

**Space Weather Highlights**  
**12 November - 18 November 2018**

**SWPC PRF 2255**  
**19 November 2018**

Solar activity was at very low levels. Region 2726 (N05, L=137, class/area Axx/010 on 13 Nov) was inactive and decayed to plage 15 Nov. Region 2727 (N01, L=112, class/area Cao/060 on 18 Nov) showed slight growth, but remained inactive. No Earth-directed CMEs were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 12-16 Nov and moderate levels on 17-18 Nov.

Geomagnetic field activity was at predominately quiet levels, with a isolated periods of unsettled conditions observed early on 12 Nov. Solar wind speeds were elevated 12-13 Nov due to a negative polarity CH HSS. Peak speeds of 638 km/s occurred on 12 Nov at approximately 1936 UTC, and decreased over the course of the week, reaching a minimum of 298 km/s by 17/2326 UTC. 14-17 Nov were unremarkable under a nominal solar wind regime. The solar wind environment underwent a slight enhancement on 18 Nov due to CIR arrival ahead of a negative polarity CH. Total field became enhanced to 8 nT and the Bz component saw a maximum southward deflection of -8 nT by the end of the day. Wind speeds increased to around 330 km/s and density increased to a peak of 20 particles per cubic cm.

**Space Weather Outlook**  
**19 November - 15 December 2018**

Solar activity is expected to be at very low levels throughout the forecast period (19 Nov-15 Dec). Region 2727 (N05, L=137) will exit the solar disk on 21 Nov, and pending decay, is due to return on 04 Dec.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to remain at moderate levels 19 Nov-1 Dec. Predominately high levels are likely 2 Dec-13 Dec due to a pair of recurrent CH HSSs. Moderate levels are likely 14-15 Dec as CH HSS influence wanes.

Geomagnetic field activity is expected to be at mostly unsettled levels 19-22 Nov due to a pair of negative polarity CH HSSs. Predominately quiet levels are expected 23-30 Nov under nominal solar wind conditions. Active conditions are expected on 01 Dec due to a SSBC ahead of a recurrent positive polarity CH. G1 (Minor) storming is likely 02 Dec due to the CIR in advance of the HSS of the aforementioned positive polarity CH. Unsettled conditions are expected 03-06 Dec as CH HSS influence wanes. Active conditons are likely 07-08 Dec due to HSS influence from a recurrent, negative polarity CH. Mostly unsettled conditions, with a chance of active intervals, is expected 09 Dec as the negative polarity CH HSS influence wanes. Quiet conditions are expected for the remainder of the period.



### ***Daily Solar Data***

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
12 November	68	0	0	A0.0	0	0	0	0	0	0	0	0
13 November	67	11	10	A0.0	0	0	0	0	0	0	0	0
14 November	68	11	10	A0.0	0	0	0	0	0	0	0	0
15 November	68	13	20	A0.0	0	0	0	0	0	0	0	0
16 November	71	14	20	A1.0	0	0	0	0	0	0	0	0
17 November	73	13	60	A1.7	0	0	0	0	0	0	0	0
18 November	72	14	60	A1.5	0	0	0	0	0	0	0	0

### ***Daily Particle Data***

Date	Proton Fluence (protons/cm <sup>2</sup> -day -sr)			Electron Fluence (electrons/cm <sup>2</sup> -day -sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
12 November		6.1e+05	1.6e+04	3.5e+03		3.6e+07
13 November		4.8e+05	1.6e+04	3.6e+03		7.1e+07
14 November		7.7e+05	1.6e+04	3.6e+03		8.0e+07
15 November		7.8e+05	1.7e+04	3.6e+03		6.7e+07
16 November		7.8e+05	1.6e+04	3.7e+03		6.3e+07
17 November		6.2e+05	1.7e+04	3.6e+03		4.6e+07
18 November		1.2e+06	1.6e+04	3.7e+03		3.8e+07

### ***Daily Geomagnetic Data***

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
12 November	6	2-2-2-1-2-1-2-2	10	1-3-4-3-2-1-1-2	9	2-3-3-1-2-1-2-2
13 November	3	1-1-1-1-1-1-1-0	2	1-0-2-2-0-0-0-0	4	2-1-1-1-1-0-1-0
14 November	2	0-0-1-1-1-1-1-0	1	0-0-0-0-2-1-0-0	3	0-1-1-1-1-1-1-0
15 November	1	0-0-0-0-1-1-0-0	0	0-0-0-0-0-1-0-0	2	0-0-0-0-0-1-0-0
16 November	1	0-0-1-0-0-2-0-0	1	0-0-0-0-1-1-0-0	2	0-0-1-0-0-1-0-0
17 November	1	0-0-1-0-0-1-0-0	0	0-0-0-0-0-0-0-0	1	0-0-1-0-0-0-0-0
18 November	2	0-1-0-0-1-1-1-2	2	0-0-0-2-2-0-0-0	2	0-1-0-1-1-1-0-1

