The HWN Report

The Official Newsletter of the Hurricane Watch Net

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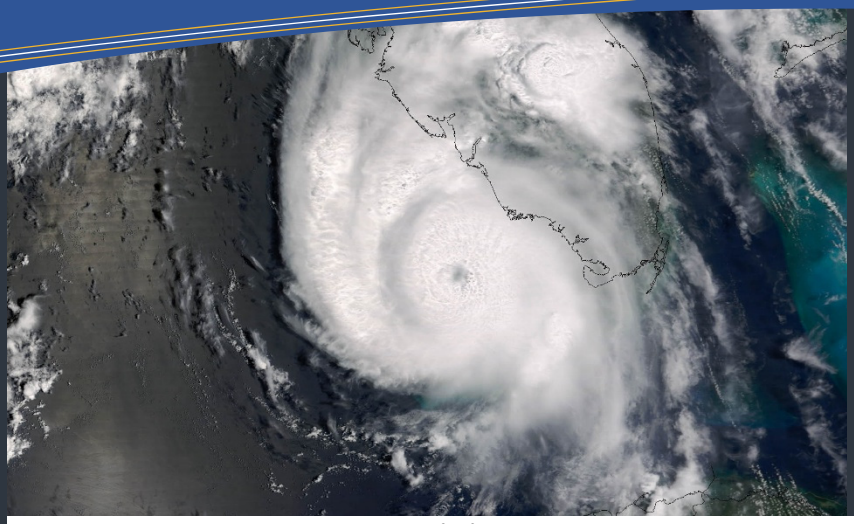

Hurricane Charley 2004

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COMING SOON

Earlier this year, we announced plans to launch a new video podcast on our YouTube Channel, youtube.com/HurricaneWatchNet. While life and other responsibitilies temporarily delayed our rollout, the idea was never forgotten.

We are excited to share that the video podcast is now scheduled to launch over Labor Day Weekend.

This new series will feature in-depth discussions on tropics weather, the rich history of amateur radio's involvement with the National Weather Service and the National Hurricane Center, hurricane preparedness tips, and much more.

Stay tuned—we're just getting started!

Hurricane Charley: When Ham Radio Was the Lifeline

In 2004, Florida endured one of the most destructive hurricane seasons in recent memory. Within just six weeks, four named hurricanes—Charley, Frances, Ivan, and Jeanne—made landfall in the state, testing emergency response systems, infrastructure, and the resilience of entire communities. It was a true trial-by-fire for everyone, including amateur radio operators.

- **Hurricane Charley** hit the southwest coast in mid-August as a powerful Category 4 storm, causing widespread wind damage across central Florida.
- **Hurricane Frances** came ashore on the east coast weeks later, bringing prolonged rain and flooding.
- **Hurricane Ivan** made landfall in Alabama but caused severe damage in the Florida Panhandle, especially around Pensacola.
- **Hurricane Jeanne**, cruelly, made landfall almost exactly where Frances had struck, worsening already devastated areas.

The rapid succession of storms overwhelmed communities, emergency services, and recovery efforts across the state, making 2004 a uniquely challenging year for Florida.

The 2004 season was a turning point, reminding us how vulnerable even well-prepared regions can be. Among the most memorable storms was Hurricane Charley—not just for its power, but for the critical role amateur radio played during and after the storm.

The Official Track of Hurricane Charley 2004

In this month's newsletter, we revisit Hurricane Charley.

Hurricane Charley struck with astonishing intensity. It wasn't just the force of the winds or the path of destruction that made Charley historic—it was also a turning point in how amateur radio operators once again proved themselves as an essential part of emergency communications.

Hurricane Charley was the strongest hurricane to strike the U.S. since Hurricane Andrew in 1992. It later tied with Hurricane Ian (2022) as the strongest on record to hit that part of the state of Florida.

