

# **Operating from Lake Superior in the 2018 ARRL 10 GHz & Above Contest**

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**Microwave Update Conference October 12/13, 2018**

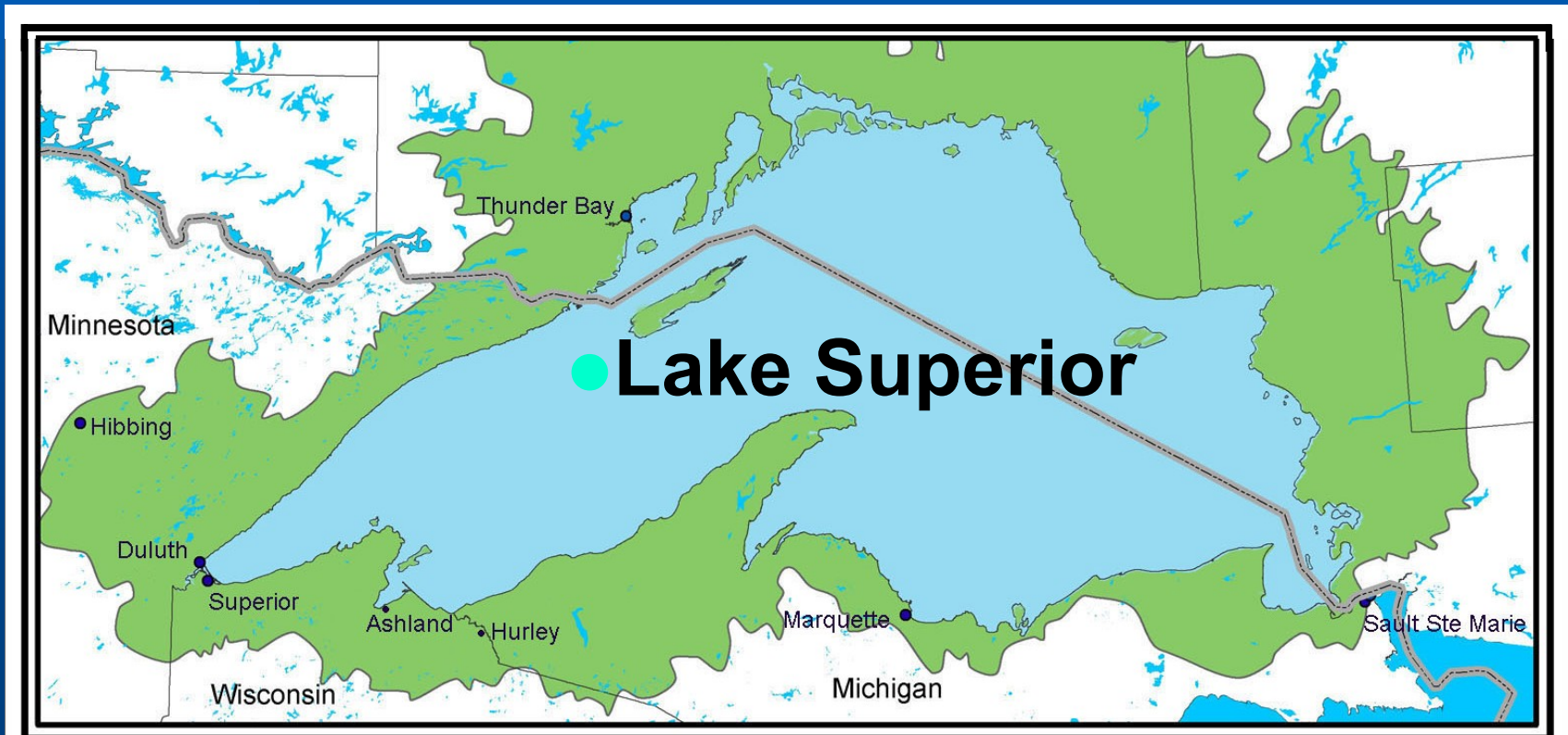


# Operating from Lake Superior in the 2018 ARRL 10 GHz & Above Contest

- History of Lake Superior Microwave Operations
- Contest Operating Philosophy
- Weather & Band Conditions
  - Marathon Group
  - North Shore Group
  - Upper Peninsula of Michigan
  - Grand Marais, Michigan

