

# SOLAR WEATHER

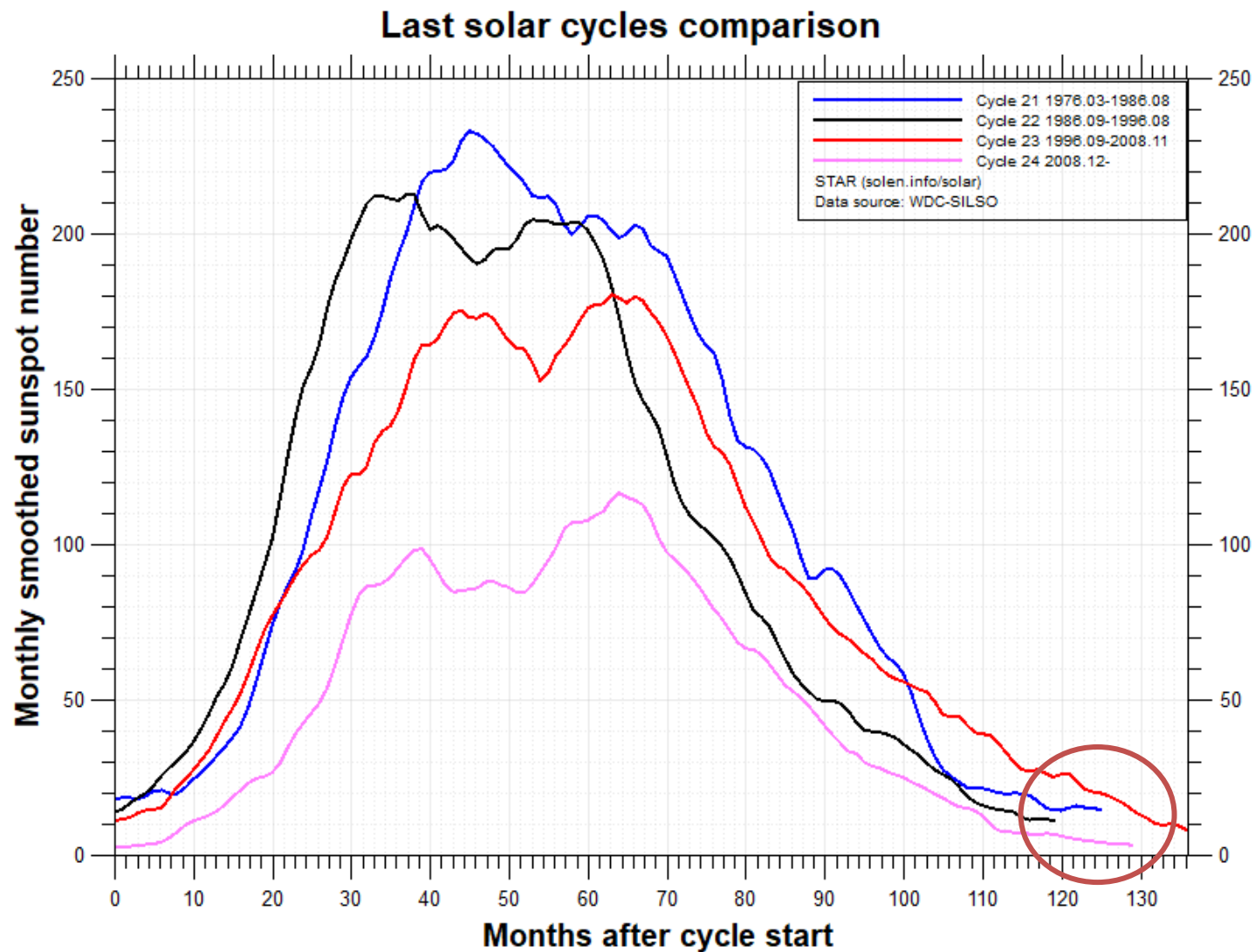
## 7 APR 2020

Lewis Thompson  
W5IFQ

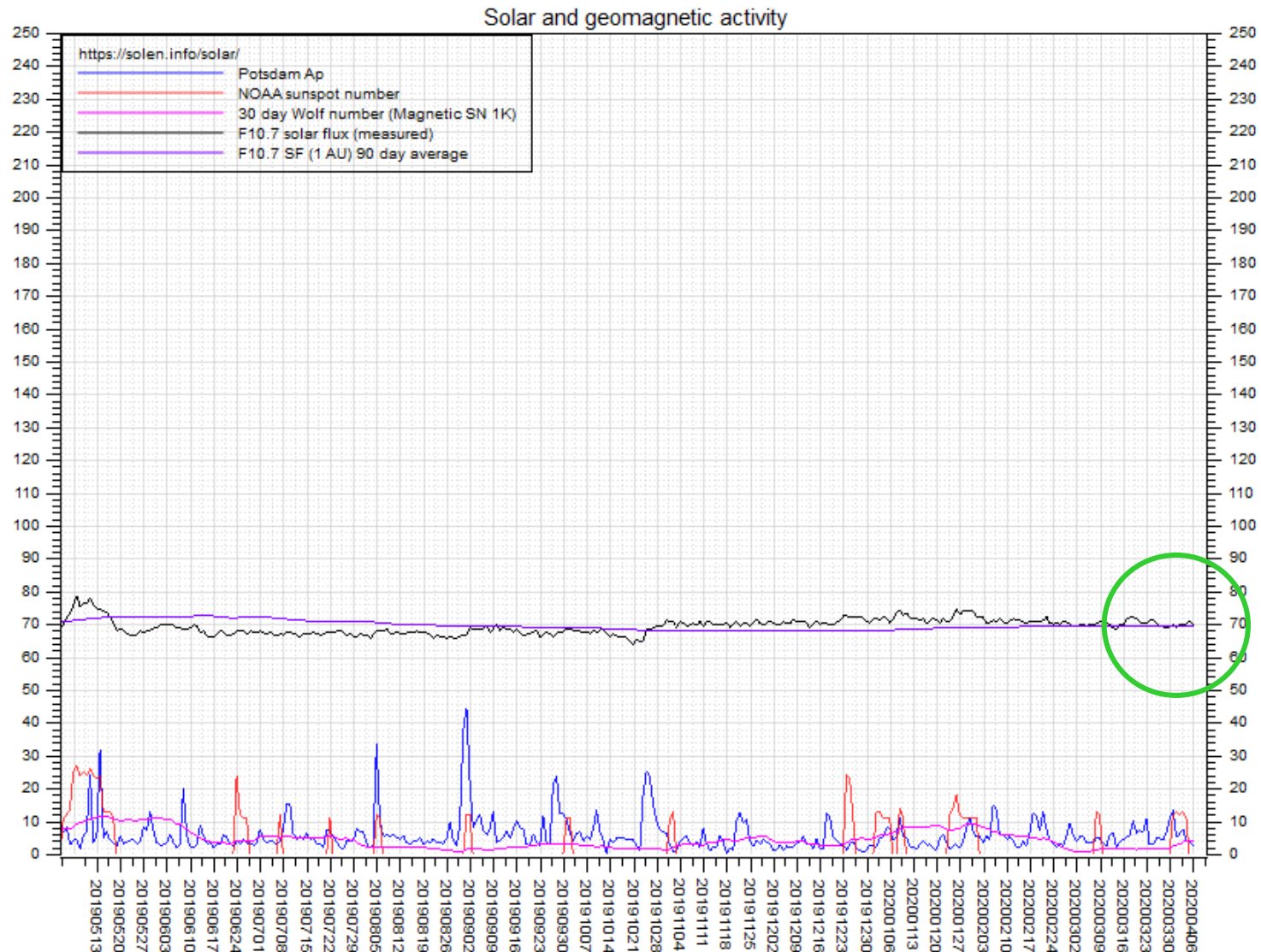


Tromsø, Norway, 2 April 2020

# SOLAR CYCLE COMPARISON



# SOLAR FLUX INDEX – 2020



SF 69.9 (0.9 decrease from one previous 27 day solar rotation)

# SolarHam.net Forecast

## Solar-Terrestrial Data

07 Apr 2020 1343 GMT