The Setup: A Sudden and Rapid Threat

Charley formed on August 9, 2004, south of Barbados and rapidly intensified as it swept through the Caribbean. By August 11, it reached Category 1 status. The Hurricane Watch Net (HWN) activated immediately, tracking the storm as it brushed Jamaica and intensified further.

Charley slammed into western Cuba on August 12 as a Category 3, causing serious damage and four fatalities. It then crossed into the Gulf of Mexico.

In a historic twist, Charley followed Tropical Storm Bonnie, which had struck northwestern Florida less than a day earlier—marking the first time on record that two named storms hit Florida within 24 hours.

The Strike: A Storm That Defied Expectations
Forecasters initially expected a direct hit on Tampa Bay, prompting evacuations of more than 2 million people. But just six hours before landfall, Charley veered right, catching many off guard.

The storm made landfall on Captiva Island around 3:45 PM EDT on August 13, then plowed through Punta Gorda, Port Charlotte, and Central Florida with sustained winds up to 145 mph and gusts over 165 mph.

It left behind a path of destruction:

- Punta Gorda Airport saw aircraft tossed like toys.
- Zolfo Springs was completely cut off for 48 hours.
- Winter Park lost massive oak trees that crushed homes, vehicles, and power lines.
- Orlando metro was battered by gusts over 100 mph.
- Arcadia and Wauchula suffered widespread damage and power loss.

Captiva Island - By Tampa Bay National Weather Service

Charley moved quickly—up to 25 mph—which helped it retain hurricane strength far inland, exiting near Ormond Beach before being absorbed by a frontal system near Massachusetts on August 15.

In total, the storm caused over $17 billion in insured damages and claimed 10 lives, becoming the second-costliest U.S. hurricane at the time.

When Ham Radio Stepped In
Amid this chaos, one form of communication remained steady: amateur radio.
With phone lines down and cell towers crippled, ham operators became the eyes and ears for emergency managers, shelters, and the National Weather Service.

- In Charlotte County, hams had emergency stations running within 20 minutes of landfall.
- In Zolfo Springs, a lone operator with an HF rig and generator maintained contact for two days until help arrived.
- ARES® and SKYWARN® volunteers were often the only link between isolated communities and emergency services.

Operators worked tirelessly from EOCs, hospitals, shelters, and field setups, relaying damage reports, road conditions, power outages, and welfare traffic. The Hurricane Watch Net, WX4NHC at the National Hurricane Center, and local repeaters were flooded with vital traffic.

Charley's last-minute course change proved especially dangerous—originally forecast to hit Tampa, it struck Punta Gorda with little warning.

Punta Gorda, Florida - post Charley
By Andrea Booher

Key Lessons from Hurricane Charley
Hurricane Charley hit Florida fast and hard, and it left behind more than just damage—it taught us a lot. Here are some of the key takeaways that still apply today:

1. **Don't focus only on the forecast line.**
   Charley was originally expected to make landfall near Tampa, but shifted south and hit Punta Gorda with little warning. The lesson? Always prepare for the *entire cone of uncertainty*, not just the center line. Storms don't always follow the script.Small storms can be deadly – Charley was compact but intense.
2. **Small storms can still do big damage.**
   Charley was compact, but it packed winds of 150 mph. It tore
3. **Communications can (and do) fail.**
   Cell towers, phone lines, and internet were wiped out in many areas. That's where amateur radio stepped in. Hams helped relay real-time updates and kept emergency services connected. It's a reminder of how valuable radio operators are when everything else goes down.
4. **Storm speed doesn't mean less danger.**
   Charley moved quickly across Florida, but that didn't make it any less destructive. In fact, its speed gave people less time to react—and the storm still caused widespread damage.
5. **Building codes matter.**
   Homes built to post-Andrew standards fared better. Stronger construction meant fewer roofs peeled off and fewer walls collapsed. It's proof that good building codes can save lives and reduce loss.
6. **Inland doesn't mean safe.**
   Many folks evacuated inland thinking they'd avoid the worst—but Charley didn't just affect the coast. It tore through Central Florida, including Orlando and surrounding areas. Bottom line: hurricanes don't stop at the beach. Hurricane Helene in 2024 reminded us of this fact.
7. **Messaging needs to improve.**
   Too many people were caught off guard because the focus stayed on Tampa. We learned that public messaging needs to emphasize that storms can shift—and quickly..

