

Space Weather Highlights
02 October - 08 October 2017

SWPC PRF 2197
09 October 2017

Solar activity was at low levels. Region 2683 (N13, L=111, class/area Cko/330 on 03 Oct) produced the strongest flare of the period, a C1 at 05/1341 UTC. All regions remained relatively simple as they rotated off the visible disk, leaving no sunspots groups by the end of the reporting period. No Earth-directed CMEs were observed in available coronagraph imagery.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit ranged from moderate to high levels. High levels were observed from 02-05 Oct while moderate levels were observed from 06-08 Oct. High levels were associated with activity from a positive polarity CH HSS.

Geomagnetic field activity was at quiet to active levels. A single active period was observed on 02 Oct from the influence of a positive polarity CH HSS. Quiet to unsettled levels were observed from 03-06 Oct while only quiet conditions were observed for the remainder of the reporting period.

Space Weather Outlook
09 October - 04 November 2017

Solar activity is expected to be at very low levels throughout the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to range from normal background to very high levels. Very high levels are expected on 27 Oct; high levels are expected on 12-21 Oct, 25-26 Oct and 28 Oct - 01 Nov; moderate levels on 09-11 Oct, 23-24 Oct and 02-04 Nov. Normal levels are expected on 22 Oct. All enhancements in electron flux are anticipated from multiple, recurrent CH HSSs.

Geomagnetic field activity is expected to range from quiet to G2 (Moderate) geomagnetic storm levels. G2 (Moderate) conditions are likely on 13 Oct and 24-25 Oct; G1 (Minor) conditions on 11-12 Oct and 14 Oct; active levels on 15 Oct and 26-27 Oct; unsettled conditions on 10 Oct, 16 Oct, 28-29 Oct and 01-02 Nov. All enhancements in geomagnetic activity is anticipated in response to multiple, recurrent CH HSSs. The remainder of the outlook period is expected to be at quiet levels under a nominal solar wind environment.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
02 October	86	25	400	A6.9	0	0	0	0	0	0	0	0
03 October	86	25	450	A5.5	0	0	0	0	0	0	0	0
04 October	87	27	430	A5.8	0	0	0	0	0	0	0	0
05 October	85	26	400	A5.9	1	0	0	0	0	0	0	0
06 October	84	22	390	B1.3	0	0	0	2	0	0	0	0
07 October	80	11	220	A7.5	0	0	0	0	0	0	0	0
08 October	77	0	0	A8.7	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	>0.6 MeV	>2MeV	>4 MeV
	02 October	4.1e+06	1.4e+04	3.4e+03	1.1e+09	
03 October	2.8e+06	1.4e+04	3.5e+03	3.3e+08		
04 October	1.9e+06	1.4e+04	3.3e+03	3.7e+08		
05 October	3.7e+06	1.4e+04	3.3e+03	7.6e+07		
06 October	1.1e+07	1.4e+04	3.4e+03	5.0e+06		
07 October	1.8e+06	1.4e+04	3.4e+03	6.8e+06		
08 October	2.8e+06	1.4e+04	3.2e+03	7.9e+06		

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	02 October	6	2-3-3-2-1-0-0-1	13	2-3-2-4-5-1-0-0	7
03 October	8	2-3-4-2-1-0-1-1	9	2-3-4-3-0-1-0-1	8	3-3-3-2-0-1-1-1
04 October	5	2-3-0-1-2-0-1-2	2	1-1-0-0-1-0-1-1	5	2-3-1-1-1-0-1-2
05 October	6	3-1-0-1-1-1-2-3	3	1-0-0-0-0-2-1-2	7	3-1-1-1-1-1-1-3
06 October	6	2-2-2-1-2-2-1-2	11	2-3-2-2-4-3-1-1	9	3-3-2-2-2-2-1-2
07 October	5	1-1-1-1-2-2-2-2	3	1-0-0-0-1-2-1-2	5	2-1-1-1-1-1-2-1
08 October	3	1-2-0-0-1-2-1-0	2	1-2-0-2-0-0-0-0	5	1-2-1-0-1-1-1-1