SFI: 70 SN: 11  
304A: 150.0 @ EVE  
A 5 K 1  
X-Ray: n/a  
Aurora: /n=  
Mag (Bz): 0.2  
Solar Wind: 389.3  
MUF Boulder NoRpt

Data provided by NONBH

## Solar Flare Risk

M-Class: 01%

X-Class: 01%

## Active Watches

Geomag. Storm NO

Radiation Storm NO

Past 24 Hrs

Solar X-Rays:

NORMAL

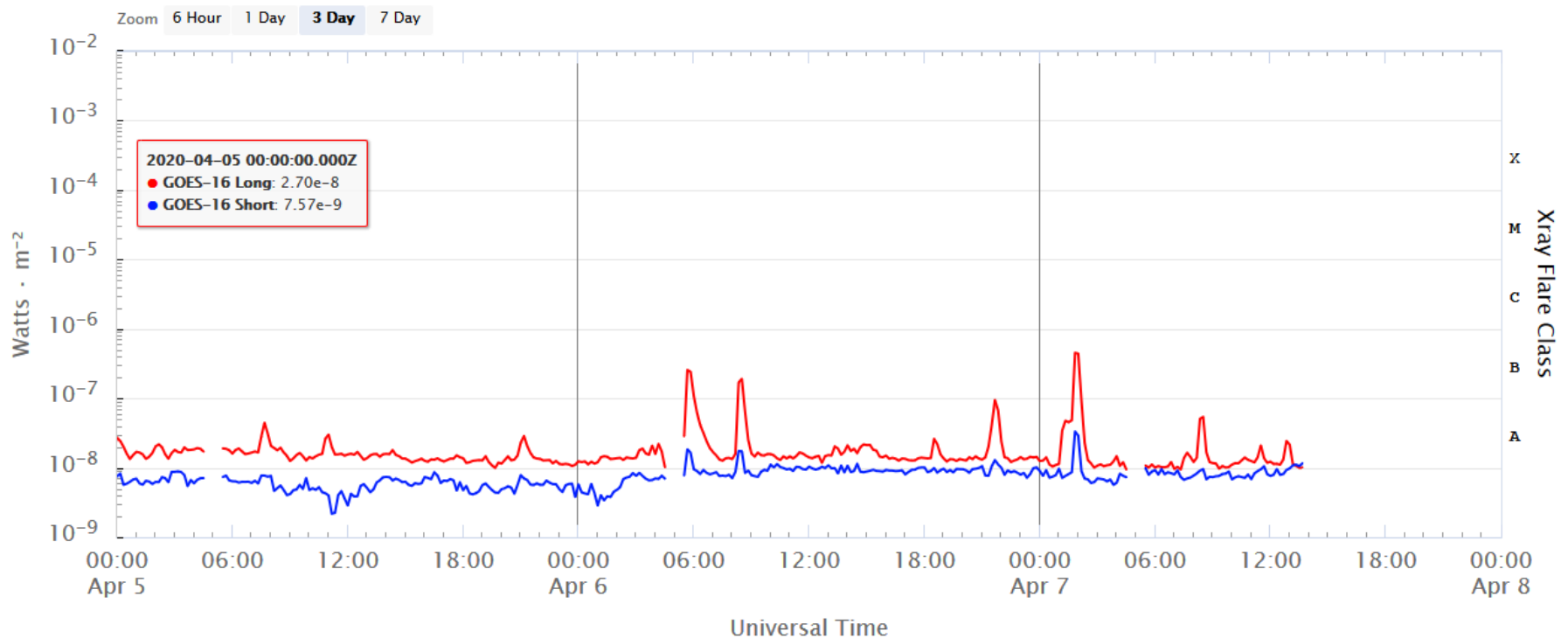
Geomagnetic Field:

