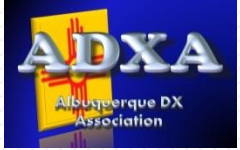


High Frequency University
the Senior Year 4.0

3-HF Propagation

A pdf of this presentation will be posted on www.dukecityhamfest.org
shortly after the Hamfest is over.



W5UR

RADIO COMMUNICATIONS



ARRL The national association for
AMATEUR RADIO®
www.arrl.org

SKILL • SERVICE • DISCOVERY



HF Propagation

- Predictions
- Summer Propagation
- Cycle 25
- Reality vs. the Numbers










Propagation Predictions

- There Are Many Cycles:
11 Years 22 Years Annual 28 Days
- Even 24 Hours
- What Will Tomorrow Be Like?
- Many Tools and Even More ...!

Propagation Predictions

- VOACAP On-Line
- Space Weather Prediction Ctr.
- ARRL Weekly Bulletin
- W₃LPL Mon-Fri Daily DX
- Wet Your Finger & Hold It Up

ClubLog Ending 17 Sep 24

80M	34,137	20.22	
60M	11,788	33.58	
40M	131,834	25.51	
30M	63,992	45.42	
20M	204,320	43.52	
17M	59,228	56.99	
15M	129,400	66.22	
12M	56,241	72.30	
10M	169,286	76.47	

VOACAP On-Line

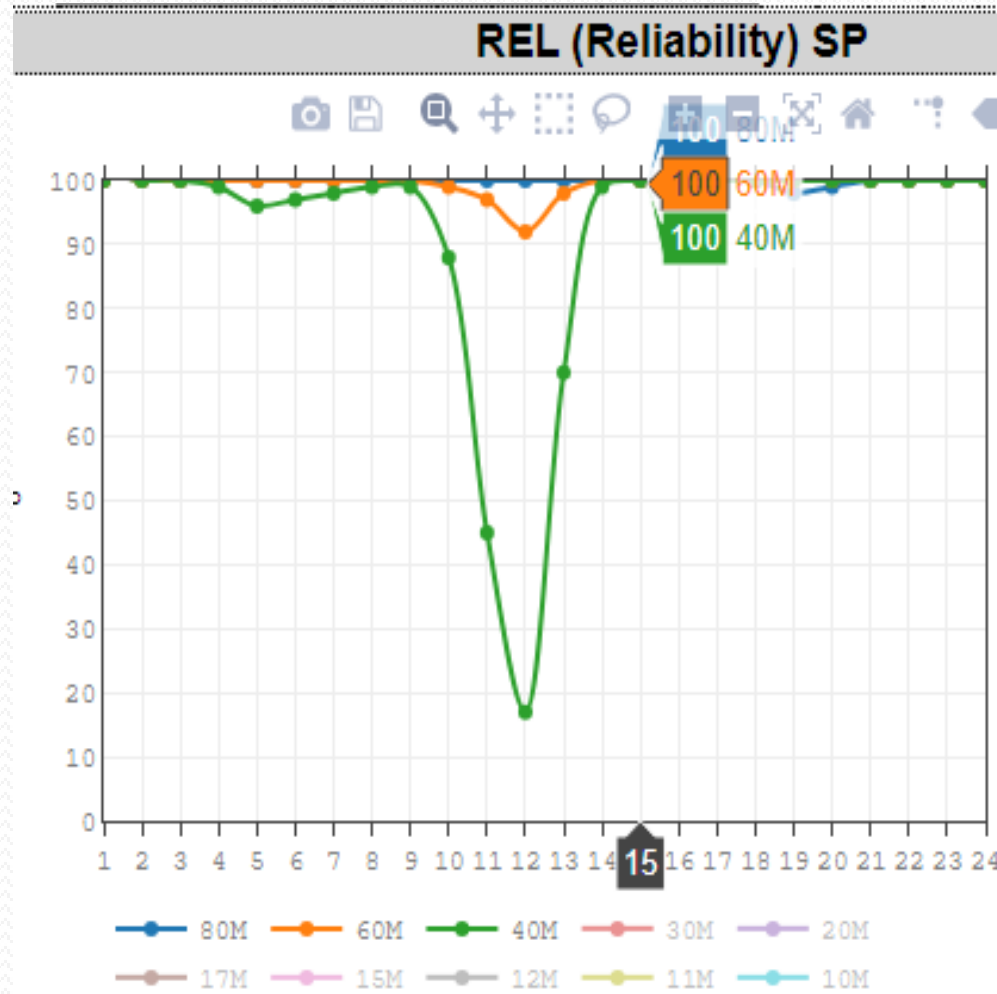
- Uses Current SSN
- Provides Generic Predictions
- Doesn't Use Late News
- Doesn't Account for Ol' Sol's Daily Moods (CME, Flare, etc.)

