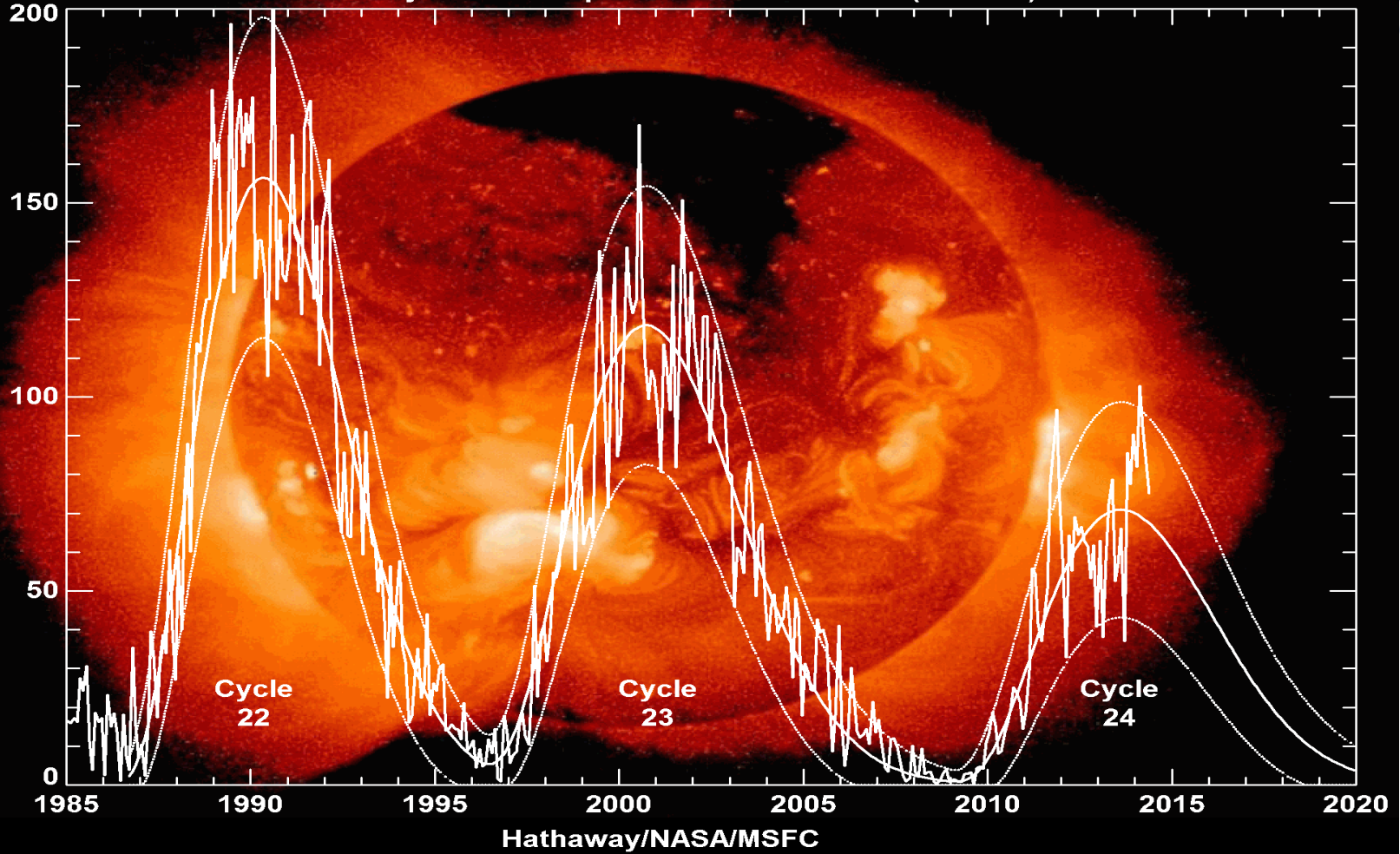


# HF Propagation with a Flare

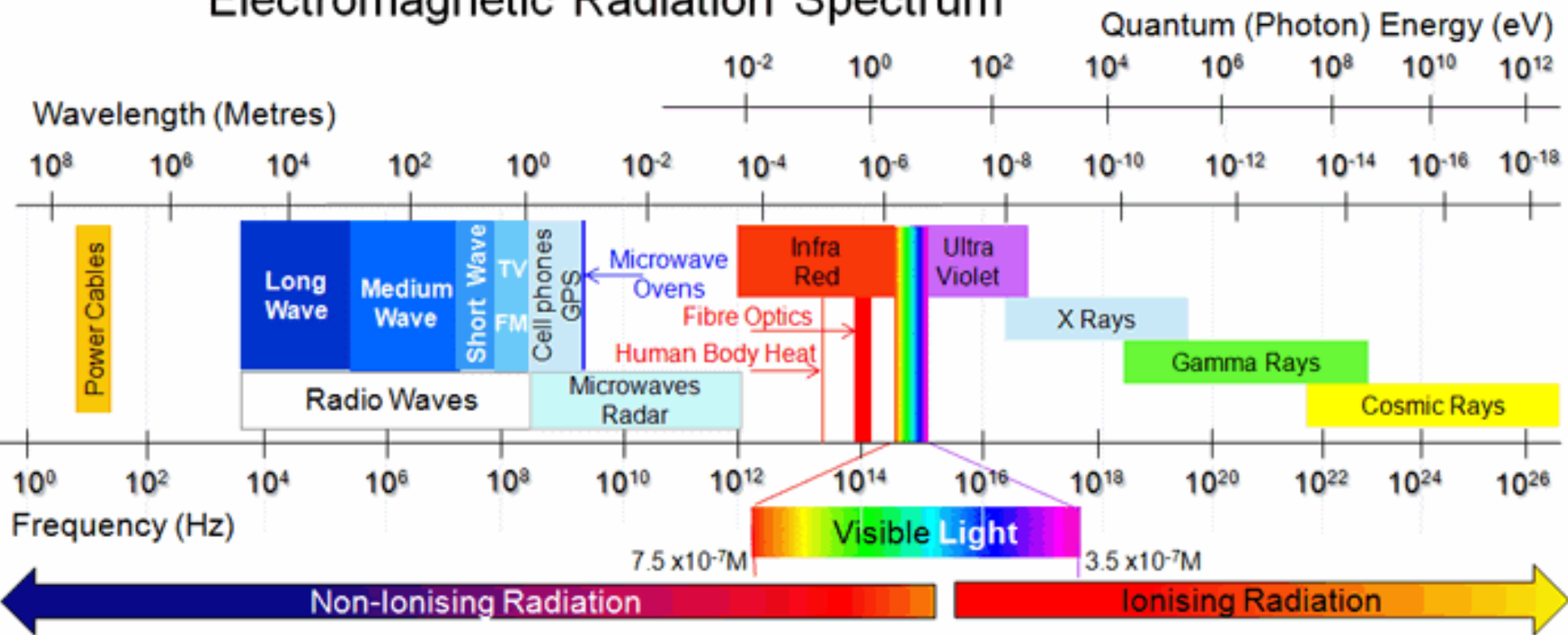
How to decipher solar weather data

A presentation by: W4RQ

# Cycle 24 Sunspot Number Prediction (2014/06)



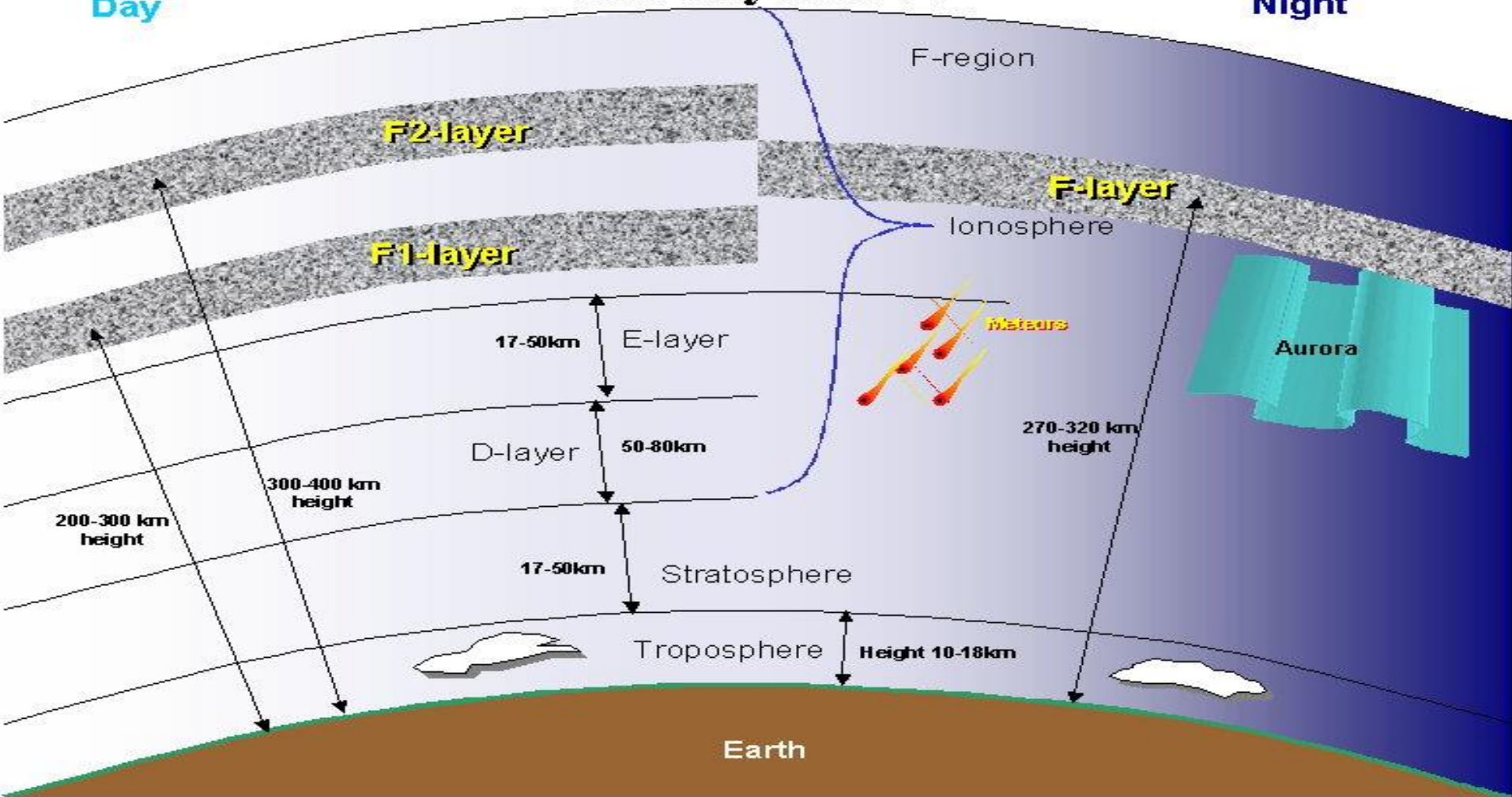
# Electromagnetic Radiation Spectrum



# The Sky Above

Day

Night





Solar Flares

Coronal Holes

Sunspots/Solar Cycle

F10.7 cm Radio Emissions

Solar EUV Irradiance

Coronal Mass Ejections

Solar Radiation Storm

Solar Wind

Magnetosphere

Geomagnetic Storms

Aurora

Ionosphere

Total Electron Content

Ionospheric Scintillation

Ground Induced Currents

Solar-Terrestrial Data - <http://www.n0nbh.com>

15 Jul 2019 1726 GMT

SFI 66 SN 0  
 A 5 K 2 / PIntry  
 X-Ray A6.9  
 304A 89.5 @ SEM  
 Ptn Flx 0.21  
 Elc Flx 1660.00  
 Aurora 2/n=1.99  
 Aur Lat 66.5°  
 Bz -3.0 SW 437.9

## VHF Conditions

Item	Status
Aurora	Band Closed
6n EsEU	Band Closed
4n EsEU	Band Closed
2n EsEU	Band Closed
2n EsNA	Band Closed
EME Deg	Very Poor

MUF

MS



## HF Conditions

Band	Day	Night
80n-40n	Fair	Good
30n-20n	Poor	Poor
17n-15n	Poor	Poor
12n-10n	Poor	Poor
Geomag Field	QUIET	
Sig Noise Lvl	S1-S2	
MUF US Boulder	NoRpt	
Solar Flare Prb	1%	