QUIET

## 3-Day Geomagnetic Forecast [\[Details\]](#)

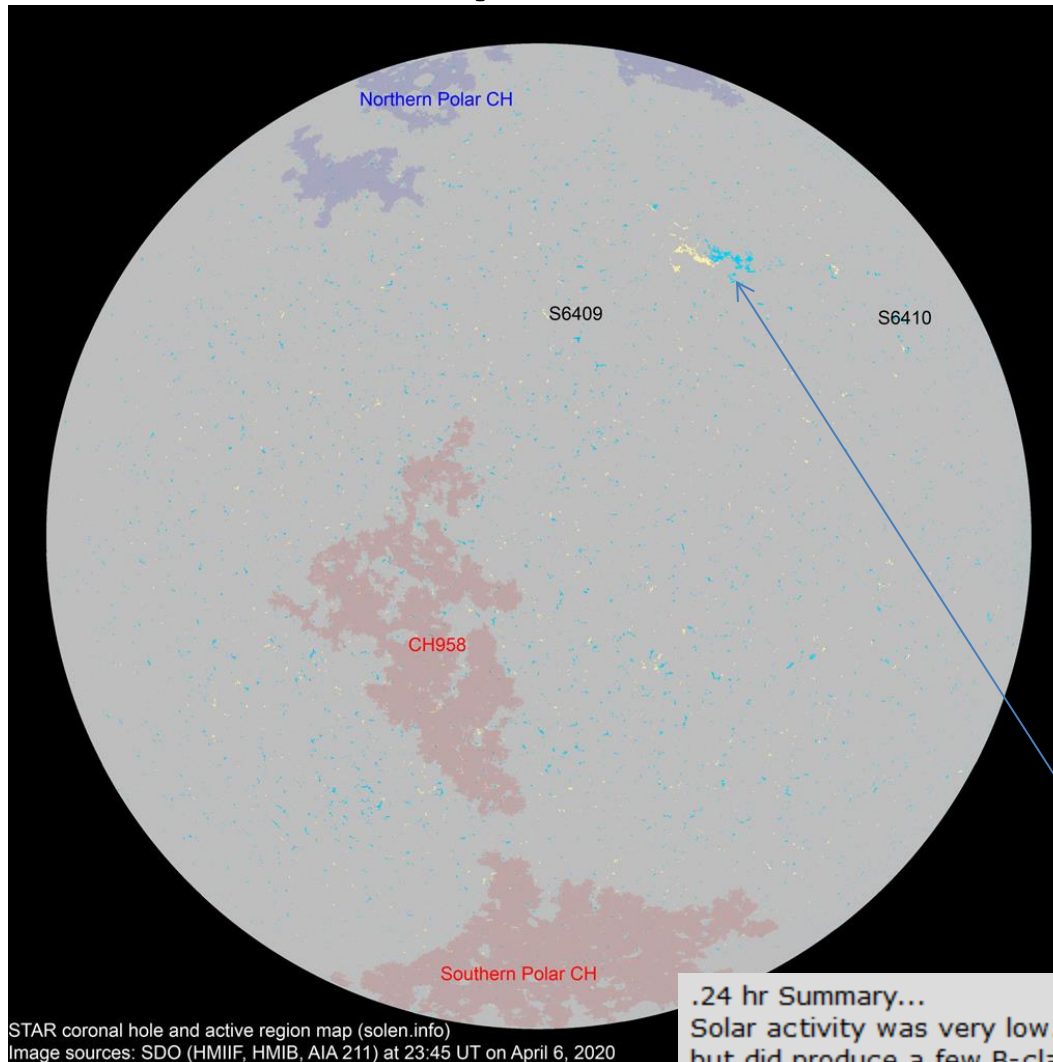
| April 07                 | April 08                 | April 09                 |
|--------------------------|--------------------------|--------------------------|
| 2-3 (G0)<br>Max Kp       | 2-3 (G0)<br>Max Kp       | 2-3 (G0)<br>Max Kp       |
| Prob-M 01%<br>Prob-H 20% | Prob-M 01%<br>Prob-H 20% | Prob-M 02%<br>Prob-H 20% |

# Solar X-Ray Flux: 5 – 7 APR 2020



Note: GOES 14 & 15 have been turned off and placed in storage orbit

# Sunspots – 6 APR 2020

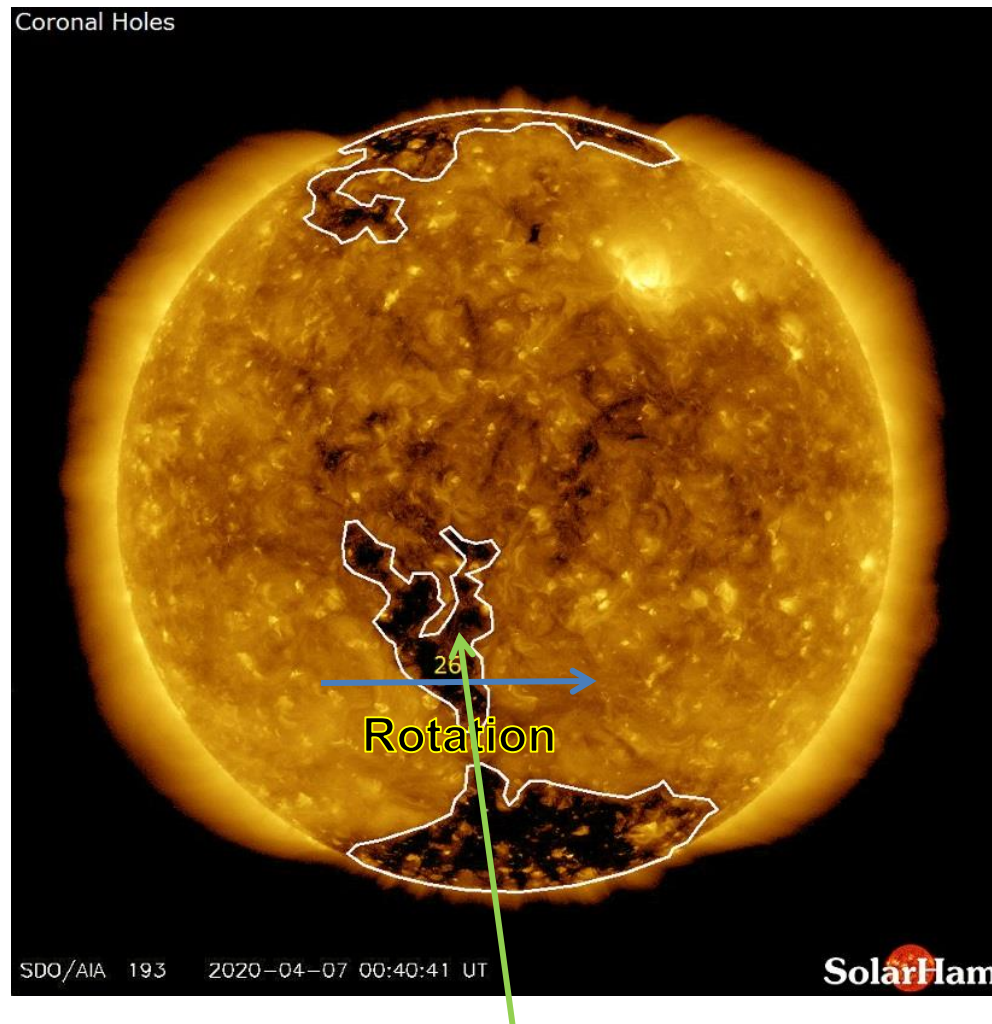


STAR coronal hole and active region map (solen.info)  
Image sources: SDO (HMIIF, HMIB, AIA 211) at 23:45 UT on April 6, 2020

## .24 hr Summary...

Solar activity was very low. Region 2759 (N28, L=261) remained spotless, but did produce a few B-class flares early in the UTC day. There were no Earth-directed CMEs observed in available coronagraph imagery, although there was some activity off the East limb.

# Coronal Holes – 7 APR 2020



Unsettled and active intervals are possible on April 11-12 due to effects from CH958.



