

Space Weather Highlights
01 May - 07 May 2017

SWPC PRF 2175
08 May 2017

Solar activity was at very low levels with only B-class activity observed. On 04 May, an episode of large-scale magnetic reconnection was observed in the NE quadrant with a subsequent slow-moving CME off the NE limb, first observed in LASCO C2 imagery beginning at 04/1900 UTC. Analysis, and follow on WSA-Enlil model output of the CME, suggested an arrival at Earth early to midday on 10 May.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 01-04 and 07 May and normal levels on 05-06 May.

Geomagnetic field activity was at predominately quiet levels throughout the period. Isolated unsettled to active periods were observed late on 04 May and early on 05 May due to weak effects from the 30 April CME. Isolated unsettled periods were observed on 07 May due to sustained southward Bz.

Space Weather Outlook
08 May - 03 June 2017

Solar activity is expected to be very low with a slight chance for C-class flare activity throughout the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is likely to reach high levels on 08-09, 13-15, 17-20, and 24-31 May with very high levels likely on 21-23 May. Normal to moderate flux levels are expected for the remainder of the period.

Geomagnetic field activity is likely to reach G2 (Moderate) geomagnetic storm levels on 17 and 21 May with G1 (Minor) geomagnetic storm levels likely on 22 May due to the influence of multiple, recurrent CH HSSs. Active conditions are likely on 10-11 May due to effects from the 04 May CME with additional active conditions possible on 16, 18 and 20 May due to CH HSS influence. Quiet to unsettled levels are expected for the remainder of the period.



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
01 May	75	11	20	A6.2	0	0	0	2	0	0	0	0
02 May	77	25	70	A7.2	0	0	0	0	0	0	0	0
03 May	75	15	70	A6.1	0	0	0	0	0	0	0	0
04 May	74	29	90	A5.8	0	0	0	0	0	0	0	0
05 May	74	31	70	A6.2	0	0	0	7	0	0	0	0
06 May	73	26	50	A4.4	0	0	0	1	0	0	0	0
07 May	72	23	30	A3.6	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
	01 May	2.3e+07	1.5e+04	3.5e+03	2.6e+08	
02 May	2.2e+07	1.5e+04	3.4e+03	3.3e+08		
03 May	1.7e+07	1.5e+04	3.4e+03	4.2e+08		
04 May	2.1e+07	1.6e+04	3.6e+03	2.3e+08		
05 May	1.6e+07	1.5e+04	3.3e+03	1.3e+07		
06 May	1.9e+07	1.5e+04	3.6e+03	1.7e+07		
07 May	2.0e+07	1.6e+04	3.7e+03	2.4e+07		

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	01 May	5	2-2-1-1-1-1-1-2	2	1-2-0-0-0-0-1-1	5
02 May	4	1-2-1-1-1-1-1-1	2	0-2-1-0-0-0-0-1	5	1-2-1-1-1-1-0-2
03 May	2	0-0-1-1-2-1-0-0	5	1-0-0-4-2-1-0-0	4	1-1-1-1-2-1-0-0
04 May	6	0-2-1-1-1-0-2-4	2	0-1-1-0-0-0-1-2	7	0-2-2-1-1-0-1-4
05 May	5	3-2-0-0-2-1-1-1	2	2-2-0-0-0-0-0-0	6	3-2-1-1-2-0-0-1
06 May	5	1-2-1-2-2-1-1-2	2	1-2-1-0-0-0-1-0	5	1-2-1-1-1-1-1-1
07 May	7	2-2-3-1-2-1-2-2	12	1-2-5-3-2-2-1-1	6	2-3-3-1-1-1-3-2