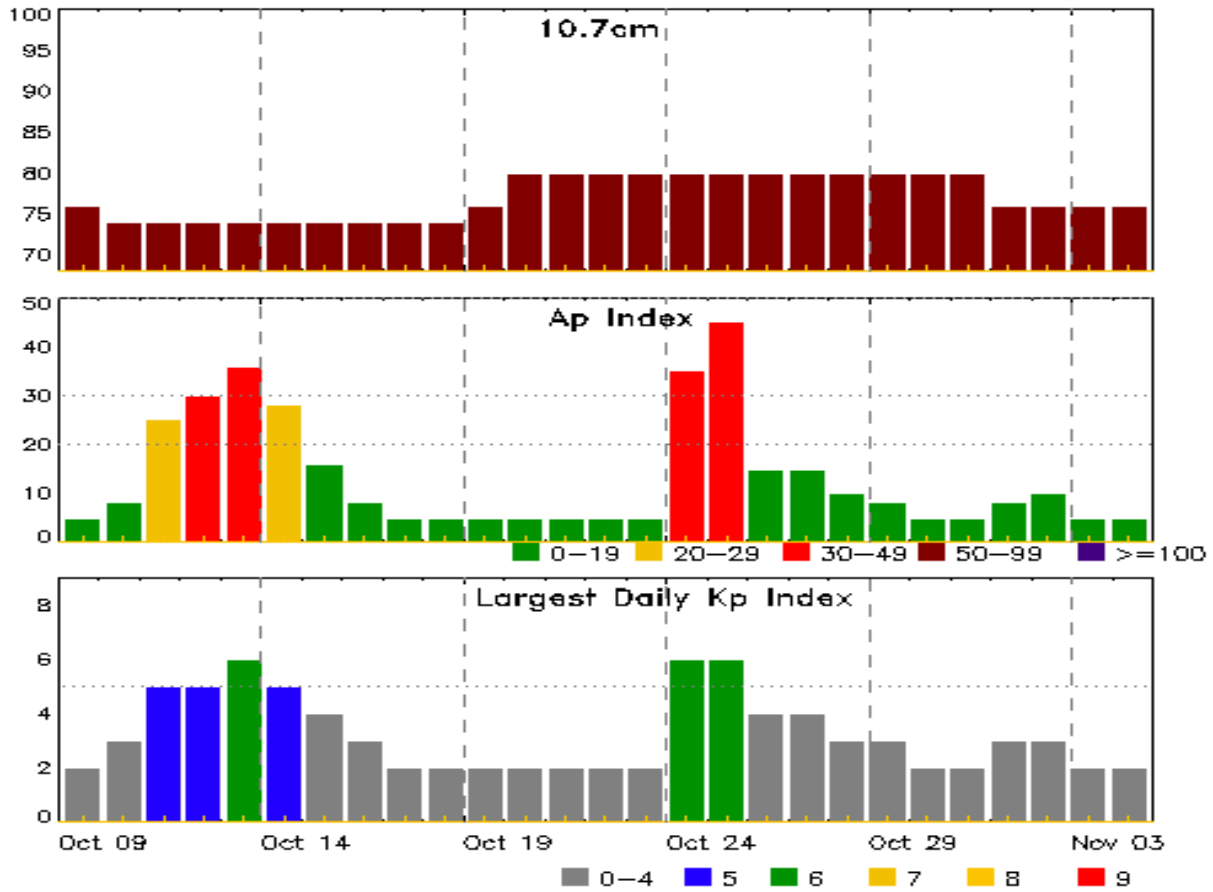


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
02 Oct 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	28/1235
02 Oct 0545	WARNING: Geomagnetic K = 4	02/0545 - 1200
02 Oct 0600	ALERT: Geomagnetic K = 4	02/0559
03 Oct 0626	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	28/1235
04 Oct 0501	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	28/1235
05 Oct 1336	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	28/1235
08 Oct 1753	WATCH: Geomagnetic Storm Category G1 predicted	



Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
09 Oct	76	5	2	23 Oct	80	5	2
10	74	8	3	24	80	35	6
11	74	25	5	25	80	45	6
12	74	30	5	26	80	15	4
13	74	36	6	27	80	15	4
14	74	28	5	28	80	10	3
15	74	16	4	29	80	8	3
16	74	8	3	30	80	5	2
17	74	5	2	31	80	5	2
18	74	5	2	01 Nov	76	8	3
19	76	5	2	02	76	10	3
20	80	5	2	03	76	5	2
21	80	5	2	04	76	5	2
22	80	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class	Optical			Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #	
03 Oct	0116	0119	0121	B2.2			2683	
04 Oct	0125	0128	0138	B1.1			2683	
04 Oct	0246	0249	0251	B1.7			2683	
04 Oct	0347	0354	0358	B2.4			2683	
04 Oct	1004	1008	1010	B1.2			2683	
05 Oct	0243	0248	0250	B2.4			2682	
05 Oct	0456	0503	0509	B2.4			2683	
05 Oct	0611	0619	0625	B3.5			2683	
05 Oct	1059	1104	1111	B1.2			2683	
05 Oct	1125	1129	1131	B1.4			2682	
05 Oct	1326	1341	1349	C1.0			2683	
05 Oct	1951	2002	2010	B3.3			2683	
05 Oct	2319	2327	2333	B5.5			2683	
06 Oct	0036	0039	0041	B1.6			2683	
06 Oct	0252	0255	0304	B1.6			2683	
06 Oct	0554	0558	0601	B1.5			2683	
06 Oct	1118	1121	1123	B2.2			2683	
06 Oct	1535	1538	1540	B2.8			2683	
06 Oct	1631	1634	1636	B9.8	SF	N11W66	2683	
06 Oct	1921	1924	1926	B4.5			2683	
06 Oct	1937	1940	1942	B2.9			2683	
06 Oct	2157	2158	2200		SF	N11W70	2683	
06 Oct	2227	2231	2233	B3.2			2683	
06 Oct	2326	0028	0112	B4.6			2683	
07 Oct	0219	0223	0228	B4.9			2683	
07 Oct	0522	0525	0527	B1.2			2683	
07 Oct	0530	0535	0538	B1.4			2683	
07 Oct	0559	0602	0606	B1.6			2683	
08 Oct	0347	0350	0352	B1.1			2683	
08 Oct	0642	0647	0650	B5.0			2683	
08 Oct	1254	1259	1308	B1.7			2683	



Flare List

Date	Time			Optical			Rgn #
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	
08 Oct	1617	1621	1623	B1.8			2683
08 Oct	2004	2007	2010	B1.3			
08 Oct	2047	2050	2052	B1.3			



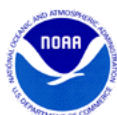
Region Summary

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
Region 2681																		
20 Sep	S12E73	178	60	2	Hsx	1	A											
21 Sep	S13E59	179	80	2	Hsx	1	A											
22 Sep	S13E46	180	80	2	Hsx	1	A											
23 Sep	S13E32	179	90	3	Cso	2	B											
24 Sep	S13E19	179	90	2	Hsx	1	A											
25 Sep	S12E04	179	100	3	Cso	3	B					1						
26 Sep	S15W09	181	120	6	Cso	7	B											
27 Sep	S13W21	179	80	3	Hsx	1	A											
28 Sep	S14W35	180	70	2	Hsx	1	A											
29 Sep	S14W48	180	70	2	Hsx	1	A											
30 Sep	S14W61	180	60	2	Hsx	1	A											
01 Oct	S14W74	180	60	2	Hsx	1	A											
02 Oct	S13W87	179	plage															
											0	0	0	1	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 179

Region 2682																		
24 Sep	S09E71	127	180	3	Hsx	1	A											
25 Sep	S10E59	126	200	3	Hax	1	A											
26 Sep	S11E46	122	180	3	Hax	1	A											
27 Sep	S10E31	127	180	3	Hax	2	A											
28 Sep	S09E21	124	130	11	Cao	7	B											
29 Sep	S09E08	124	120	9	Cao	6	B					1						
30 Sep	S11W05	124	110	9	Cso	5	B					1						
01 Oct	S11W18	124	100	3	Hsx	1	A											
02 Oct	S10W35	127	110	2	Hsx	1	A											
03 Oct	S10W47	126	120	2	Hsx	1	A											
04 Oct	S10W61	127	130	2	Hsx	1	A											
05 Oct	S10W74	127	120	2	Hsx	1	A											
06 Oct	S11W87	127	120	2	Hsx	1	A											
											0	0	0	2	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 124



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 2683																							
25 Sep	N11E76		109	260	3	Hkx	2	A															
26 Sep	N12E60		111	160	5	Dao	2	B	1				1										
27 Sep	N13E46		112	270	4	Hkx	2	A	1					1									
28 Sep	N14E26		119	280	5	Hkx	2	A															
29 Sep	N14E21		111	270	4	Hkx	2	A															
30 Sep	N13E08		111	270	4	Hkx	2	A															
01 Oct	N13W05		111	270	4	Hkx	2	A															
02 Oct	N13W19		111	290	3	Hkx	4	A															
03 Oct	N13W32		111	330	4	Cko	4	B															
04 Oct	N13W45		111	300	6	Cko	6	B															
05 Oct	N13W58		111	280	5	Cko	5	B	1														
06 Oct	N13W71		111	270	5	Hkx	1	A					2										
07 Oct	N13W84		111	220	4	Hax	1	A															
08 Oct	N13W98		111	plage																			
									3	0	0		3	1	0	0	0						

Still on Disk.