# GOES Magnetometer – 5 – 7 APR 2020

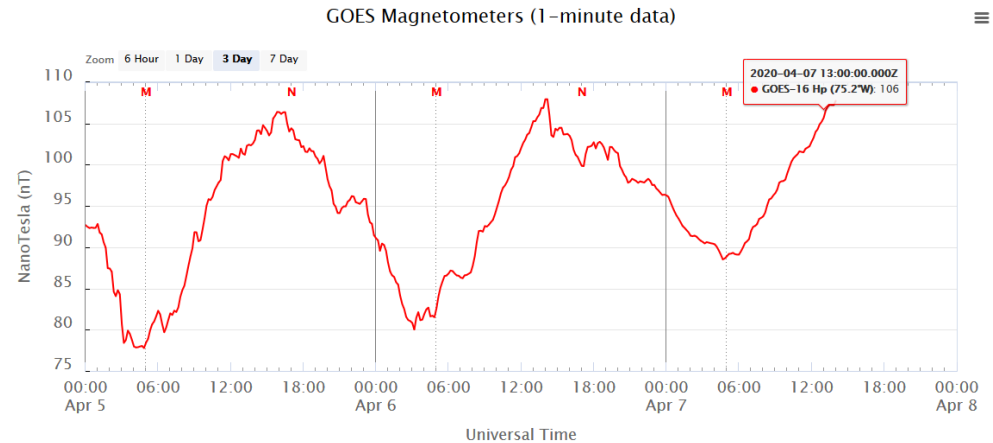
**Solar wind**

**Bz = 0.5 nT North**

**speed = 302 km/sec**

**density = 1.94 protons/cm<sup>3</sup>**

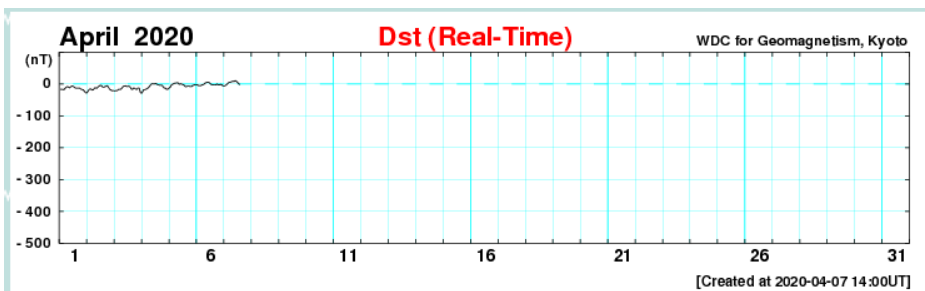
**(From – NOAA DSCOVR  
In L1, Lagrange Point)**



**Dst = -2 nT (Ring Field)**

**(From – Data Analysis Center  
For Geomagnetism and Space  
Magnetism – Kyoto University)**

**From – GOES 16  
In geostationary orbit**

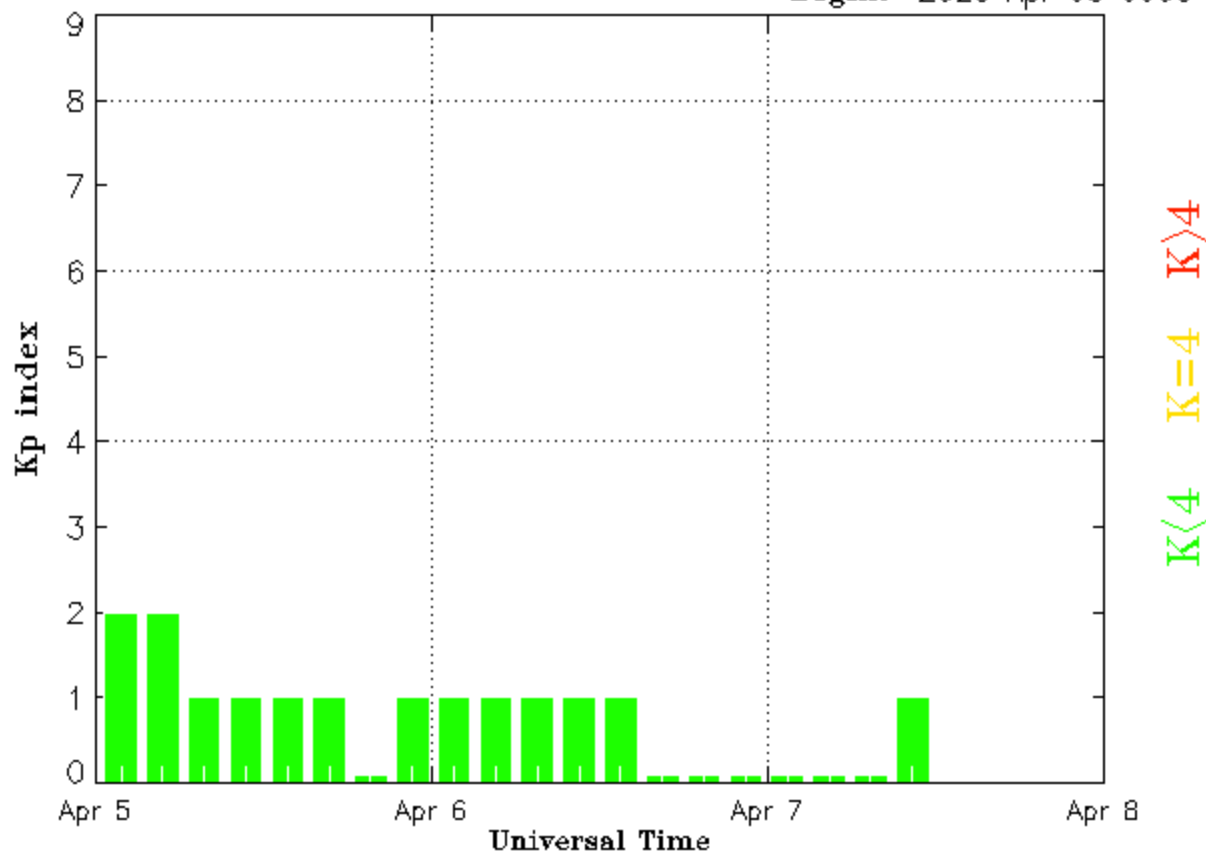




# Planetary K index – 5 – 7 APR 2020

Estimated Planetary K index (3 hour data)

Begin: 2020 Apr 05 0000 UTC



Generally, as planetary K-Index rises, critical frequency is suppressed.

