

Solar activity was very low throughout the period. Region 2664 (N18, L=313, class/area=Dsi/100 on 27 Jun) was the most active region this week but only produced low-level B-class flare activity. A very faint CME, not associated with a flare event, was detected in coronagraph imagery midday on 27 Jun and is believed to have arrived at Earth late on 30 Jun/early on 01 Jul, causing a solar wind disturbance. Another, larger, partial halo CME associated with a long-duration B1 flare from Region 2664 was detected in coronagraph imagery midday on 28 Jun. This event is expected to arrive at Earth on 03 Jul.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached moderate levels on 26-30 Jun with normal levels observed on 01-02 Jul.

Geomagnetic field activity reached active and G1 (Minor) geomagnetic storm levels on 02 Jul due to the influence of a transient solar wind feature believed to be the passage of the 27 Jun CME. Quiet and quiet to unsettled conditions were observed throughout the remainder of the period under a nominal solar wind regime.

Space Weather Outlook **03 July - 29 July 2017**

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

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 16-19 Jul with moderate and normal levels expected throughout the remainder of the period.

Geomagnetic field activity is likely to reach G1 (Minor) geomagnetic storm levels on 03 Jul due to the anticipated arrival of the 28 Jun CME. G1 storm conditions are likely on 13 Jul with active levels likely on 14 Jul due to the influence of a recurrent negative polarity CH HSS. Generally quiet and quiet to unsettled conditions are expected throughout the remainder of the outlook period as a nominal solar wind regime prevails.



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
26 June	74	19	90	A5.2	0	0	0	0	0	0	0	0
27 June	74	17	100	A5.3	0	0	0	2	0	0	0	0
28 June	72	13	60	A5.2	0	0	0	0	0	0	0	0
29 June	72	12	50	A4.3	0	0	0	0	0	0	0	0
30 June	72	11	50	A3.7	0	0	0	0	0	0	0	0
01 July	71	11	20	A3.4	0	0	0	0	0	0	0	0
02 July	71	11	20	A3.5	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
	26 June	1.6e+07	1.5e+04	3.4e+03	7.5e+06	
27 June	1.9e+07	1.5e+04	3.5e+03	2.0e+07		
28 June	1.5e+07	1.4e+04	3.3e+03	3.3e+07		
29 June	6.4e+06	1.5e+04	3.5e+03	1.4e+07		
30 June	2.0e+07	1.5e+04	3.7e+03	1.3e+07		
01 July	1.4e+07	1.5e+04	3.8e+03	2.7e+06		
02 July	2.1e+07	1.5e+04	3.5e+03	1.5e+06		

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	26 June	9	3-2-1-3-2-2-2-2	14	3-2-2-5-3-2-1-2	7
27 June	5	1-1-1-2-2-2-1-1	5	2-1-1-2-3-1-1-0	5	2-2-1-1-1-1-0-1
28 June	5	1-2-2-2-2-2-1-0	6	2-1-1-3-1-3-0-0	5	1-2-2-2-1-1-0-1
29 June	6	1-2-2-3-2-2-1-0	7	1-2-3-4-0-0-0-1	5	1-2-2-2-1-1-1-1
30 June	4	0-0-1-1-2-2-2-2	2	0-0-1-1-2-0-0-1	4	0-1-1-1-2-1-1-2
01 July	14	2-4-3-2-3-3-3-2	15	2-4-3-1-4-4-2-1	11	2-3-3-2-3-3-3-2
02 July	20	3-3-4-4-3-3-3-4	22	2-3-6-4-4-1-2-2	15	3-2-5-4-3-2-3-4

