the IMF Bz began ranging from +15 to -20 nT, all indicative of a co-rotating interactive region (CIR) in advance of a coronal hole high speed wind stream. By early on 01 September, wind speed was steady at near 500 km/s and the IMF Bz was weak, not varying much beyond +/- 5 nT. These conditions persisted through about midday on 02 September when transient flow from the 31 August CME arrived at Earth. Wind speed increased from about 450 km/s to near 675 km/s by late on 02 September, while the IMF Bz varied between +/-12 nT throughout the 2nd. The IMF Bz finished the period not varying much beyond +/- 7 nT. Solar wind speed and temperature increased mid-day on 04 September as a coronal hole high speed wind stream rotated into a geoeffective position. Solar wind speed rose to approximately 830 km/s and finished the period around 650 km/s.

No greater than 10 MeV proton events were observed during the period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 29 – 30 August, and again on 02 – 04 September.

The geomagnetic field ranged from quiet to major storm levels with severe storm periods observed at high latitudes. The period began with quiet to unsettled levels through midday on 31 August. An 18-hour period of minor to major storming began on 31/1000 UTC following the arrival of a CIR and coronal hole high speed wind stream. Several periods of severe storm conditions were observed at high latitudes during this time. Conditions calmed to quiet to unsettled later on 01 September. By mid-day on 02 September, geomagnetic storm conditions began again as transient flow from the 31 August CME arrived. Active to minor storm levels were observed. Early on 03 September, activity further increased to major storm levels for about six hours. By 04 September, mostly unsettled to minor storming with periods of major to severe storm conditions at high latitudes were observed as a coronal hole high speed wind stream influenced the geomagnetic field.

Space Weather Outlook **07 September - 03 October 2005**

Solar activity is expected to be at very low to high levels. Moderate to high levels are possible from 07 – 20 September after the return of old Region 798 (S11, L=227). Otherwise, very low to low levels are expected.

The greater than 10 MeV proton events are possible between 08 – 22 September due to activity from old Region 798. This region was a proton flare producer before it rotated around the West limb on 25 August.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 07 – 08 September, 14 – 19 September, 21 – 26 September, and on 29 September – 03 October.

The geomagnetic field is expected to range from quiet to minor storm levels. Active to minor storm conditions are possible on 09 September, 12 – 14 September, 20 – 22 September, and 28 – 30 September due to recurrent coronal hole high speed wind streams. Otherwise, expect mostly quiet to unsettled conditions.



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 August	89	88	270	A9.1	3	0	0	2	0	0	0	0
30 August	86	68	150	A8.5	1	0	0	1	0	0	0	0
31 August	84	48	120	A7.1	1	0	0	0	0	0	0	0
01 September	79	24	80	A4.4	0	0	0	0	0	0	0	0
02 September	77	28	80	A3.7	0	0	0	0	0	0	0	0
03 September	74	14	60	A2.7	0	0	0	1	0	0	0	0
04 September	75	12	60	A3.2	1	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 August	6.0E+5	2.5E+4	4.2E+3		2.3E+7
30 August	1.7E+6	5.5E+4	4.0E+3		1.4E+8	
31 August	1.2E+6	2.4E+4	3.5E+3		1.1E+7	
01 September	2.1E+6	4.9E+4	8.8E+3		5.7E+6	
02 September	2.8E+6	6.6E+4	7.0E+3		4.3E+7	
03 September	1.7E+6	1.7E+4	3.9E+3		2.1E+8	
04 September	3.2E+6	1.5E+4	3.5E+3		4.3E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	29 August	5	2-3-2-0-1-1-0-1	7	2-3-3-3-1-0-0-0	9
30 August	3	0-0-0-0-0-1-3-2	1	0-0-0-0-0-0-2-1	4	1-0-0-0-1-1-3-2
31 August	17	1-2-2-2-4-4-4-4	60	1-2-2-3-7-7-7-4	36	2-2-2-3-5-6-6-5
01 September	11	4-4-2-2-2-1-1-2	26	3-4-4-5-6-1-1-2	21	5-5-3-3-4-2-2-2
02 September	24	3-3-4-3-3-4-5-4	55	2-3-6-6-6-6-6-3	33	3-4-5-4-4-5-5-4
03 September	20	5-4-4-4-2-1-2-3	42	4-4-6-6-6-4-2-2	32	6-6-4-5-3-3-2-4
04 September	18	4-4-4-3-3-2-2-3	55	3-4-7-7-6-3-3-2	26	4-4-5-5-3-3-2-3