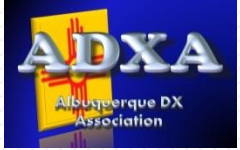
VOACAP On-Line

- Point-to-Point Predictions
- Coverage Area Maps
- Contest Planning by Zone
- DXpedition Planning
- Uses Your & Their
Location/Power/Mode/Antennas

VOACAP Example

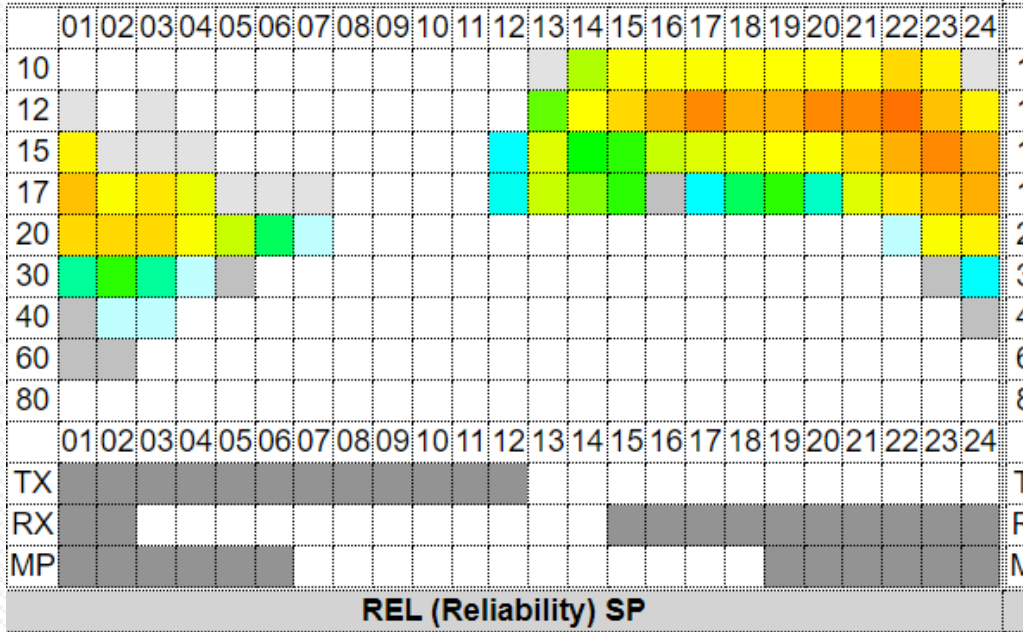
- Multiple Bands
- 24 Hours
- Current Solar Conditions
- De-Select Unwanted Bands
- Feb 2024 Prediction





TX: DM65QG (35.27, -106.63); RX: LH31SC (-18.90, 47.52)

Short-Path (SP)