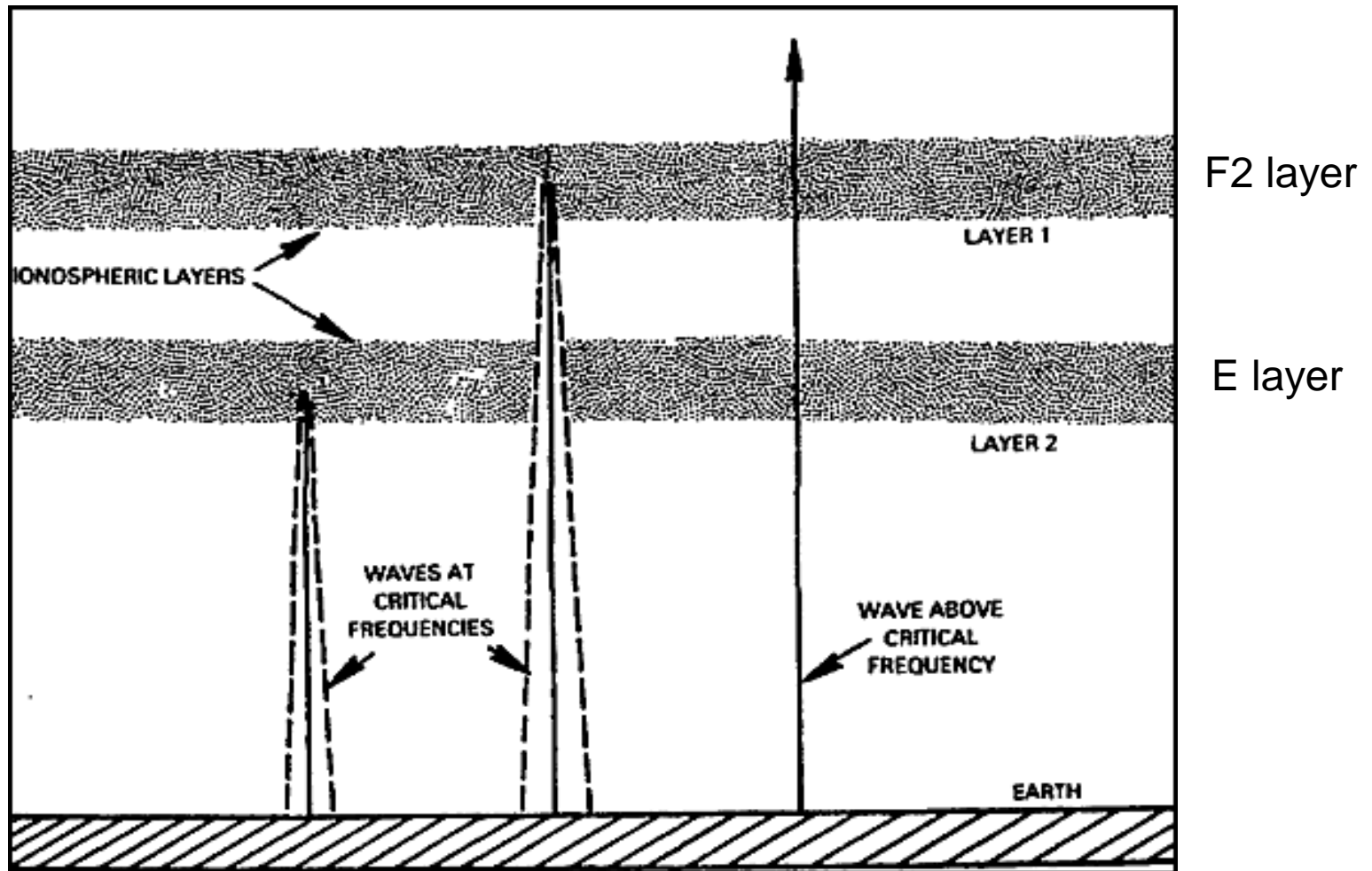
| K-Index | Effect  |
|---------|---|
| 0-2     | Inactive/Quiet, no impact on HF                     |
| 3-4     | Unsettled/Active, minor HF fade in higher latitudes |
| 5-6     | HF fade at higher latitudes                         |
| 7-8     | HF sporadic   |
| 9       | HF impossible above 40M                             |

Updated 2020 Apr 7 12:30:02 UTC

NOAA/SWPC Boulder, CO USA

# Critical or foF2 Frequency Definition

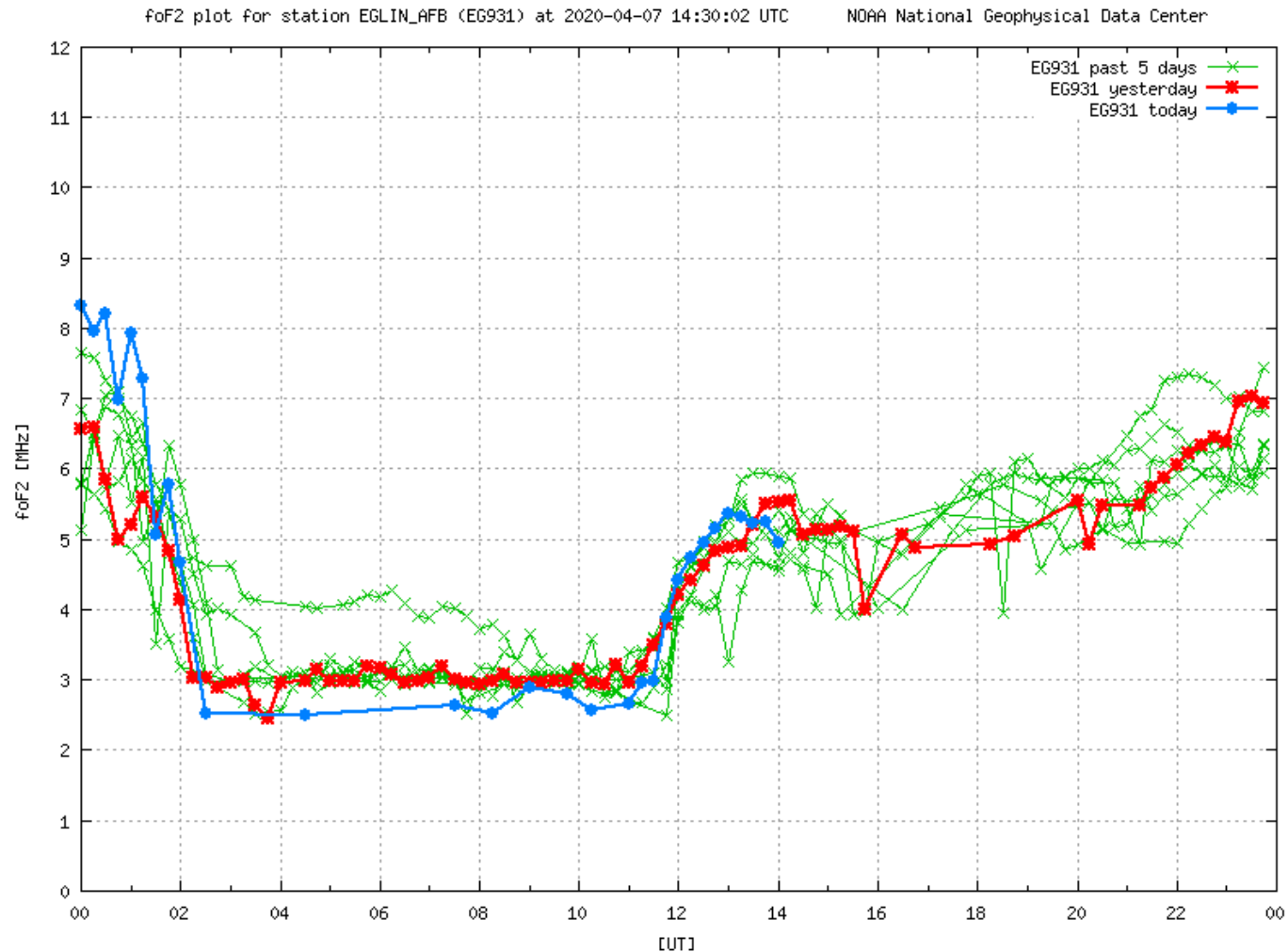
- For State-Wide HF communications (NVIS), but operate at or below CF