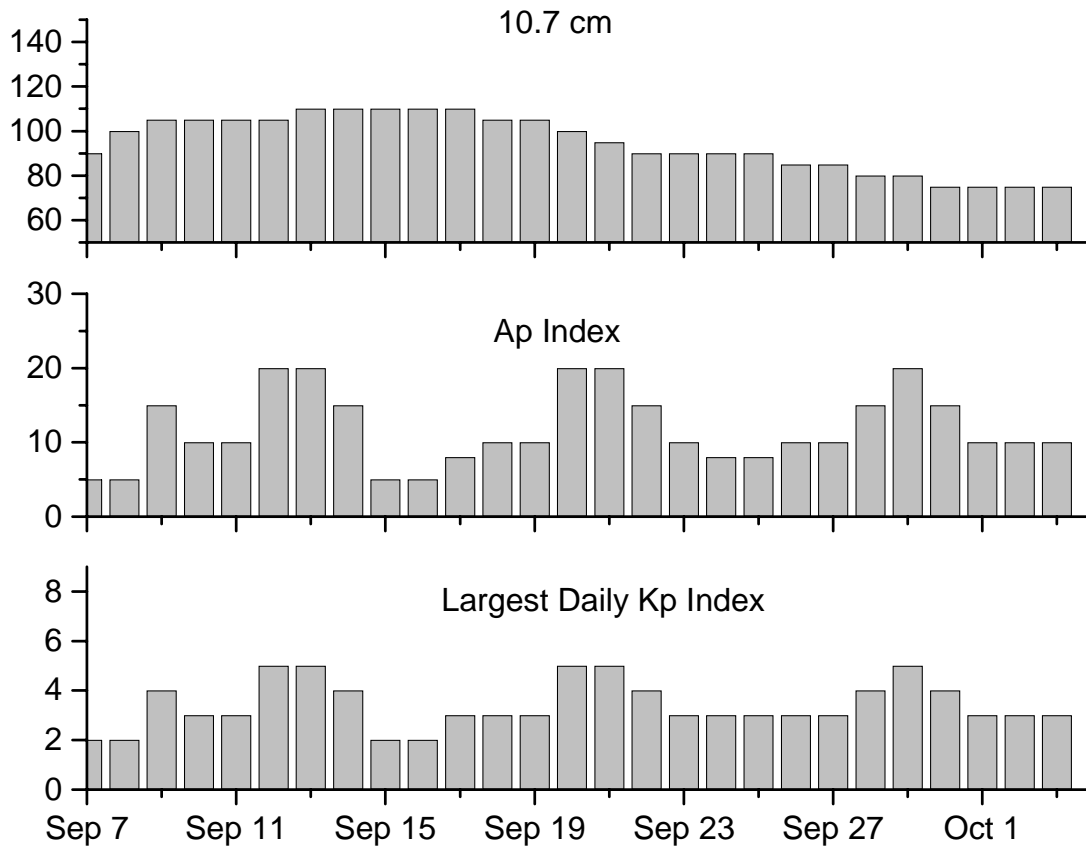


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
29 Aug 0006	1 – 245 MHz Radio Burst	28 Aug
29 Aug 0501	ALERT: Geomagnetic K = 4	29 Aug 0459
30 Aug 0656	ALERT: Electron 2MeV Integral Flux > 1000pfu	30 Aug 0635
31 Aug 1246	WARNING: Geomagnetic K = 4	31 Aug 1250 - 1600
31 Aug 1319	ALERT: Geomagnetic K = 4	31 Aug 1318
31 Aug 1341	WARNING: Geomagnetic K = 5 expected	31 Aug 1345 - 1600
31 Aug 1523	EXT WARNING: Geomagnetic K = 5	31 Aug 1345 - 2359
31 Aug 1537	ALERT: Geomagnetic K = 5	31 Aug 1535
31 Aug 2156	WATCH: Geomagnetic A \geq 20	02 Sep
31 Aug 2201	WATCH: Geomagnetic A \geq 20	03 Sep
31 Aug 2337	EXT WARNING: Geomagnetic K = 5	31 Aug 1345 - 01 Sep 1600
01 Sep 0415	ALERT: Geomagnetic K = 6	01 Sep 0410
01 Sep 1555	EXT WARNING: Geomagnetic K = 4	31 Aug 1250 - 01 Sep 2359
02 Sep 0440	ALERT: Geomagnetic K = 4	02 Sep 0438
02 Sep 0809	ALERT: Geomagnetic K = 5	02 Sep 0805
02 Sep 1029	WARNING: Geomagnetic K = 4	02 Sep 1029 -2359
02 Sep 1042	ALERT: Geomagnetic K = 4	02 Sep 1042
02 Sep 1227	ALERT: Electron 2MeV Integral Flux > 1000pfu	02 Sep 1205
02 Sep 1418	WARNING: Geomagnetic Sudden Impulse	02 Sep 1425 - 1435
02 Sep 1438	SUMMARY: Geomagnetic Sudden Impulse	02 Sep 1431
02 Sep 1636	WARNING: Geomagnetic K = 5	02 Sep 1637 - 2359
02 Sep 1638	ALERT: Geomagnetic K = 5	02 Sep 1638
02 Sep 2355	EXT WARNING: Geomagnetic K = 5	02 Sep 1637 - 03 Sep 1500
03 Sep 0147	WARNING: Geomagnetic K = 6	03 Sep 0147 - 04 Sep 1500
03 Sep 0149	ALERT: Geomagnetic K = 6	03 Sep 0148
03 Sep 1257	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Sep 1235
04 Sep 0302	ALERT: Geomagnetic K = 4	04 Sep 0300
04 Sep 0314	WARNING: Geomagnetic K = 4	04 Sep 0314 - 1500