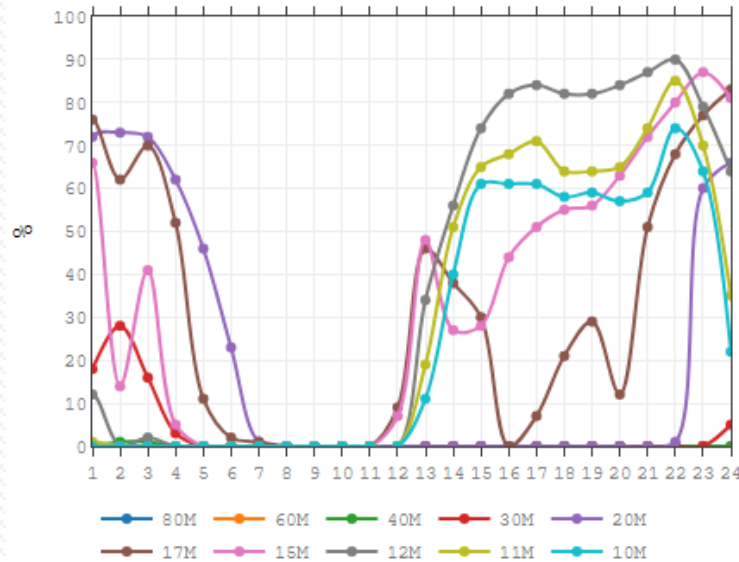
24 Hour Probabilities

Hourly by Band

5R8R Madagascar
On Fri & Sat

Pick a Single Band
For Increased Clarity

Know When NOT
to Bother



S-Meter



VOACAP Predictions

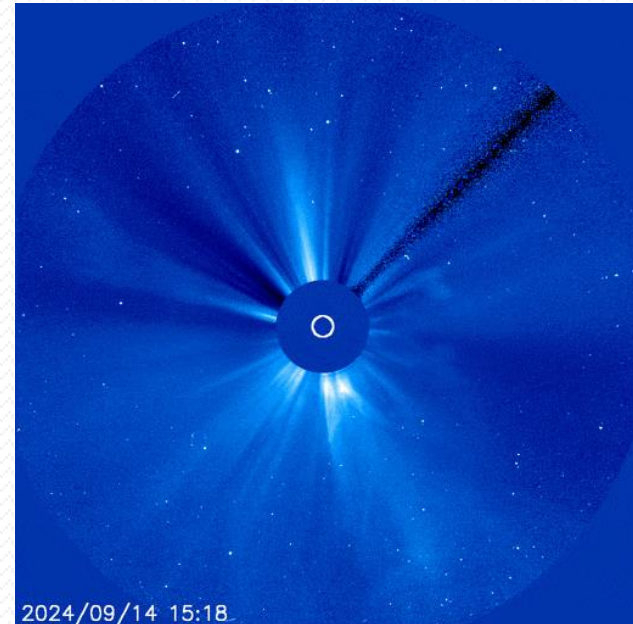
- Very Useful for Planning
- Chasing DX
- Contesting
- Field Day
- Sked

Angry Sun

- CME Coronal Mass Ejection
- Solar Flare
- X-Ray Burst
- Geomagnetic Storm

Angry Sun

- CME Coronal Mass Ejection
- Solar Flare
- X-Ray Burst
- Geomagnetic Storm



So What Mr. Sun?

Info - W6H - Exch: 59 SANDOVAL

K: NA/UNITED STATES, Zn 5, Hdg 65° LP 245° 1946mi 3131km
 Sunrise:10:23Z Sunset:22:59Z

WCY DE BK0WCY-1 <20> : K=6 EXPK=0 A=13 R=179 SFI=207 SA=ACT GMF=MIN AU=STRONG

- Q's - 10, 100, 60m, 27m -



W6H

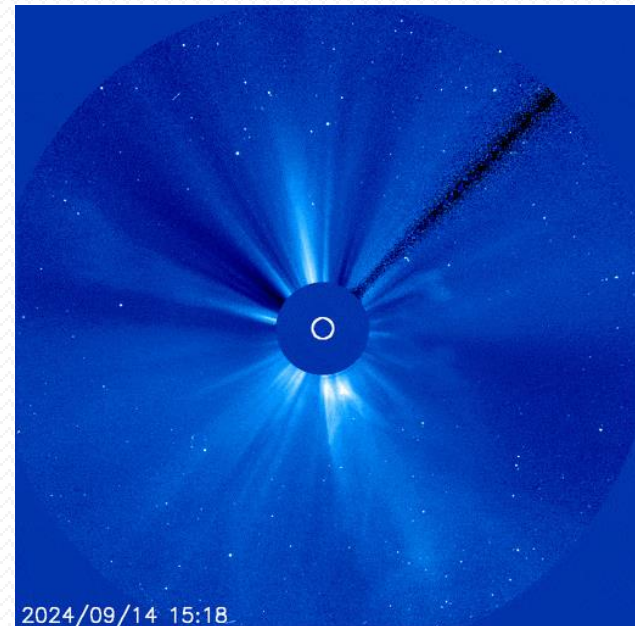
Last QSO

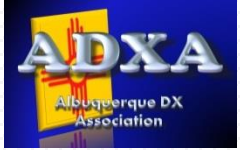
00:08

Dire Predictions Don't Always Mean Poor Results!

