

# Hurricane Recovery Puerto Rico

Analysis of  
the Force Of Fifty

# Purposes

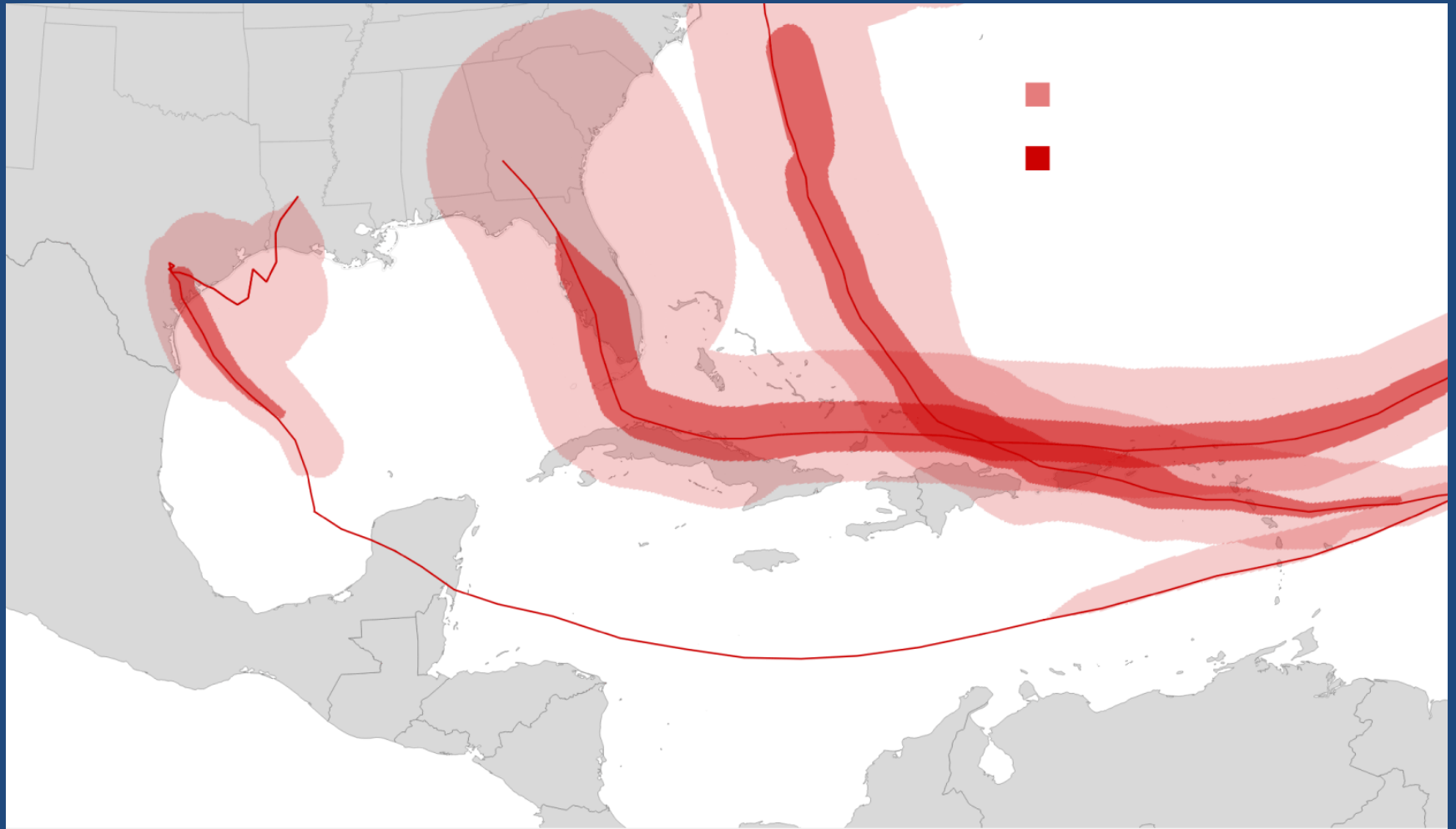
- Some reconstruction of event and response
- What went right
- What went wrong
- What can be done better next time
- This can happen to you
- This ~~can~~ will happen to us

# Parameters

- First-hand accounts only
  - Force of Fifty volunteers
  - Puerto Rico hams
  - ShaRes ham
- Telephone, email, forums, media interviews

# Irma—October 5

## Maria—October 18



# Wednesday

- Power grid destroyed
- Flooding
- Roads blocked and bridges destroyed
- No potable water and no sewage pumping
- Homes destroyed
- Local phone service out
- Cell phone coverage out
- Public service radios and 911 out
- Food shortages
- Fuel shortages
- No banking
- No US Mail
- No newspapers, no broadcast radio or TV
- Hospitals lose backup power