## Current Solar Image



(C) Paul L Herrman 2013

**SFI Solar Flux Index**

**( Level of solar radiation & electron density )**

**SN Number of sunspot Groups**

**K Index Earth's Geomagnetic Activity**

**( Level of Geomagnetic disturbance )**

**Kp Planetary Average of K readings**

**A log average of K readings**

**X-Ray Index**

**Solar X-Ray emissions**

**Responsible for D layer attenuation**

**304A**

**UV emissions responsible for**

**ionization of upper F Layer**

**Proton Index**

**Heavy particle emissions**

**Electron Flux**

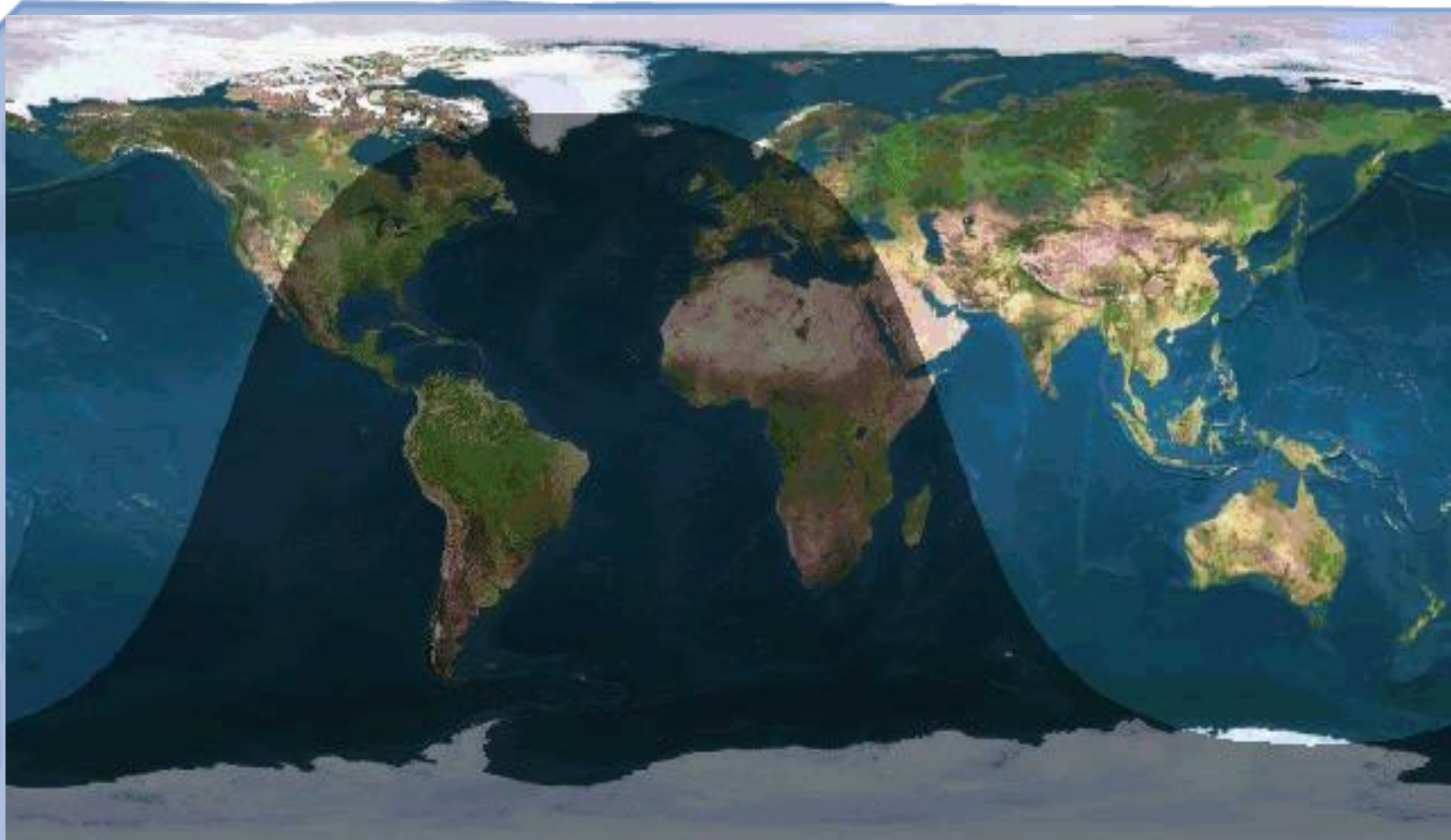
**Free electron emissions**

**upper F Layer ionization**

## **MUF Maximum Usable Frequency**

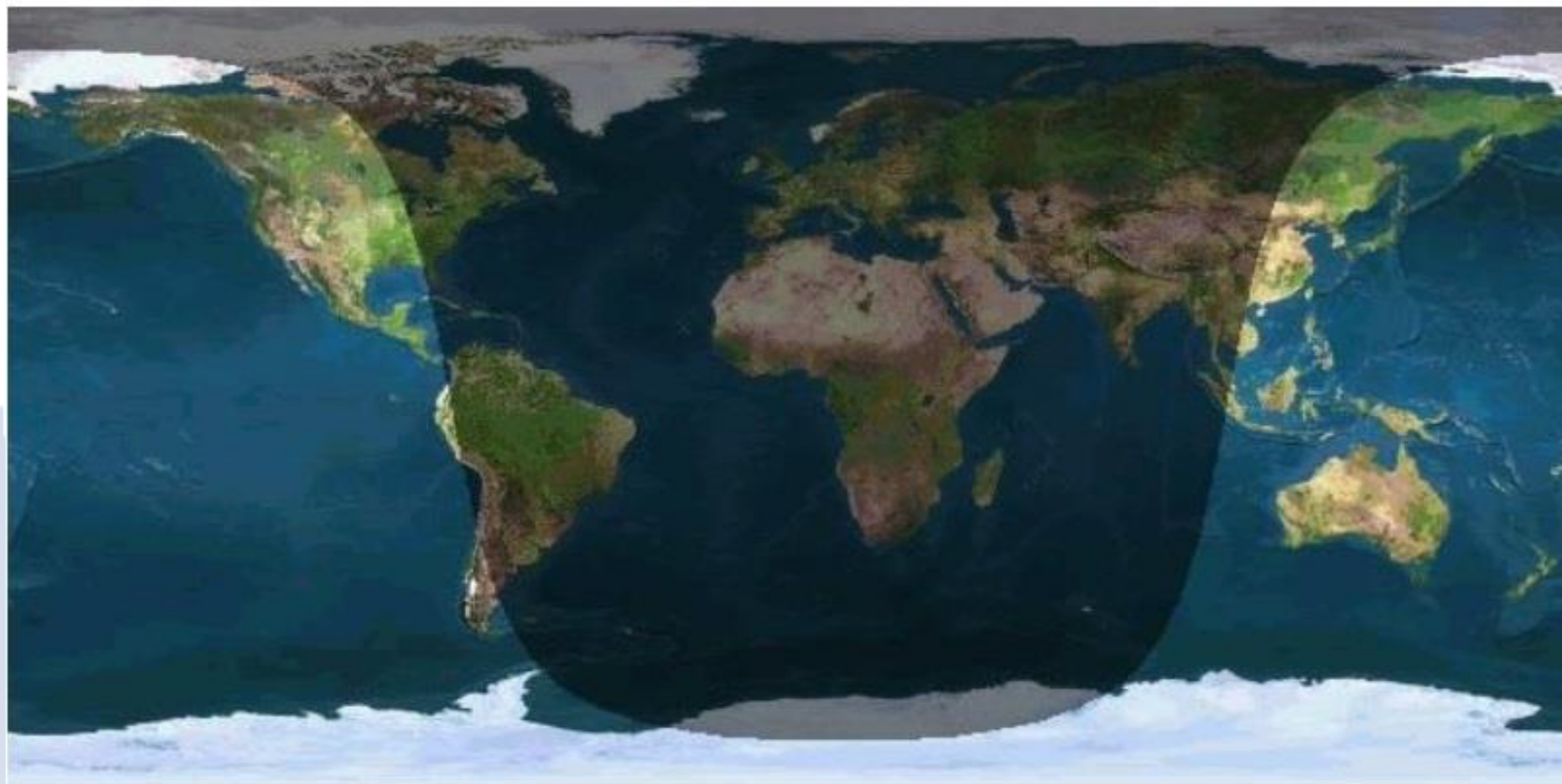
**The maximum Frequency that will be refracted to earth in a given time period.**

**Grey Line Shows stations that are in simultaneous Sunset/Sunrise & is one of the best times for contacts**



This map will automatically refresh every 5 minutes.

**The current time is: 23:28 UTC on Tuesday, February 21, 2012**



**The Data  
is like each piece  
of a jigsaw puzzle!**



**How can  
we put the  
data pieces  
together to  
see the  
whole  
picture ?**



We Can't

( Not without HELP ! )

15 Jul 2019 1726 GMT

SFI 66 SN 0  
 A 5 K 2 / PIntry  
 X-Ray A6.9  
 304A 89.5 @ SEM  
 Ptn Flx 0.21  
 Elc Flx 1660.00  
 Aurora 2/n=1.99  
 Aur Lat 66.5°  
 Bz -3.0 SW 437.9

VHF Conditions

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HF Conditions

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Sig Noise Lvl	S1-S2	
MUF US Boulder	NoRpt	
Solar Flare Prb	1%	

Current Solar Image



(C) Paul L Herrman 2013

We can only do as shown here, a very General Prediction of HF conditions.....