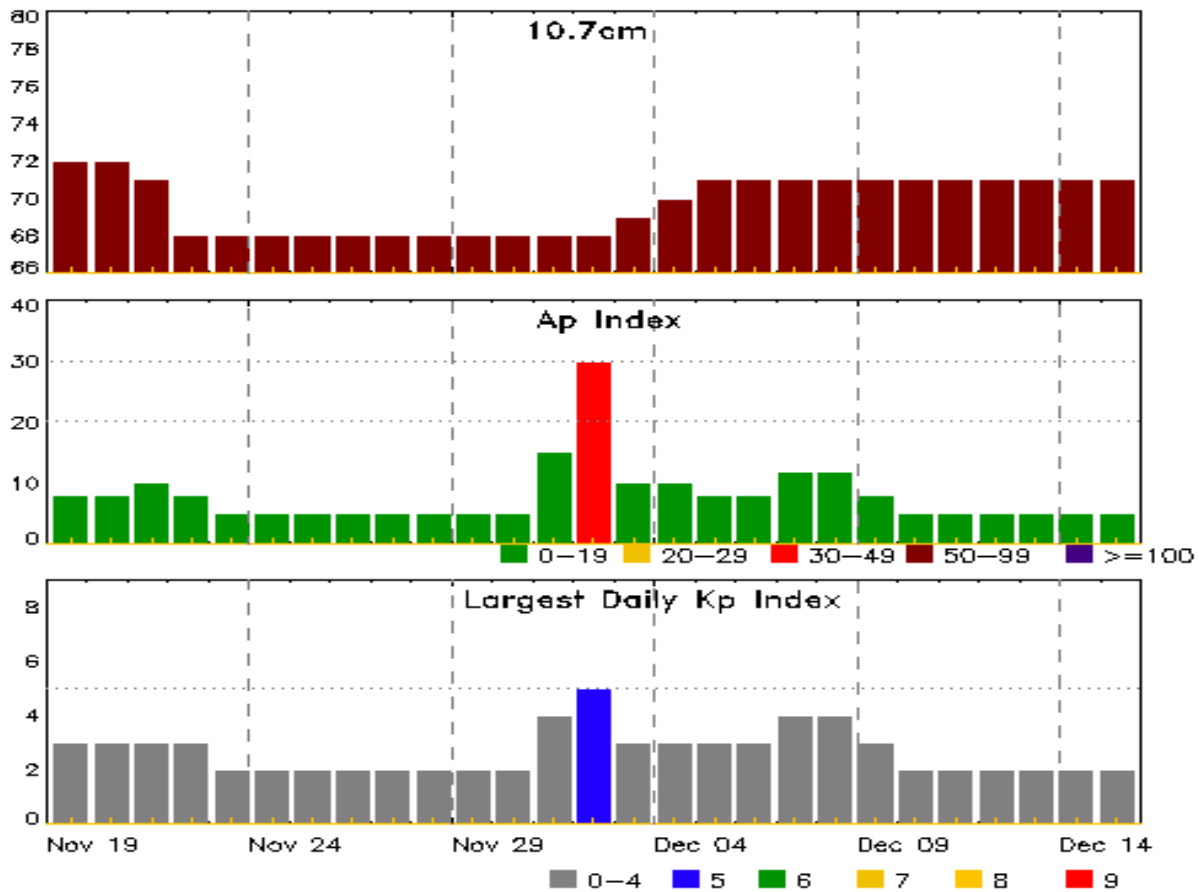


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
12 Nov 1901	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625
13 Nov 1631	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625
14 Nov 1400	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625
15 Nov 1614	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625
16 Nov 1701	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	11/1625



## 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
19 Nov	72	8	3	03 Dec	69	10	3
20	72	8	3	04	70	10	3
21	71	10	3	05	71	8	3
22	68	8	3	06	71	8	3
23	68	5	2	07	71	12	4
24	68	5	2	08	71	12	4
25	68	5	2	09	71	8	3
26	68	5	2	10	71	5	2
27	68	5	2	11	71	5	2
28	68	5	2	12	71	5	2
29	68	5	2	13	71	5	2
30	68	5	2	14	71	5	2
01 Dec	68	15	4	15	71	5	2
02	68	30	5				

### ***Energetic Events***

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

**No Events Observed**

### ***Flare List***

Date	Time			X-ray	Optical		
	Begin	Max	End		Class	Imp/ Brtns	Location Lat CMD
17 Nov	1053	1057	1058		A5.3		



