



Merrimack Valley Digital Network

Partners and collaborators
are a key success factor

Key Topics

- Partners and collaborators are vital to success
- Primary focus on AREDN microwave network
- Network management information is vital
- Microwave RF is subject to tropospheric effects
- Portable / mobile microwave streaming video for community events

Acknowledgements

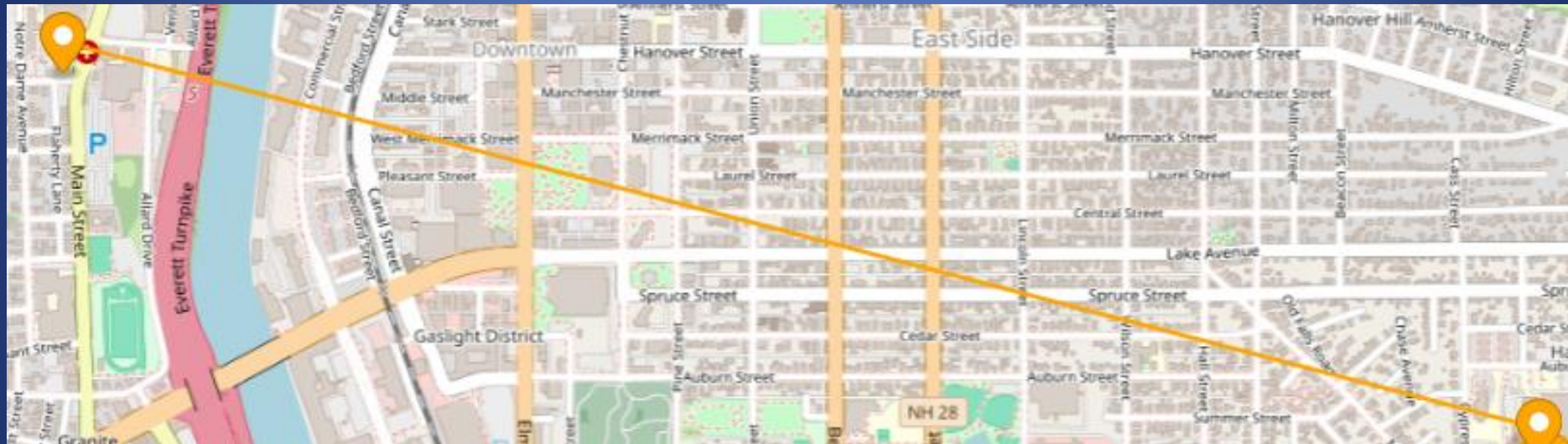
- **Amateur Radio Digital Communications (ARDC) Grant**
- **Partner - New England Digital Emergency Communications Network (NEDECN) -- 90+ DMR repeater sites**
- **Collaborators**
 - Central New Hampshire Amateur Radio Club
 - Capital Area Repeater Society
 - Manchester, NH area agencies and hospitals
 - Pembroke, NH Fire Dept
 - Goffstown, NH Police Dept
 - Fred Kemmerer AB1OC – Tunnel gateways, camera server, data backup
- **Organizations and individual radio amateurs who generously volunteer time, money, equipment, expertise, and site access**

WHY MVDN?

- Emergency Preparedness
- Community Support
- Recent Technology
- Life-long Learning
- GHz Spectrum Defense