# Operating from Lake Superior in the 2018 ARRL 10 GHz & Above Contest

- **350 miles Wide, 160 miles High,  
a shoreline almost 2,800 miles**



# Operating from Lake Superior in the 2018 ARRL 10 GHz & Above Contest

- **Largest Freshwater Lake in the  
World by Surface Area**



# History of Microwave Operations on Lake Superior

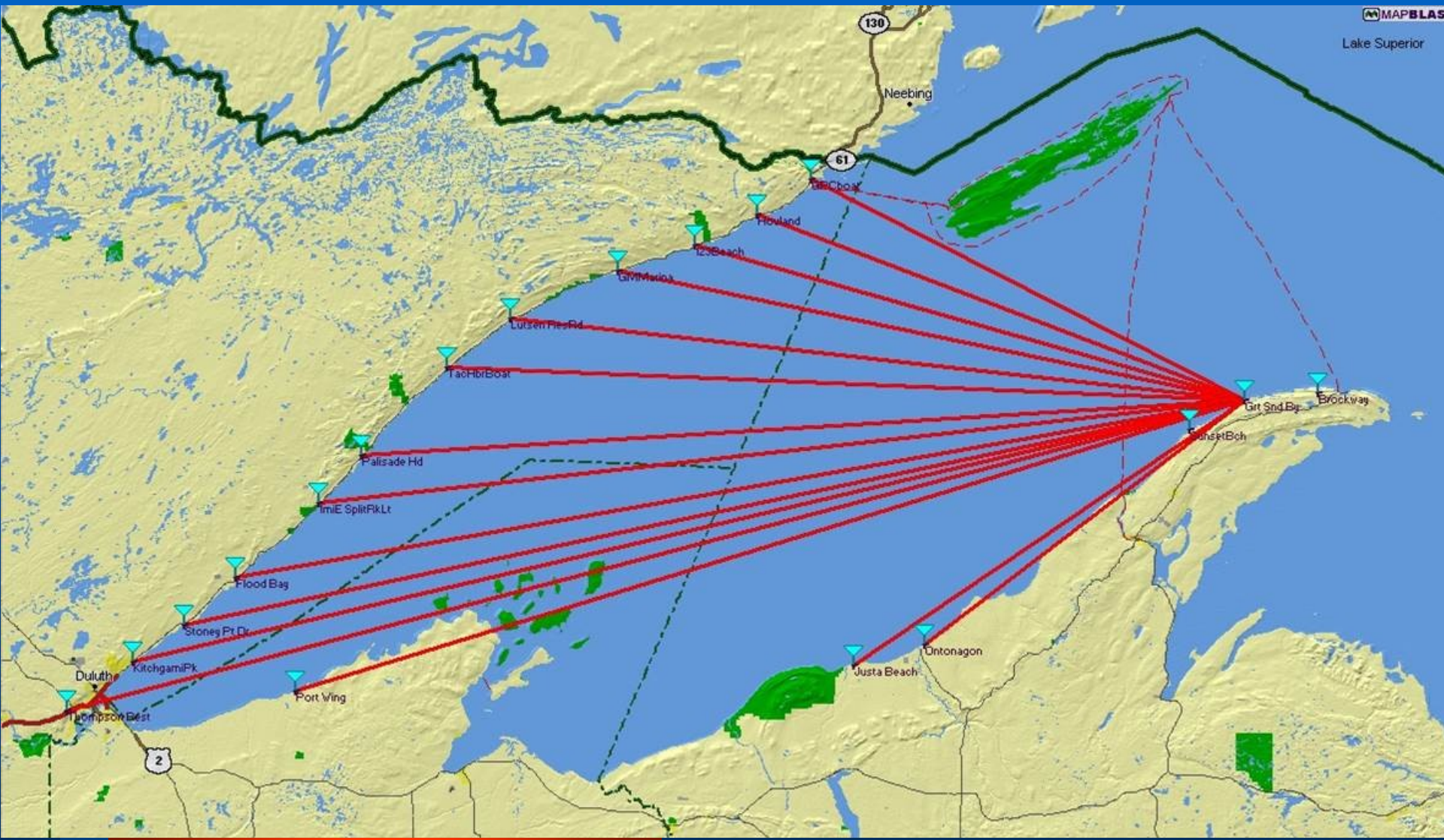
- **Operating from Superior is a Real “Treat” for Land Locked Stations**
  - Clear Shots with Little Obstacles
  - Long Paths with Promise of Enhanced Propagation
- **First Operations by the Northern Lights Radio Society (NLRs) in 2001/ 2002**
- **Short one-day visits made with good results using WBFM & SSB/CW systems.**

# History of Microwave Operations on Lake Superior Cont'd

- *“What if we made a major effort?”*
- In 2003 there were 18 stations around the lake. Experimentation with High/Low Locations.
- 2004: Major Effort that included expedition to VE3 Side at WaWa.
  - Repeat of High/Low with UHF bands.
  - No contacts were made across the wide part of the lake.



