

Space Weather Highlights
19 – 25 September 2005

SWO PRF 1569
27 September 2005

Solar activity was at very low to low levels. Region 808 (S09, L=232, class/area, Fkc/1430 on 09 September) quietly rotated around the west limb on 20 September. During its recent transit across the visible disk, Region 808 produced 13 major flares greater than or equal to M5, to include ten X-class and three M5 or higher M-class flares. Based on this criteria (greater than or equal to M5 flares) alone, Region 808 produced more major flares than any other region during Solar Cycle 23. New region 810 (N09W06, L=107, class/area, Eki/250 on 23 September) is the largest region on the Sun at present. Since first rotating onto the disk on 17 September, the region has demonstrated slow, steady growth, but managed only a single low-level C-class flare on 23 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 high of near 575 km/s early on 19 September to a low of near 295 km/s early on 24 September. The Bz component of the IMF did not vary much beyond +/- 5 nT for the entire summary period.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at very high levels 19 September and high levels on 20 – 25 September.

The geomagnetic field ranged from quiet to unsettled at middle latitudes with some isolated active to minor storm periods at high latitudes.

Space Weather Outlook
28 September – 24 October 2005

Solar activity is expected to be very to low through 04 October. Thereafter, and through about 18 October, activity levels are expected to increase to low to moderate due to the return of old Region 808 (S11, L=232).

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 29 September – 03 October, 05 – 06 October, and again on 08 – 22 October.

The geomagnetic field is expected to range from quiet to minor storm levels. Active to minor storm conditions are possible on 28 – 30 September and 01 October due to a recurrent coronal hole high speed wind stream. Otherwise, expect 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
19 September	91	43	460	B1.8	2	0	0	0	0	0	0	0
20 September	88	23	250	B1.7	1	0	0	0	0	0	0	0
21 September	86	19	210	B1.1	0	0	0	0	0	0	0	0
22 September	84	28	230	A5.9	0	0	0	0	0	0	0	0
23 September	83	49	280	A3.8	1	0	0	1	0	0	0	0
24 September	81	33	220	A2.7	0	0	0	0	0	0	0	0
25 September	81	28	170	A2.2	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
	19 September	5.0E+6	6.0E+4	3.7E+3		3.3E+9
20 September	3.1E+6	3.6E+4	4.0E+3		2.6E+9	
21 September	2.6E+6	2.0E+4	4.4E+3		2.6E+9	
22 September	3.9E+6	1.9E+4	4.5E+3		1.5E+9	
23 September	1.0E+6	1.5E+4	4.1E+3		5.0E+7	
24 September	1.2E+6	1.6E+4	4.3E+3		5.5E+7	
25 September	2.1E+6	1.7E+4	4.7E+3		3.7E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	19 September	8	2-2-2-2-2-2-3-1	9	2-1-3-3-2-3-2-0	8
20 September	3	0-1-1-2-2-0-1-1	13	0-1-3-4-5-2-1-0	6	1-2-2-2-2-1-2-1
21 September	3	1-1-2-2-1-1-0-0	6	1-0-2-3-3-2-0-0	5	1-1-2-2-2-1-1-1
22 September	6	1-2-2-1-2-2-2-1	10	1-1-2-3-3-4-2-1	8	2-2-2-1-2-3-2-1
23 September	5	1-2-3-1-1-1-1-1	10	0-2-5-3-2-1-0-0	8	1-3-3-1-2-2-2-2
24 September	2	1-0-0-0-2-0-1-0	0	0-1-0-0-0-0-0-0	4	1-1-1-0-1-1-1-1
25 September	3	0-0-0-2-2-1-0-2	11	1-0-0-4-5-1-0-2	5	1-0-0-2-3-2-0-2