Absolute heliographic longitude: 111

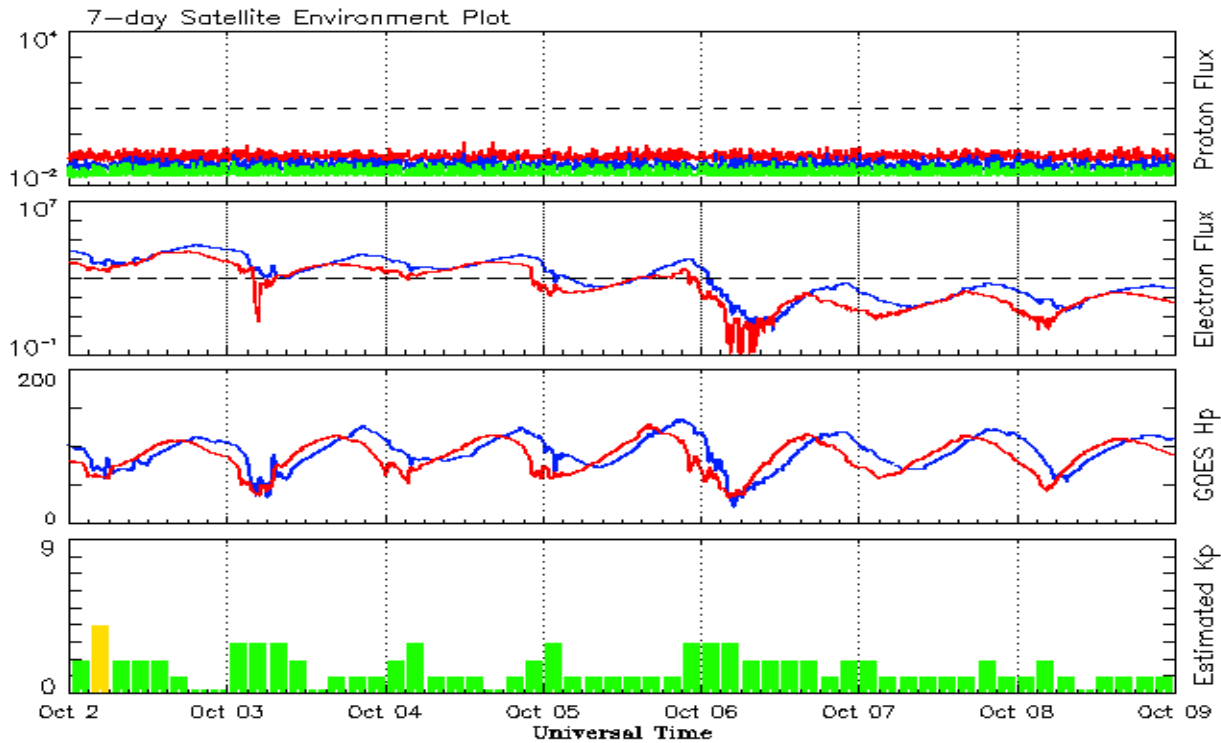


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2015									
October	59.5	38.2	0.62	61.8	38.6	104.1	107.9	15	12.5
November	61.8	37.3	0.61	59.0	36.7	109.6	105.3	13	12.5
December	54.1	34.8	0.64	55.1	34.7	112.8	102.5	15	12.5
2016									
January	50.4	34.2	0.67	51.4	32.6	103.5	99.9	10	12.3
February	56.0	33.8	0.61	49.6	31.5	103.5	98.1	10	12.0
March	40.9	32.5	0.80	47.7	30.2	91.6	96.6	11	11.8
April	39.2	22.7	0.58	45.0	28.7	93.4	95.3	10	11.8
May	48.9	30.9	0.64	42.1	26.9	93.1	93.2	12	11.7
June	19.3	12.3	0.65	39.0	24.9	81.9	90.4	9	11.4
July	36.8	19.4	0.53	36.5	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
2017									
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.5	74.6	78.6	15	11.5
April	30.4	19.4	0.64			80.9		13	
May	18.1	11.3	0.62			73.5		9	
June	18.0	11.5	0.64			74.8		7	
July	18.8	11.0	0.59			77.7		9	
August	25.0	19.9	0.80			77.9		12	
September	42.2	26.2	0.62			92.0		19	