Bands Good , Fair, Poor daytime/night time.

Noise Level to expect. And the present MUF

**THERE IS  
HELP !**

**The National Telecommunications and Information Administration ( NTIA ) developed ITSHF HF propagation prediction software for The Voice of America, better known as VOACAP VOACAP is FREE !**

**Alex Shovkoplyas, VE3NEA WROTE A freeware program, HAMCAP, which uses the ITSHF engine to graphically display a more accurate picture of predictions.**

**HAMCAP is a tiny program that resides on your PC.**

**HAMCAP is FREE**

**Download** the latest version of **ITSHF** ( FREE )

From **WWW.DXATLAS.COM**

You don't have to run this, it will be used by **HAMCAP**

Download **HAMCAP** ( FREE )

**Run HAMCAP and enter your location & antenna info**

You may also want to get **IONOPROBE** and **DX ATLAS** to use with **HAMCAP**.

**DX ATLAS REGISTRATION** \$29.95 But has a thirty day free trial period.

**IONOPROBE REGISTRATION** \$20 But likewise has free trial period.



Home

26

° N

80

° W



DX Atlas

Chart



Plot MUF



Mark Best Hour



IonoProbe

Map



Show Sun



Plot Path

Map Style



Color



Gray



Pseudo

Map Resolution



High



Medium



Low



Params



Chart



Map



Settings



Ant





### TX Antennas

- 28 3-el Yagi @ 55 ft
- 24 3-el Yagi @ 55 ft
- 21 3-el Yagi @ 55 ft
- 18 3-el Yagi @ 55 ft
- 14 3-el Yagi @ 35 ft
- 10 Dipole @ 55 ft
- 7 Dipole @ 55 ft
- 3.5 Dipole @ 55 ft

### RX Antennas

- 28 3-el Yagi @ 55 ft
- 24 3-el Yagi @ 55 ft
- 21 3-el Yagi @ 55 ft
- 18 3-el Yagi @ 55 ft
- 14 3-el Yagi @ 35 ft
- 10 Dipole @ 55 ft
- 7 Dipole @ 55 ft
- 3.5 Dipole @ 55 ft