# Austin Ionosonde Problems

- The Austin Ionosonde is presently not functioning correctly due to timing issues between it VIPIR and conventional Ionosonde electronics. Both ARL and NOAA personnel are working to solve this problem.
- The Eglin AFB Ionosonde with a 45 minute delay should be used until this problem is solved.
- For foF2 trending charts for all Ionosondes See:  
[https://www.ngdc.noaa.gov/stp/IONO/rt-iono/realtime/RealTime\\_foF2.html](https://www.ngdc.noaa.gov/stp/IONO/rt-iono/realtime/RealTime_foF2.html)

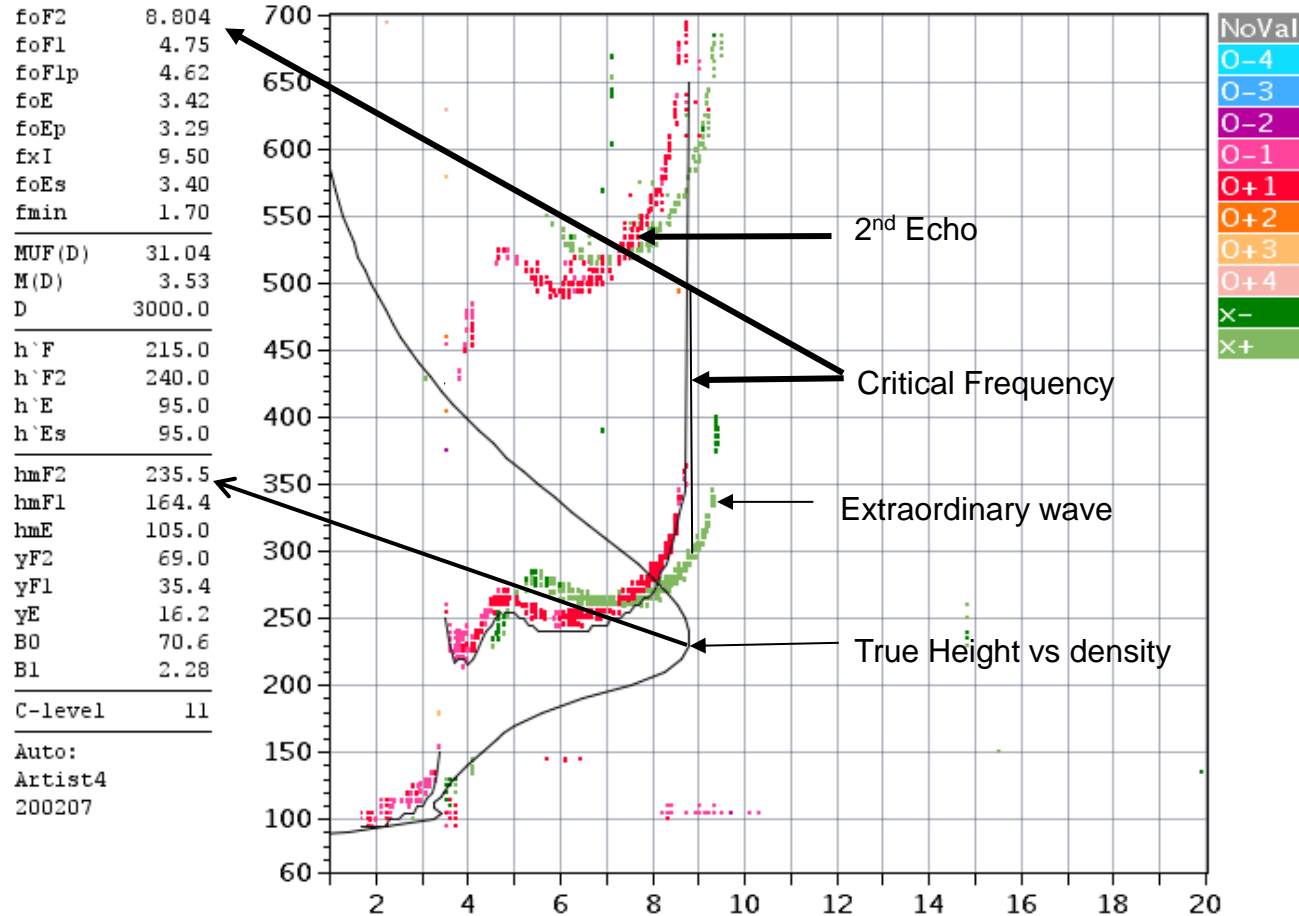
# foF2 Trend – Eglin Ionosonde



# Ionogram Interpretation



Statio YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS  
Austin 2013 Jan03 003 185505 MMM 1 045 100 32+ A1



D 100 200 400 600 800 1000 1500 3000 [km] ← Oblique propagation MUF Chart  
MUF 9.4 9.5 10.0 10.8 12.0 13.7 18.5 31.0 [MHz] i.e. 31 MHz to 3000 km

AU930\_2013003185505.MMM / 190fx128h 100 kHz 5.0 km / DGS-256 AU930 130 / 30.4 N 262.3 E

Ion2Png v. 1.3.11

# Eglin AFB Ionosonde – 1400 CST, 7 APR



Station YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS  
Eglin AFB 2020 Apr07 098 140000 RSF 1 713 100 03+ 79

foF2 4.950  
foF1 N/A  
foF1p 3.90  
foE N/A  
foEp 2.77  
fxI 5.58  
foEs 3.58  
fmin 2.83