Note: Values are final except for the most recent 6 months which are considered preliminary.
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 02 October 2017*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

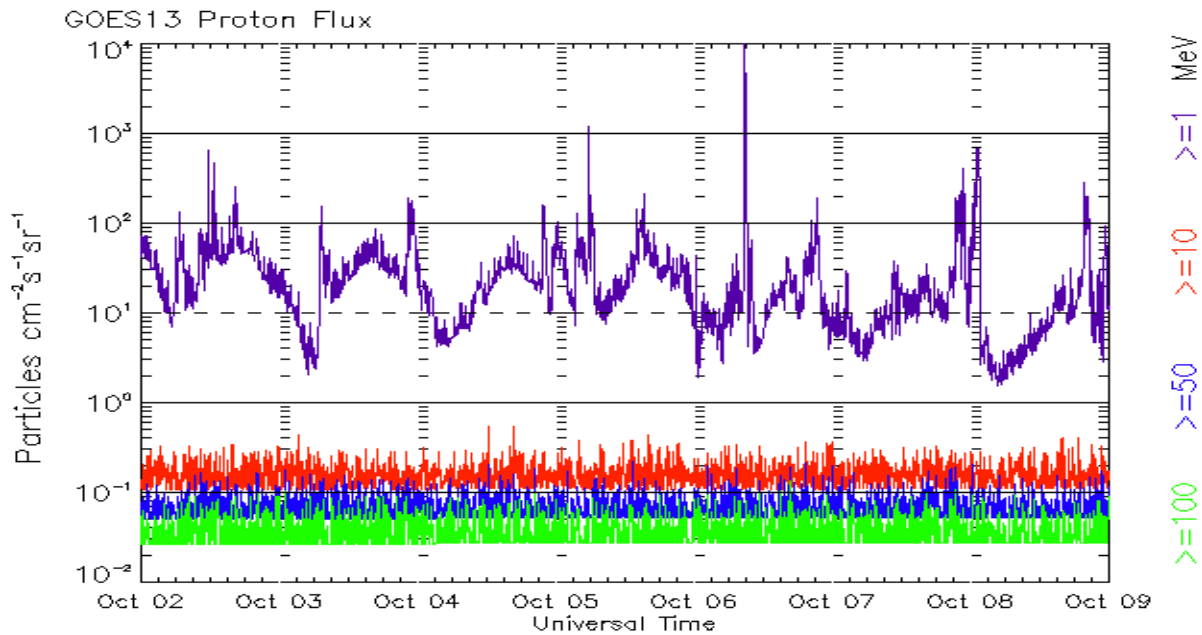
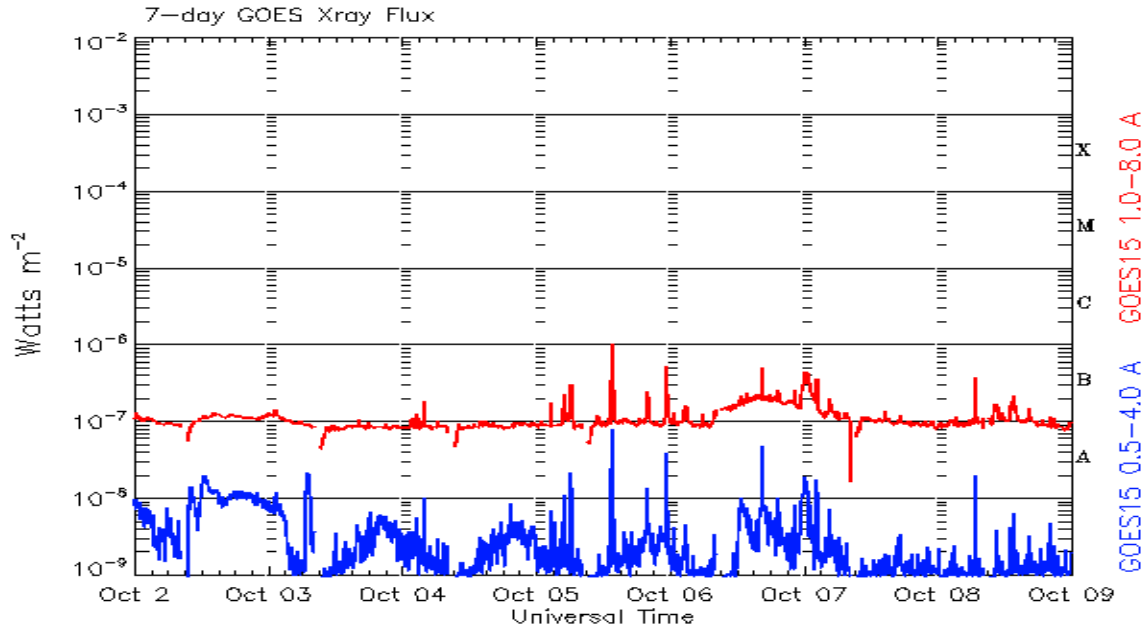
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