# Possible Paths from UP to North Shore

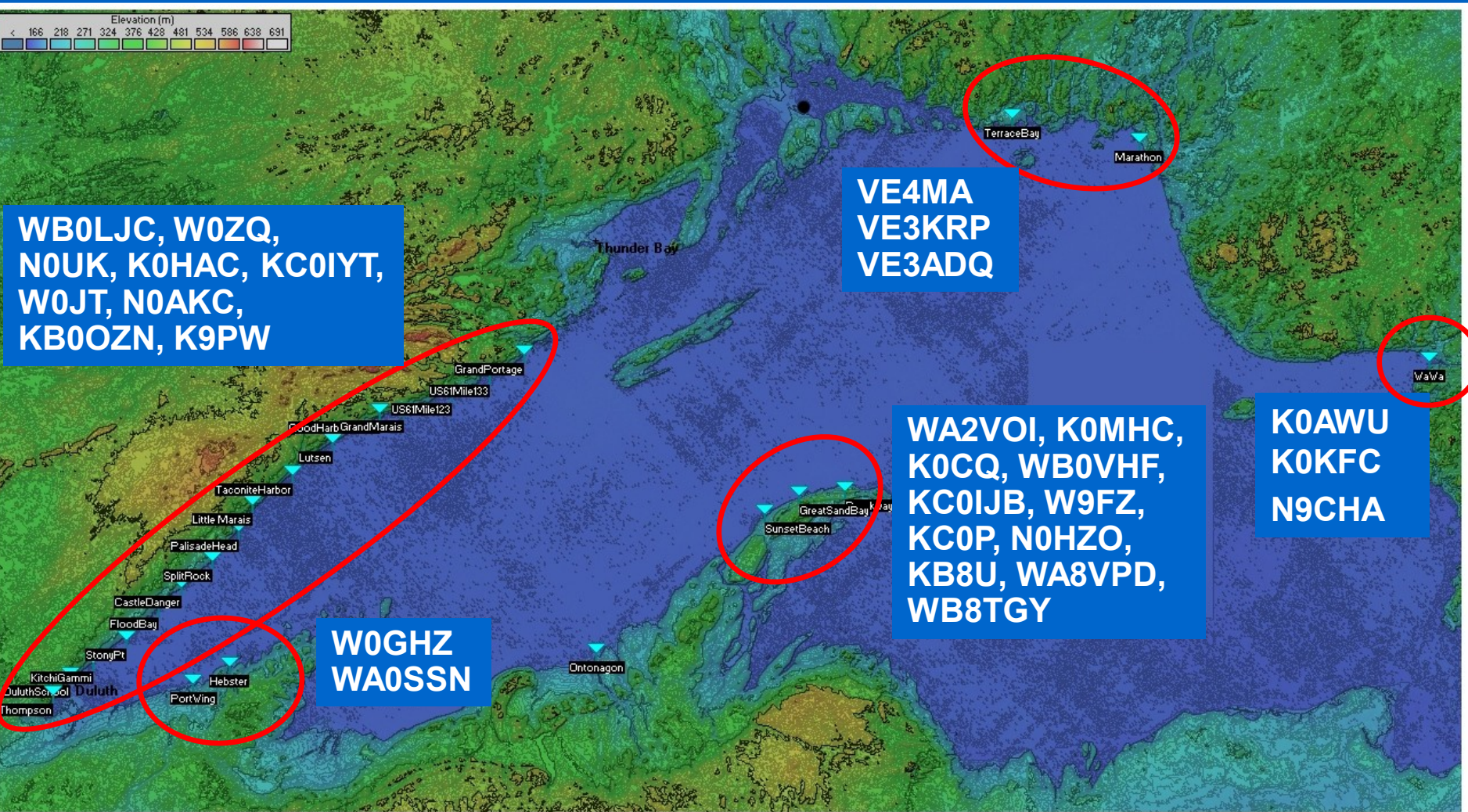


# History of Microwave Operations on Lake Superior

- **Big Effort in 2012 with Significant Improvements**
  - Better Frequency Accuracy with PLLs
  - More Experience with Antenna Pointing
  - More Experience with Propagation
  - More Stations Running Higher Powers
- **More Stations Deployed Around the Lake**