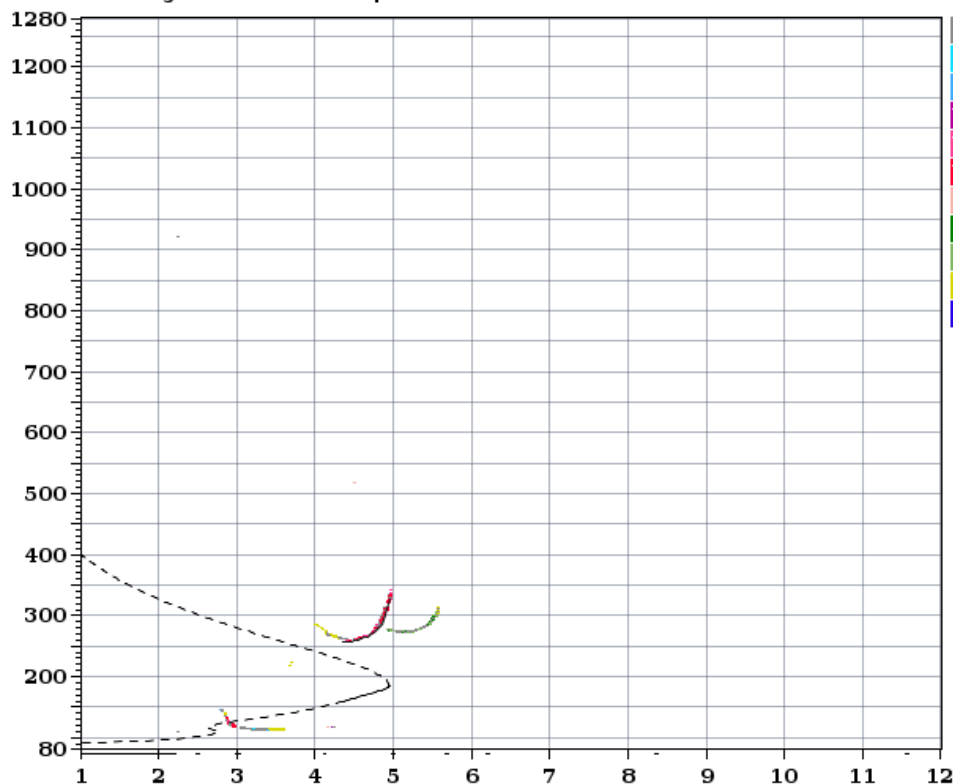
MUF(D) 18.30  
M(D) 3.70  
D N/A

h`F 257.5  
h`F2 257.5  
h`E N/A  
h`Es 110.0

hmF2 184.7  
hmF1 N/A  
hmE 110.0  
yF2 55.9  
yF1 N/A  
yE 20.0  
B0 81.1  
B1 1.34

C-level 22

Auto:  
Artist5  
500200



D 100 200 400 600 800 1000 1500 3000 [km]  
MUF 5.5 5.6 5.9 6.4 7.1 8.0 10.9 18.3 [MHz]

24901677.tmp / 440fx512h 25 kHz 2.5 km / DPS-4D EG931 084 / 30.5 N 273.5 E

ShowIonogram v 1.0

# Excellent HF Propagation Web Site

<https://www.hfunderground.com/propagation/>

## **HFUnderground.com Propagation Data and Tools**

[RadioHobbyist.org](#) Blog

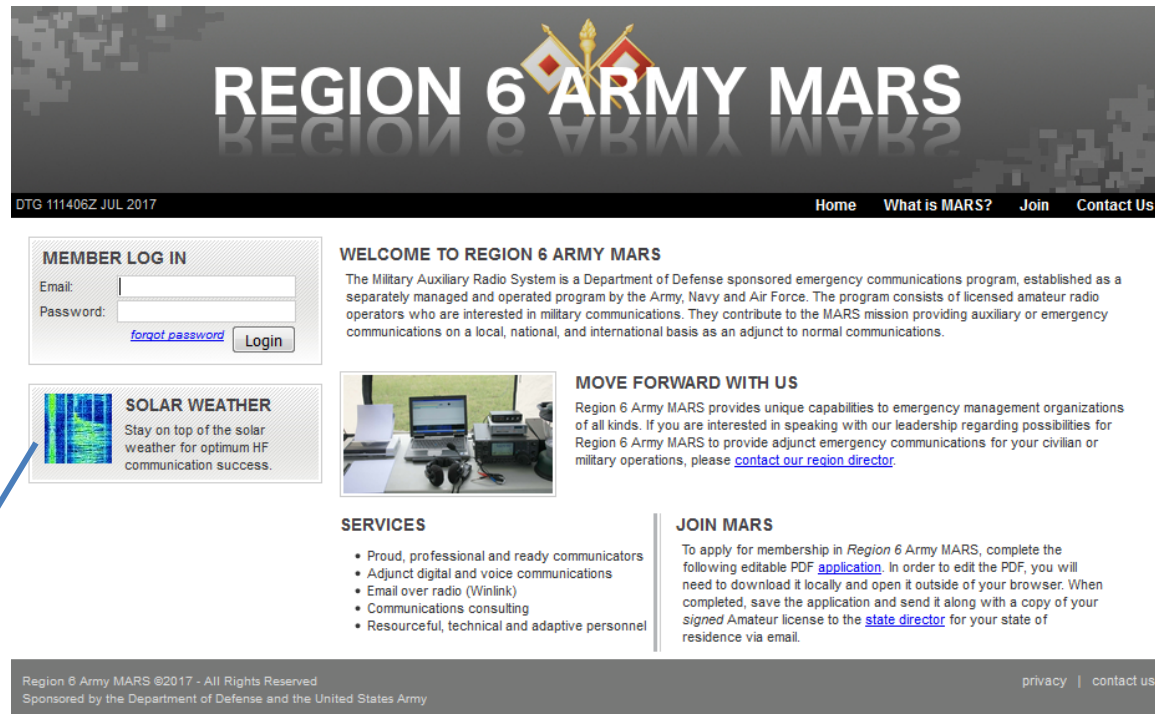
[AtmosFEAR](#) Regular (non space) Weather discussions

**Current UTC time and date: 1226 02-07-2019**

- [X-Ray Flux](#)
- [A Index](#)
- [K Index](#)
- [Ionosphere](#)
- [Aurora](#)
- [Longwave](#)
- [foF2 and T Index](#) —————> foF2 Trending charts for all US Ionosondes
- [Skip Zone](#)
- [Solar Cycle](#)
- [Solar Map](#)
- [Geospace](#)



# Solar Weather Sites



**REGION 6 ARMY MARS**

DTG 111406Z JUL 2017

Home What is MARS? Join Contact Us

**MEMBER LOG IN**

Email:

Password:  [forgot password](#)

**SOLAR WEATHER**

Stay on top of the solar weather for optimum HF communication success.