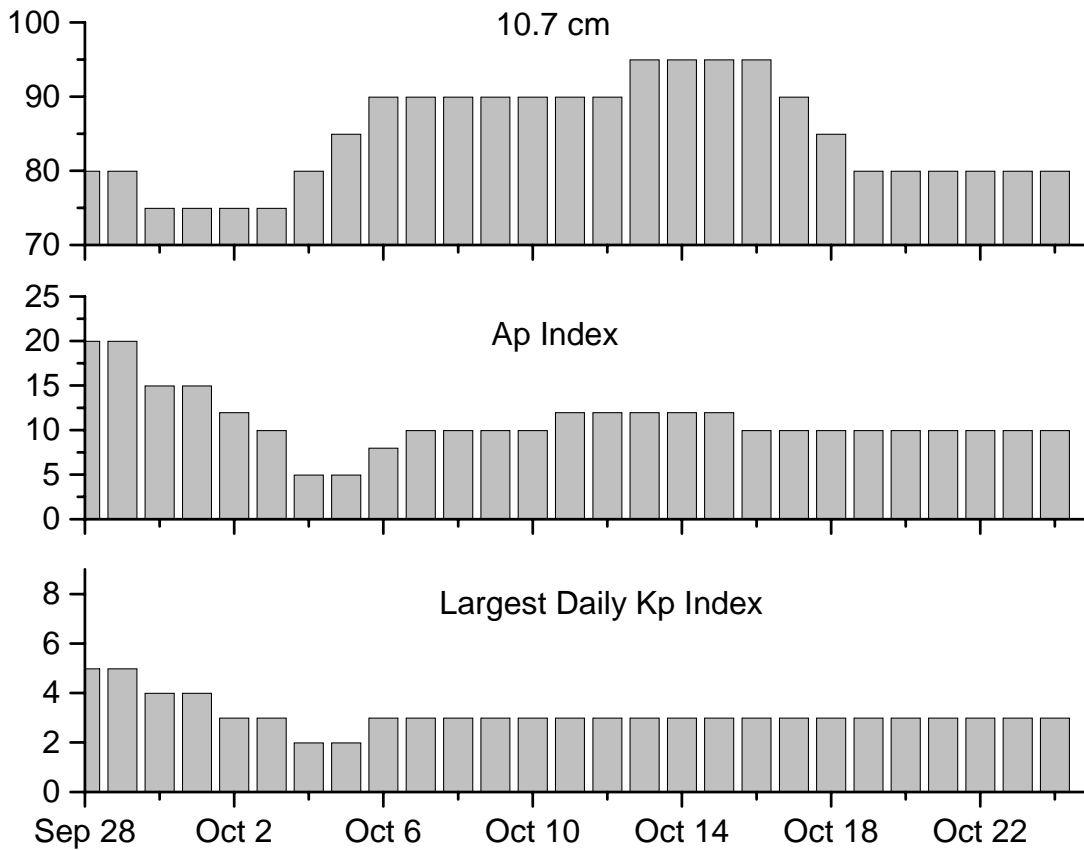


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
19 Sep 0515	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	19 Sep 0500
20 Sep 0515	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	20 Sep 0500
21 Sep 0515	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21 Sep 0500
22 Sep 0515	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	22 Sep 0500
23 Sep 0805	WARNING: Geomagnetic K = 4	23 Sep 0804 – 1600
23 Sep 0915	ALERT: Geomagnetic K = 4	23 Sep 0950
23 Sep 1354	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	23 Sep 1250
24 Sep 1429	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	24 Sep 1410
25 Sep 1153	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	25 Sep 1130



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
28 Sep	80	20	5	12 Oct	90	12	3
29	80	20	5	13	95	12	3
30	75	15	4	14	95	12	3
01 Oct	75	15	4	15	95	12	3
02	75	12	3	16	95	10	3
03	75	10	3	17	90	10	3
04	80	5	2	18	85	10	3
05	85	5	2	19	80	10	3
06	90	8	3	20	80	10	3
07	90	10	3	21	80	10	3
08	90	10	3	22	80	10	3
09	90	10	3	23	80	10	3
10	90	10	3	24	80	10	3
11	90	12	3				



