

Space Weather Highlights
29 August - 04 September 2016

SWPC PRF 2140
05 September 2016

Solar activity was at low levels from 29-31 Aug. Regions 2583 (N13, L=025, class/area Dao/130 on 29 Aug) and 2585 (N08, L=222, class/area Ekc/590 on 03 Sep) were responsible for the C-class activity. Activity dropped to very low levels for the remainder of the period. No Earth-directed CMEs were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 29 Aug and 02-04 Sep due to CH HSS influence.

Geomagnetic field activity was at quiet to unsettled levels on 29-31 Aug with active conditions late on 30 Aug due to CH HSS effects. Mostly active to major storm conditions were observed on 01-03 Sep due to effects from an extension of the northern polar coronal hole. Active to minor storm levels prevailed on 04 Sep due to continued CH HSS effects.

Space Weather Outlook
05 September - 01 October 2016

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

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high to very high levels on 05-12 Sep due to CH HSS influence. Normal to moderate levels are expected from 13-20 Sep and 26-28 Sep. High levels are expected on 21-25 Sep and 29 Sep-01 Oct due to effects from anticipated recurrent CH HSS events.

Geomagnetic field activity is expected to be at unsettled to active levels on 05-06 Sep with minor storms expected early on 05 Sep as CH HSS effects continue. Quiet to unsettled conditions are expected on 07-08 Sep as effects begin to subside. Mostly quiet conditions are expected from 09-18 Sep with isolated unsettled periods likely on 13, 14 and 17 Sep due to weak recurrent CH HSS events. Quiet to unsettled levels are expected on 19-21 Sep with active periods possible on 19 Sep due to effects from a recurrent, negative polarity CH HSS. Mostly quiet conditions are expected from 22-25 Sep. Quiet to unsettled conditions are expected on 26-27 Sep followed by active to major storm levels from 26 Sep-01 Oct due to effects from the northern polar coronal hole extension.



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
29 August	88	67	350	B2.7	3	0	0	8	0	0	0	0
30 August	100	64	290	B5.0	2	0	0	1	0	0	0	0
31 August	98	91	575	B4.2	2	0	0	3	0	0	0	0
01 September	95	66	730	B3.0	0	0	0	3	0	0	0	0
02 September	95	50	620	B3.4	0	0	0	10	0	0	0	0
03 September	99	46	690	B2.1	0	0	0	2	0	0	0	0
04 September	97	59	560	B1.9	0	0	0	2	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
	29 August		7.2e+05	1.5e+04	3.8e+03	
30 August		3.8e+05	1.4e+04	3.2e+03		1.6e+06
31 August		4.1e+05	1.4e+04	3.2e+03		2.1e+06
01 September		7.7e+05	1.3e+04	3.1e+03		8.6e+05
02 September		2.9e+06	1.3e+04	3.0e+03		1.8e+08
03 September		4.6e+06	1.3e+04	3.0e+03		5.0e+08
04 September		4.4e+06	1.3e+04	2.9e+03		1.1e+09

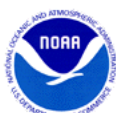
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	29 August	5	1-1-0-2-3-1-1-2	6	1-0-0-1-3-3-2-1	6
30 August	12	3-2-2-2-3-3-3-3	30	2-2-4-3-6-6-3-2	16	3-2-2-2-3-4-4-4
31 August	8	2-1-1-2-2-1-3-3	5	2-1-1-2-1-1-2-2	8	2-2-1-1-2-1-3-3
01 September	29	4-3-5-3-5-2-4-5	52	2-5-7-5-5-5-4-5	36	4-4-5-4-4-3-5-6
02 September	24	5-5-3-3-4-2-2-4	44	5-5-3-6-6-5-3-3	39	6-6-3-3-5-4-3-5
03 September	21	3-4-4-3-4-3-3-4	70	3-5-7-7-6-6-4-4	40	4-6-5-4-4-4-4-5
04 September	20	4-3-4-3-3-3-4-3	46	3-3-7-5-6-4-4-3	39	5-4-4-4-4-4-5-4