Angry Sun

- Check Current Conditions
- Ignore the Naysayers
- Transmit WSPR/FT8
- Call CQ???
- “Just Play Ball”





10m Summer Propagation

W5UR

- Thermally driven high velocity seasonal thermospheric **winds at F2 region** altitude blow from the high temperature dayside hemisphere to the lower temperature nightside hemisphere **reducing the volume of neutral atomic oxygen available to be ionized** in the F2 region during daytime hours, lowering the MUF for F2 propagation crossing high latitudes to mostly less than 28 MHz and **degrading the duration and reliability of 10 meter DX propagation crossing high latitudes until about mid-September.**
- **ARRL 10m Contest is 2nd Weekend of December!**

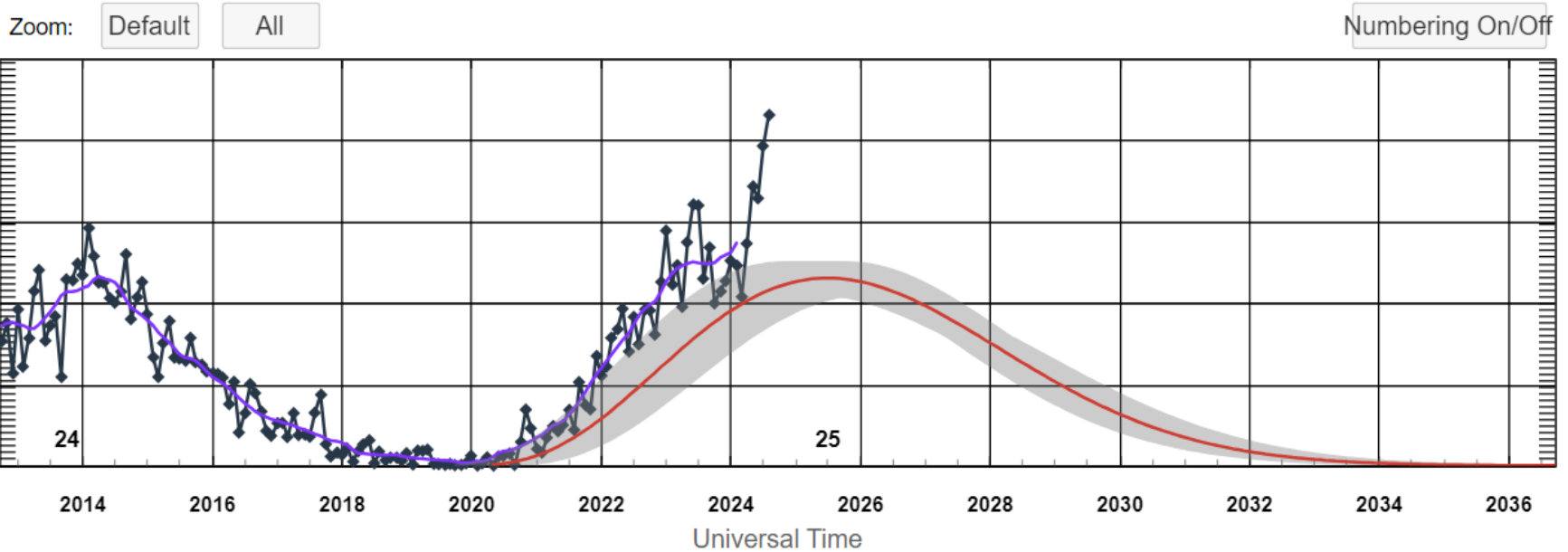


20m Summer Propagation

- North Pole Tipped Toward Sun
- 300 km at the F2 Layer
- **Sun Never Sets Up There!**
- Propagation to Asia is Better!
- And Central Europe over the Pole