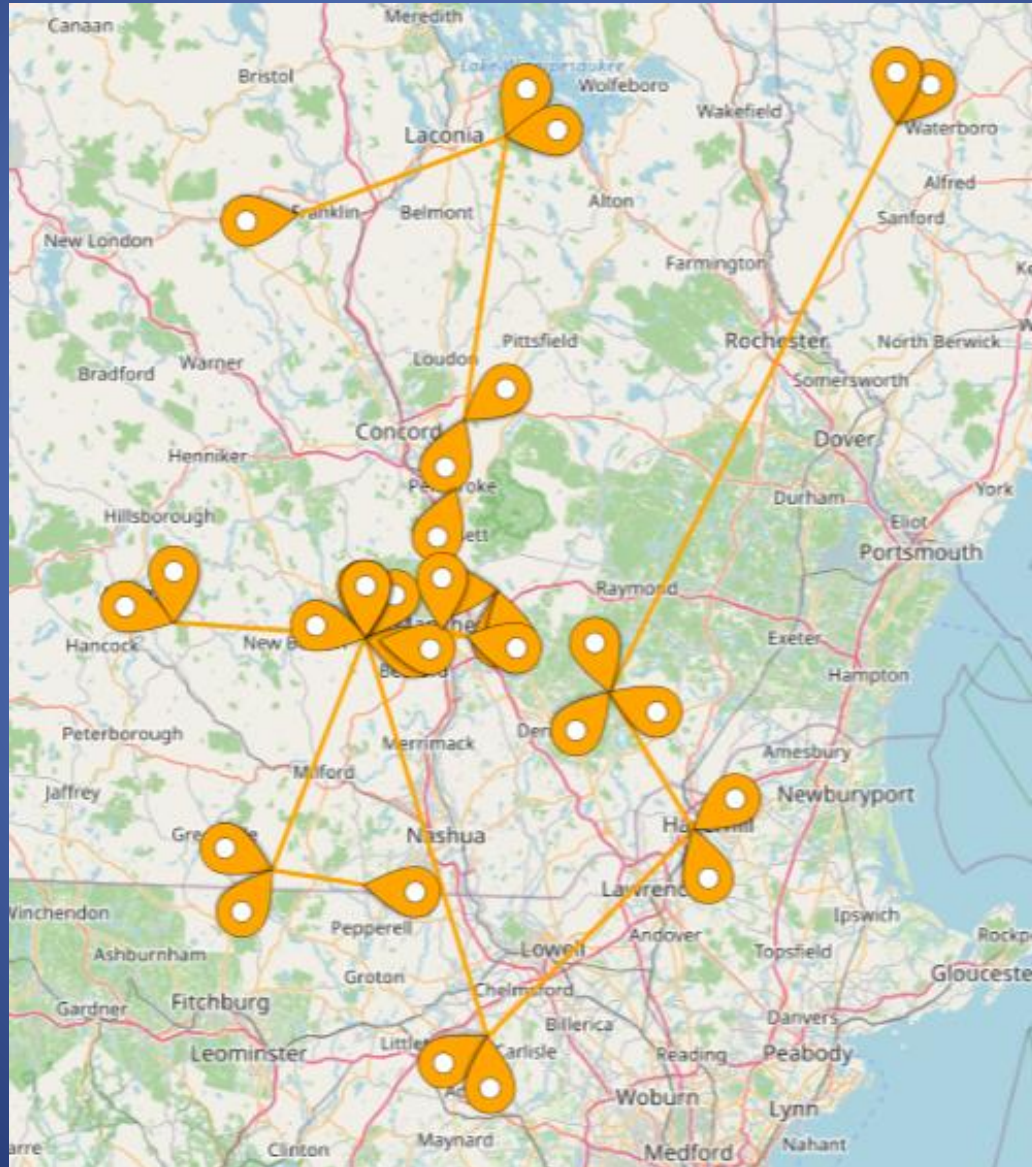
Merrimack Valley Digital Network in 2020