Energetic Events

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

Flare List

Date	Time			Optical	Imp/ Brtns	Location Lat CMD	Rgn				
	Begin	Max	End	X-ray Class.							
19 September	0339	0350	0416	C3.8							
	1636	1642	1646	B3.2							
	1728	1731	1735	B3.2							
	2014	2022	2030	C1.2							
20 September	0820	0844	0856	C1.2							
	1145	1151	1207	B4.9							
	1446	1455	1503	B8.9							
	2126	2134	2141	B3.6							
21 September	2300	2305	2310	B4.3							
	0442	0448	0457	B2.5							
	0657	0703	0710	B2.5							
	0853	0900	0906	B9.5							
22 September	2109	2115	2120	B3.1							
	2347	0000	0029	B3.7							
	0128	0134	0139	B4.9							
	0141	0145	0148	B3.5							
	0642	0733	0818	B3.5							
23 September	1427	1431	1435	B1.2							
	1641	1644	1648	B1.2							
	1703	1706	1709	B1.6							
	0554	0556	0607	C1.5	Sf	N09E04	810				
	1703	1708	1711	B1.3							
24 September	<i>No Flares Observed</i>										
25 September	<i>No Flares Observed</i>										



Region Summary

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	4			
<i>Region 808</i>																		
07 Sep	S12E83	229	0010	00	Hsx	001	A			1								1
08 Sep	S09E67	232	0510	12	Ekc	014	Bg	5	2	1	2							1
09 Sep	S09E54	232	1430	16	Fkc	038	Bgd	7	5	3	12	1	2					
10 Sep	S09E44	229	1400	12	Ekc	038	Bgd	3	3	2	13	4	1					
11 Sep	S09E30	229	1250	14	Ekc	080	Bgd	4	2		5	2						
12 Sep	S11E17	229	0840	16	Fkc	052	Bgd	1	3		1	2	2					
13 Sep	S11E04	229	0840	16	Fkc	074	Bgd	7		2	8	1	1					
14 Sep	S11W10	230	1000	14	Ekc	076	Bgd	6			8							
15 Sep	S11W22	229	0880	15	Ekc	067	Bgd	7	1	1	9							1
16 Sep	S11W37	230	0620	14	Ekc	041	Bgd	5	3		6	2						
17 Sep	S11W50	230	0420	13	Ekc	038	Bd	2	1		4							1
18 Sep	S11W63	230	0340	12	Cki	022	Bg				2							
19 Sep	S11W78	232	0280	03	Hax	003	A											
								47	20	10	70	12	9	1	0			

Crossed West Limb.

Absolute heliographic longitude:229

Region 810

17 Sep	N10E78	102	0050	02	Hsx	001	A												
18 Sep	N10E69	098	0170	09	Dao	008	B												
19 Sep	N10E51	103	0180	11	Eao	009	B												
20 Sep	N10E37	104	0250	12	Eai	013	B												
21 Sep	N08E21	107	0210	09	Cai	009	B												
22 Sep	N09E07	107	0230	09	Dki	018	B												
23 Sep	N09W06	107	0250	12	Eki	025	Bg	1			1								
24 Sep	N08W19	107	0190	09	Eko	010	B												
25 Sep	N08W35	110	0150	08	Cao	005	B												
								1	0	0	1	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude:107

Region 811

19 Sep	S10E00	154	0000	01	Axx	001	A												
20 Sep	S10W13	154																	
21 Sep	S10W26	154																	
22 Sep	S10W39	154																	
23 Sep	S10W52	154																	
24 Sep	S10W65	154																	
25 Sep	S10W78	154																	
								0	0	0	0	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude:154



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	4								
<i>Region 812</i>																							
23 Sep	S01E73	028	0030	03	Cso	004	B																
24 Sep	S03E62	026	0030	05	Cao	003	B																
25 Sep	S02E45	030	0020	05	Cso	003	B																