04 Sep 0347	ALERT: Geomagnetic K = 4	04 Sep 0346
04 Sep 0804	WARNING: Geomagnetic K = 5	04 Sep 0805 - 1500
04 Sep 0830	ALERT: Geomagnetic K = 5	04 Sep 0820
04 Sep 1138	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Sep 1115
04 Sep 1700	WARNING: Geomagnetic K = 4	04 Sep 1659 - 2359
04 Sep 2354	EXT WARNING: Geomagnetic K = 4	04 Sep 1659 -05 Sep 1500



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 Sep	90	5	2	21 Sep	95	20	5
08	100	5	2	22	90	15	4
09	105	15	4	23	90	10	3
10	105	10	3	24	90	8	3
11	105	10	3	25	90	8	3
12	105	20	5	26	85	10	3
13	110	20	5	27	85	10	3
14	110	15	4	28	80	15	4
15	110	5	2	29	80	20	5
16	110	5	2	30	75	15	4
17	110	8	3	01 Oct	75	10	3
18	105	10	3	02	75	10	3
19	105	10	3	03	75	10	3
20	100	20	5				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Max	Integ	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									Class	Flux	245	2695

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
29 August	0151	0158	0202	B4.4			803
	0225	0229	0231	B5.0			803
	0543	0551	0558	B2.6			803
	1655	1703	1711	C1.3			806
	1829	1840	1852	B5.6			806
	2152	2154	2204	C6.5	Sf	S16E50	806
	2244	2248	2251	B5.7			806
	2301	2307	2314	B7.5			806
	2359	0002	0023	C1.2	Sf	S17E49	806
30 August	0233	0240	0244	B2.6			806
	0422	0426	0429	C1.4	Sf	S18E48	806
	0617	0624	0639	B2.4			806
	1453	1501	1519	B2.2			806
31 August	2334	2340	2345	B1.9			806
	0018	0023	0033	B1.6			806
	0052	0110	0123	B5.0			806
	0952	1002	1008	B3.2			806
	1026	1151	1251	C2.0			803
01 September	2253	2321	2356	B4.5			806
	2258	2306	2316	B2.1			806
02 September	0532	0536	0540	B1.3			803
	1123	1132	1144	B1.9			803
	1337	1341	1347	B1.3			803
	2017	2022	2032	B1.4			803
03 September	0410	0410	0417	B6.1	Sf	S14W09	805
04 September	1408	1506	1621	C2.0			803



