SHARES: SHAred RESources
HF Radio Program
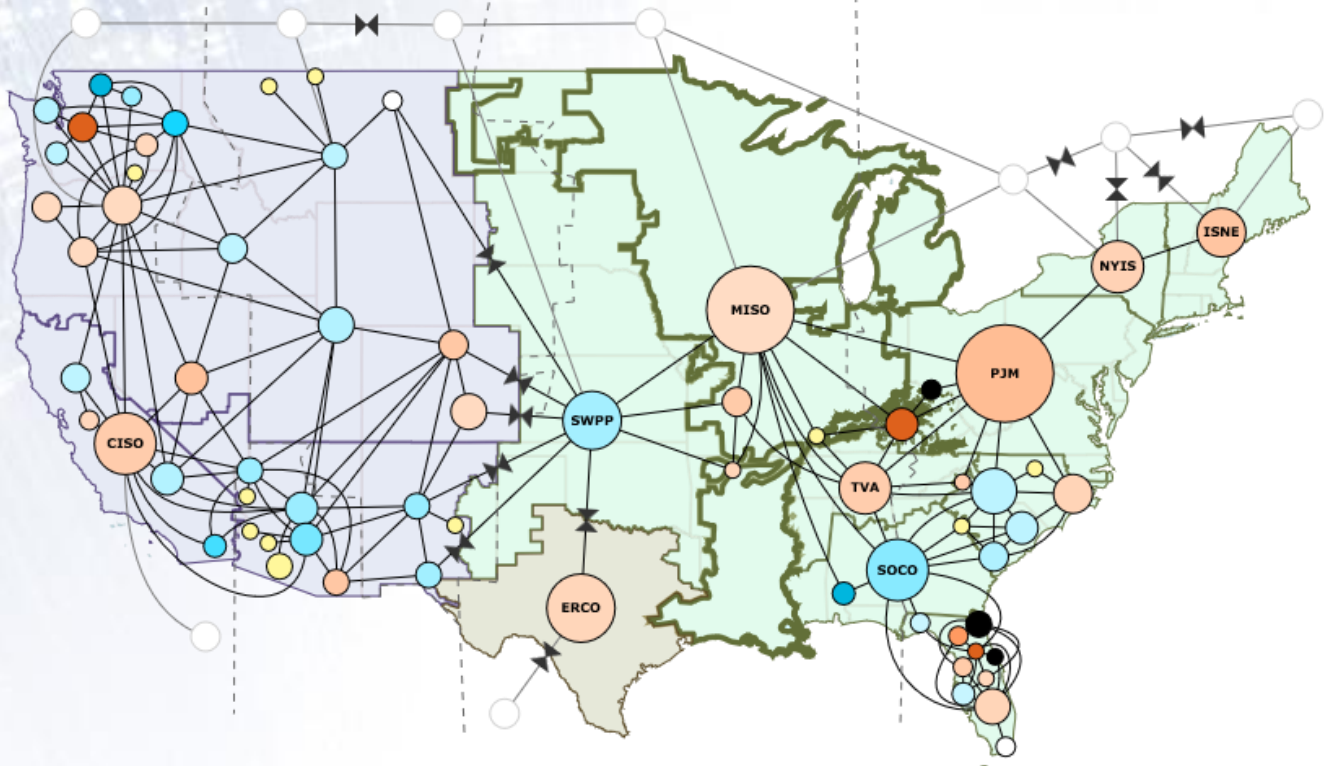
HF Interoperability – SHARES and Amateur Radio Emergency Communications
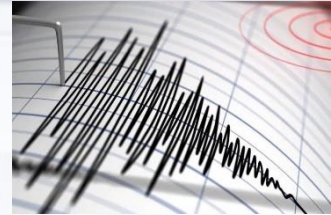
Presented by Hayden Kaufman, N2HAY/NNA4GC

A Bad Day

- How do you coordinate grid restoration without phones & internet?

Telephones, cell phones, satellite phones, LMR networks all depend on vulnerable infrastructure, which depend on power, water, fuel, people.