Two 5GHz AREDN Nodes



Merrimack Valley Digital Network in 2026

Forty-two AREDN Routers & Sixteen 5GHz Sites



Example Backbone Nodes at DMR Repeaters

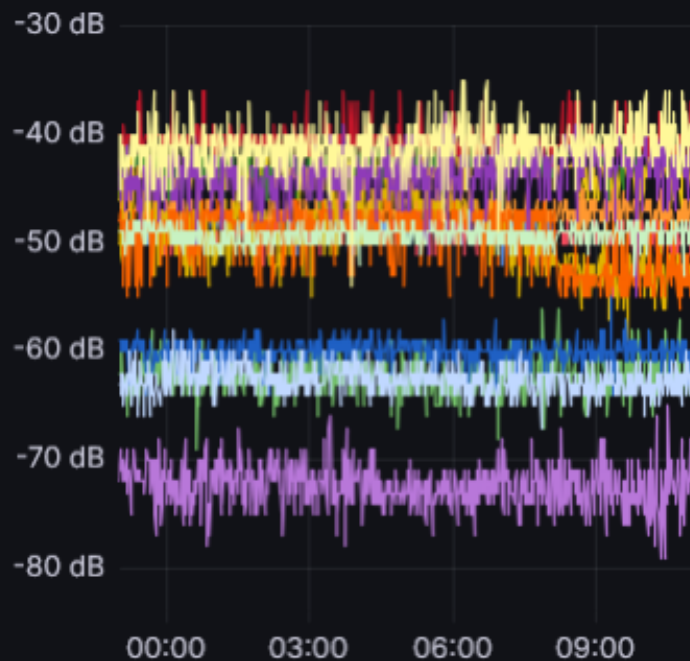
AREDN increases DMR resilience with multiple paths to the c-Bridge



Grafana Dashboard for Network Monitoring

Configured by Bryan King KX1B using
Prometheus to collect data from nodes
Runs on server at AB1OC

Signal Strength



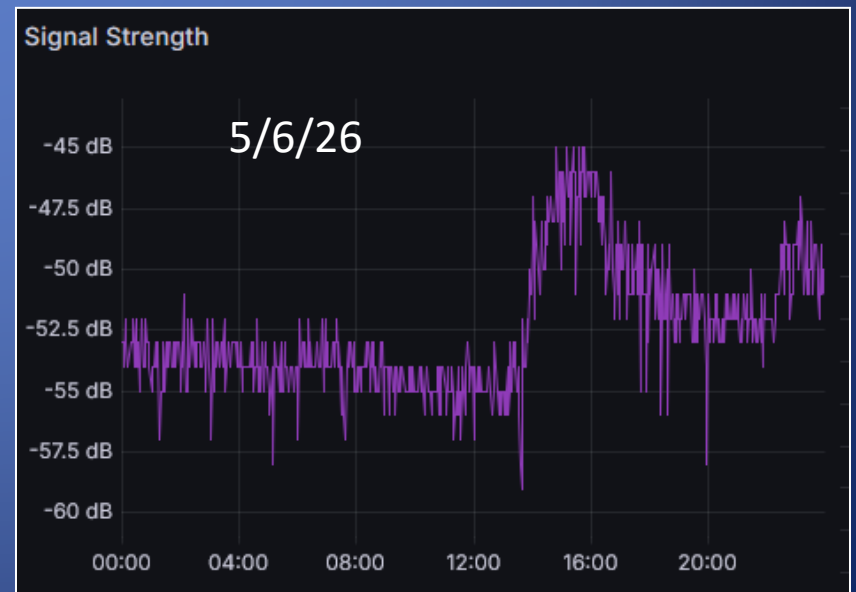
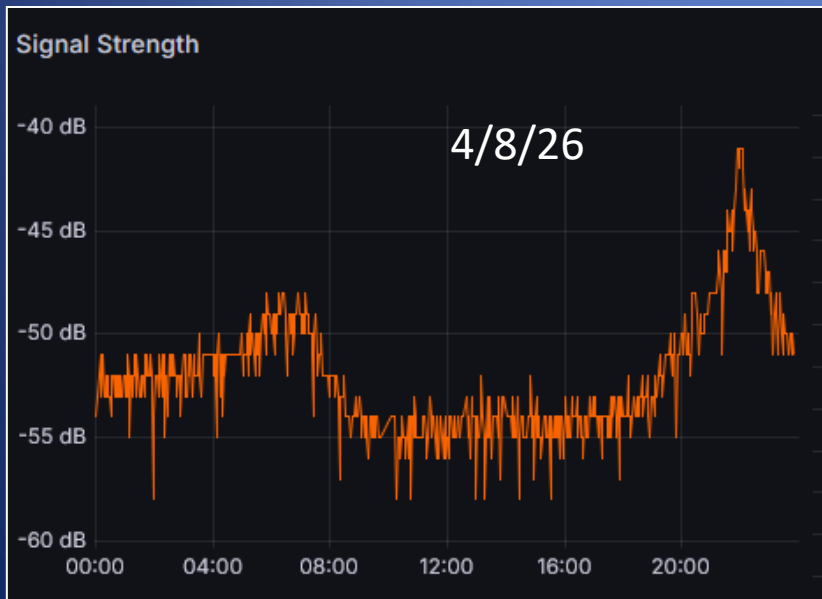
Name ^	Mean	Min	Max
n1mva-gunstock-nh-fri	-62.2 dB	-69 dB	-56 dB
n1mva-gunstock-nh-plw	-43.4 dB	-47 dB	-40 dB
n1mva-hollis-nh-msn	-48.6 dB	-52 dB	-46 dB
n1mva-mason-nh-hls	-47.2 dB	-50 dB	-44 dB
n1mva-mason-nh-unc	-49.3 dB	-55 dB	-47 dB
n1mva-pembrokeeoc2-nh-plw	-72.4 dB	-79 dB	-65 dB
n1mva-plausawa3-nh-gun	-42.6 dB	-47 dB	-40 dB
n1mva-shapleigh2-me-chs	-49.2 dB	-59 dB	-41 dB
n1mva-uncanoonuc-nh-crt	-60.1 dB	-64 dB	-55 dB
n1mva-uncanoonuc-nh-ehs	-49.6 dB	-56 dB	-46 dB
n1mva-uncanoonuc-nh-ehs	-40.5 dB	-43 dB	-36 dB