## ***Region Summary***

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

### ***Region 2726***

12 Nov	N06W01	134	plage												
13 Nov	N05W16	137	10	1	Axx	1	A								
14 Nov	N04W32	139	10		Axx	1	A								
15 Nov	N04W45	140	plage												
16 Nov	N04W59	140	plage												
17 Nov	N04W73	141	plage												
18 Nov	N04W86	141	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 134

### ***Region 2727***

15 Nov	N01W17	111	20	4	Cro	3	B								
16 Nov	N01W29	110	20	4	Bxo	4	B								
17 Nov	N01W42	110	60	4	Cao	3	B								
18 Nov	N01W57	112	60	5	Cao	4	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 111

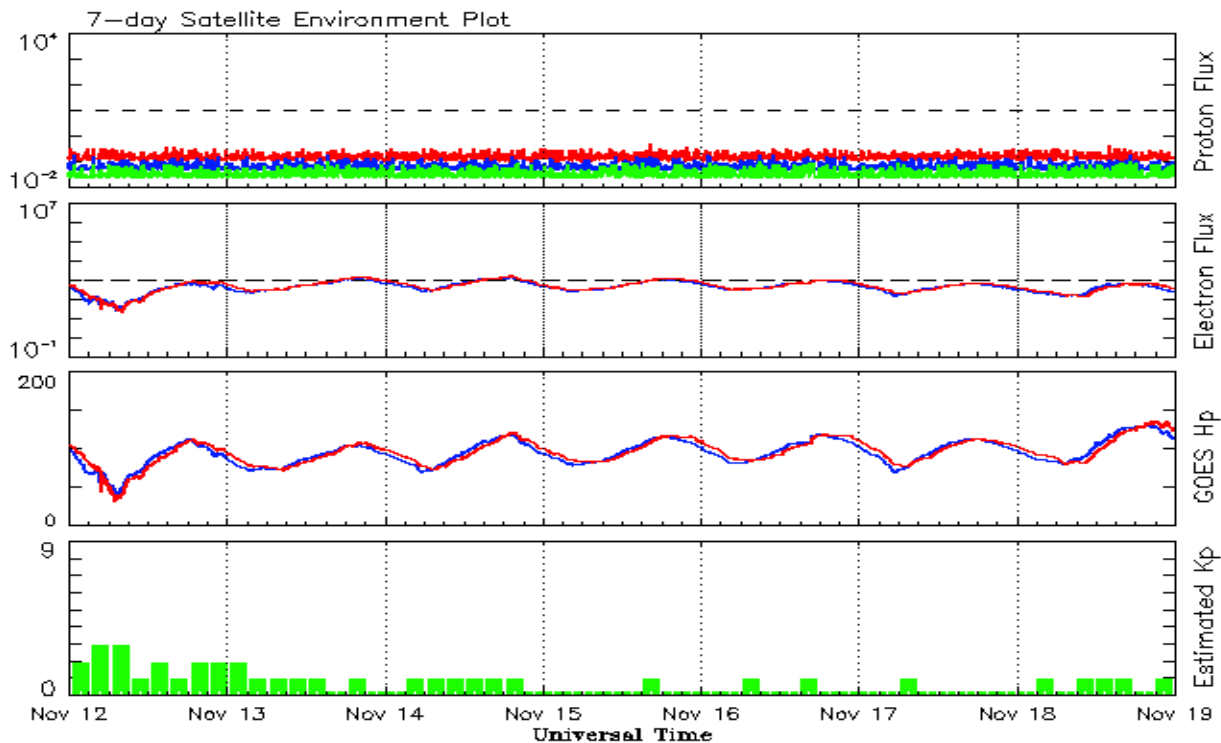


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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
<b>2016</b>									
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
<b>2017</b>									
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	15.4	74.6	78.6	15	11.5
April	30.4	19.4	0.64	24.3	14.9	80.9	78.4	13	11.5
May	18.1	11.3	0.62	23.1	14.0	73.5	77.7	9	11.3
June	18.0	11.5	0.64	22.0	13.3	74.8	77.3	7	11.3
July	18.8	10.7	0.59	20.8	12.6	77.7	76.8	9	11.0
August	25.0	19.6	0.80	19.7	11.8	77.9	76.3	12	10.7
September	42.2	26.2	0.62	18.6	11.0	92.0	75.9	19	10.3
October	16.0	7.9	0.49	16.8	10.0	76.4	75.1	11	9.8
November	7.7	3.4	0.44	15.7	9.2	72.1	74.6	11	9.5
December	7.6	4.9	0.64	15.7	9.1	71.5	74.4	8	9.4
<b>2018</b>									
January	7.8	4.1	0.51	15.0	8.5	70.0	74.0	6	9.3
February	16.0	6.4	0.40	13.7	7.6	72.0	73.3	7	9.1
March	6.0	1.5	0.25	11.5	5.9	68.4	71.9	8	8.6
April	7.0	5.3	0.76	9.6	4.7	70.0	70.6	7	8.0
May	15.0	7.9	0.53			70.9		8	
June	19.7	9.4	0.48			72.5		7	
July	1.3	1.0	0.77			69.7		6	
August	10.0	5.3	0.53			69.1		10	
September	5.7	2.0	0.35			68.3		9	
October	6.9	2.9	0.42			69.5		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 12 November 2018*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-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/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