Photo credits: N5TGL, N0CSM, N3CKF





# Then Things Got Worse

- No jobs
- Vulnerable populations
- No garbage pickup
- Gangs at night
- Generators fail
- Generators stolen
- Fuel stolen

# Thursday

## Local Hams Respond

- 4580 amateur licensees in Puerto Rico
  - 500 active and regular licensees
  - 198 UHF/VHF repeaters, some coordinated, some not.
  - Four repeaters survived.
- On the air 146.52, 146.59 team coordination
- Emergency power
- Net established
- Simplex relay
- Deploy to emergency offices and municipalities under RACES
- Tasking by electrical utility and police
- Licensing requirements waived
- Repeaters slowly restored, 100 percent by Day 20
- Operation limited to daylight hours for security



# Friday

- 10:30 p.m. Red Cross calls ARRL for assistance
- MOU in place
- 50 operators for three weeks in Puerto Rico
- Red Cross has never made this kind of request
- ARRL has never responded to this kind of request
- ASAP

# Saturday

- Conference call
  - Safe and Well traffic from Red Cross shelters
  - ARRL to recruit, screen, and equip
  - Red Cross to screen, transport, deploy, and support for 21 days
- Email to ARRL members
- Online and RF announcements
- Approach equipment suppliers

# ARRL Qualifications

- General or higher license
- Strong technical skills
- Work under difficult conditions
- Deploy for up to three weeks
- Work as part of a team
- Familiarity with WinLink, HF voice, and VHF simplex
- Helpful Skills
  - Spanish
  - Prior disaster response
  - Red Cross volunteer
  - Shelter experience

# Sunday

## Ham Aid kits

- 25 HF Radios Icom 7200 (built-in sound card)
- 40m dipole antenna and cable
- Tuner
- Laptop (Red Cross)
- 12v power supply
- Tool kit, manual
- Pelican box
- Box with UHF HTs ICOM V-82 (6 AAs each)

# Sunday

- 350 volunteers respond via email
- Ham Aid kits assembled in Newington \$75,000
- Winmor for Safe-and-Well traffic
  - Winlink administrator advises against Winmor
  - Offers
    - Licenses off amateur bands through FEMA
    - Pactor IV modems
    - FCC speed waiver in place
    - ARRL declines



# Monday

- Some phone screening by ARRL
- Screening by Red Cross
  - Email questionnaire
  - Phone call from nurse
- 23 selected
- Personal equipment
  - Red Cross hazard codes and checklist
  - Food bars
  - Water purification
  - No radios

# Tuesday

- Pack
- Airline tickets
- 19 travel to Atlanta, 4 designated for USVI
- Equipment boxes shipped overnight to Atlanta from Newington
- Cots in conference rooms
- Press release: “Force of Fifty”

# Wednesday

- Volunteers processed by Red Cross at Atlanta hotel
- Leadership
- Meet equipment
  - Winlink accounts and training
  - Read manuals
  - Dummy loads from local ham club
  - \$1,000 in additional supplies with Red Cross credit card
- Cached Google maps
- Conference call with ARRL recommends delay
  - More training
  - More screening
  - Allow Red Cross to re-strategize



jetBlue E 36  
jetBlue 8:00 AM  
SAN ALAN  
HOVH 8:00A

E 37  
8:15 AM  
SAN ALAN  
HOVH 8:00A

Baggage Claim  
Ground Transportation

EXIT

EXIT

# Thursday

- 4am to airport
- Red Cross unprepared for weight of equipment
- San Juan via FEMA Jet Blue charter
  - DHL trucks requisitioned
  - Sleep on church pews several nights
  - Generators and solar panels never shipped

# Kein Plan überlebt die erste Feindberührung

Moltke the Elder

(no plan survives contact with the enemy)

# Friday

## the mission begins

- Safe-and-Well mission scrubbed
- Bottom-up planning and organization
- Install net control station on HF
- Local RACES 2 meter net
- Other networks and NGO hams
- FEMA Communications task force at EOC—ICS 205
- Meetings about the next meeting
- Hams craft a strategy and Red Cross approves

# Force of Fifty deploys

- Net control at Red Cross HQ
  - Joe W1CN steps up as IC for hams and net control
  - 7.085 for Winmor and tactical
  - Local 2m net
- FEMA EOC
- Guajataca Dam—7.5 hours
- Mayaguez shelter
- Yuncos fire station
- Culebra island hospital





# Hams deploy

- Heil Sound headsets shipped
- Perishables, water, MREs
- Safe haven at fire stations
- Survey of 52 hospitals
- Hams to 14 Hospitals
- Red Cross reunification teams
  - Red Cross mobile radios discovered
  - ARRL HTs
  - FEMA antennas
- Unused equipment cannibalized
- Winlink Telnet via cell phone hot spot