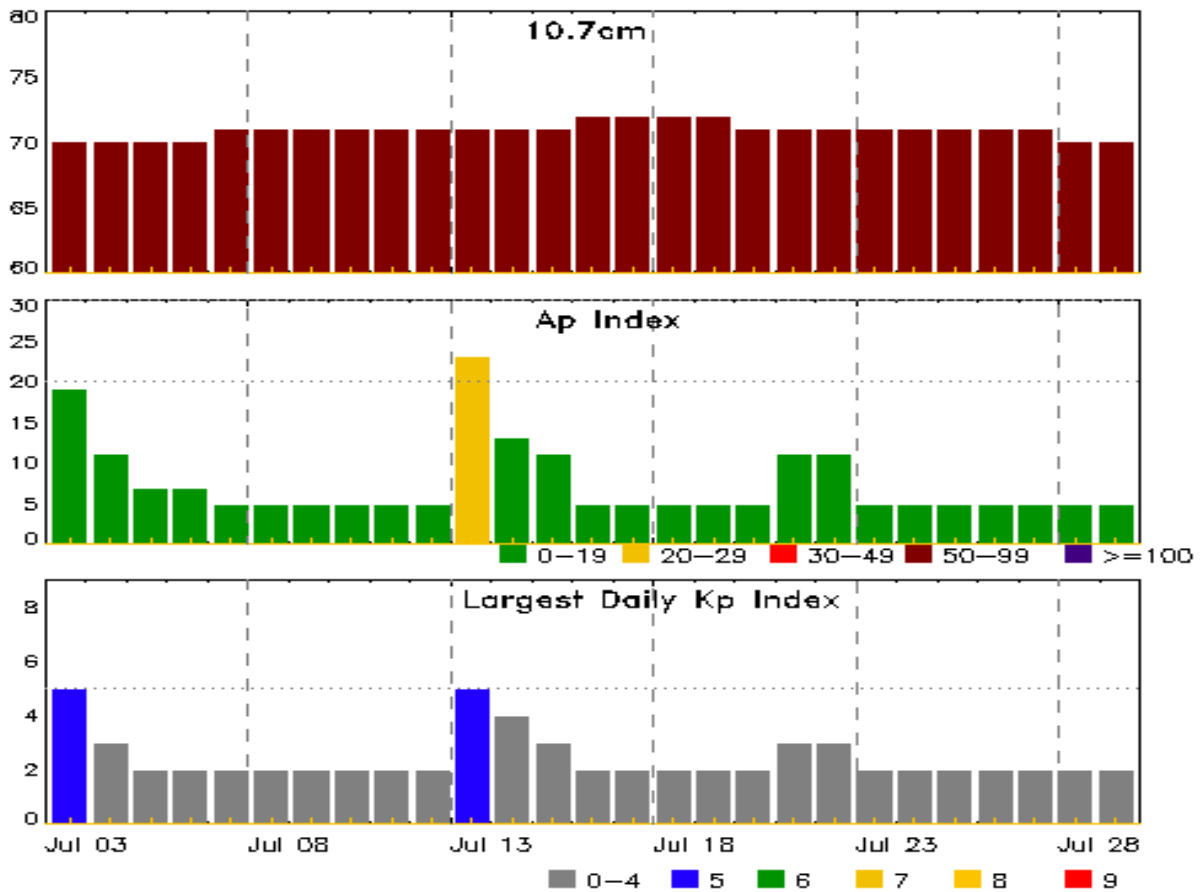


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
30 Jun 1518	WATCH: Geomagnetic Storm Category G1 predicted	
01 Jul 0533	WARNING: Geomagnetic K = 4	01/0532 - 1200
01 Jul 1641	WARNING: Geomagnetic K = 4	01/1640 - 2359
01 Jul 1651	WARNING: Geomagnetic Sudden Impulse expected	01/1715 - 1745
01 Jul 1735	SUMMARY: Geomagnetic Sudden Impulse	01/1712
01 Jul 1954	WATCH: Geomagnetic Storm Category G1 predicted	
01 Jul 2359	EXTENDED WARNING: Geomagnetic K = 4	01/1640 - 02/1200
02 Jul 0637	EXTENDED WARNING: Geomagnetic K = 4	01/1640 - 02/1500
02 Jul 0637	WARNING: Geomagnetic K = 5	02/0630 - 1300
02 Jul 0642	ALERT: Geomagnetic K = 4	02/0642
02 Jul 0900	ALERT: Geomagnetic K = 5	02/0859
02 Jul 1456	EXTENDED WARNING: Geomagnetic K = 4	01/1640 - 03/1500