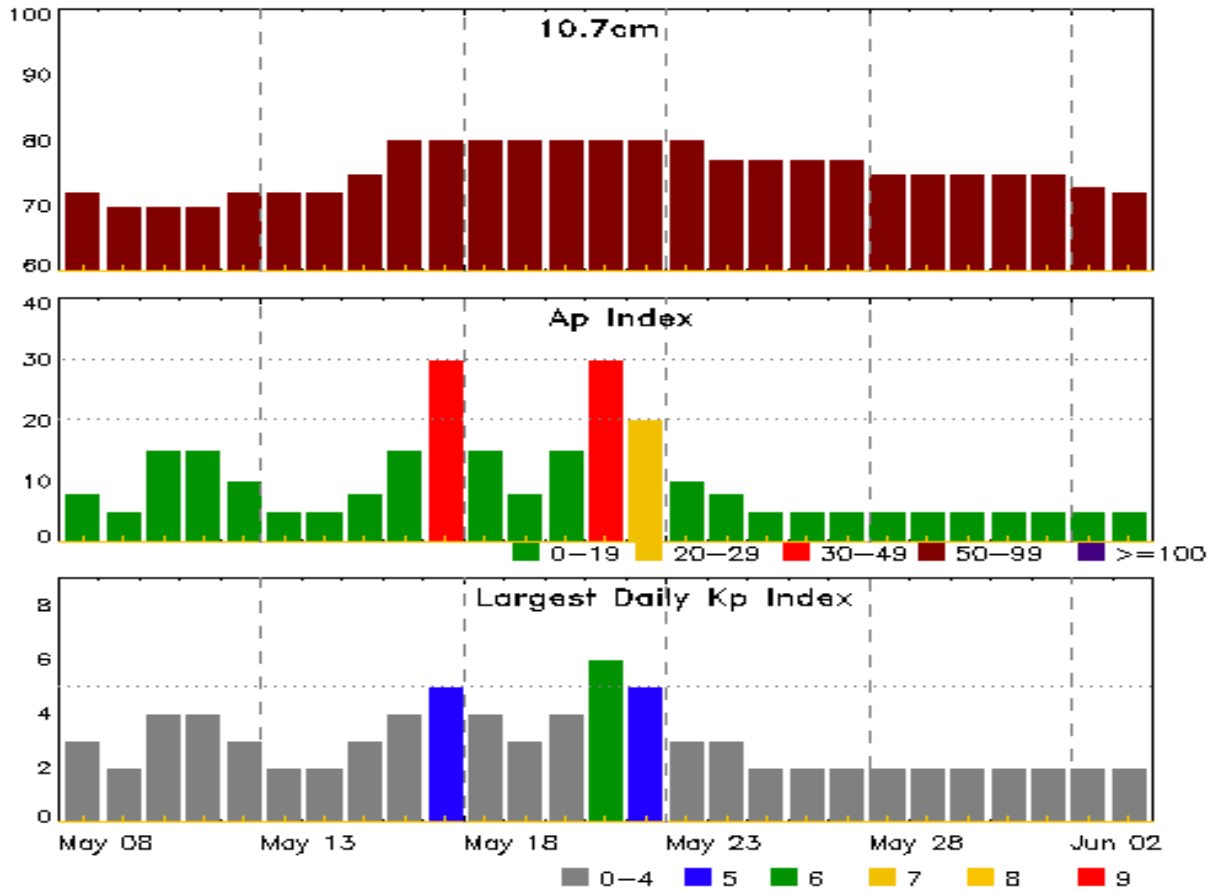


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
01 May 0501	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1425
02 May 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1425
03 May 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1425
04 May 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1425
04 May 2135	WARNING: Geomagnetic K = 4	04/2135 - 05/0600
04 May 2222	ALERT: Geomagnetic K = 4	04/2222
07 May 1630	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	07/1615



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
08 May	72	8	3	22 May	80	20	5
09	70	5	2	23	80	10	3
10	70	15	4	24	77	8	3
11	70	15	4	25	77	5	2
12	72	10	3	26	77	5	2
13	72	5	2	27	77	5	2
14	72	5	2	28	75	5	2
15	75	8	3	29	75	5	2
16	80	15	4	30	75	5	2
17	80	30	5	31	75	5	2
18	80	15	4	01 Jun	75	5	2
19	80	8	3	02	73	5	2
20	80	15	4	03	72	5	2
21	80	30	6				