0 0 0 0 0 0 0 0

Still on Disk.
 Absolute heliographic longitude:30

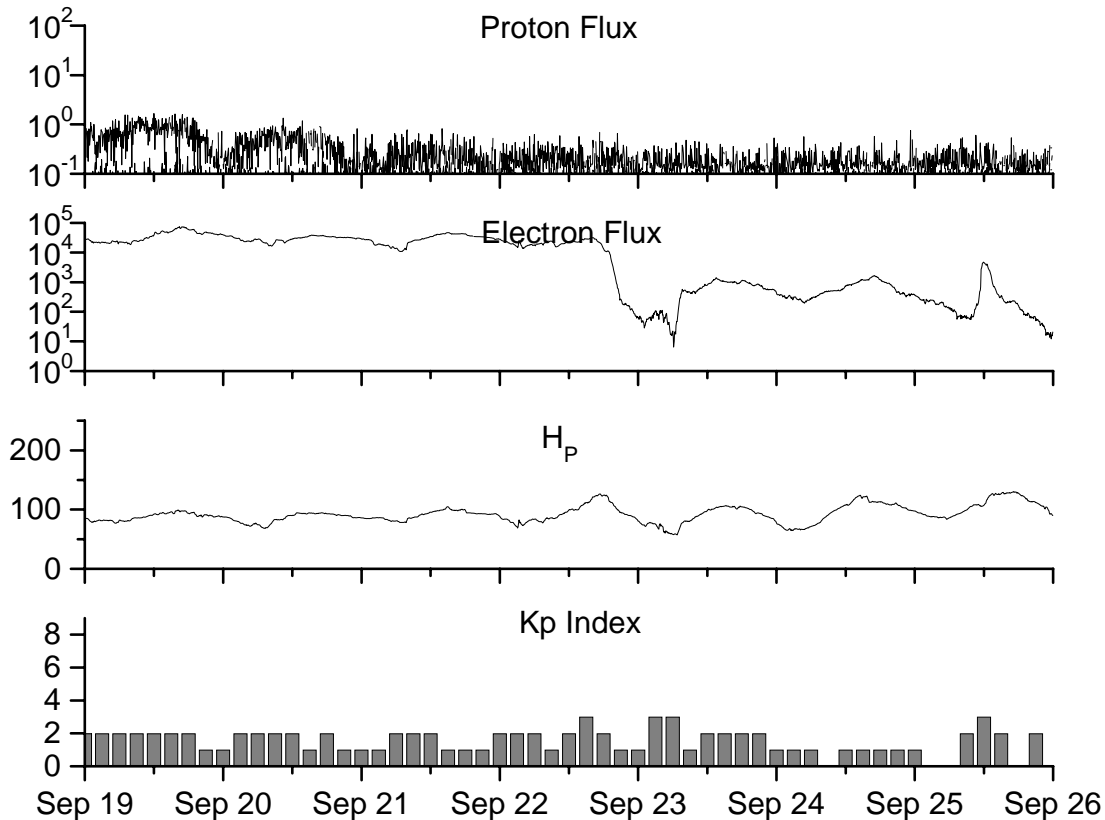


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2003									
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	56.4	34.0	97.3	98.5	11	14.6
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	
August	65.6	36.4	0.55			90.7		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 19 September 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.