Params



Chart



Map



Settings



Ant





Ham CAP 1.91



# Ham CAP 1.91

by VE3NEA

## Input parameters



**DX QTH**

27

°

S

109

°

W



**SSN**

0



**DX Call**

CE0Y



**Kp**

1



**Month**



Jul 2019



Use Kp



**Path**



Short



Long



**Power**

100



Params



Chart



Map



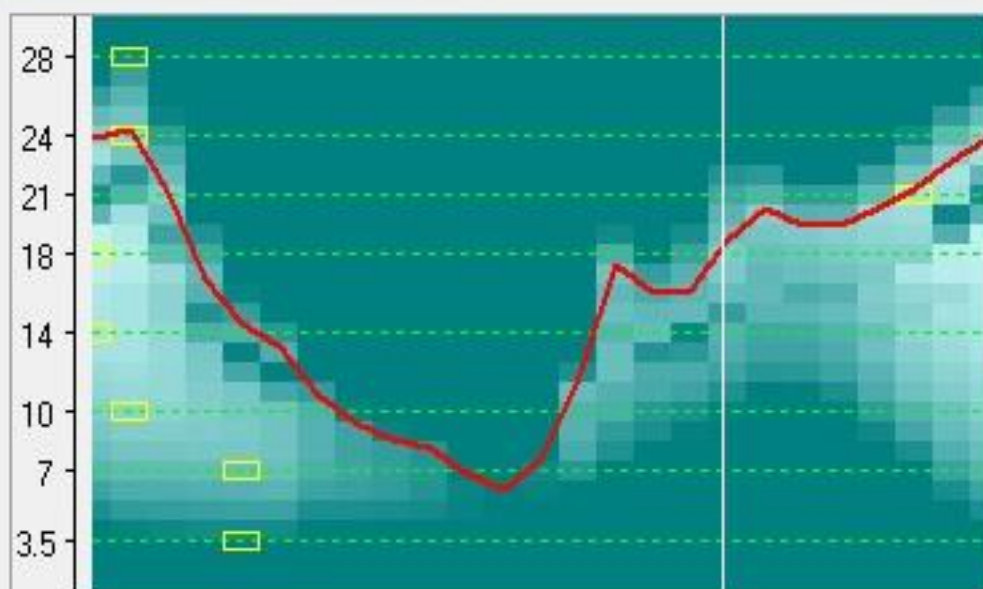
Settings



Ant

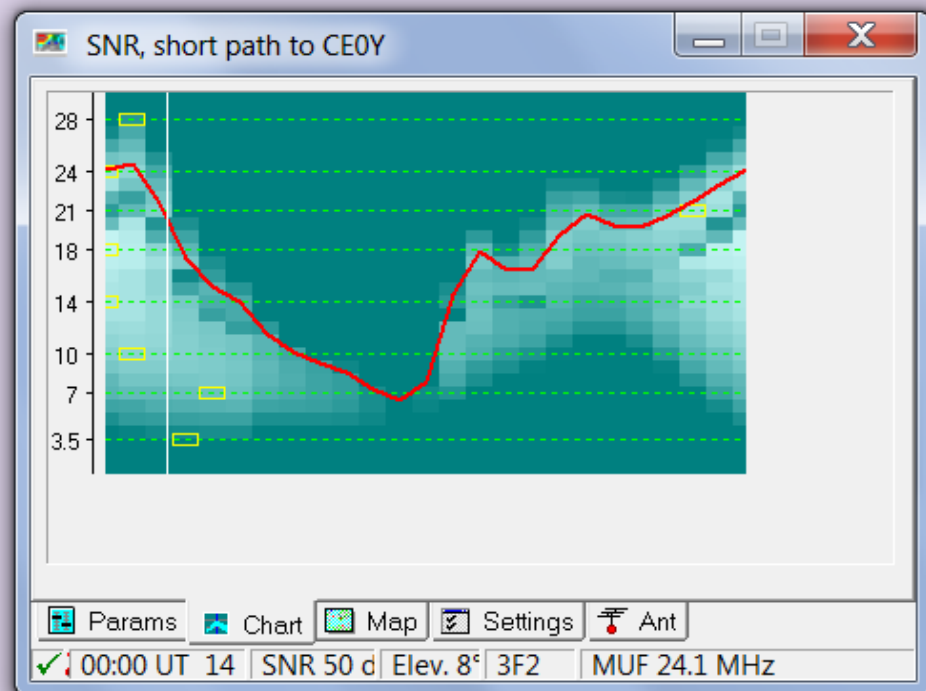
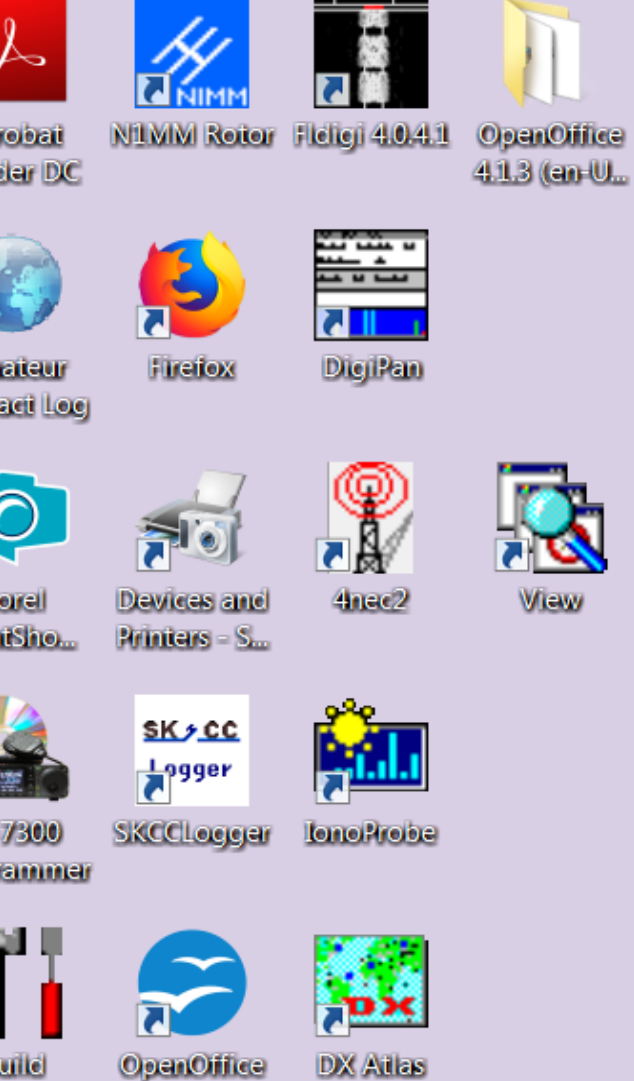