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	Imp/ Brtns	Optical Location Lat CMD	Optical Rgn #
	Begin	Max	End				
01 May	0355	0401	0405	B9.9	SF	N18W78	2652
01 May	0905	0911	0915	B1.4			2652
01 May	1258	1303	1309	B2.9	SF	N19W79	2652
02 May	1933	1936	1941	B1.3			2654
05 May	0053	0054	0103		SF	N12E39	2655
05 May	0330	0338	0343	B1.4	SF	N14E38	2655
05 May	0418	0437	0442	B4.7	SF	N14E36	2655
05 May	0609	0614	0618	B1.5			2654
05 May	0841	0845	0850	B1.5			2655
05 May	1025	1033	1039	B4.2	SF	N13E32	2655
05 May	1223	1229	1236	B3.4	SF	N15E31	2655
05 May	1423	1428	1436	B1.7			2654
05 May	1526	1535	1543	B2.8	SF	N13E30	2655
05 May	2250	2257	2312	B3.3	SF	N13E26	2655
06 May	0104	0109	0114	B3.1	SF	N12E24	2655
06 May	1110	1114	1120	B1.1			2655
06 May	1827	1831	1834	B1.0			2654
06 May	1955	2009	2023	B3.5			2654



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
									C	M	X	S	1	2	3	4		
Region 2653																		
21 Apr	S09E82		19	40	2	Hax	1	A										
22 Apr	S09E57		31	100	4	Hax	2	A										
23 Apr	S09E45		29	100	4	Hax	2	A										
24 Apr	S08E34		27	90	2	Hax	2	A										
25 Apr	S11E21		27	60	2	Hax	2	A										
26 Apr	S09E08		27	50	3	Hsx	1	A				1						
27 Apr	S09W06		28	40	2	Hax	1	A										
28 Apr	S09W20		28	30	1	Hsx	1	A										
29 Apr	S09W33		28	30	1	Hsx	1	A										
30 Apr	S09W46		28	20	1	Hrx	1	A										
01 May	S08W59		27	20	1	Hrx	1	A										
02 May	S08W73		27	10		Axx	1	A										
03 May	S08W87		29	plage														
									0	0	0	1	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 28

Region 2654

28 Apr	N10E52		316	10	1	Axx	2	A										
29 Apr	N11E38		317	10	1	Axx	1	A										
30 Apr	N11E25		317	10	1	Axx	1	A										
01 May	N11E11		317	plage														
02 May	N11E01		314	60	5	Dao	4	B										
03 May	N12W12		314	70	5	Dso	5	B										
04 May	N11W25		314	80	6	Dso	5	B										
05 May	N11W38		314	40	5	Cso	5	B										
06 May	N11W53		316	30	1	Hsx	1	A										
07 May	N11W66		315	20	1	Hsx	1	A										
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 314

Region 2655

04 May	N13E37		252	10	3	Bxo	4	B										
05 May	N14E25		251	30	3	Dro	6	B				7						
06 May	N13E11		252	20	3	Cro	5	B				1						
07 May	N14W04		253	10	5	Bxo	2	B										
									0	0	0	8	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 253