Region Summary

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

Region 800

19 Aug N16E46	157	0030	05	Cao	004	B														
20 Aug N16E33	156	0050	07	Dso	008	B														
21 Aug N17E19	157	0030	08	Cso	017	B														
22 Aug N17E06	157	0130	09	Dai	028	B														
23 Aug N17W08	158	0180	10	Dai	023	B	1													
24 Aug N17W21	158	0220	11	Eai	028	Bg					1									
25 Aug N17W35	158	0210	13	Eao	020	B														
26 Aug N17W48	158	0170	12	Eso	010	B														
27 Aug N16W61	158	0060	13	Eao	007	B														
28 Aug N16W74	158	0030	10	Bxo	004	B														
29 Aug N16W87	158	0030	03	Cao	002	B														
							1	0	0	1	0	0	0	0	0					

Crossed West Limb.

Absolute heliographic longitude: 157

Region 801

20 Aug N06E54	135	0020	01	Hsx	001	A													
21 Aug N07E38	138	0010	01	Axx	001	A													
22 Aug N08E33	130	0000	01	Axx	001	A													
23 Aug N08E20	130																		
24 Aug N08E07	130																		
25 Aug N08W06	129																		
26 Aug N08W19	129																		
27 Aug N09W31	128	0020	04	Dso	005	B													
28 Aug N09W44	128	0040	04	Cso	004	B													
29 Aug N09W57	128	0020	04	Cso	002	B													
30 Aug N09W70	128																		
31 Aug N09W83	128																		
01 Sep N09W96	128																		
							0	0	0	0	0	0	0	0	0				

Crossed West Limb.

Absolute heliographic longitude: 129



Region Summary - continued.

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

Region 802

24 Aug S12E14	123	0020	01	Hsx	001	A									
25 Aug S12E00	123	0010	01	Hsx	001	A									
26 Aug S12W13	123														
27 Aug S12W26	123														
28 Aug S12W39	123														
29 Aug S12W52	123														
30 Aug S12W65	123														
31 Aug S12W78	123														
01 Sep S12W91	123														
							0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 123

Region 803

24 Aug N12E78	059	0030	04	Dao	011	B									
25 Aug N12E67	056	0200	08	Dai	010	B		1			2				
26 Aug N11E52	058	0110	09	Dai	015	Bg	3				1				
27 Aug N11E40	057	0130	08	Dai	026	Bg	1				1				
28 Aug N11E27	057	0100	08	Dsi	037	Bgd		1			1				
29 Aug N11E14	057	0050	07	Dao	013	Bg									
30 Aug N11E01	057	0040	06	Dai	019	Bg									
31 Aug N11W13	057	0020	05	Bxo	008	B	1								
01 Sep N10W26	057														
02 Sep N10W39	057														
03 Sep N10W52	057														
04 Sep N10W65	057									1					
							6	2	0	3	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 057

Region 804

25 Aug N11E12	111	0030	04	Cso	005	B									
26 Aug N11W01	111	0010	02	Cso	002	B									
27 Aug N11W14	111	0010	01	Axx	001	A									
28 Aug N11W27	111	0000	01	Axx	001	A									
29 Aug N11W39	111	0010	03	Bxo	002	B									
30 Aug N10W57	115														
31 Aug N10W70	115														
01 Sep N10W83	115														
02 Sep N10W96	115														
							0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 111



Region Summary - continued.

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

Region 805

27 Aug S08E73	024	0060	04	Dso	002	B												
28 Aug S08E60	024	0100	04	Dso	003	B												
29 Aug S08E47	024	0090	05	Dao	003	B	1											
30 Aug S08E34	024	0050	03	Dso	005	B												
31 Aug S09E21	023	0050	02	Hax	002	A												
01 Sep S10E08	023	0070	02	Hsx	002	A												
02 Sep S10W04	022	0060	04	Cso	006	B												
03 Sep S11W17	022	0060	04	Dso	004	B												
04 Sep S11W30	022	0060	03	Cso	002	B												
							1	0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 022