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
29 Aug 0926	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	25/1900
29 Aug 1213	WARNING: Geomagnetic K = 4	29/1215 - 1600
30 Aug 0316	WARNING: Geomagnetic K = 4	30/0915 - 1500
30 Aug 1452	EXTENDED WARNING: Geomagnetic K = 4	30/0915 - 1900
30 Aug 1538	ALERT: Geomagnetic K = 4	30/1537
30 Aug 1540	WARNING: Geomagnetic K = 5	30/1540 - 1815
30 Aug 1854	EXTENDED WARNING: Geomagnetic K = 4	30/0915 - 31/0100
30 Aug 1906	WATCH: Geomagnetic Storm Category G1 predicted	
31 Aug 0043	EXTENDED WARNING: Geomagnetic K = 4	30/0915 - 31/1300
31 Aug 2031	WARNING: Geomagnetic K = 4	31/2035 - 01/0300
01 Sep 0152	ALERT: Geomagnetic K = 4	01/0152
01 Sep 0154	EXTENDED WARNING: Geomagnetic K = 4	31/2035 - 01/0900
01 Sep 0407	EXTENDED WARNING: Geomagnetic K = 4	31/2035 - 01/1200
01 Sep 0407	WARNING: Geomagnetic K = 5	01/0405 - 0900
01 Sep 0856	EXTENDED WARNING: Geomagnetic K = 5	01/0405 - 1500
01 Sep 0856	EXTENDED WARNING: Geomagnetic K = 4	31/2035 - 01/1800
01 Sep 0900	ALERT: Geomagnetic K = 5	01/0859
01 Sep 1429	EXTENDED WARNING: Geomagnetic K = 5	01/0405 - 1800
01 Sep 1937	WARNING: Geomagnetic K = 4	01/1937 - 02/0300
01 Sep 1946	ALERT: Geomagnetic K = 4	01/1945
01 Sep 1950	WARNING: Geomagnetic K = 5	01/1947 - 2359
01 Sep 2049	ALERT: Geomagnetic K = 5	01/2049
01 Sep 2323	ALERT: Geomagnetic K = 5	01/2323
01 Sep 2330	EXTENDED WARNING: Geomagnetic K = 4	01/1937 - 02/1200
01 Sep 2330	EXTENDED WARNING: Geomagnetic K = 5	01/1947 - 02/0600
01 Sep 2334	WARNING: Geomagnetic K = 6	01/2334 - 02/0300
01 Sep 2358	ALERT: Geomagnetic K = 6	01/2358
02 Sep 0209	ALERT: Geomagnetic K = 5	02/0209



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
02 Sep 0249	ALERT: Geomagnetic K = 6	02/0248
02 Sep 0249	EXTENDED WARNING: Geomagnetic K = 6	01/2334 - 02/0900
02 Sep 0249	EXTENDED WARNING: Geomagnetic K = 5	01/1947 - 02/1200
02 Sep 0455	ALERT: Geomagnetic K = 5	02/0455
02 Sep 0525	ALERT: Geomagnetic K = 6	02/0525
02 Sep 1150	EXTENDED WARNING: Geomagnetic K = 4	01/1937 - 02/2359
02 Sep 1312	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	02/1305
02 Sep 1438	WARNING: Geomagnetic K = 5	02/1438 - 1900
02 Sep 1448	ALERT: Geomagnetic K = 5	02/1448
02 Sep 2155	WARNING: Geomagnetic K = 5	02/2151 - 03/0300
02 Sep 2155	EXTENDED WARNING: Geomagnetic K = 4	01/1937 - 03/0600
02 Sep 2218	ALERT: Geomagnetic K = 5	02/2218
03 Sep 0252	EXTENDED WARNING: Geomagnetic K = 5	02/2151 - 03/0900
03 Sep 0252	EXTENDED WARNING: Geomagnetic K = 4	01/1937 - 03/1500
03 Sep 0435	ALERT: Geomagnetic K = 5	03/0435
03 Sep 0445	WARNING: Geomagnetic K = 6	03/0444 - 0900
03 Sep 0600	ALERT: Geomagnetic K = 6	03/0559
03 Sep 0844	ALERT: Geomagnetic K = 5	03/0843
03 Sep 0849	EXTENDED WARNING: Geomagnetic K = 6	03/0444 - 1200
03 Sep 0849	EXTENDED WARNING: Geomagnetic K = 5	02/2151 - 03/1800
03 Sep 0849	EXTENDED WARNING: Geomagnetic K = 4	01/1937 - 03/2359
03 Sep 0950	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	02/1305
03 Sep 1033	WATCH: Geomagnetic Storm Category G1 predicted	
03 Sep 1328	WARNING: Geomagnetic K = 5	03/1330 - 1900
03 Sep 1835	EXTENDED WARNING: Geomagnetic K = 5	03/1330 - 04/0600
03 Sep 2345	ALERT: Geomagnetic K = 5	03/2345
04 Sep 0112	WARNING: Geomagnetic K = 4	04/0111 - 1200
04 Sep 0117	ALERT: Geomagnetic K = 4	04/0116