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
03 Jul	70	19	5	17 Jul	72	5	2
04	70	11	3	18	72	5	2
05	70	7	2	19	72	5	2
06	70	7	2	20	71	5	2
07	71	5	2	21	71	11	3
08	71	5	2	22	71	11	3
09	71	5	2	23	71	5	2
10	71	5	2	24	71	5	2
11	71	5	2	25	71	5	2
12	71	5	2	26	71	5	2
13	71	23	5	27	71	5	2
14	71	13	4	28	70	5	2
15	71	11	3	29	70	5	2
16	72	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	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD	Rgn #	
26 Jun	0723	0728	0733	B1.3				2664
27 Jun	0448	0448	0450		SF	N19W08		2664
27 Jun	0729	0735	0741	B1.2				2664
27 Jun	2049	2053	2056	B1.2				2664
27 Jun	2109	2115	2119	B2.6	SF	N19W18		2664
28 Jun	1227	1524	1835	B1.3				2664
02 Jul	1223	1239	1259	B3.1				2664



Region Summary

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 2664																							
20 Jun	N18E72	314	80	2	Cso	1	B																
21 Jun	N17E60	314	50	2	Hsx	1	A																
22 Jun	N17E47	312	50	1	Hsx	1	A																
23 Jun	N18E35	312	70	2	Hsx	1	A																
24 Jun	N18E21	313	70	5	Cso	7	B																
25 Jun	N18E07	314	90	7	Cso	10	B																
26 Jun	N18W07	315	90	7	Dsi	9	BG																
27 Jun	N18W19	313	100	4	Dsi	7	B					2											
28 Jun	N18W33	314	60	5	Cso	3	B																
29 Jun	N18W46	314	50	5	Cso	2	B																
30 Jun	N17W58	313	50	3	Hsx	1	A																
01 Jul	N18W71	313	20	1	Hsx	1	A																
02 Jul	N18W85	313	20	1	Hsx	1	A																
												0	0	0	2	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 314