Troposphere Affects 5GHz Propagation



**Shapleigh, ME
looking towards
Chester, NH
48 miles away**

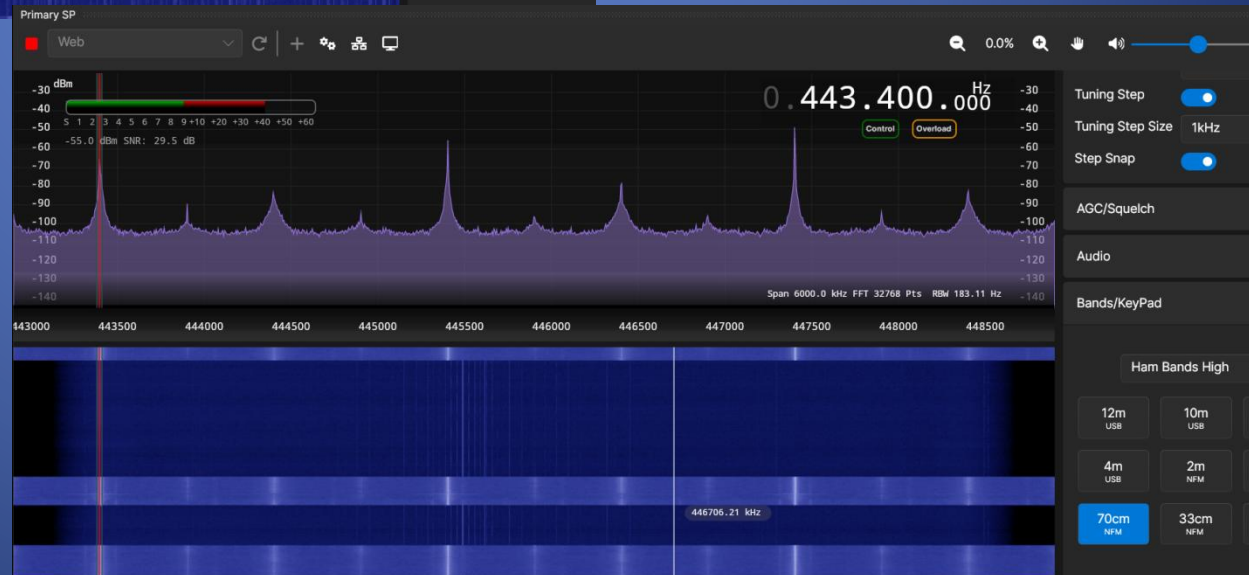
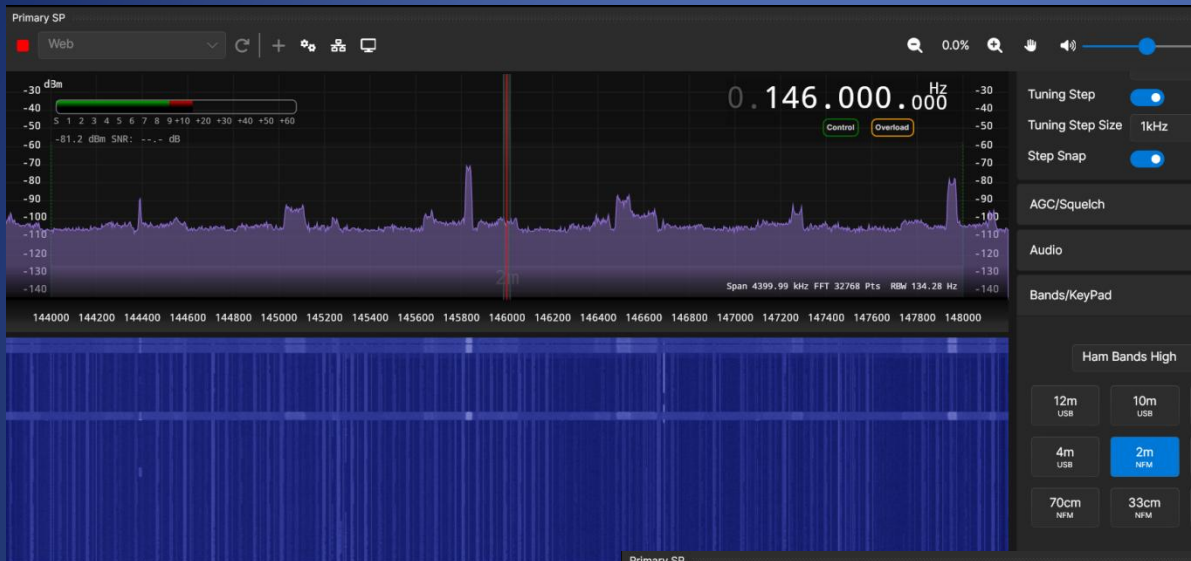
Shapleigh - Chester Ducting on 4 Different Days