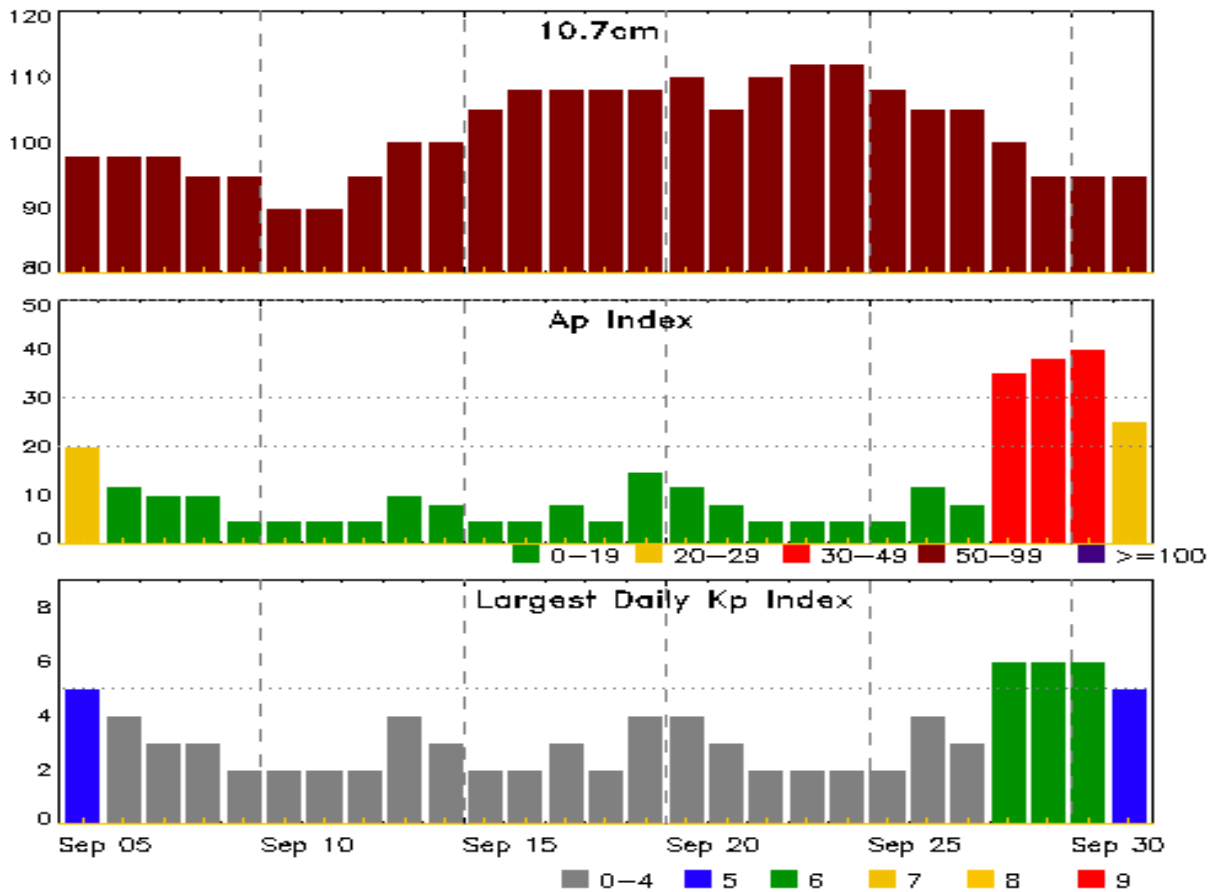


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
04 Sep 0300	ALERT: Geomagnetic K = 5	04/0259
04 Sep 0500	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	02/1305
04 Sep 0551	EXTENDED WARNING: Geomagnetic K = 5	03/1330 - 04/1200
04 Sep 1142	EXTENDED WARNING: Geomagnetic K = 4	04/0111 - 05/0900
04 Sep 2044	WARNING: Geomagnetic K = 5	04/2045 - 05/0600
04 Sep 2104	ALERT: Geomagnetic K = 5	04/2059



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
05 Sep	98	20	5	19 Sep	108	15	4
06	98	12	4	20	110	12	4
07	98	10	3	21	105	8	3
08	95	10	3	22	110	5	2
09	95	5	2	23	112	5	2
10	90	5	2	24	112	5	2
11	90	5	2	25	108	5	2
12	95	5	2	26	105	12	4
13	100	10	4	27	105	8	3
14	100	8	3	28	100	35	6
15	105	5	2	29	95	38	6
16	108	5	2	30	95	40	6
17	108	8	3	01 Oct	95	25	5
18	108	5	2				



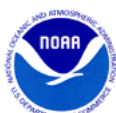
Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
29 Aug	0229	0236	0239	B5.0			
29 Aug	0334	0346	0402	C2.2	SF	N12W51	2583
29 Aug	0351	0421	0431		SF	N11W27	2579
29 Aug	0415	0416	0417		SF	N15W50	2583
29 Aug	0420	0427	0436	C1.3	SF	N13W54	2583
29 Aug	0450	0453	0455		SF	N13W54	2583
29 Aug	0726	0731	0740	B5.2			2585
29 Aug	0939	0939	0945		SF	N13W56	2583
29 Aug	1035	1039	1044	B5.1			2585
29 Aug	B1327	U1328	1346		SF	N14W60	2583
29 Aug	1733	1736	1738	C1.1	SF	N16W57	2583
29 Aug	2305	2309	2317	B5.7			2585
29 Aug	2348	2355	0000	B8.9			2585
30 Aug	0240	0245	0251	B5.6			2585
30 Aug	0958	1006	1015	C1.0			2585
30 Aug	B1321	U1321	A1327		SF	N14W66	2583
30 Aug	2241	2245	2248	C1.5			2583
31 Aug	0723	0726	0730		SF	N09W79	2582
31 Aug	0745	0746	0748		SF	N09W79	2582
31 Aug	0753	0755	0809		SF	N09W80	2582
31 Aug	0812	0819	0826	C1.1			2585
31 Aug	2010	2019	2039	C2.2			2585
01 Sep	0227	0231	0237	B5.8			2585
01 Sep	1253	1258	1306	B6.1			
01 Sep	1330	1351	1400		SF	N12E66	2585
01 Sep	1433	1442	1451		SF	N12E65	2585
01 Sep	1453	1520	1533		SF	N12E65	2585
02 Sep	0428	0429	0430		SF	N08E60	2585
02 Sep	0438	0441	0443	B9.1	SF	N08E59	2585
02 Sep	0616	0620	0622	B5.9	SF	N11E57	2585
02 Sep	B0648	U0649	A0653		SF	N10E57	2585



Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/Brtns	Location Lat CMD	Rgn #
02 Sep	B0649	U0651	A0656		SF	S22W71	2580
02 Sep	1336	1339	1342	B5.9	SF	N07E50	2585
02 Sep	1356	1356	1418		SF	N07E50	2585
02 Sep	1538	U1538	1540		SF	N10E60	
02 Sep	1707	1708	1713		SF	N09E50	2585
02 Sep	1846	1849	1852	B8.9	SF	N05E47	2585
03 Sep	0042	0103	0113	B6.4			2585
03 Sep	0525	0530	0533	B7.1			2585
03 Sep	0535	0537	0540		SF	N10E52	2585
03 Sep	1506	1510	1529		SF	N10E36	2585
04 Sep	1038	1039	1040		SF	N10E26	2585
04 Sep	1804	1817	1831	B9.2	SF	N11E21	2585



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 2579																		
22 Aug	N12E17		34	60	5	Dai	12	B					3					
23 Aug	N12E04		34	90	6	Dao	11	B										
24 Aug	N11W08		33	80	5	Dao	9	B										
25 Aug	N12W21		32	40	4	Cao	4	B										
26 Aug	N12W37		35	10	2	Axx	3	A					2					
27 Aug	N11W47		32	plage														
28 Aug	N11W61		33	plage														
29 Aug	N11W75		34	plage									1					
30 Aug	N11W89		35	plage														
									0	0	0	6	0	0	0	0	0	

Crossed West Limb.
 Absolute heliographic longitude: 34

Region 2580																		
22 Aug	S16E60		351	20	1	Hsx	1	A										
23 Aug	S17E46		352	20	1	Hsx	1	A										
24 Aug	S18E34		351	20	1	Hsx	1	A										
25 Aug	S18E21		350	40	6	Cso	2	B										
26 Aug	S18E09		350	20	1	Hsx	2	A										
27 Aug	S18W05		350	20	1	Hsx	1	A										
28 Aug	S18W19		351	20	3	Hrx	2	A										
29 Aug	S18W30		349	30	3	Hrx	3	A										
30 Aug	S17W43		349	30	4	Cao	8	B										
31 Aug	S16W57		349	60	5	Cao	6	B										
01 Sep	S16W71		350	60	5	Cao	3	B										
02 Sep	S16W85		351	plage									1					
									0	0	0	1	0	0	0	0	0	

Crossed West Limb.
 Absolute heliographic longitude: 350



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 2581																		
25 Aug	N12E35	336	40	3	Cso	3	B											
26 Aug	N12E22	337	80	6	Dao	9	B						3					
27 Aug	N12E08	337	100	8	Cai	17	B											
28 Aug	N12W05	337	110	9	Cao	10	B											
29 Aug	N12W19	338	130	10	Cso	8	B											
30 Aug	N11W34	340	90	8	Cao	9	B											
31 Aug	N11W48	340	90	8	Cso	9	B											
01 Sep	N12W64	343	130	2	Hsx	1	A											
02 Sep	N13W79	345	130	2	Hsx	1	A											
03 Sep	N13W92	345	90	1	Hsx	1	A											
								0	0	0		3	0	0	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 337

Region 2582																		
27 Aug	N08W39	24	10	3	Bxo	4	B											
28 Aug	N08W51	23	40	5	Dao	8	B						1					
29 Aug	N08W67	26	60	8	Cso	6	B											
30 Aug	N09W83	29	50	1	Cso	1	B											
								0	0	0		1	0	0	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 24

Region 2583																		
28 Aug	N13W51	23	30	3	Dao	4	B	1					1					
29 Aug	N13W66	25	130	6	Dao	10	B	3					7					
30 Aug	N14W80	26	120	8	Cao	6	B	1					1					
31 Aug	N14W94	26	120	8	Cao	6	B											
								5	0	0		9	0	0	0	0	0	0

Crossed West Limb.
 Absolute heliographic longitude: 23



Region Summary - continued

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

Region 2584

31 Aug	S06E62	230	75	6	Cao	7	B										
01 Sep	S08E41	238	10	1	Bxo	2	B										
02 Sep	S08E27	239	plage														
03 Sep	S08E13	240	plage														
04 Sep	S08W01	241	plage														
								0	0	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 241