# Remember

- Nothing like this ever attempted by ARRL or Red Cross
- The devastation was far beyond anything ever seen
- Puerto Rico is 1,150 miles from the US

# Other Duties As Assigned

- First aid
- Anything to do with communications
- Prepare landing zone
- Survey local needs
- Distribute food
- Driver and team member





# Demobilization

- No renewal by Red Cross after 21 days
- FEMA SHARed RESources HF
  - 10 Federal employees on loan
  - Own equipment
  - Did not replace Force of Fifty
  - Priorities changed daily
- Ham Aid equipment shipped back to ARRL
- Return to CONUS
  - ARRL request for after-action responses
  - Intense feelings about ARRL
  - Many willing to do again



# What Went Right

**“The Amateur Radio community was widely recognized as having accomplished the assigned tasks and, genuinely surprised many with its innovation, capabilities and reliability.”**

**“the Red Cross did an excellent job providing us with information to prepare to equip and provision ourselves.”**

# What Went Right

“The Winlink team has been very supporting of our efforts by making several gateways private or EMCOM, turning beams our direction, increasing the power output of some stations, offering suggestions for better operations...

they created an NCS Winlink address so that the rotating position for NCS wasn't tied to a single operator and, they created a form for us after a specific format was developed for the field deployed operators to use for request.”

# Issues

- Hot climate and no AC. Sealed buildings untenable.
- Rain
- Devastation
- Power grid out and unreliable
- Generators designed for short term failed
- Potable water
- Land navigation
- Traffic safety
- Physical safety
- Language

# Issues

- Lack of clear understanding of capabilities of amateur radio
- Volunteer qualifications and screening
- Leadership
- 40 meter band conditions
- Winlink connections 1,150 miles away
- Pactor IV modems not deployed
- RFI
- Malicious interference

# Issues

- UHF/VHF radios not deployed
- Power sources not deployed
- Icom radio glitch
- Satellite phones
- Advance liaison and collaboration
  - Local groups and licensees
  - Local repeaters and nets

# Issues

- Not enough hams
- Not enough equipment
- Equipment “inappropriate” to mission
- Equipment redundancy
- Winlink knowledge
- Illness and fatigue
- Conduct
- Lodging and sanitation
- Radio operator vs. Red Cross volunteer
- Planning

# Lessons Learned

- Need for clear understanding by served agency of capabilities of amateur radio
- “No” can be the right answer

# Lessons Learned

- Screening
  - Training
  - Activation history
  - Skill
    - Equipment
    - Operation
  - Physical Suitability
- ComT and ComL advance team



# Lessons Learned

## Equipment

- Standardization vs. BYO
- All bands
- Cable and accessories
- Redundancy
- Rechargeable batteries
- Winlink
- Power spikes
- Refuse nothing

# Lessons Learned

- Volunteer accountability
  - Performance
  - Conduct
- Early clear lines of authority
- Red Cross deployment of communications teams
- Continuing logistics for volunteers
- Red Cross has 47 mHz radios

- Planning
  - Local resources
    - Repeaters
    - Licensees
  - ARES groups and RACES structure
  - NGOs
  - FEMA SHARES

# Craig McVeay NØCSM

- Run a **directed** net, set expectations and procedures, operating times
- Updates to deployed operators “Team Mushroom”
- Traffic management and message handling
- Dedicated NCS operators

# Joe Bassett W1WCN

- Uneven experience levels
- 20 “volatile” personalities
- Volunteers not qualified and not suited
- Everything learned could have been foreseen
- “Red Cross did an excellent job providing us with information to prepare to equip and provision ourselves.”
- “ARRL leadership should never have agreed to the mission as outlined by the ARC.”

# Scenario I

- Catastrophic earthquake
- ARES activates in support of City and neighborhoods
- Unlicensed operators
- Red Cross coordinates with ARES for support
- NGOs import hams as their own assets
  - Unknown to ARES team
  - Use amateur bands and repeaters
- FEMA communications task force
- SHARES operators on HF

# Scenario II

- Request for volunteers outside home jurisdiction
- Establish mission and needs
- Establish leadership structure
- Guarantee volunteer suitability
- Organize a cohesive team
- Identify logistic support
- Establish mission end and rotation
- Continue to verify team support

# Sources

- *Ham Radio Now* episode 359 “Force of Two”
- *Ham Nation* episode 323 – three volunteers
- Wey Walker K8EAB
- Jeremy Dougherty NSØS
- Craig McVeay NØCSM
- Joe Bassett W1WCN
- Harold Roll KM4FUD
- Justo Yambo WP4PEG
- Jim Drowne KP3BR
- Loring Kutchins W3QA
- Michael Logan KM4WUO
- Joe Pistritto, N3CKF
- Jim Hughes KI7CTF
- Gary Sessums KC5QCN