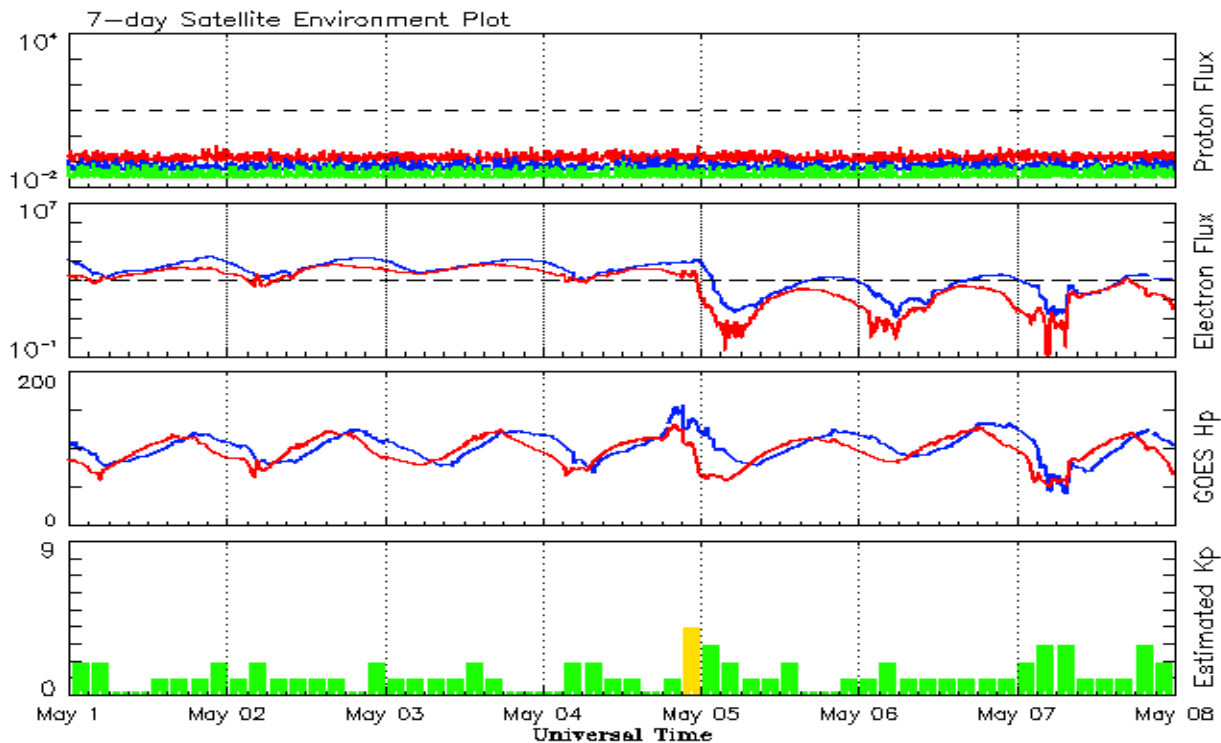


Recent Solar Indices (preliminary)
Observed monthly mean values

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									
May	83.0	53.3	0.71	77.5	45.7	120.1	123.3	9	12.7
June	77.3	39.9	0.53	73.1	43.3	123.2	119.5	14	13.0
July	68.4	39.5	0.58	68.2	41.0	107.0	116.0	10	13.1
August	61.6	38.6	0.63	65.5	39.8	106.2	113.3	16	13.1
September	72.5	47.2	0.65	64.0	39.5	102.1	110.8	16	12.8
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	18.8	86.1	82.5	16	11.6
November	22.4	12.8	0.57			78.7		10	
December	17.6	11.1	0.64			75.1		10	
2017									
January	28.1	15.5	0.55			77.4		10	
February	22.0	15.7	0.71			76.9		10	
March	25.4	10.6	0.42			74.6		15	
April	30.4	19.6	0.64			80.9		13	

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 01 May 2017*

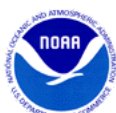
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