Graphic by U. S. Energy Information Administration

Catastrophic Incident

- Includes
  - Earthquake, tsunami, hurricane, flood, ice storm
  - Geomagnetic Disturbance (GMD)
  - Electromagnetic Pulse (EMP) attack
  - Cyber attack

- Commonality
  - Little or no notice
  - Impact extends across an extremely large geographic area and multiple states
  - Extensive damage to critical infrastructure and communications
  - Significant impact on response and recovery resources

SHARES is an HF radio system for

- Backup communications
- Interoperability
- Situational Awareness

This is an actual picture sent by HF email to explain why the land mobile radio system wasn't working.

Communications Impact

Systems
Landline Telephone
Cell phone
Internet
Satellite phones, terminals
Public Safety LMR
Amateur Radio

Impacts
Infrastructure damaged – backhaul, local
Supporting infrastructure damaged
Access – personnel, supplies, sites
Satellite phones, terminals
Overload (↓ capacity, ↑ demand)
Confusion/Chaos ↑, Coordination ↓

Interoperability

CISA: Ability of emergency response providers and relevant government officials to communicate across jurisdictions, disciplines, and levels of government as needed and as authorized.

FCC: An essential communications link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results.

Interoperability Within Sectors

- Public Safety
  - Analog Narrowband, P25, APCO, NPSTC, ANSI
- Federal Government Civilian Agencies
  - Analog Narrowband, P25, APCO, NPSTC, ANSI
- Military
  - STANAG
  - ACP
  - Analog Narrowband, P25
- All
  - NIFOG (eNIFOG app, Android and iOS)

National Interoperability
Field Operations
Guide

U.S. Department of Homeland Security
Office of Emergency Communications
Version 1.3

Homeland
Security

Interoperability Across Sectors

- Common Channels
- Shared Systems (common talk groups)
- Gateway Devices
- Unified Command / face-to-face coordination

Interoperability in Amateur Radio

- – Common waveforms
  - CW, SSB, RTTY, xPSKnnnx, PACTOR etc.
- – Common Procedures
  - Directed net procedures
  - ITU Phonetic Alphabet
  - Message Formats
    - – Radiogram – Amateur Radio Only
    - – ICS 213 - Everyone

Interoperability Between Federal & Amateur Radio

– Five Channels at 5 MHZ – Federal Gov't primary, Amateur Secondary

– What about State / Local?

• State /local Gov't, critical infrastructure, key resources operating in SHARES are Federal Government radio stations

SHARES Overview

- **SHA**red **RES**ources – 4566 participants
  - HF Radio Stations, Channels, and Operators
- BACKUP
  - Send messages via other agencies' stations
  - Use DHS channels or other agencies' channels
    - SHARES Coordination Net – 141 DHS channels
    - Agency SHARES channels – 218 channels
    - HF email network has 80+ gateways to the internet
- INTEROPERABILITY
  - Federal, State, County EMA, Territorial, PVO/NGO, CI/KR, Medical, Critical supply chain
- SITUATIONAL AWARENESS

SHARES Mission

- <u>Support</u> interoperable emergency communications by radio for national security and emergency preparedness (NS/EP) uses.

- Non-federal stations can register as DHS auxiliary stations ("NCC AUX"), becoming Federal volunteers to gain access to Federal radio channels.

SHARES' mission is to support <u>your</u> mission

NS/EP Comms

NS/EP: National Security or Emergency Preparedness telecommunications. Telecommunications services that are used to maintain a state of readiness or to respond to and manage any event or crisis (local, national, or international) that causes or could cause injury or harm to the population, damage to or loss of property, or degrade or threaten the national security or emergency preparedness posture of the United States.

- Fed Std 1037 C http://www.its.bldrdoc.gov/fs-1037/fs-1037c.htm

- NCS DIRECTIVE 4-3, Interoperability of Telecommunications in Support of National Security and Emergency Preparedness (NS/EP)

Participants

1. Federal Departments and Agencies, including stations of their volunteer auxiliary programs

2. Any State/Local Agency

   – EMA; County EMA, DOH; major cities, isolated locales

3. Critical Infrastructure / Key Resources providers.

   – FCC licenses some - telecommunications, power, pipeline industries

   – SHARES can support more: hospitals, medevac systems, transportation, critical supply chain, etc.