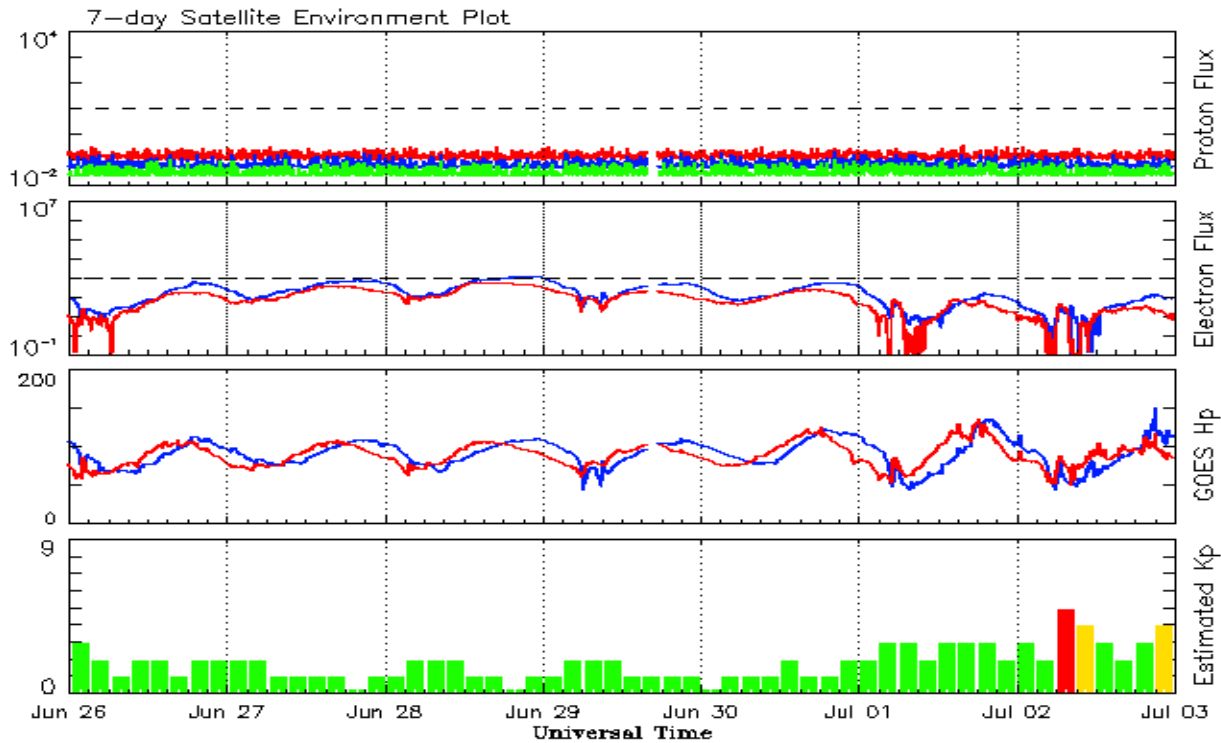


Recent Solar Indices (preliminary)
Observed monthly mean values

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									
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	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	15.5	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	
May	18.1	11.3	0.62			73.5		9	
June	18.0	11.6	0.64			74.8		7	

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 26 June 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.

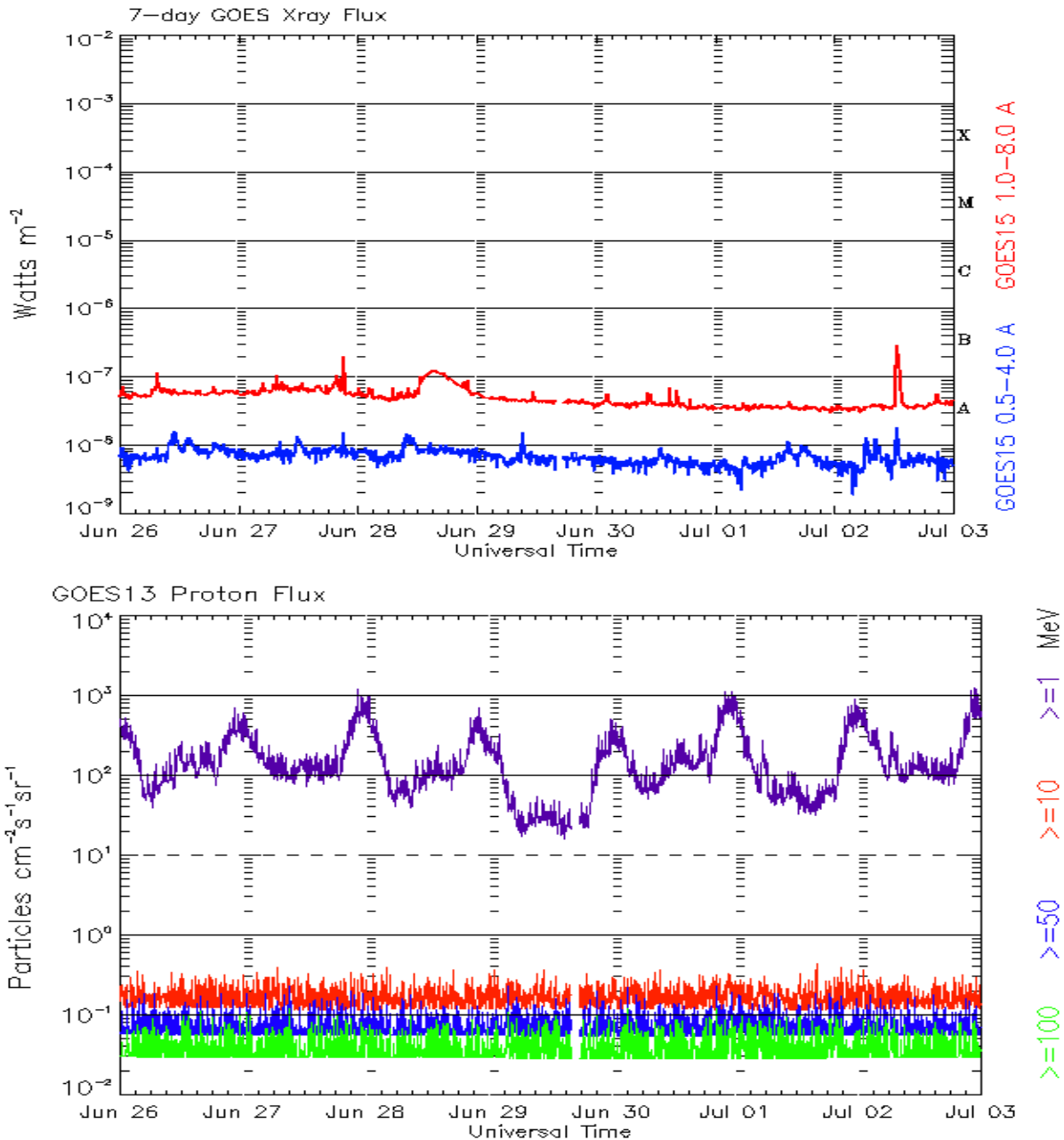
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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.