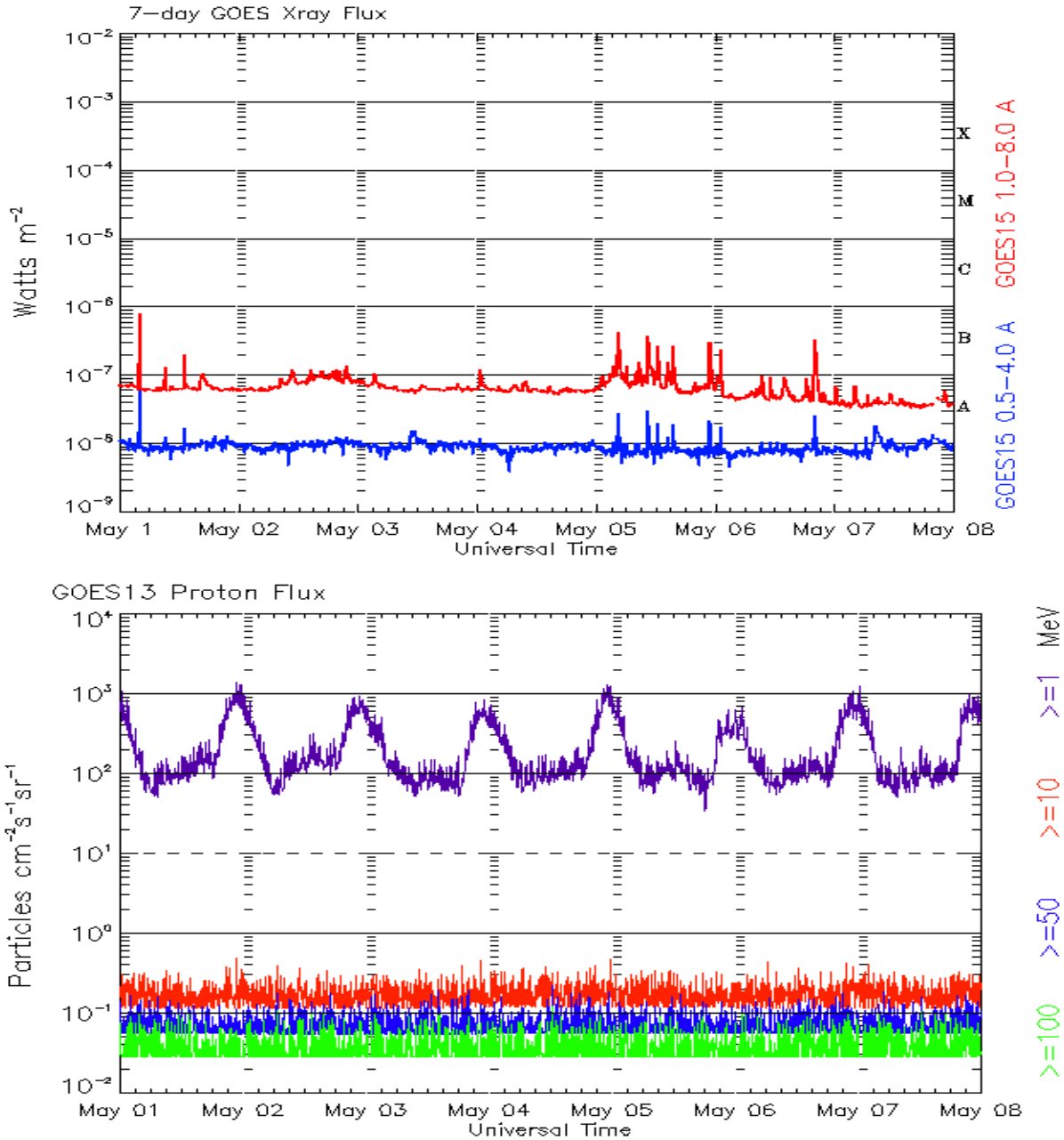
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 01 May 2017*

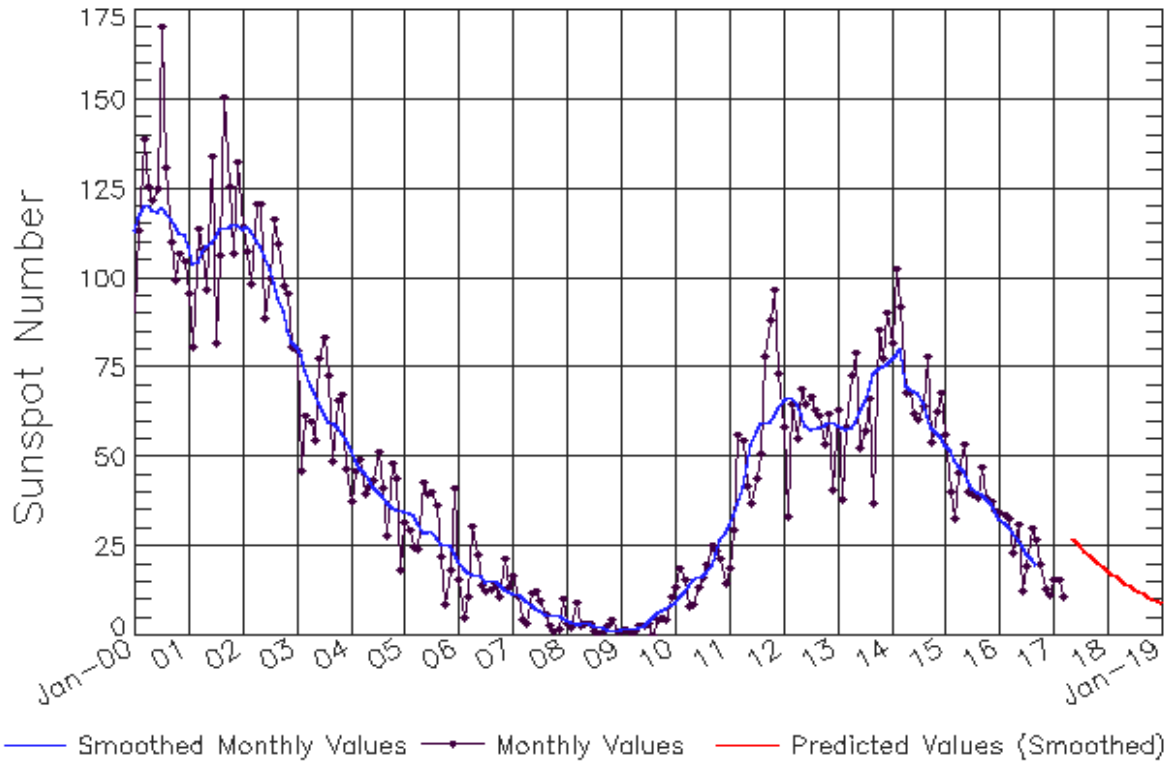
The x-ray plots contains five-minute averages x-ray flux (Watt/m²) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/cm² -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 Apr 2017