Region 2585

30 Aug	N08E85	221	plage														
31 Aug	N08E71	221	230	9	Csi	13	B	1									
01 Sep	N07E56	223	520	11	Eai	8	B	2					3				
02 Sep	N06E43	223	460	11	Ekc	17	BG						8				
03 Sep	N08E31	222	590	11	Ekc	14	BG						2				
04 Sep	N08E16	224	550	12	Ekc	25	BG						2				
								3	0	0	15	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 224

Region 2586

01 Sep	N08W03	282	10	3	Bxo	2	B										
02 Sep	N05W17	283	30	4	Bxo	2	B										
03 Sep	N05W33	286	10	1	Hrx	1	A										
04 Sep	N07W47	287	10	2	Bxo	2	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 282

Region 2587

04 Sep	N10E28	212	0	1	Axx	2	A										
								0	0	0	0	0	0	0	0	0	0

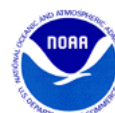
Still on Disk.
Absolute heliographic longitude: 212

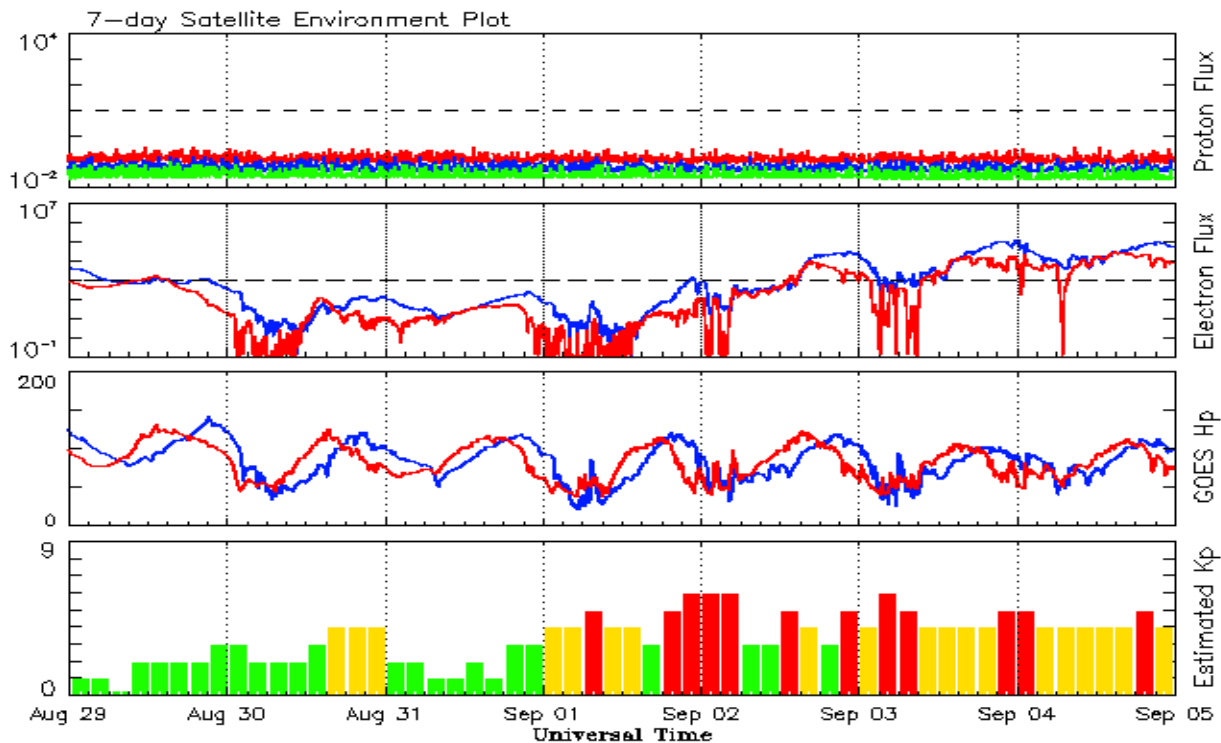


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2014									
September	127.4	78.0	0.69	107.4	61.1	146.1	140.1	11	9.3
October	92.0	54.0	0.66	101.7	58.4	153.7	138.4	10	9.9
November	101.8	62.2	0.69	97.9	56.8	155.3	137.4	10	10.1
December	120.0	67.7	0.65	95.2	55.3	158.7	137.0	12	10.5
2015									
January	101.2	55.8	0.66	92.1	53.6	141.7	135.8	10	11.0
February	70.6	40.0	0.63	88.3	51.7	128.8	133.8	10	11.5
March	61.7	32.7	0.62	84.2	49.3	126.0	131.2	17	12.0
April	72.5	45.2	0.75	80.5	47.3	129.2	127.3	12	12.4
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	36.8	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	32.7	103.5	99.9	10	12.3
February	56.0	33.8	0.61	49.6	31.6	103.5	98.1	10	12.0
March	40.9	32.5	0.80			91.6		11	
April	39.2	22.8	0.58			93.4		10	
May	48.9	31.3	0.64			93.1		12	
June	19.3	12.5	0.65			81.9		9	
July	36.8	19.5	0.53			85.9		10	
August	50.4	30.4	0.60			85.0		10	

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 29 August 2016*

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.