SNR, short path to CE0Y



Params Chart Map Settings Ant

✓ 00:00 UT 18 SNR 56 d Elev. 9° 3F2 MUF 23.8 MHz



Ham CAP



SDRSharp -



Google

# **3 to 7 dB SNR / 1Hz Needed for JT65/JT9**

**7 to 11 FT-8**

**22 - 27 PSK**

**27 - 31 Conversational CW**

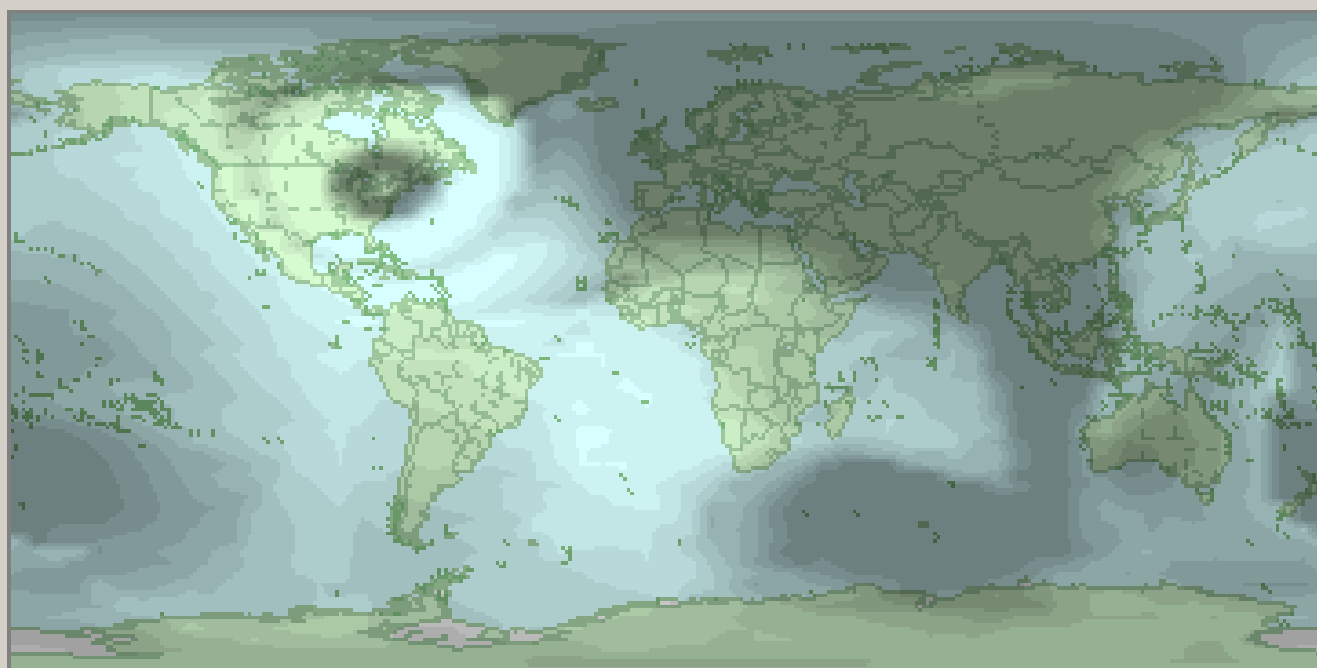
**31-37 RTTY**

**37-42 FM OR Noisy SSB**

**42-54 SSB**

**>55 Am (60 dB)**

# HamCAP 1.0



< 22:00 > |▶

3.5 7 10 14 18 21 24 28



Params



Chart



Map



Settings



Ant



1° S 64° W

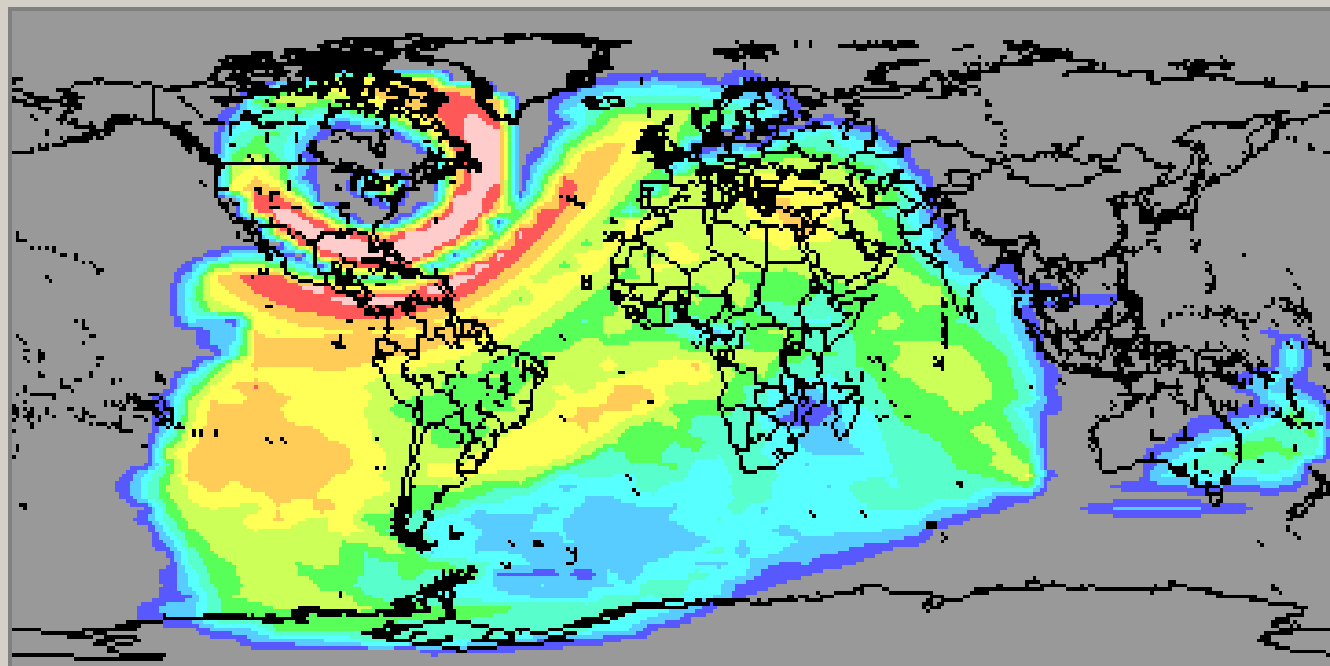
SNR 41 dB

Elev. 4°

Mode 2F2

MUF 25.4 MHz

# HamCAP 1.0



◀ 15:00 ▶ ▶▶

3.5 7 10 14 18 21 24 28

Params Chart Map Settings Ant

✓ 48° S 46° E SNR 15 dB Elev. 8° Mode F2F2 MUF 22.6 MHz

# Fullscreen-shot of Hamcap w/o DX ATLAS

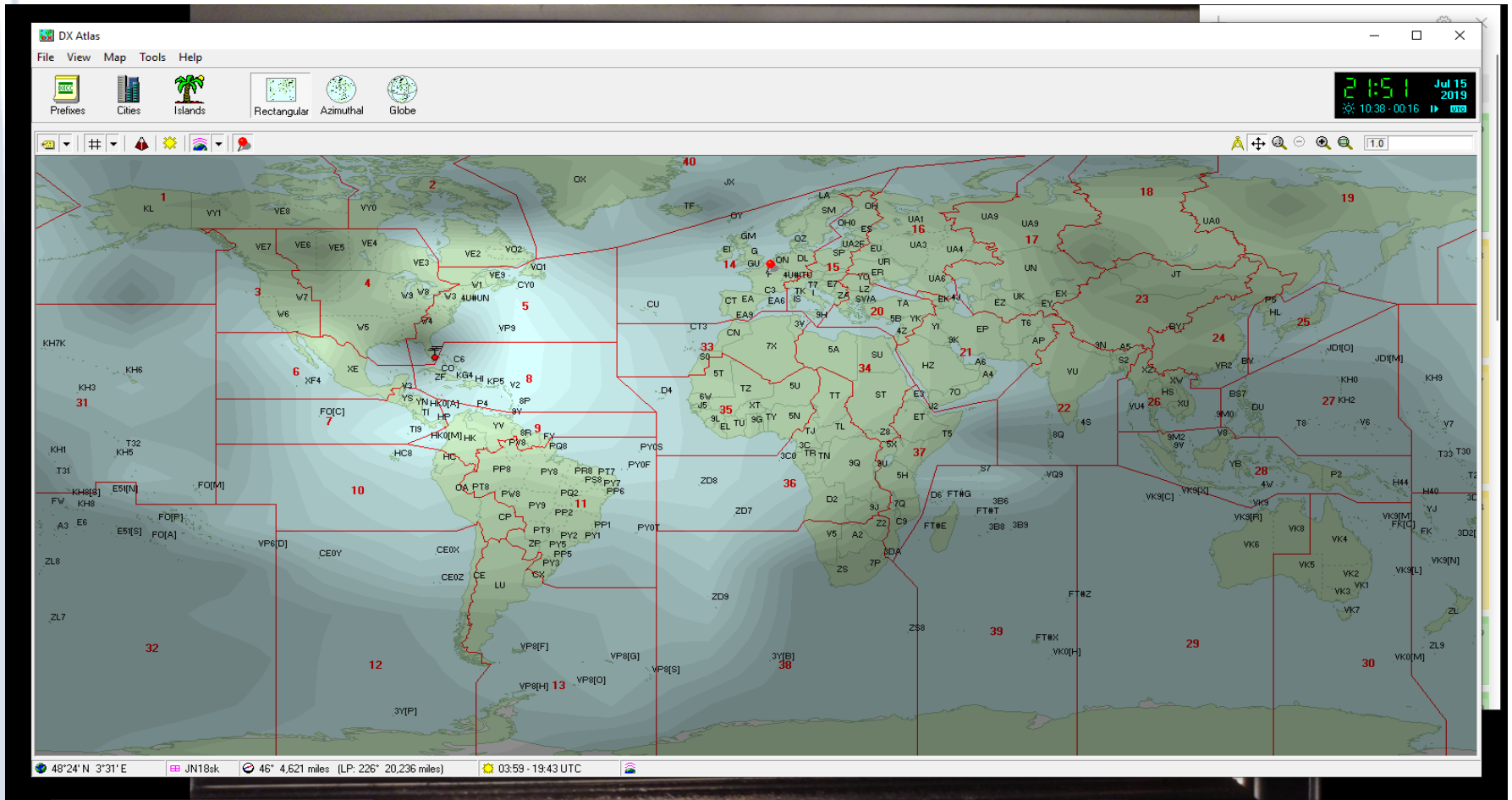
The image shows a screenshot of a Hamcap software interface. The background is a DX Century Club certificate from The American Radio Relay League, Inc. The certificate is for Kay Craigie, N3KN, and is dated 1/24/17. The certificate text includes: "The American Radio Relay League, Inc. DX CENTURY CLUB This Certifies that Kay Craigie, W4RQ is a member of the American Radio Relay League showing two-way communication with at least one hundred different countries. This performance and attests to membership in the DX Century Club." The certificate is signed by Kay Craigie, President, APRIL, N3KN.