Updated 2017 May 8

NOAA/SWPC Boulder, CO USA

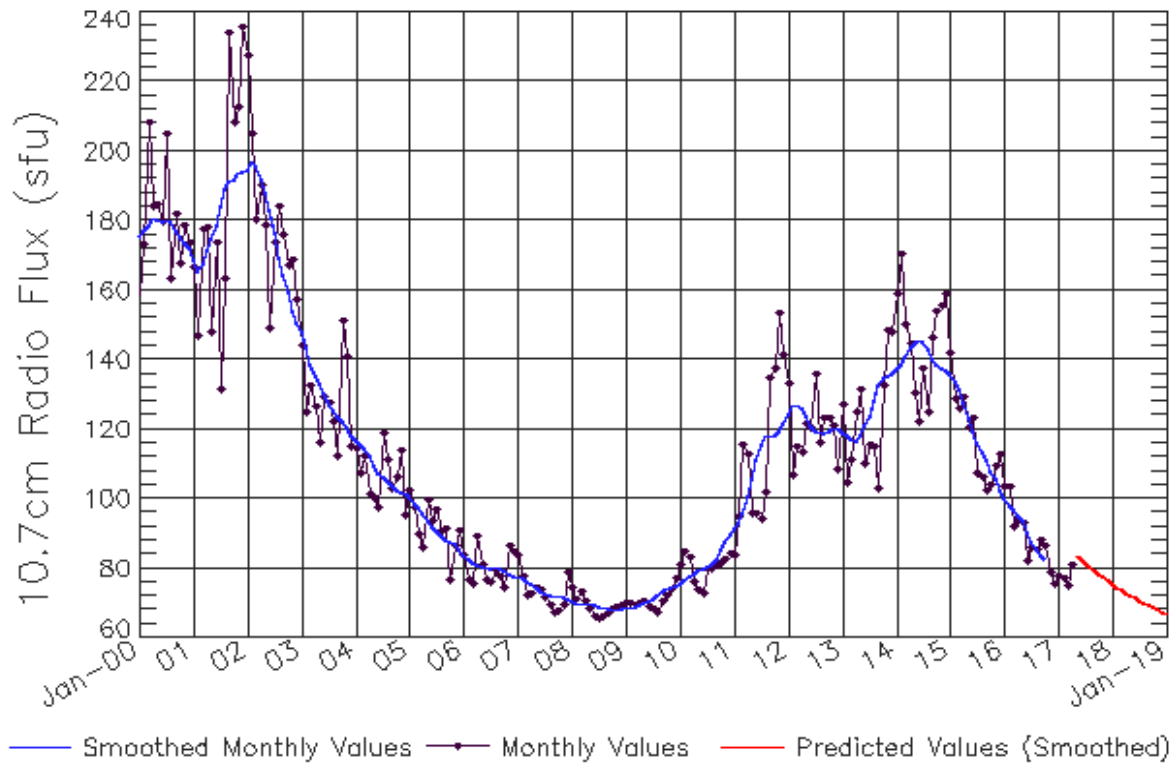
Smoothed Sunspot Number Prediction

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	20	27	26	25	24	23	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 Apr 2017