Streaming Video for Weather & Wildfire Watch



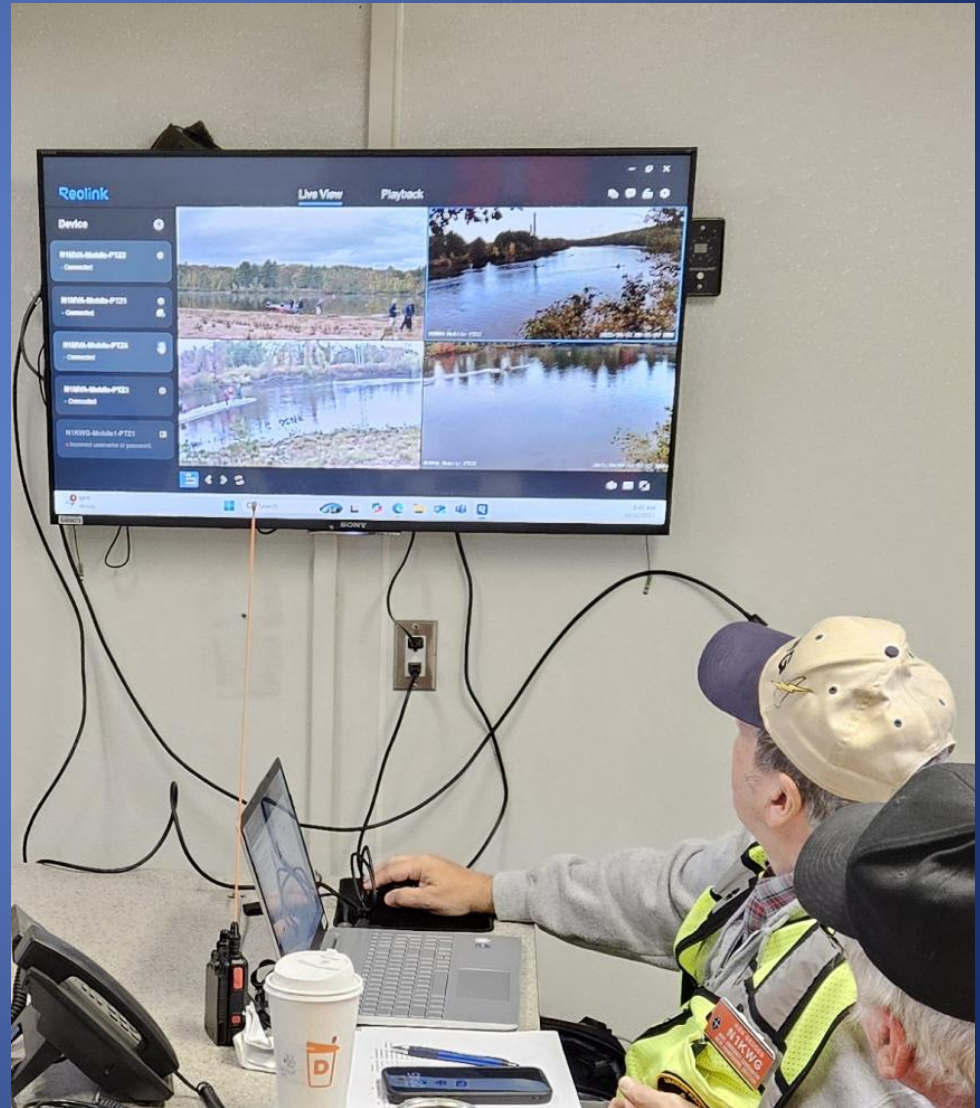
Remote 2m & 70cm Spectrum Analysis WebSDR on South Uncanoonuc



Portable / Mobile Video for Events

- NH Championship Regatta – October 2025
- Amherst German Market – December 2025
- Pack Monadnock 10-mile Race – May 2026
- Prouty 2-day Fund Raiser for Cancer Research
– July 2026
- HamFest Demos

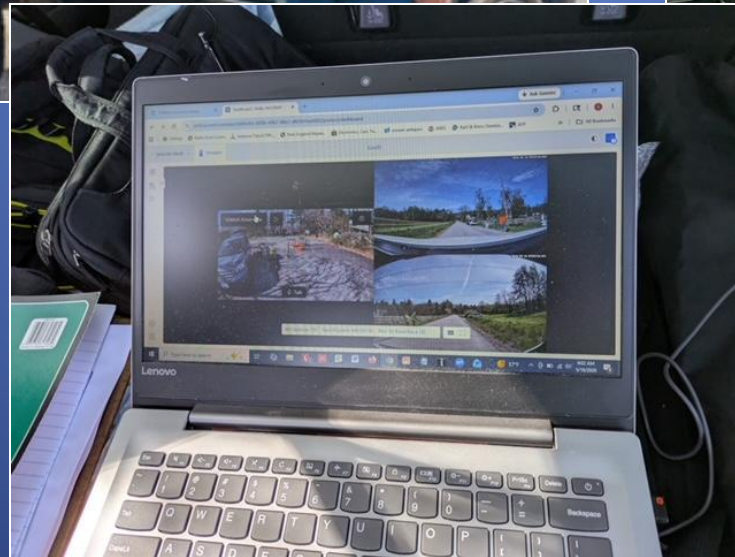
Left - Camera node & Starlink at Regatta start line 3 miles upstream
Right - Four cameras streaming video to ops trailer in
main staging area for situational awareness on the river



Pack Monadnock 10-mile Road Race

First Test of Mobile-in-Motion Video

AREDN 5GHz + Starlink





Supporting The Prouty Cancer Fundraiser with Mobile-in Motion Video for 2 days via AREDN and Starlink

Play Video at
Link Below
These Slides



Hamfest Demonstrations