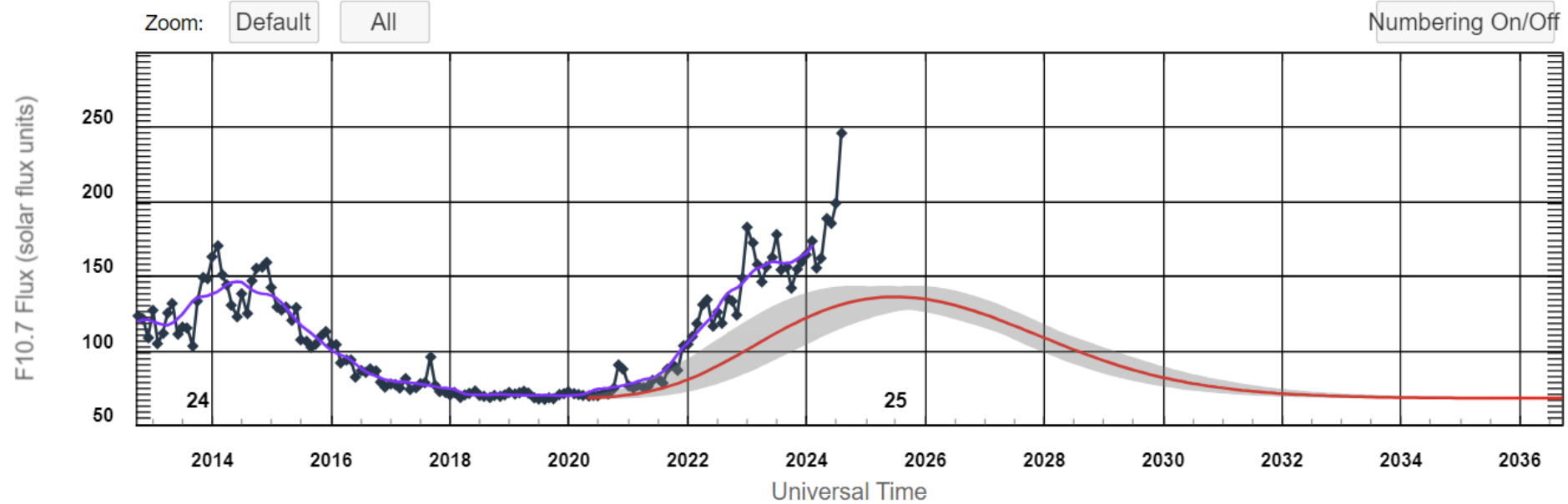
Cycle 25

ISES Solar Cycle Sunspot Number Progression

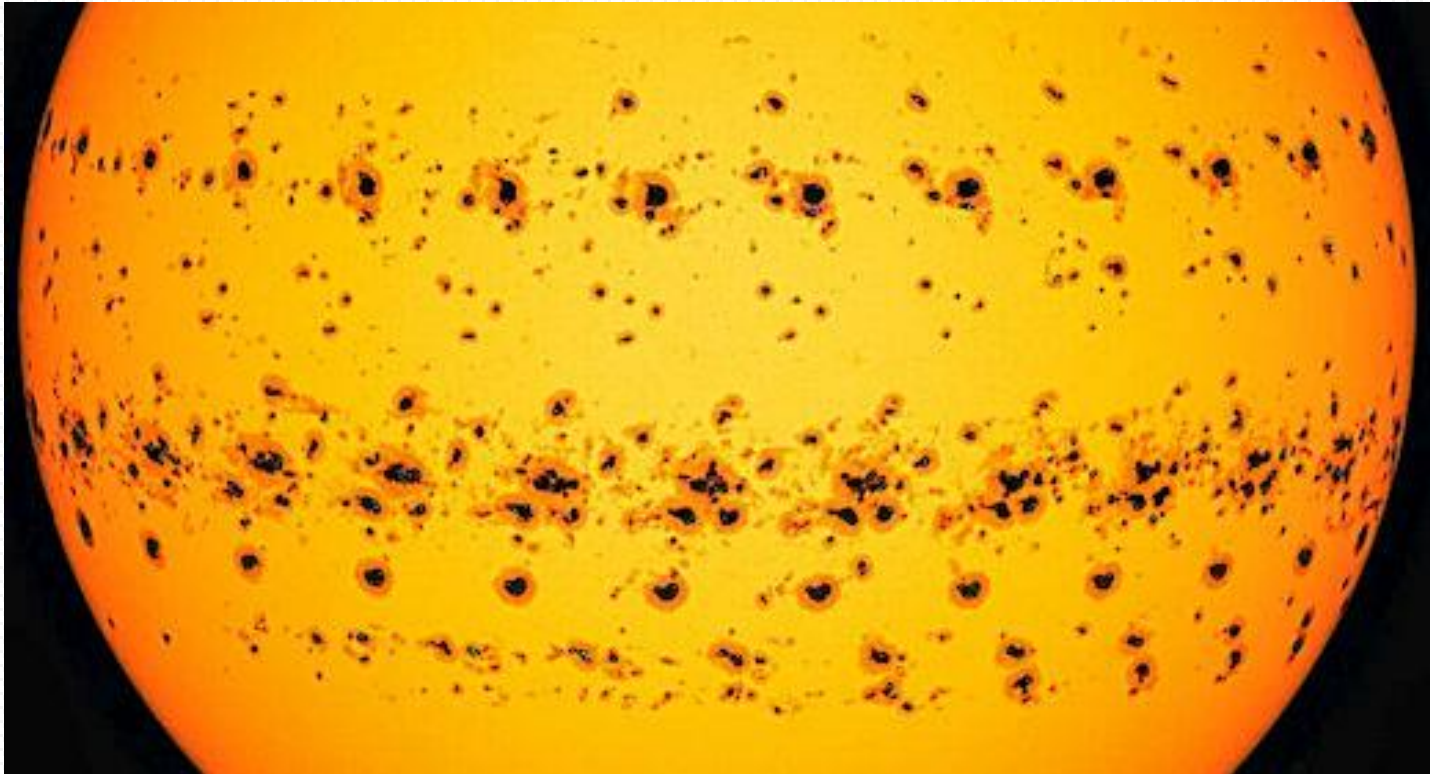


Cycle 25

ISES Solar Cycle F10.7cm Radio Flux Progression



spaceweather.com



NOT a REAL Image!