Updated 2017 May 8

NOAA/SWPC Boulder, CO USA

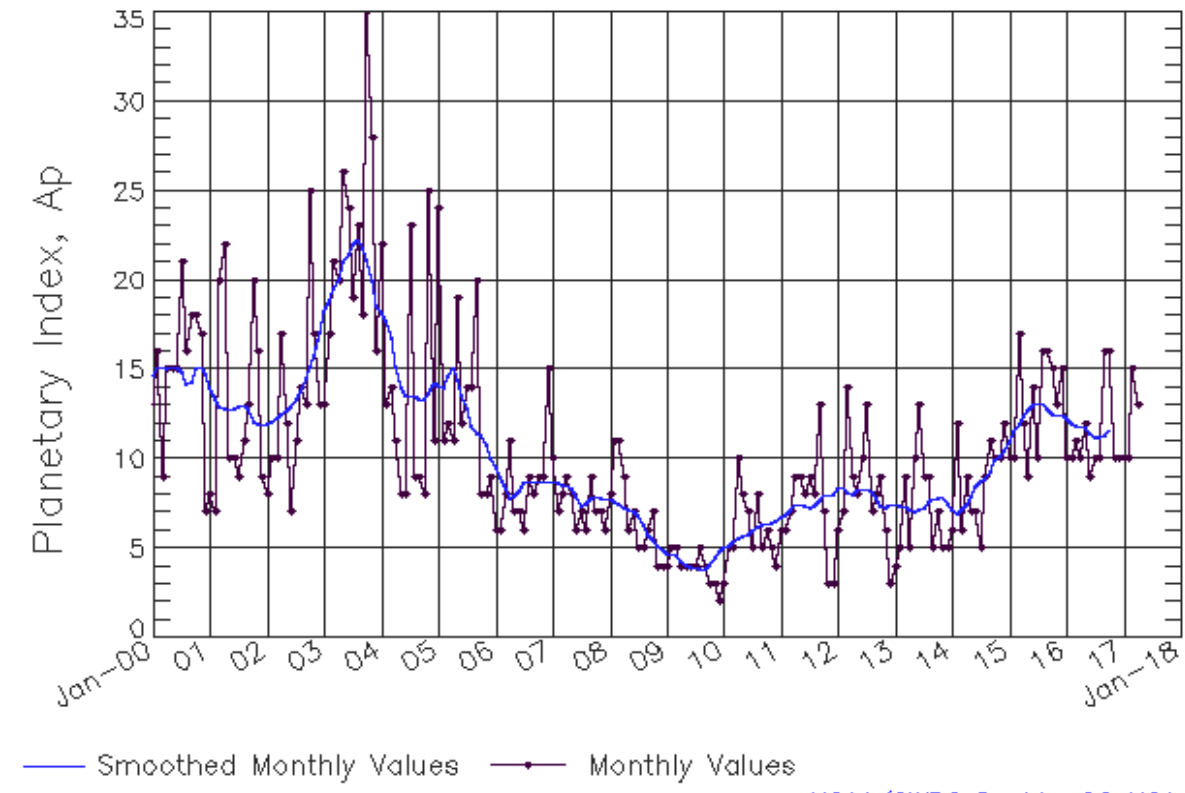
Smoothed F10.7cm Radio Flux Prediction

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 (***)	82 (1)	81 (1)
2017	81 (2)	81 (3)	80 (4)	79 (4)	79 (5)	79 (6)	79 (7)	79 (8)	79 (8)	78 (9)	77 (9)	76 (9)
2018	75 (9)	75 (9)	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 Apr 2017



Updated 2017 May 8

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