4. National/Regional/International disaster relief organizations

[2,3,4 as DHS Auxiliary ("NCC AUX") volunteers]

Stations participating in SHARES may communicate with the stations listed in 1 through 4, and:

5. *AK Emergency Channel channel at 5.1675 MHz*

6. RACES – Radio Amateur Civil Emergency Service

7. Amateur Radio stations engaged in emergency communications on the 5 Amateur Radio secondary channels at 5 MHz

8. Foreign stations for disaster response coordination

SHARES Is Not …

SHARES is not Amateur Radio
SHARES is not MARS
SHARES is not AUXCOMM
SHARES is not a club

SHARES is a Federal Government Emergency Communications Capability

SHARES depends on technologies and skills developed in Amateur Radio

SHARES Can …

- *SHARES can transmit encrypted messages*
- *… transmit data at higher symbol rates*
- *… operate automatically controlled data stations (message forwarding systems) with no symbol rate or bandwidth restrictions*
- *… be operated by anyone, no operator license*

SHARES Does Not …

- *SHARES does not compete with Amateur Radio*

- *… do Health & Welfare traffic – Amateur Radio is very good at that*

- *… recruit Hams away from MARS or State/Local*

- *… recruit Hams in general*

- *SHARES will register Hams who are:*
  - *Operators of Gov't, CI/KR member stations*
  - *SHARES Winlink RMS Gateway stations*
  - *Current/former MARS, CGAUX radio operators*
  - *In underserved areas*

- *Stations get call signs, not operators*
- *Station licensee determines who is qualified to operate the radio*
  - *Typically employees*
  - *Can be volunteers of their choosing*
  - *Leave your other affiliations at the door – this is not ARES, not RACES, not your opportunity to get publicity or be the savior of Amateur Radio*
- *Emergency personnel register for email distro*

This is me, before reading the email on the next slide:

WHAT - ME WORRY?

"One of our ... ham operators says they aren't interested in SHARES because it requires no FCC operators license.
A secretary can do it!"

This is me, after reading the email on the previous slide:

"One of our older ham operators says they aren't interested in SHARES because it requires no FCC operators license. A secretary can do it!"

1. Police, firefighters, EMTs, recreational pilots and boaters, and administrative personnel of all types have been operating radios for decades without FCC licenses. ALE empowers users and makes radio more reliable. You oppose that?
2. FCC has no jurisdiction over Federal Government radio stations – that is the job of the NTIA
3. Emergency communications is not the exclusive playground of Amateur Radio operators. Your FCC license does not make you an expert in emergency management. LISTEN to what the professionals need and don't think you know better.

The author of that email is exactly the kind of ham who should have nothing to do with emergency management.

Staff, Not Volunteers

- Radio in restricted area, not practical to give access credentials to entire amateur radio group just so one might be available when needed
- Hams have a culture of sharing, not good when information marked "FOR OFFICIAL USE ONLY" gets posted on internet
- Some hams think they are smarter than the professionals and don't follow instructions, which creates more work at the worst possible time - during an emergency
- Some Hams are publicity hounds who bypass PIO.

Early cars required a driver AND a mechanic onboard. Why don't you drive everywhere with your mechanic? Cars improved. So have radios. It doesn't take a highly skilled radio operator to operate most radios. Get used to it.