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
Week Beginning 02 October 2017

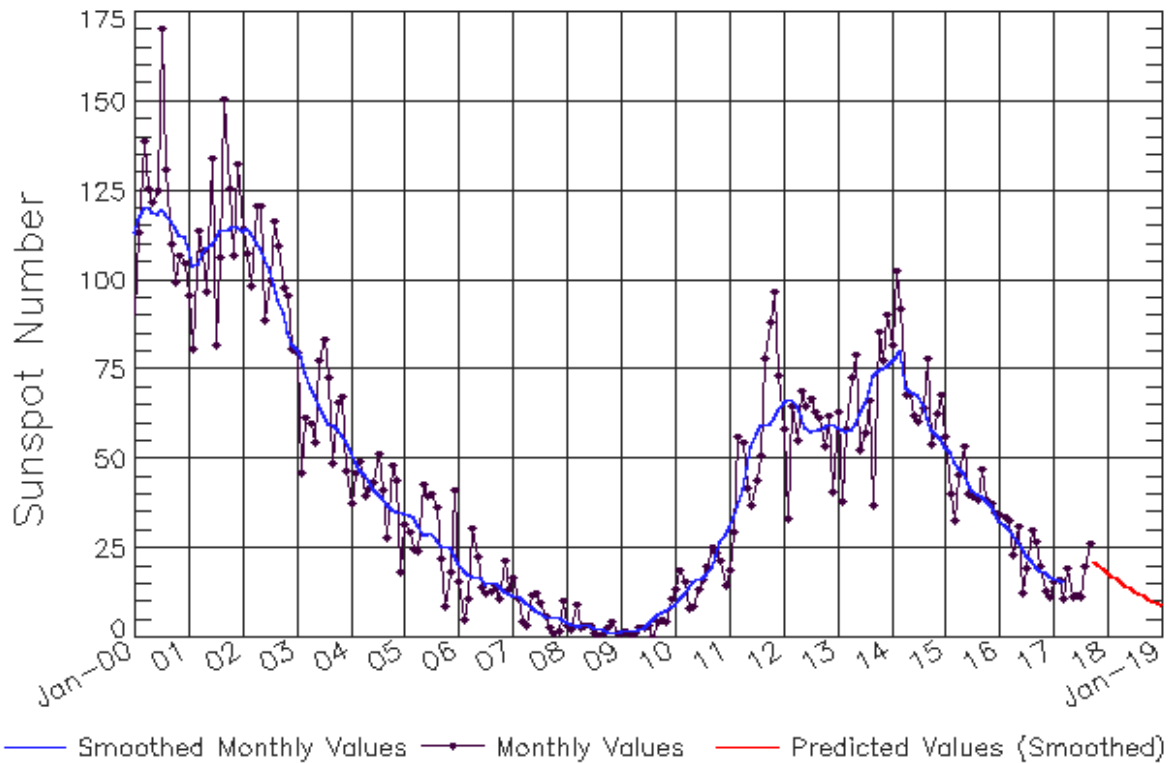
The x-ray plots contains five-minute averages x-ray flux ($Watt/m^2$) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/ cm^2 -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.