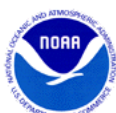




*Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 26 June 2017*

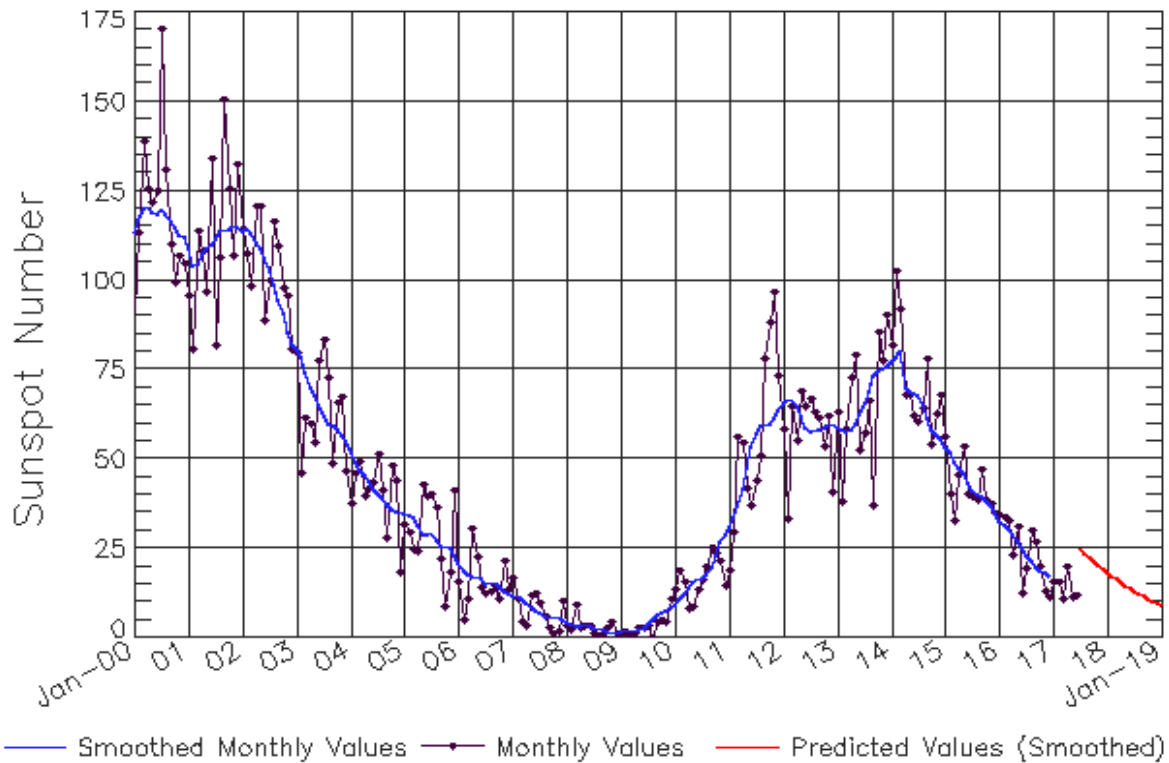
The x-ray plots contains five-minute averages x-ray flux (Watt/m²) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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 Jun 2017