# 2012 Station Deployment



# Operating Philosophy for Lake Superior in the 2018 10 GHz & Above Contest

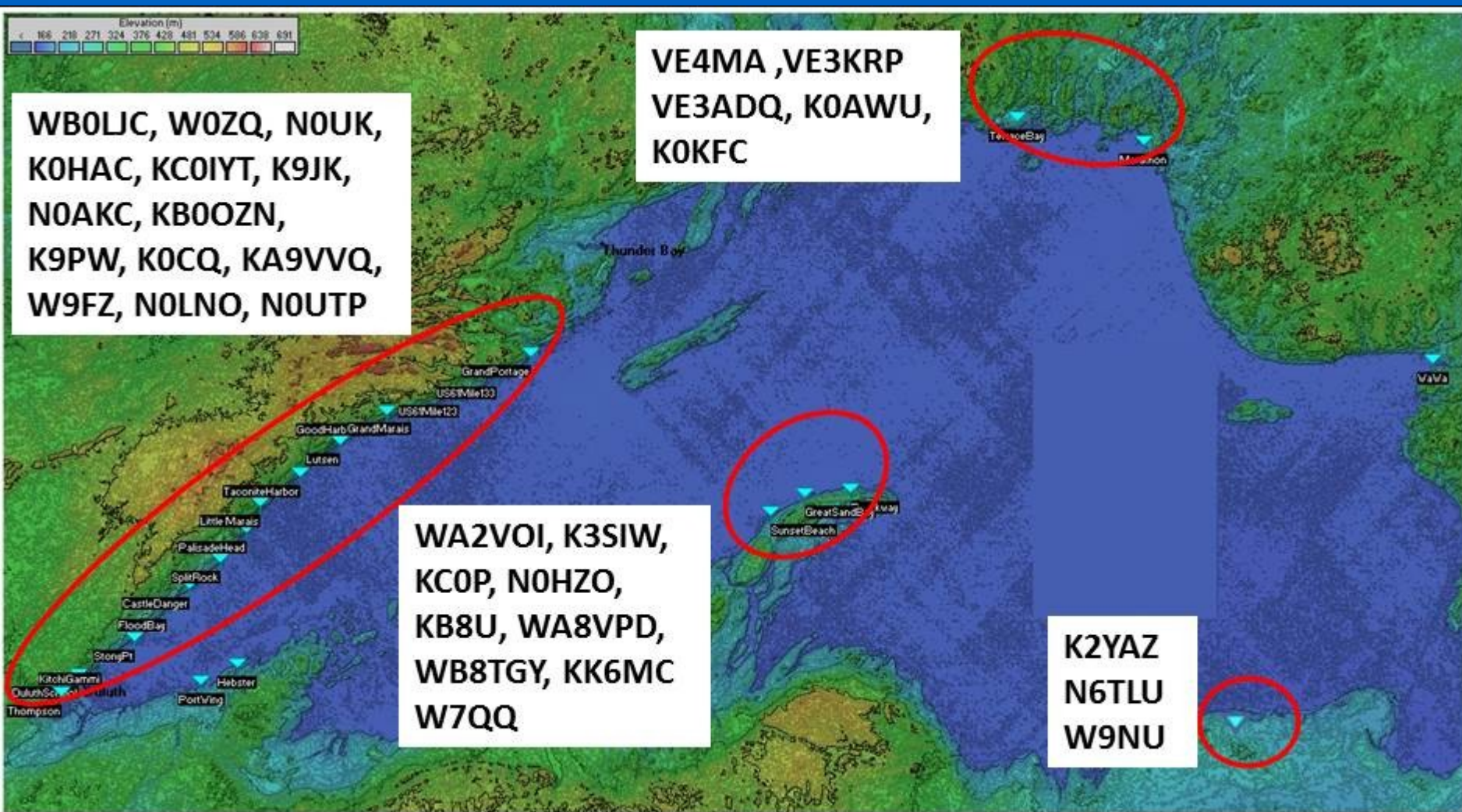
- Large group ( this year 14 stations) that moves along the North Shore, with stops of about 10 miles.
- Two Smaller groups Operate from Several Locations on the Upper Peninsula (UP) of Michigan.
- North Shore group goes North on the First day, Back on Second day with a shift of Sites by UP groups.

# Operating Philosophy for Lake Superior in the 2018 10 GHz & Above Contest

- North Shore Group Splits into 2 Groups to Facilitate Setups at Space Limited stops, and a Smoother Flow of stations to work the UP group
- Small Group of 5 stations at Marathon, ON
  - Equipped with 10, 24, 47 & 78 GHz
- Small Group of 3 stations at Grand Marais, Michigan