ISES Solar Cycle Sunspot Number Progression

Observed data through Sep 2017



Updated 2017 Oct 9

NOAA/SWPC Boulder, CO USA

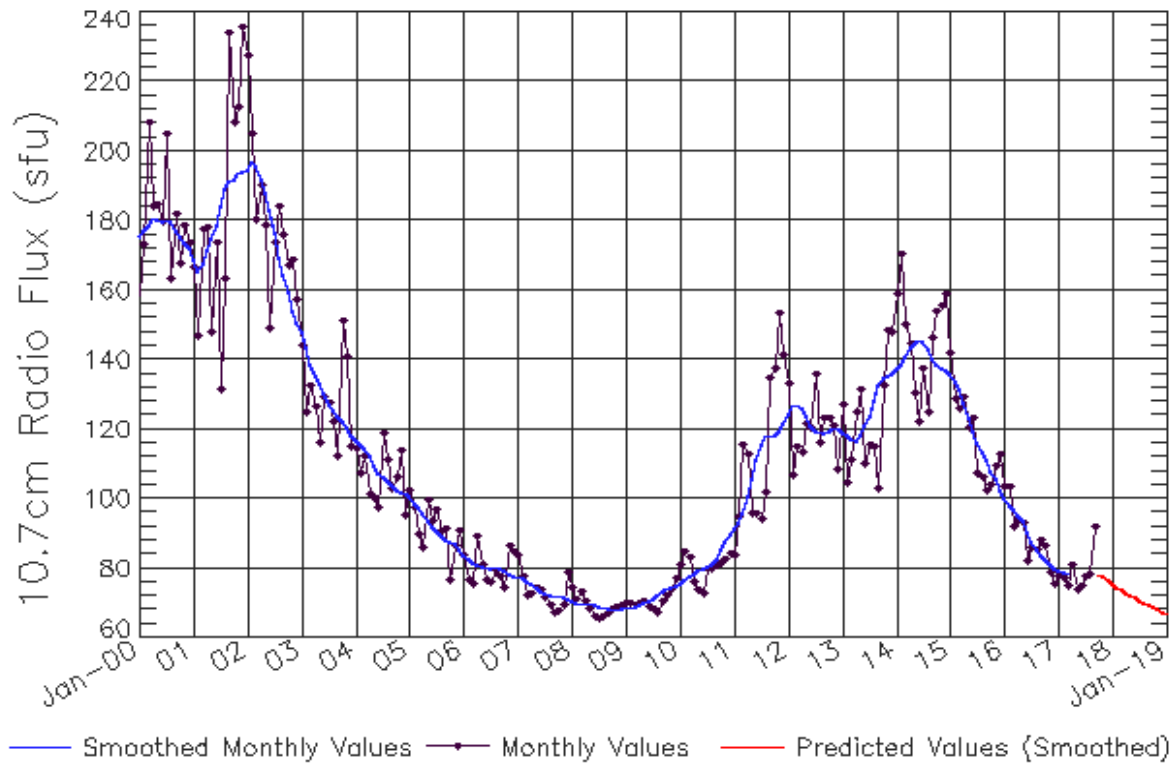
Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	9	10	11	13	15	16	17	17	20	23	27	29
	(1)	(2)	(3)	(5)	(5)	(6)	(7)	(7)	(8)	(9)	(9)	(10)
2011	19	30	56	54	42	37	44	51	78	88	97	73
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2012	58	33	64	55	69	65	67	63	61	53	62	41
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2013	63	38	58	72	79	53	57	66	37	86	78	90
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2014	82	102	92	68	68	62	60	64	78	54	62	68
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2015	56	40	33	45	53	40	40	39	47	38	37	35
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2016	34	34	33	23	31	12	19	30	27	20	13	11
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2017	16	16	11	19	11	12	11	20	26	21	20	19
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2018	18	17	16	15	15	14	13	12	12	11	10	10
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2019	9	8	8	7	7	6	6	6	5	5	4	4
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)



ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Sep 2017



Updated 2017 Oct 9

NOAA/SWPC Boulder, CO USA

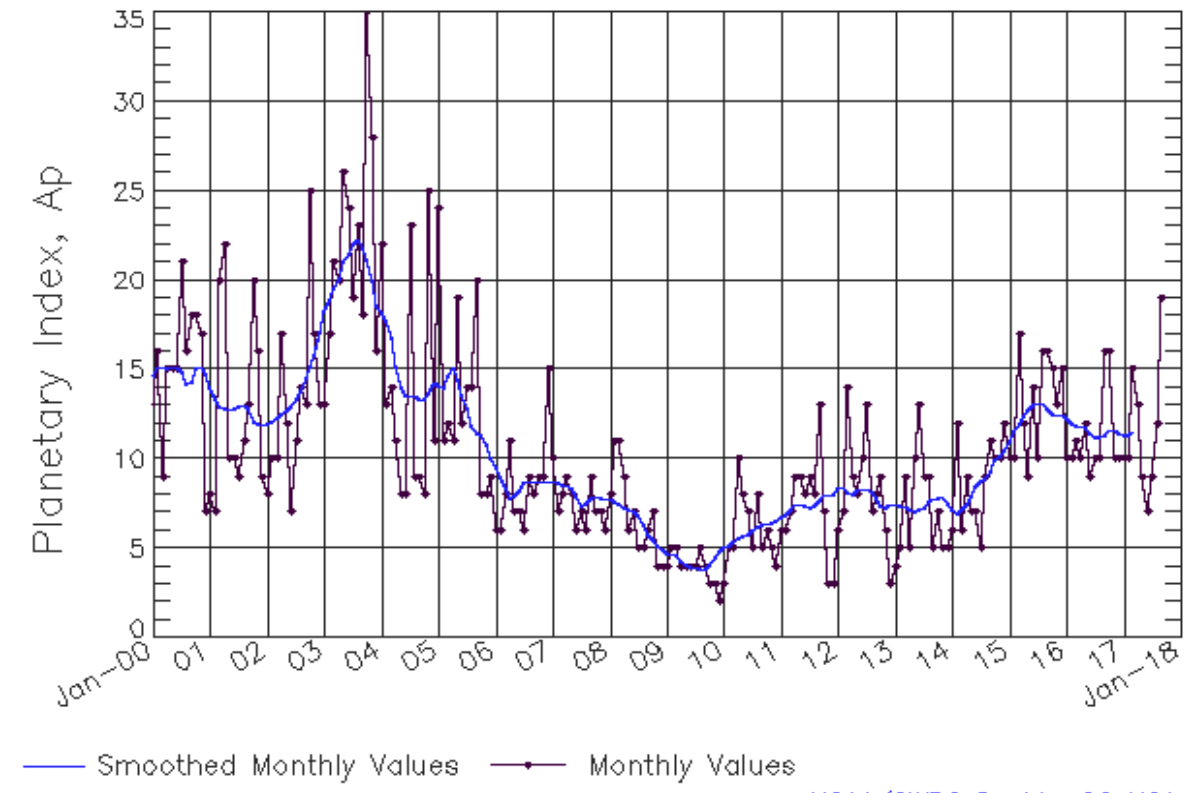
Smoothed F10.7cm Radio Flux Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	76 (***)	77 (***)	78 (***)	78 (***)	79 (***)	80 (***)	80 (***)	81 (***)	82 (***)	85 (***)	88 (***)	90 (***)
2011	91 (***)	93 (***)	96 (***)	100 (***)	106 (***)	111 (***)	115 (***)	118 (***)	118 (***)	118 (***)	120 (***)	122 (***)
2012	124 (***)	127 (***)	127 (***)	126 (***)	124 (***)	121 (***)	120 (***)	119 (***)	119 (***)	119 (***)	120 (***)	120 (***)
2013	119 (***)	118 (***)	117 (***)	117 (***)	118 (***)	121 (***)	124 (***)	128 (***)	132 (***)	135 (***)	135 (***)	136 (***)
2014	137 (***)	139 (***)	141 (***)	144 (***)	145 (***)	146 (***)	145 (***)	143 (***)	140 (***)	138 (***)	137 (***)	137 (***)
2015	136 (***)	134 (***)	131 (***)	127 (***)	123 (***)	120 (***)	116 (***)	113 (***)	111 (***)	108 (***)	105 (***)	103 (***)
2016	100 (***)	98 (***)	97 (***)	95 (***)	93 (***)	90 (***)	88 (***)	86 (***)	84 (***)	83 (***)	81 (***)	80 (***)
2017	79 (***)	79 (***)	79 (***)	79 (1)	78 (1)	78 (2)	78 (3)	78 (4)	78 (4)	77 (5)	77 (6)	77 (7)
2018	76 (8)	76 (8)	74 (9)	73 (9)	72 (9)	71 (9)	71 (9)	70 (9)	69 (9)	69 (9)	68 (9)	67 (9)
2019	67 (9)	66 (9)	66 (9)	65 (9)	65 (9)	65 (9)	64 (9)	64 (9)	63 (9)	63 (9)	63 (9)	63 (9)



ISES Solar Cycle Ap Progression

Observed data through Sep 2017



Updated 2017 Oct 9

NOAA/SWPC Boulder, CO USA

Solar Cycle Comparison charts are temporarily unavailable.



Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

The Weekly has been published continuously since 1951 and is available online since 1997.

<http://spaceweather.gov/weekly/> -- Current and previous year

<http://spaceweather.gov/ftpmenu/warehouse.html> -- Online archive from 1997

<http://spaceweather.gov/ftpmenu/> -- Some content as ascii text

<http://spaceweather.gov/SolarCycle/> -- Solar Cycle Progression web site

<http://spaceweather.gov/contacts.html> -- Contact and Copyright information

http://spaceweather.gov/weekly/Usr_guide.pdf -- User Guide

