Flood and Severe Weather Response

Floods, hurricanes, tornadoes, and severe winter storms each create different communication challenges. This page covers how mesh networks support response operations across severe weather scenarios.

Flood-specific considerations

Equipment waterproofing

Water is the primary hardware risk in flood scenarios. All field equipment should be in IP65+ rated enclosures or waterproof cases during flood response. For personal nodes:

- T1000-E: IP65 rated - can operate in rain and light water exposure
- T-Echo: Not rated; put in a small zip-lock bag or simple waterproof case during rain operations
- Heltec V3/V4: Not rated; laptop bag or waterproof case required

Elevated deployment

Flood scenarios require nodes to be deployed well above the anticipated flood level. Ground-level repeaters in flood zones should be identified and planned for relocation to higher sites during flood events. Maintain a pre-planned list of above-flood-level backup sites for your mesh repeaters.

Hurricane/tropical storm preparation

Before a storm:

1. Secure or remove antenna masts from exposed locations - a 5 dBi fiberglass vertical in 100 mph wind can become a projectile or bend the SMA connector
2. Verify all solar-powered nodes have full battery charge before the storm
3. Activate the community mesh "storm watch" channel if your network has one
4. Distribute personal nodes to participants who don't have them
5. Confirm that key participants know the channel name and PSK without needing to look it up

During a storm:

- Minimize transmissions to reduce battery drain on nodes that may not see sun for days
- Use standard welfare check format to efficiently survey neighborhood status
- Note that LoRa range is reduced in heavy rain due to signal absorption (minimal effect, but measurable at >50mm/hr rainfall)

Winter storm and extended power outage

Multi-day ice storms and blizzards create extended power outages with dangerous conditions that prevent physical access. Key preparations:

- **Battery sizing:** Solar panels under snow produce no power. Ensure battery autonomy covers the longest expected outage without sun - in northern latitudes, this can be 5 - 10 days during winter storms.
- **Panel tilt:** Steep panel angle (60 - 70° from horizontal) helps snow slide off and maximizes winter sun capture when panels are clear.
- **Cold battery performance:** LiFePO4 batteries lose capacity at −20°C. Size battery 20 - 30% larger than minimum calculation to account for cold-weather performance reduction.
- **Personal node operation:** Keep personal nodes in warm pockets - battery capacity drops sharply in cold. Charge from vehicle power banks if grid is out.

Net operating procedures for severe weather

Welfare check format

```
STATUS REPORT
Node: [NODE-NAME or callsign]
Location: [neighborhood or cross street]
Status: [OK / NEED-ASSIST / EMERGENCY]
Injuries: [none / n minor / n serious]
Power: [on / out]
Notes: [any relevant info]
```

Priority message tags

Pre-establish a priority system for your community net:

- **[ROUTINE]:** General updates, non-urgent status
- **[PRIORITY]:** Important but not life-threatening (road closed, shelter open)
- **[EMERGENCY]:** Immediate life-safety issue requiring response

All participants should know that [EMERGENCY] messages trigger immediate net control response and that they should not use the tag for non-life-safety situations.

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