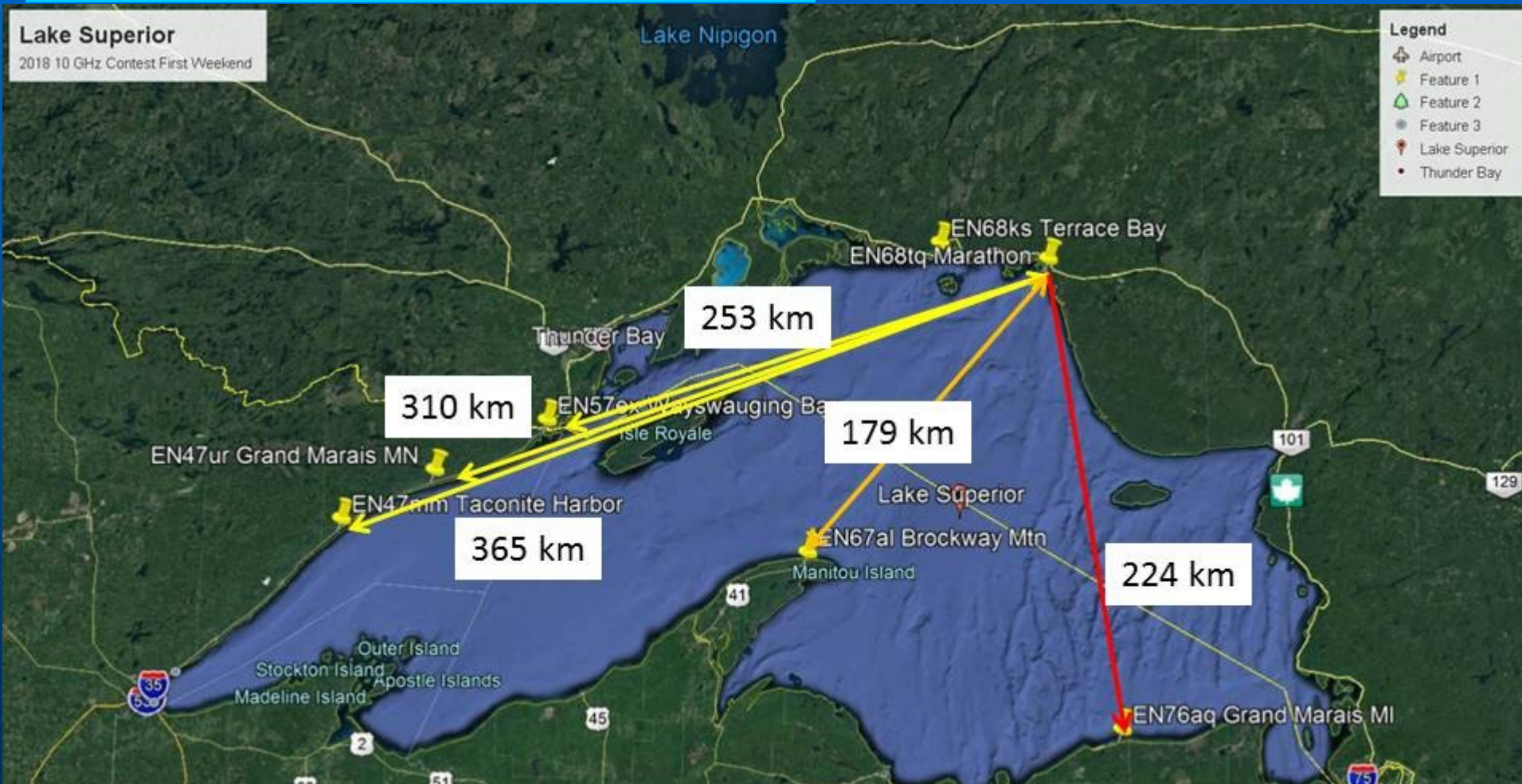


# 2018 Station Deployment





# Possible QSOs from Marathon, ON





# Weather & Band Conditions at Marathon

- Saturday morning NO Wind and 10 G conditions were S9 from Mt. Brockway.
  - But there was absolutely No 24 GHz signals.
  - The Mt. Brockway crew had local fog.
- Grand Marais Group worked on 10 G.
  - Nothing Heard on 47 G, Did not try 24 G
- Late in the Afternoon 24 GHz appeared from Mt. Brockway over the 179 km path as the fog had disappeared!

# **Weather & Band Conditions at Marathon Cont'd**

- **One Hour Later North Shore Group Good on 10, Did Not Try 24???**
- **One Hour later Again, Good 24G from UP**
- **On Sunday Strong Winds & Fluttery but Good 10 G signals were received from Several of the North Shore grids.**
  - **Limited Visibility from North Shore Sites**
- **Worked the Second UP group on 10G.**

# Grids Worked from Marathon

## ● Saturday

- EN68tq <> EN36vr 10G, 489km Early Morning, very weak CW
- EN68tq <> EN67al 10G, 179km Morning, Good Sigs but No 24G
- EN68tq <> EN76ag 10G, 224km Morning, Good Sigs, but No 47G
- EN68tq <> EN67al **24G**, 179km Late Afternoon, Good 24G Sigs
- EN68tq <> EN47mm 10G, 365km Late Afternoon
- EN68tq <> EN67al **24G**, 179km Early Evening, Good 24G Sigs agn

# Grids Worked from Marathon

## ● Sunday

- EN68tq <> EN57ex 10G, 254km Morning, Good Signals
- EN68tq <> EN67al 10G, 179km Morning, Good Signals
- EN68tq <> EN47ur 10G, 179km Morning, Good Signals
- EN68tq <> EN47mm 10G, 365km Early pm, Good Sigs