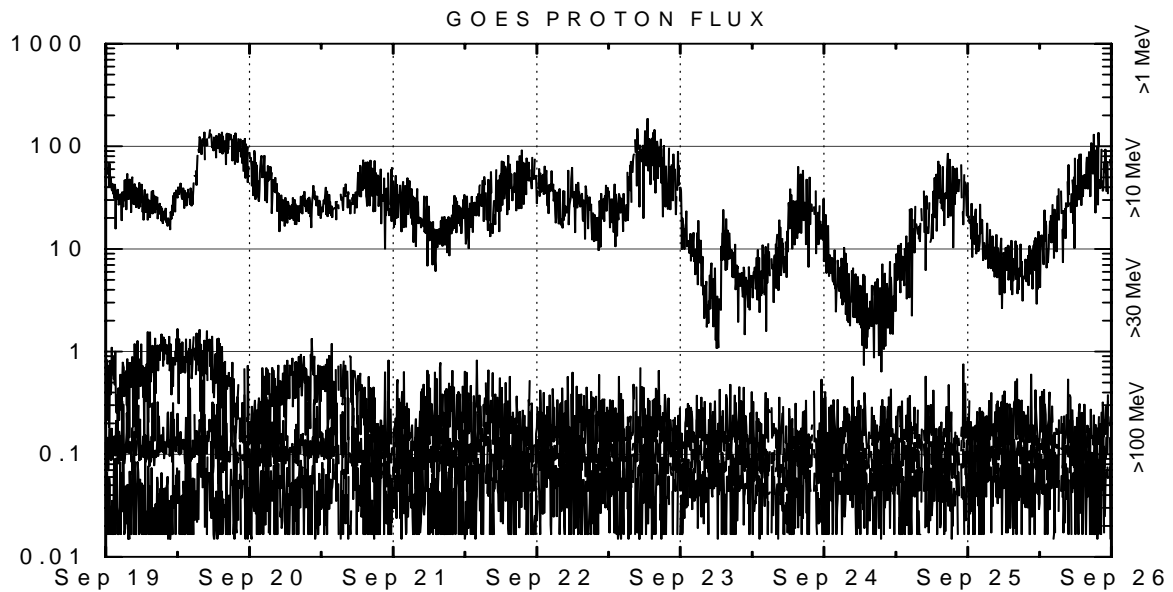
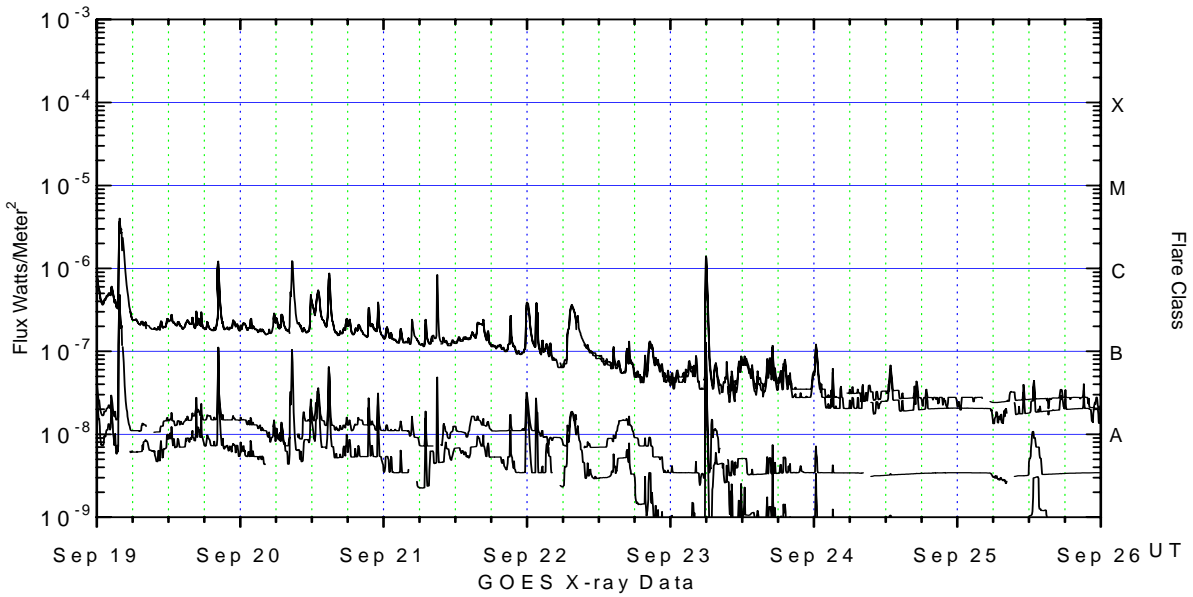
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

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/m²) 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 (protons/cm²-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 (protons/cm²-sec-sr) at greater than 10 MeV.