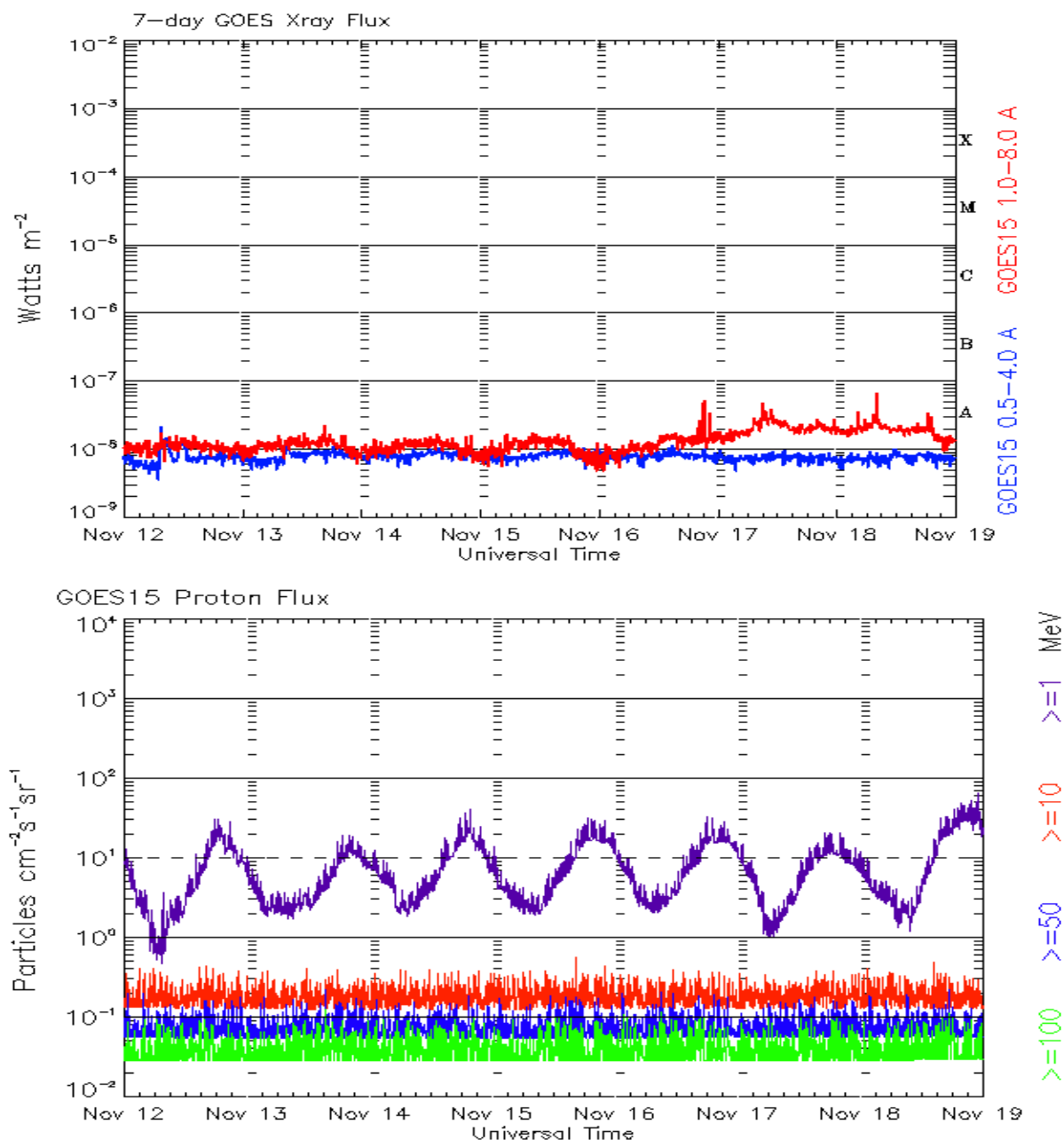
The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

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 12 November 2018*

The x-ray plots contains five-minute averages x-ray flux ( $\text{Watt/m}^2$ ) 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 integral flux units ( $\text{pfu} = \text{protons/cm}^2\text{-sec -sr}$ ) 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.



## ***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](mailto:SWPC.Webmaster@noaa.gov)

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