Region 806

29 Aug S17E50	021	0070	04	Dai	006	Bg	3			2								
30 Aug S17E37	021	0060	06	Dai	014	Bg	1			1								
31 Aug S17E23	021	0050	06	Dao	008	Bg												
01 Sep S16E07	024	0010	01	Hrx	002	A												
02 Sep S16W06	024																	
03 Sep S16W19	024																	
04 Sep S16W32	024																	
							4	0	0	3	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 024

Region 807

02 Sep S24W70	088	0020	05	Bxo	002	B												
03 Sep S24W83	088																	
04 Sep S24W96	088																	
							0	0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 088

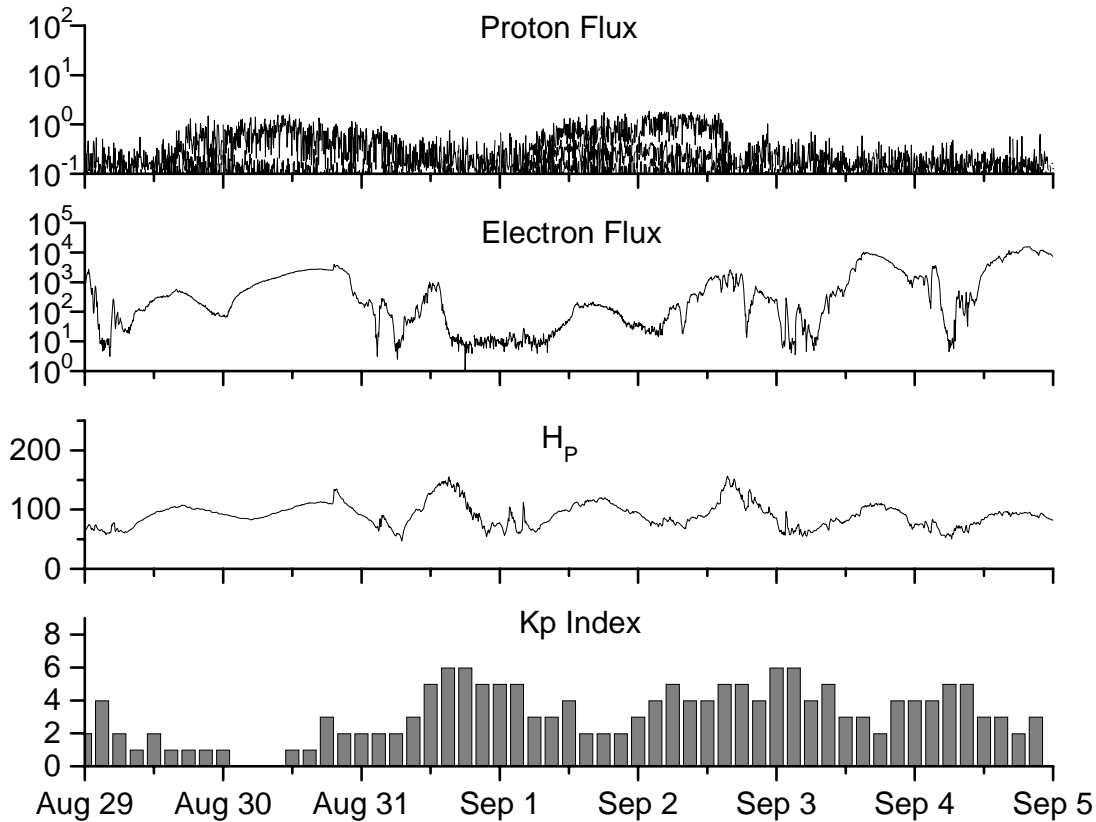


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2003									
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
2004									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
2005									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64			97.3		11	
March	41.0	24.8	0.60			90.0		12	
April	41.5	24.4	0.59			85.9		12	
May	65.4	42.6	0.65			99.5		20	
June	59.8	39.6	0.66			93.7		13	
July	71.0	39.9	0.56			96.6		16	

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 August 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