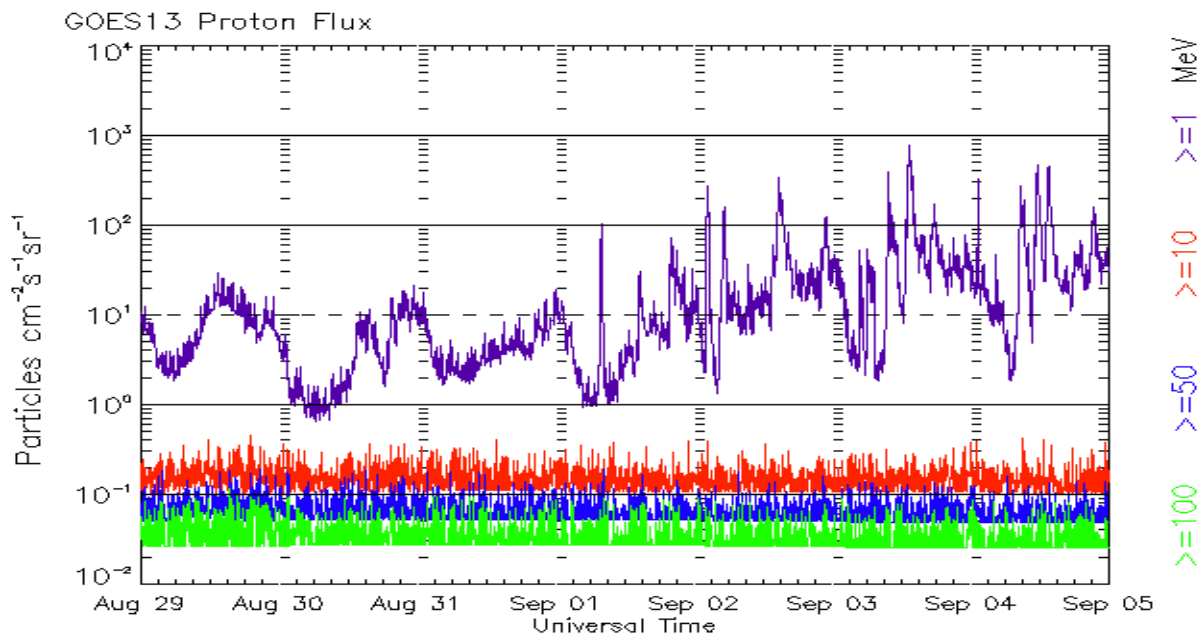
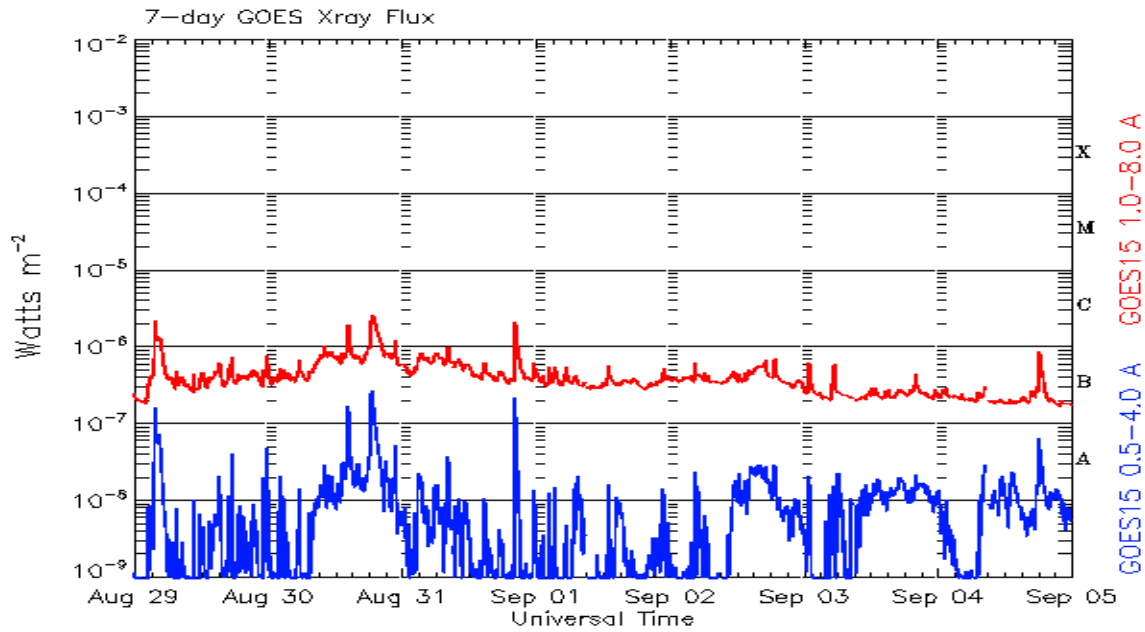
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 29 August 2016