- SHARES is for those who originate or receive NS/EP messages. That's not Hams at home.
- Hams who are well-trained and well-disciplined can relay or be net control stations. MARS & CGAUX provide all SHARES can use.
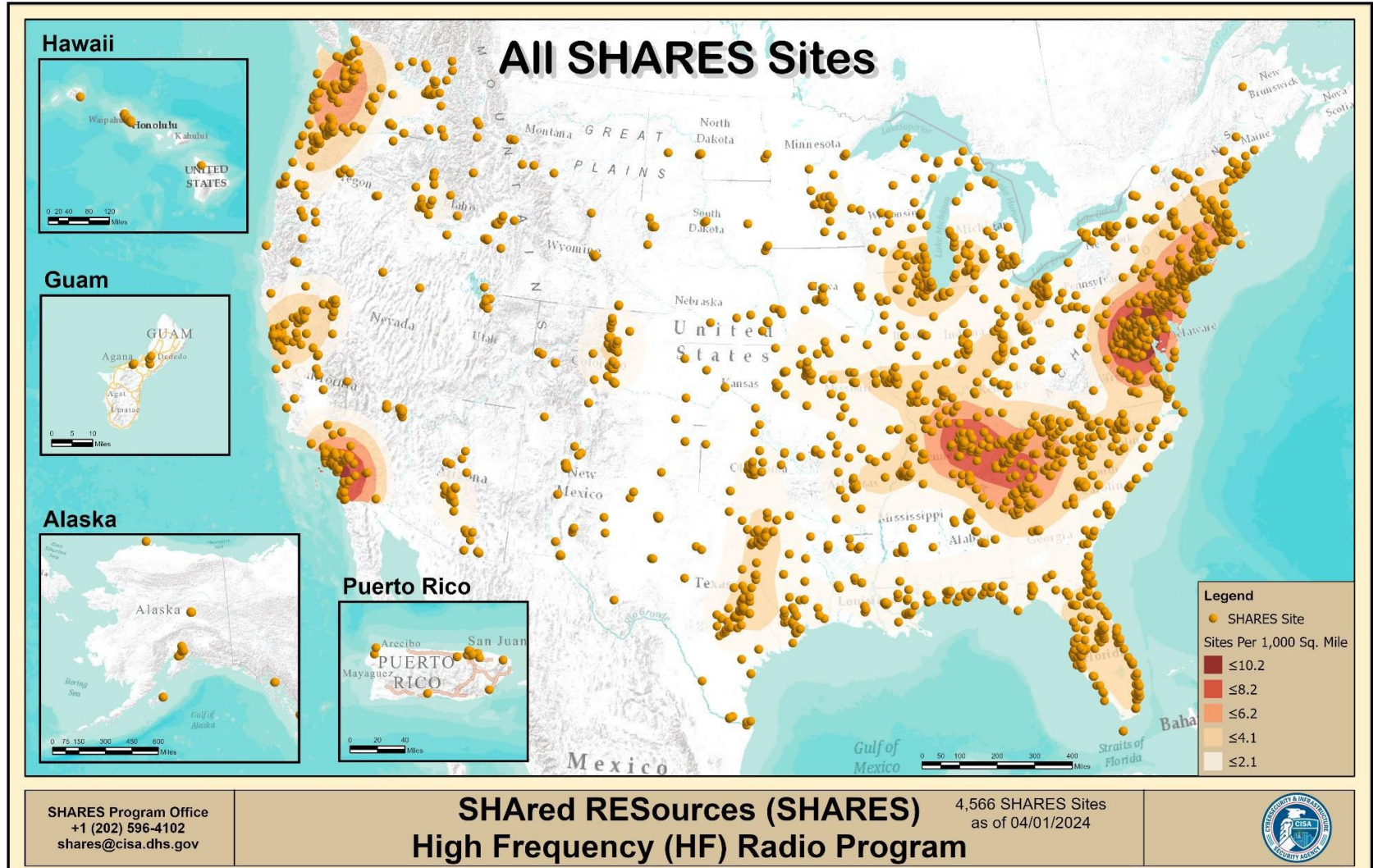
- There are 750,000 US Hams and only 3 people in the SHARES office.
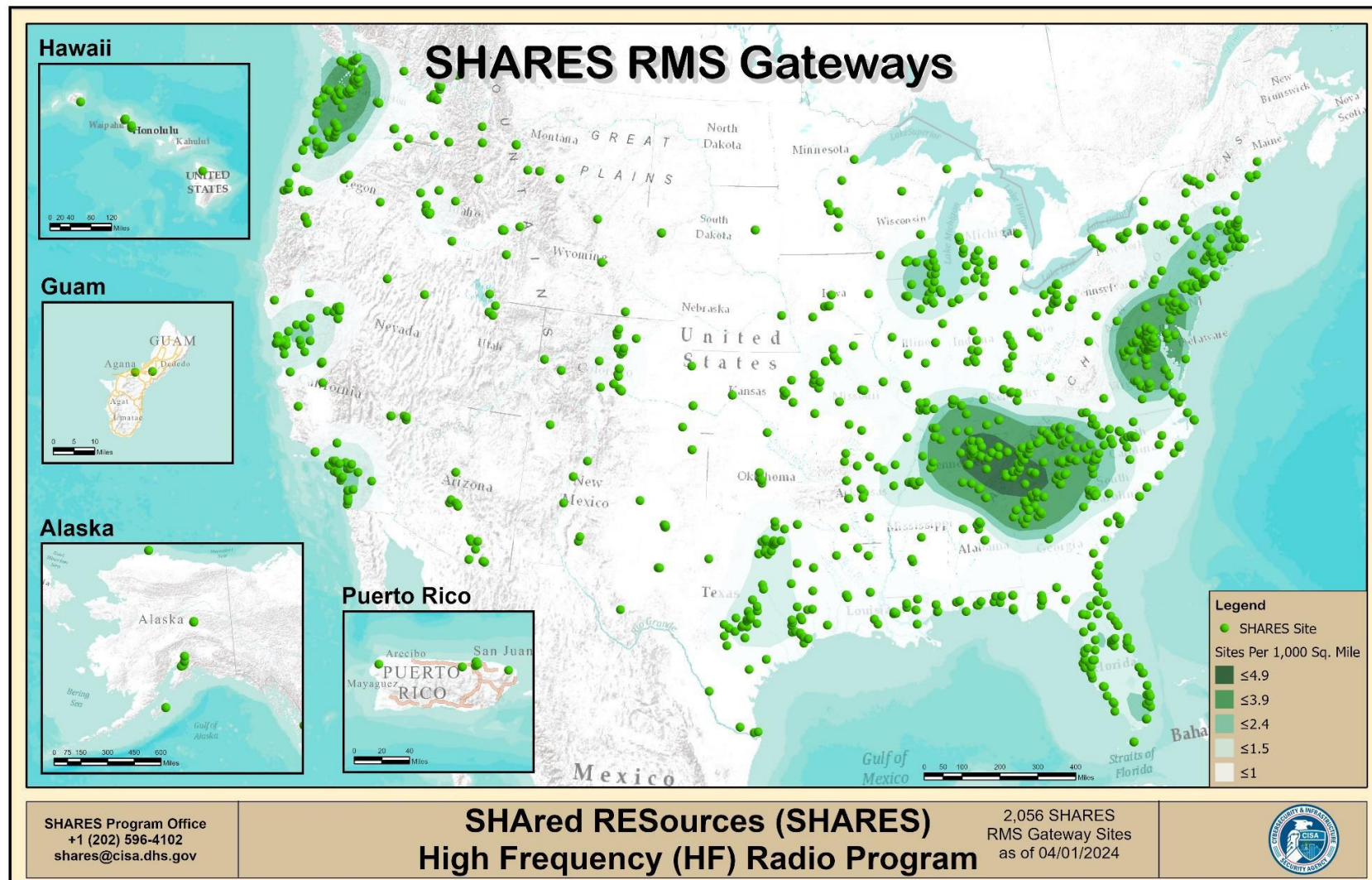- Again, applications are limited to essential need stations.

All SHARES Sites

SHARES Program Office
+1 (202) 596-4102
shares@cisa.dhs.gov

SHAred RESources (SHARES)
High Frequency (HF) Radio Program

4,566 SHARES Sites
as of 04/01/2024

SHARES Stations

SHARES RMS Gateways

SHARES Program Office
+1 (202) 596-4102
shares@cisa.dhs.gov

SHARed RESources (SHARES)
High Frequency (HF) Radio Program

2,056 SHARES
RMS Gateway Sites
as of 04/01/2024