# The Marathon Group





# The Marathon Group Setup





# VE4MA's 4 Bands at Marathon

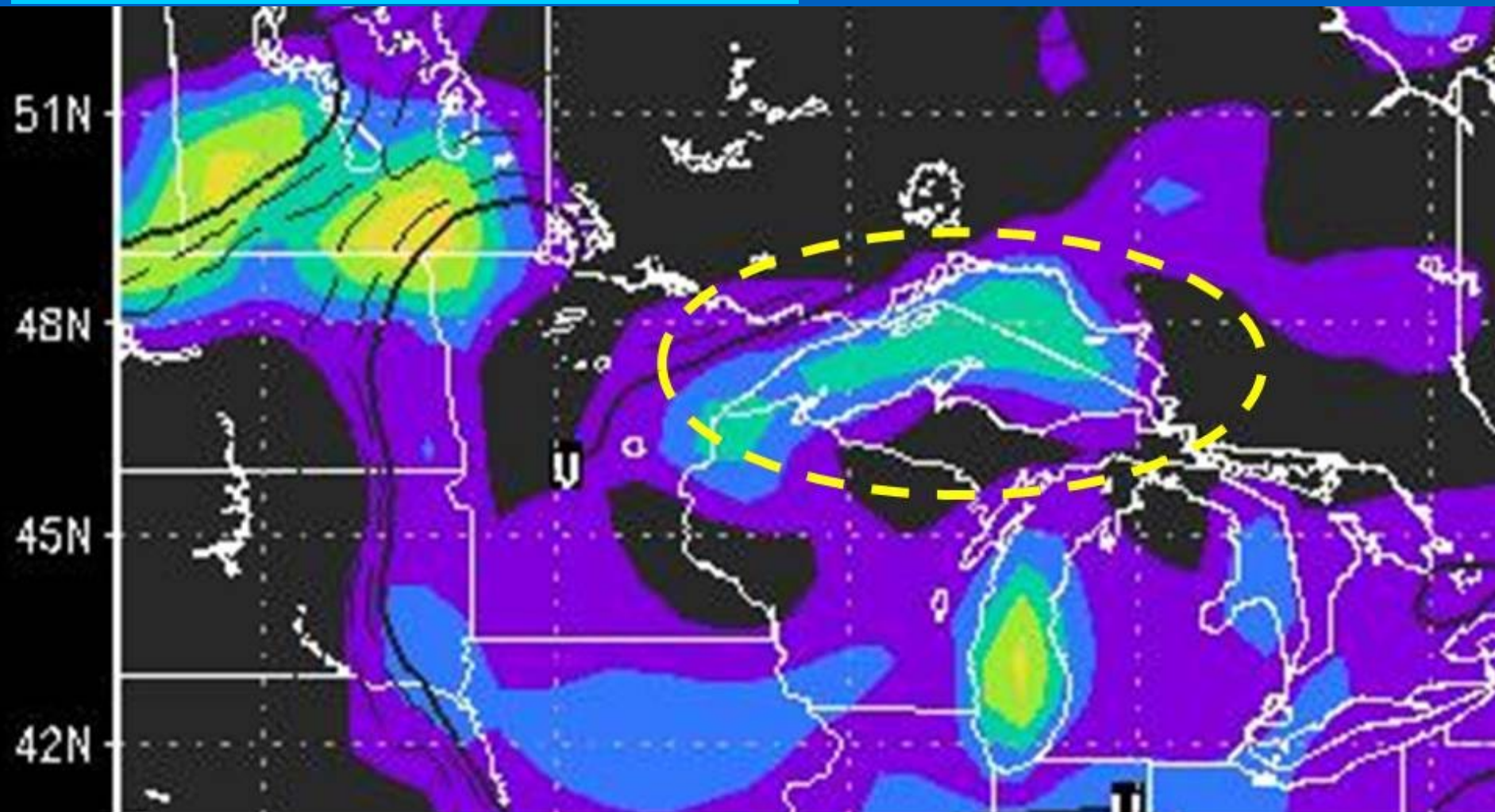


# Weather & Band Conditions on the North Shore

- The Hepburn map 2100 UTC Saturday Aug 19 shows good enhancement
  - may correlate with what the VE/UP guys saw
  - & what the NS experienced at the *last* stop on Saturday from Grand Portage, EN57ex.
- On Sunday the Hepburn maps really don't show the great propagation that we had later on the day on Sunday from the NS to the UP/VE groups.



# Hepburn Map at 2100 UTC Saturday August 19, 2018



# Weather & Band Conditions on the North Shore Cont'd

- Saw a huge swing in signal strength between Low (Kitchi Gammi) and High Elevations (Thompson Hill) at the end of the day on Sunday
- *Definitely* some Low Level Ducting.
- Glen KC0IYT worked the UP guys from Flood Bay with a 200 mW and 7 dB Horn with 59+++ signals.