Updated 2017 Jul 3

NOAA/SWPC Boulder, CO USA

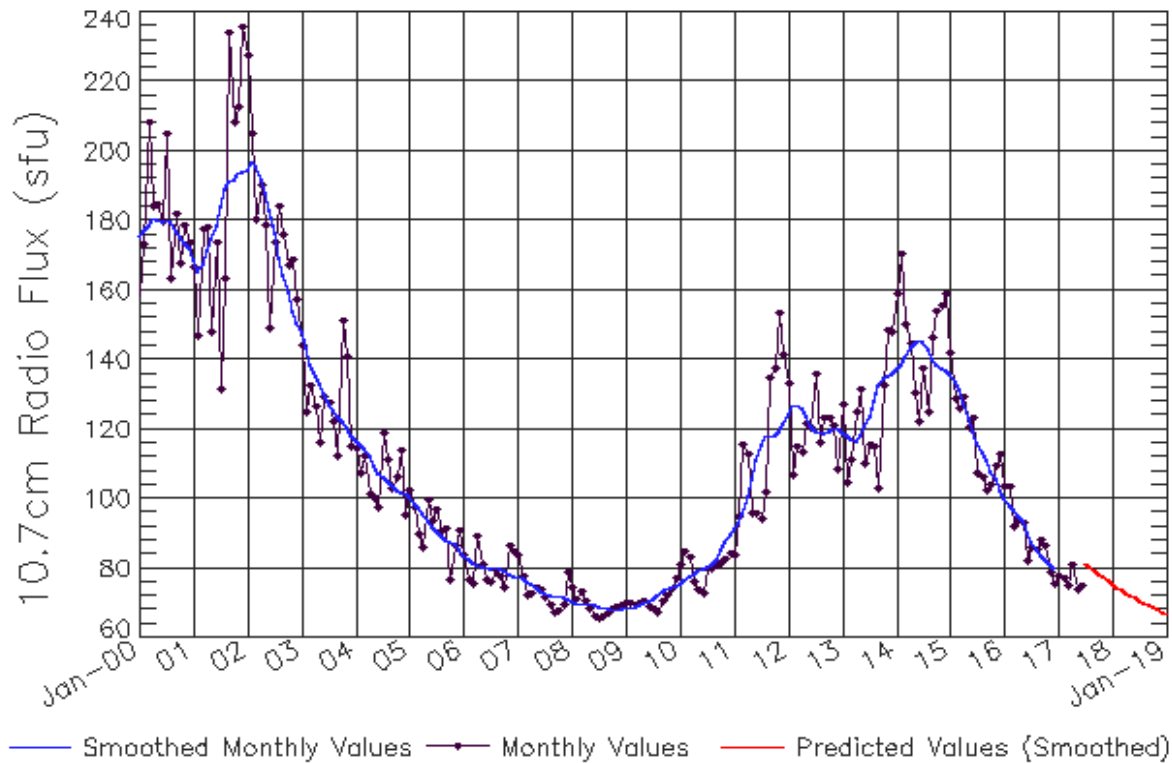
Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	9 (1)	10 (2)	11 (3)	13 (5)	15 (5)	16 (6)	17 (7)	17 (7)	20 (8)	23 (9)	27 (9)	29 (10)
2011	19 (10)	30 (10)	56 (10)	54 (10)	42 (10)	37 (10)	44 (10)	51 (10)	78 (10)	88 (10)	97 (10)	73 (10)
2012	58 (10)	33 (10)	64 (10)	55 (10)	69 (10)	65 (10)	67 (10)	63 (10)	61 (10)	53 (10)	62 (10)	41 (10)
2013	63 (10)	38 (10)	58 (10)	72 (10)	79 (10)	53 (10)	57 (10)	66 (10)	37 (10)	86 (10)	78 (10)	90 (10)
2014	82 (10)	102 (10)	92 (10)	68 (10)	68 (10)	62 (10)	60 (10)	64 (10)	78 (10)	54 (10)	62 (10)	68 (10)
2015	56 (10)	40 (10)	33 (10)	45 (10)	53 (10)	40 (10)	40 (10)	39 (10)	47 (10)	38 (10)	37 (10)	35 (10)
2016	34 (10)	34 (10)	33 (10)	23 (10)	31 (10)	12 (10)	19 (10)	30 (10)	27 (10)	20 (10)	13 (10)	11 (10)
2017	16 (10)	16 (10)	11 (10)	20 (10)	11 (10)	12 (10)	25 (10)	24 (10)	23 (10)	21 (10)	20 (10)	19 (10)
2018	18 (10)	17 (10)	16 (10)	15 (10)	15 (10)	14 (10)	13 (10)	12 (10)	12 (10)	11 (10)	10 (10)	10 (10)
2019	9 (10)	8 (10)	8 (10)	7 (10)	7 (10)	6 (10)	6 (10)	6 (10)	5 (10)	5 (10)	4 (10)	4 (10)



ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Jun 2017



Updated 2017 Jul 3

NOAA/SWPC Boulder, CO USA

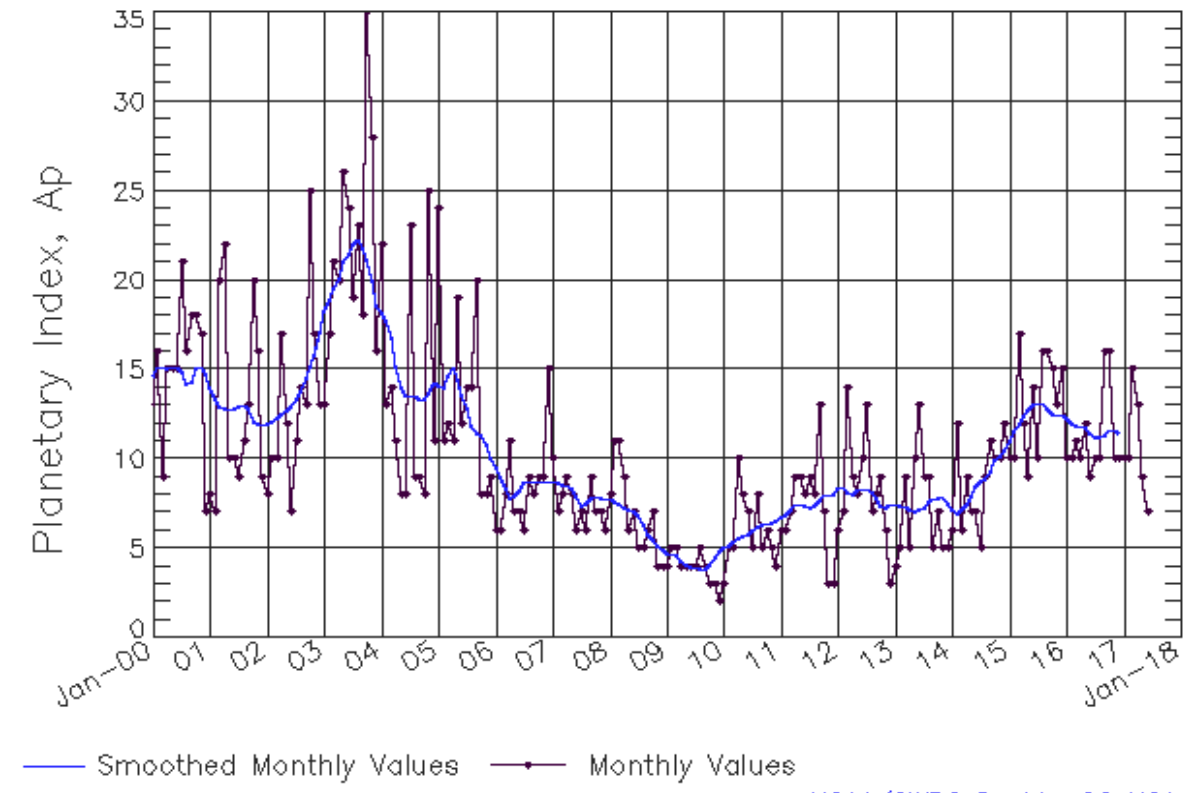
Smoothed F10.7cm Radio Flux Prediction

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	80 (1)	79 (1)	79 (2)	78 (3)	78 (4)	78 (4)	78 (5)	77 (6)	77 (7)	77 (8)	76 (8)	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 Jun 2017



Updated 2017 Jul 3

NOAA/SWPC Boulder, CO USA

Solar Cycle Comparison charts are temporarily unavailable.



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

Published every Monday by the Space Weather Prediction Center.

U.S. Department of Commerce
NOAA / National Weather Service
Space Weather Prediction Center
325 Broadway, Boulder CO 80305

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