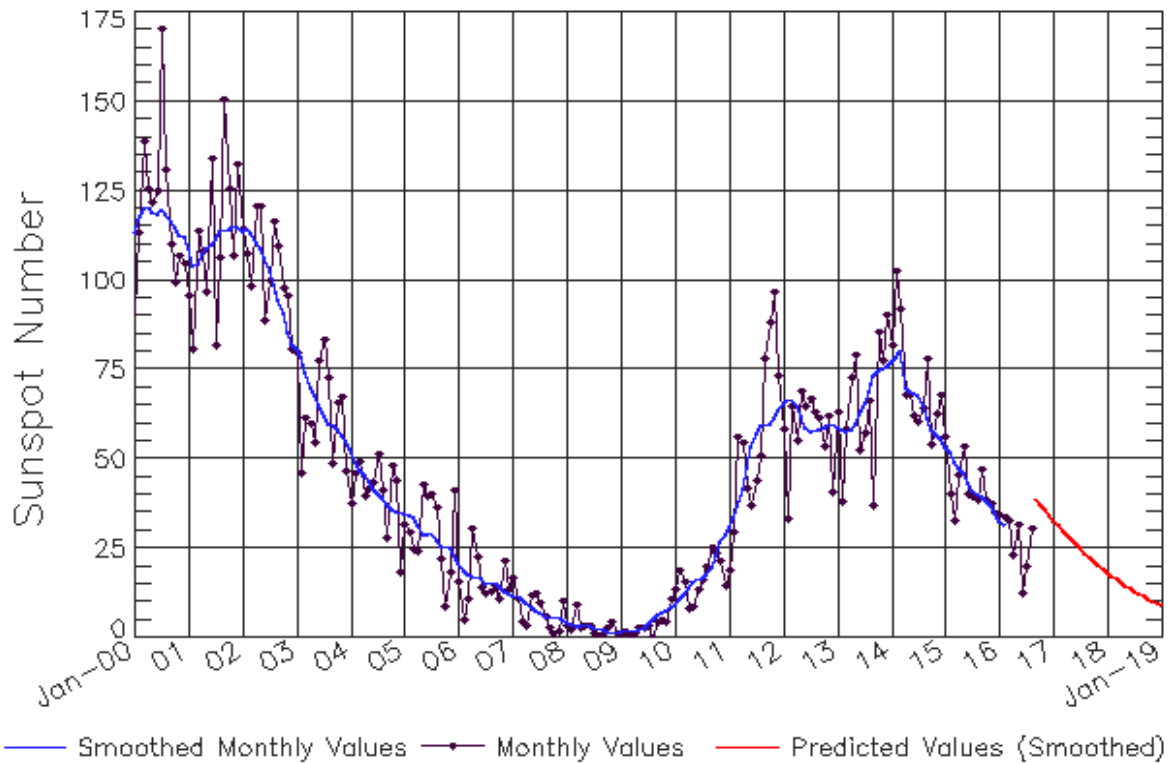
The x-ray plots contains five-minute averages x-ray flux (Watt/ m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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 Aug 2016