# Grids Worked from North Shore

## Saturday from Nine Stops

- EN36ur <> EN34iv 10G, 218 km
- EN36vr <> EN57vk 10G, 314km
- EN36vr <> EN67al 10G, 333km
- EN36vr <> EN68tq 10G, 489km very weak CW
- EN46au <> EN57vk, 10G, 292km
- EN46cw <> EN57vk, 10G, 277km
- EN46cw <> EN67al, 10G, 297km
- EN47ea <> EN67al, 10G, 282km
- EN47ea <> EN57vk, 10G, 263km

# Grids Worked from North Shore

## Saturday from Nine Stops Cont'd

- EN47hf <> EN57vk, 10G, 240km
- EN47hf <> EN67al, 10G, 260km
- EN47mm <> EN67al, 10G, 226km
- EN47mm <> EN57vk, 10G, 208km
- EN47mm <> EN68tq, 10G, 365km
- EN47xt <> EN57vk, 10G, 144km
- EN47xt <> EN67al, 10G, 161km **No 24G, We were "low"**
- EN57ex <> EN67al, 10G, 137km
- EN57ex <> EN67al, **24G**, 137km. **HUGE 24 SSB signals.**  
We were "high". Last stop was nil & we were low 7:20pm

# Grids Worked from North Shore

## Sunday from Ten Stops

- EN57ex <> EN57vk, 10G, 122km
- EN57ex <> EN67al, 10G, 137km
- EN57ex <> EN57vk, 24G, 122km
- EN57ex <> EN68tq, 10G, 254km
  
- EN47xt <> EN57vk, 10G, 144km
- EN47xt <> EN67al, 10G, 161km
  
- EN47us <> EN34iv, 10G, 394km N0KP @ Pincushion S2 SSB
  
- EN47ur <> EN68tq, 10G, 310km
- EN47ur <> EN67al, 10G, 178km
- EN47ur <> EN57vk, 10G, 160km
  
- EN47mm <> EN67al, 10G, 226km Big signals and building.
- EN47mm <> EN57vk, 10G, 208km
- EN47mm <> EN68tq, 10G, 365km

# Grids Worked from North Shore

## Sunday from Ten Stops Cont'd

- EN47hf <> EN57vk, 10G, 240km Big signals continuing to build.
- EN47hf <> EN67al, 10G, 260km
- EN47hf <> EN57vk, **24G**, 240km With such big 10G signals, 24G was weak CW with W7QQ. Too much water vapor (?)
- EN47ea <> EN67al, 10G, 282km
- EN47ea <> EN57vk, 10G, 263km Big 10G signals, no go on 24G.
- EN46cw <> EN57vk, 10G, 273km Big 10G signals, no go on 24G.
- EN46cw <> EN67al, 10G, 297km
- EN46au <> EN67al, 10G, 311km 30 Over 9 on 10G, zilch on 24 G
- EN46au <> EN57vk, 10G, 292km
- EN36vr <> EN57vk 10G, 314km Thompson Hill and high now. Weak SSB/CW to complete, out of duct now ?
- EN36vr <> EN67al 10G, 333km