**WELCOME TO REGION 6 ARMY MARS**

The Military Auxiliary Radio System is a Department of Defense sponsored emergency communications program, established as a separately managed and operated program by the Army, Navy and Air Force. The program consists of licensed amateur radio operators who are interested in military communications. They contribute to the MARS mission providing auxiliary or emergency communications on a local, national, and international basis as an adjunct to normal communications.

**MOVE FORWARD WITH US**

Region 6 Army MARS provides unique capabilities to emergency management organizations of all kinds. If you are interested in speaking with our leadership regarding possibilities for Region 6 Army MARS to provide adjunct emergency communications for your civilian or military operations, please [contact our region director](#).

**SERVICES**

- Proud, professional and ready communicators
- Adjunct digital and voice communications
- Email over radio (Winlink)
- Communications consulting
- Resourceful, technical and adaptive personnel

**JOIN MARS**

To apply for membership in Region 6 Army MARS, complete the following editable PDF [application](#). In order to edit the PDF, you will need to download it locally and open it outside of your browser. When completed, save the application and send it along with a copy of your signed Amateur license to the [state director](#) for your state of residence via email.

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## Solar Weather

Texas Army MARS would like to thank the scientists and research teams at The University of Massachusetts Lowell Center for Atmospheric Research for providing this valuable resource allowing us to determine the critical frequency (foF2) and maximum usable frequency (MUF).

### Other Solar Weather Links of Interest

- [DIDBase](#) - Select Station List then EGLIN then year/month/day/time for Ionosonde plot.
- [NOAA Solar Weather](#) - Solar Weather plots of Kp and X-Ray and other solar emissions.
- [Solen Solar Weather](#) - Good general solar forecast from an individual.
- [Solar Ham](#) - SolarHam provides real time solar news, as well as consolidated data from various sources.

Note: GOES 16 Hp and Proton Flux will be added to MARS website shortly. For now go to Solar Ham website (above).

# NEW NOAA SPACE WEATHER SITE

<http://www.swpc.noaa.gov/>



SPACE WEATHER PREDICTION CENTER  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Tuesday, January 06, 2015 20:38:45 UTC

HOME ABOUT SPACE WEATHER PRODUCTS AND DATA DASHBOARDS MEDIA AND RESOURCES SUBSCRIBE FEEDBACK

## FORECASTS

27-Day Outlook of 10.7 cm Radio Flux and Geomagnetic Indices  
3-Day Forecast  
Forecast Discussion  
Predicted Sunspot Numbers and Radio Flux  
Report and Forecast of Solar and Geophysical Activity  
Solar Cycle Progression  
Space Weather Advisory Outlook  
USAF 45-Day Ap and F10.7cm Flux Forecast  
Weekly Highlights and 27-Day Forecast

## SUMMARIES

Solar & Geophysical Activity Summary  
Solar Region Summary  
Summary of Space Weather Observations

## REPORTS

Forecast Verification  
Geoalert - Alerts, Analysis and Forecast Codes  
Geophysical Alert  
Solar and Geophysical Event Reports  
USAF Magnetometer Analysis Report

## ALERTS, WATCHES AND WARNINGS

Alerts, Watches and Warnings  
Notifications Timeline

## MODELS

Aurora Forecast – 30 Minute  
D Region Absorption Predictions (D-RAP)  
Relativistic Electron Forecast Model  
STORM Time Empirical Ionospheric Correction  
U.S. Total Electron Content  
WSA-Enlil Solar Wind Prediction  
Wing Kp

## EXPERIMENTAL

Aurora Forecast – 3 Days  
Predicted Solar Wind at Earth  
Solar Wind Transit Time

## DATA ACCESS

## OBSERVATIONS

ACE Real-Time Solar Wind  
GOES Electron Flux  
GOES Magnetometer  
GOES Proton Flux  
GOES Solar X-ray Imager  
GOES X-ray Flux  
LASCO Coronagraph  
Planetary K-index  
Satellite Environment  
Space Weather Overview

HOME ABOUT SPACE WEATHER PRODUCTS AND DATA DASHBOARDS MEDIA AND RESOURCES SUBSCRIBE FEEDBACK

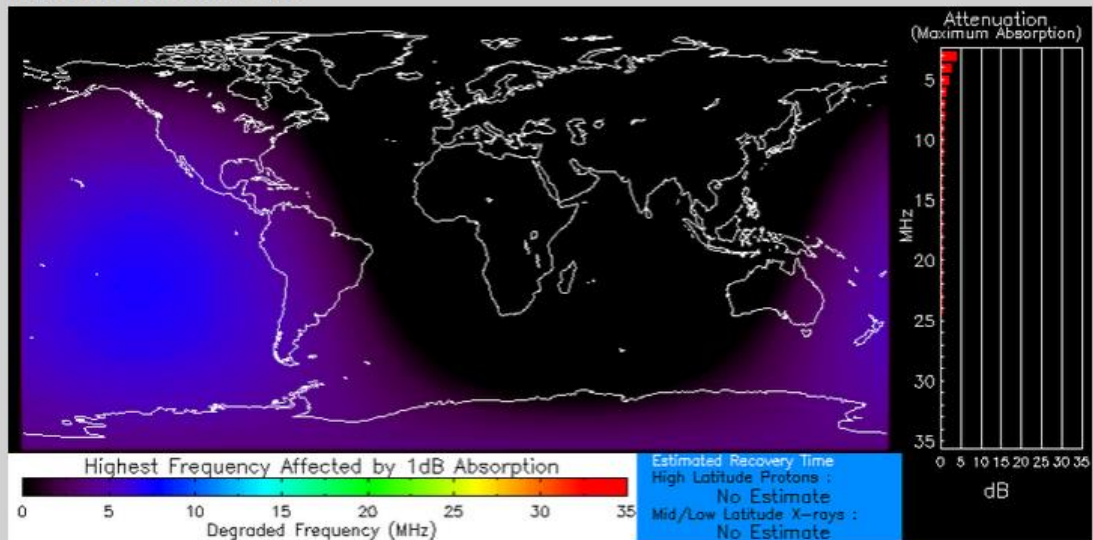
AVIATION ELECTRIC POWER EMERGENCY MANAGEMENT GLOBAL POSITIONING SYSTEM RADIO SATELLITES

SPACE WEATHER ENTHUSIASTS

# DASHBOARD - RADIO

## RADIO COMMUNICATIONS DASHBOARD

### D REGION ABSORPTION PREDICTION



Normal X-ray Background  
Product Valid At : 2015-01-06 20:39 UTC

Normal Proton Background  
NOAA/SWPC Boulder, CO USA



### SPACE WEATHER OVERVIEW