Updated 2016 Sep 5

NOAA/SWPC Boulder, CO USA

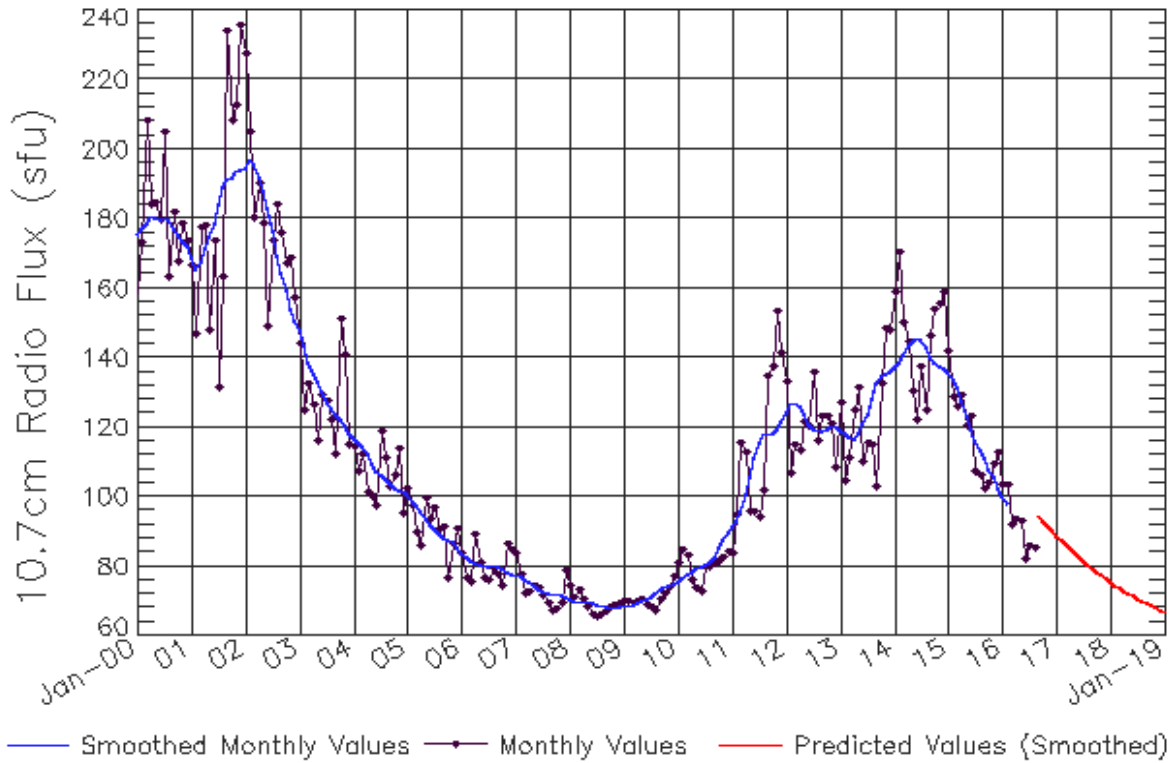
Smoothed Sunspot Number Prediction

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	13	20	30	39	37	36	34
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2017	33	31	30	29	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 Aug 2016



Updated 2016 Sep 5

NOAA/SWPC Boulder, CO USA

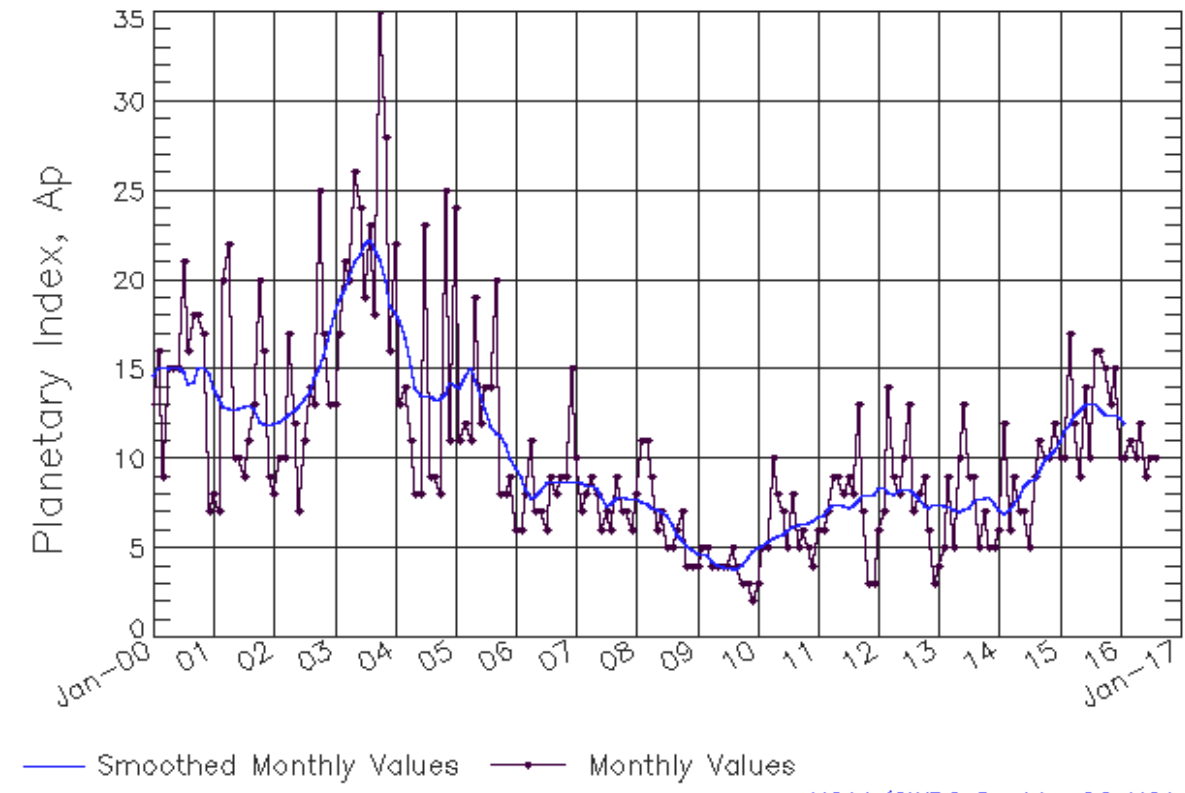
Smoothed F10.7cm Radio Flux Prediction

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 (1)	96 (1)	95 (2)	93 (3)	92 (4)	90 (4)	90 (5)	89 (6)	88 (7)	88 (8)
2017	88 (8)	87 (9)	86 (9)	85 (9)	84 (9)	83 (9)	82 (9)	80 (9)	79 (9)	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

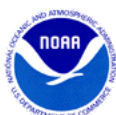
Observed data through Aug 2016



Updated 2016 Sep 5

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Solar Cycle Comparison charts are temporarily unavailable.



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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

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<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