# North Shore Group at Duluth





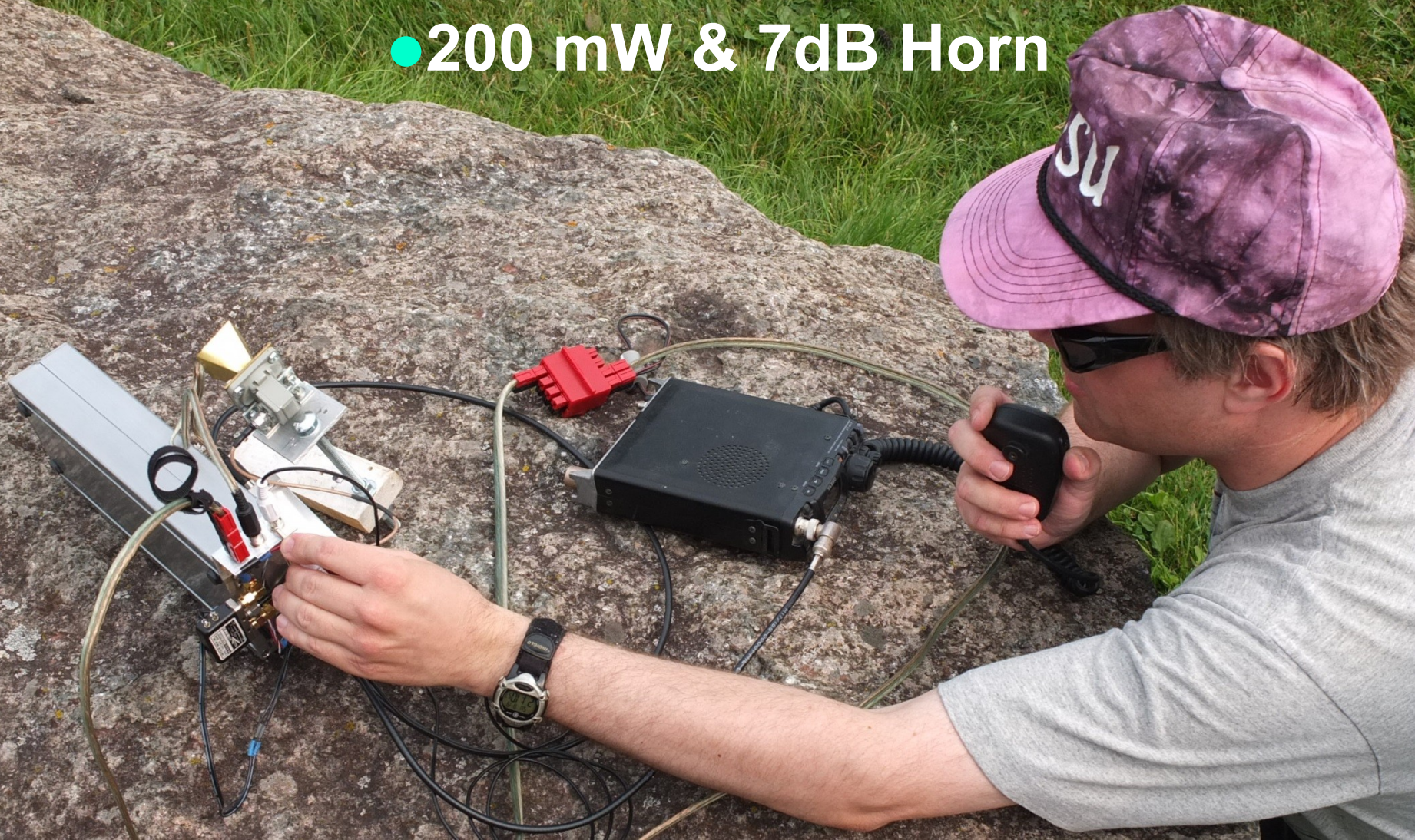
# North Shore Group in Fog at EN57ex





# KC0IYT QRP 263 km 10G QSO

● 200 mW & 7dB Horn





# Upper Peninsula of Michigan Groups

- 2 Groups operating from 3 locations in the Upper Peninsula.
- Kept busy with QSOs from the 2 North Shore groups and the Marathon group.
- 3 UP locations did not have complete visibility of all sites, so they had to move.
- Mount Brockway site was very high above the water (726 ft.) and the only one with Marathon visibility.

# W7QQ, K3SIW & KK6MC on UP





# Donn WA2VOI with 10 & 24 on UP





# WB8TGY & WA8VPD 10/ 24 on UP



# Grand Marais, Michigan Group

- Smallest group and Only Marathon site was visible at a distance of 224 km.
- Operation was limited to Saturday only
- Unfortunately Propagation did not Support Using the 24 & 47 GHz bands but they had a good 10 GHz signal.
- Their operation is documented well in a Youtube video at :

<https://www.youtube.com/watch?v=AyplGi4kty8>.



# W7NU & K2YAZ at Grand Marais





# Lake Superior “Out Takes”

- The Marathon Group had “Countless” Interruptions from Locals wanting to know what we were doing.
- We have the Feeling that this was Great PR for the Hobby!
- Even visited by the Local Historian, who is going to do a Write-up for the Local Newspaper.

# Enquiring Minds Want to Know!



# Lake Superior “Out Takes” Cont’d

- The Upper Peninsula Group had an Unexpected interruption from a Wedding Party taking Photos !
- It’s Not Clear the Ham Activities Actually Stopped? 😊



# Upper Peninsula Wedding Photos





# Operating from Lake Superior in 2018

## Accomplishments & Accolades

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- **Some Interesting Propagation seen with Very Long QSOs on 10 & 24 GHz.**
- **Unfortunately there were no signals exchanged on 47 and 78 GHz**

# **Operating from Lake Superior in 2018 Accomplishments & Accolades Cont'd**

**A Large Part of the Success of this weekend was due to the:**

- **Early Coordination by Gary WB0LJC**
- **On-Site Activities of the Group leaders:**
  - **N0HAC, W0ZQ & W9FZ on the North Shore,**
  - **WA2VOI on the Upper Peninsula,**
  - **VE3KRP at Marathon.**

# Operating from Lake Superior in the 2018 ARRL 10 GHz Contest **Summary**

- History of Superior Microwave Operations
- Contest Operating Philosophy
- Weather & Band Conditions
  - Marathon Group
  - North Shore Group
  - Upper Peninsula of Michigan
  - Grand Marais, Michigan
- **Questions?**