In the foreground, there is a window titled "S/N Ratio Prediction Map". The window displays a world map with a color-coded overlay representing signal-to-noise ratio. The map shows a high signal-to-noise ratio (red/orange) over the North Atlantic and Europe, and a lower signal-to-noise ratio (green/blue) over the Americas and the Pacific. The window has a toolbar with buttons for "Params", "Chart", "Map", "Settings", and "Ant". The status bar at the bottom of the window shows: "34° N 2° E SNR 30 dB Elev. 14° F2F2 MUF 16.9 MHz".

On the right side of the screenshot, there is a "Sticky Notes" window. It contains several notes:

- LET THE GOOD TIMES ROLL** (Jul 9)  
French: laissez Les Bons temps rouler  
Lazy Lay Bon Tom Roulay  
or  
Lay-zEh Leh Bawn taw roo-leh
- inverted V** and **inverted L** (Jun 28)  
1.840 88 43 201      86/46 200  
1.840 88 47 218  
1.930 76 47 228      75/45 200  
1.963 76 44 221...
- SKED KB2EF** (Jun 27)  
0900R WEDNESDAY 14.185  
SKED W1FOX  
1300z 14.065 daily  
need to try 40m @ 730-800am
- FT-8 FREQUENCIES** (Apr 4)  
1.840  
3.573  
5.357
- PROGRESSIVE POLICY** (Jan 29)  
# 920472953

# Fullscreen-shot of Hamcap with DXATLAS





Questions ?