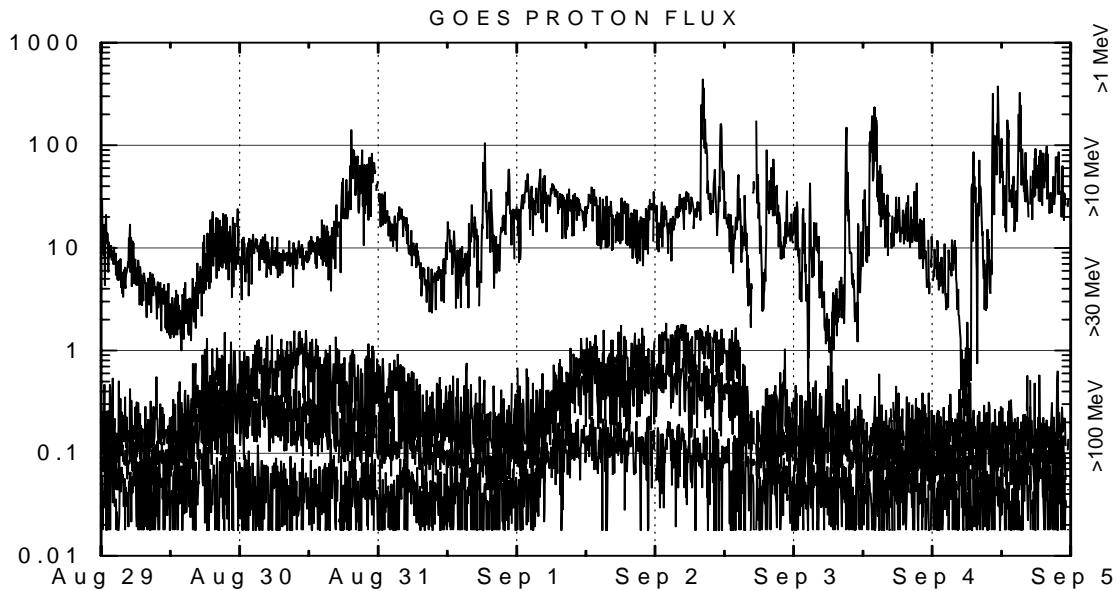
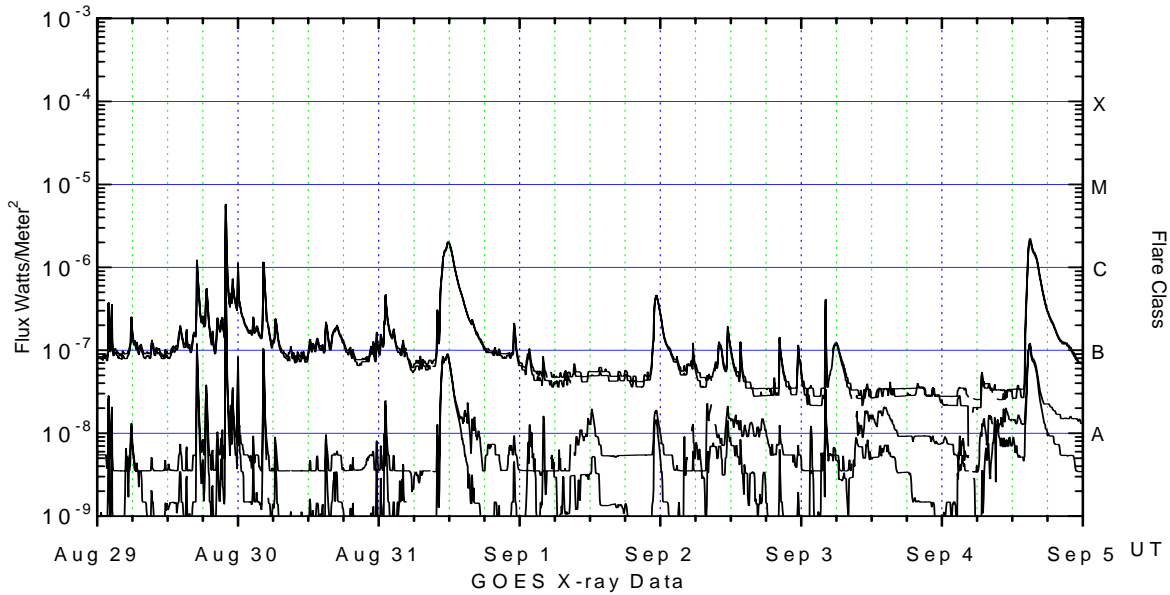
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p 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.

K_p 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 K_p 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_p 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 12 (W75) and GOES 10 (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 (W113) 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.