W3LPL Cycle 25 & 6m

- Not Very Productive in the Rocky Mountains Region
- Stay Tuned for More Activity
- Expect Heating Up Next Month
- Expect Peaking in December
- Read 100th ARRL Handbook
- “Some of the best HF Propagation in 20 years!”

Reality vs. the Numbers

- All the Indices Are Useful
- They (Fairly) Accurately Describe Current Propagation Conditions
- They Present a Useful Picture
- But Reality is Sometimes Strange

7 (G3)		5-6 (G2)		4 (G1)	
Max Kp					
M-Lat	45%	M-Lat	35%	M-Lat	25%
H-Lat	85%	H-Lat	75%	H-Lat	60%
Probabilities					
Latest SWPC Forecast (@ 00:30 + 12:30 UTC)					
Detailed Forecast					

Current Moon Phase:
63% Illumination
 Waxing Gibbous

Flare Events (M2+) Past 48 Hours

M6.8 AR 3811 9/12/24 @ 14:43 UTC

Info - W6H - Exch: 59 SANDOVAL

K: NA/UNITED STATES, Zn 5, Hdg 65° LP 245° 1946mi 3131km
 Sunrise:10:23Z Sunset:22:59Z
 WCY DE DK0WCY-1 <20> : K=6 EXPK=0 A=13 R=179 SFI=207 SA=ACT GMF=MIN AU=STRONG

W6H
 Last QSO **00:08**

- Q's - 10, 100, 60m, 27m

140	69	20	20
-----	----	----	----

Goal 0

Q's/Hr

Next Goal 0

[Sunspot Summary](#) [SRS](#)

AR 3825 **B** S-E-

Solar Flare Class

Radio Blackout Level

R3
R1
R0

Current
Solar Demon
Solar SOFT

Global D-LAYER Absorption

Current Solar Flare Threat

C-Flare: 99% M-Flare: 60%
 X-Flare: 15% Proton: 15%

[Probability Details](#)

Geomagnetic Field and Aurora

Aurora Forecast

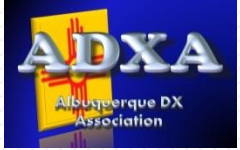
Storm (G3)

Past 24 Hours

Begin: Tue, 10 Sep 2024 00:00:00 GMT

Aurora Oval Forecast | South Pole

Kp-Index | A-Indices | Magnetometers



So What Mr. Sun?

40/80m is Almost Always "Poor"
During the Day

Experience Demonstrates that is
Almost Always Not True!

I Have Received No Response to
my Query of N0NBH

Yeah, No DX on 40m/80m
During the Day but They're Useful

Solar-Terrestrial Data
17 Sep 2024 2158 GMT
 SFI 165 SN 140
 A 72 K 3
 X-Ray C1.1
 304A 154.6 @ SEM
 PF 20100 Ef 211000
 Aurora 4/n=1.99
 Bz -1.2 SW 450.1

HF Conditions		
Band	Day	Night
80m-40m	Poor	Fair
30m-20m	Good	Good
17m-15m	Good	Good
12m-10m	Good	Poor

VHF Conditions
 Aur Lat 63.9°
 Aurora Band Closed
 6m EsEU Band Closed
 4m EsEU Band Closed
 2m EsEU High MUF
 2m EsNA Band Closed
 EME Deg Good
 Solar Flare Prb 48%

MUF scale: 0 MIN to 18+ MAX (UTC)

Geomag Field UNSETTLD
 Sig Noise Lvl S2-S3
 MUF US Boulder NoRpt

Current Solar Image

<http://www.n0nbh.com>
 Copyright Paul L Herrman 2023



References

- <https://www.voacap.com/hf>
- www.solarham.com
- www.hamqsl.com
- <https://k9la.us/>
- <https://adxgroups.io/g/ADXA/>
- <https://www.contestuniversity.com/>
- www.hamwaves.com