Preparing for the Next Storm
Today, we are better equipped—but we can never afford to be complacent. Each storm season brings new challenges. Here are ways amateur radio groups can stay ready:

- Conduct regular multi-agency drills
- Keep go-kits packed and updated with tested equipment
- Engage in digital communications training
- Build partnerships with county EMAs and the Red Cross
- Mentor younger hams and promote licensing in schools and youth organizations

Final Thoughts
When the winds howl and infrastructure crumbles, amateur radio still stands. In 2004, Hurricane Charley showed us the value of preparedness, the necessity of adaptability, and the unmatched dedication of volunteer communicators.

Hurricane Charley's name may have faded from public memory, but for those of us in the amateur radio community, it remains a vivid reminder of what we're capable of—and what's still at stake.

We were the lifeline in 2004. Let's make sure we still are in 2025 and beyond.

The "Tempest°" Weather Station - Review

By Dick Seeley, N8NIF

It finally happened, my LaCrosse weather station died earlier this spring. After more than 10 years of service, and having already replaced the transmitter once, the wind sensor and transmitter finally gave out. Since the parts are no longer in production and unavailable, it was clearly time to upgrade.

Several of my ham and weather enthusiast friends had moved away from traditional weather station gear and purchased the Tempest unit, which uses all-inclusive sensors instead of individual components with wires connecting them. So, my research began! I started by asking friends about their likes and dislikes, then moved on to the plethora of YouTube videos for their reviews and comments. Based on those personal recommendations and online reviews, I decided to go with the Tempest weather station.

Tempest Weather Station and App

Shown with Optional Bird Protector

I bought my unit directly from Tempest during one of their periodic sale days—they offer a few throughout the year if you sign up for their emails. (Which, I might add, are few and far between; they are not spammers by any means.) I saved $70 on the purchase. I also added the bird protector to prevent birds from perching—and pooping—on top of the unit. The bird protector cost an extra $6. Side note: I'm not sure why this isn't included by default. I don't know of *any* place in the world that doesn't have birds!

Shipping was quick, just two days from Florida. Setup took about 15 minutes, including downloading the app. I mounted the unit on a tripod and pole from an old TV antenna I had removed. The mounting bracket for the pole is included with the unit.

Things I Like:

- Easy setup and user-friendly.
- Self-charging internal battery.
- Completely maintenance-free.
- Well-designed phone and tablet app.
- Reports are extremely accurate close to alternate weather stations.

Things That Could Be Better:

- App history broken into days instead of current, weekly, monthly, etc., without having to go through the cumbersome scrolling.
- There's no physical monitor included with the unit.
  My work around was to take a retired android tablet and/or iPad and load the app to display it constantly.

Things I Can't Speak To:

- My backyard has a privacy fence left over from a previous pool installation. Because of this—and surrounding neighborhood houses—my wind speed readings aren't accurate.

I like and use this Tempest weather station regularly. I hope you find this quick review helpful!

For more information and where to buy, please visit:
https://tempest.earth

From the Manager

By Bobby Graves, KB5HAV

Welcome back to *"The HWN Report"*! Our last issue went out in March, and while there's been a bit of a delay since then, we're excited to be publishing again – and we truly appreciate your continued interest and support of the Hurricane Watch Net.

Each spring, I have the honor of attending the National Hurricane Conference. This year's event took place April 14–17 in New Orleans, Louisiana. On Tuesday afternoon, April 15, I had the privilege of representing the Hurricane Watch Net during the Amateur Radio Forum. At the close of the session, attendees were treated to some great door prizes – a fun and much-appreciated tradition.

The forum featured several distinguished speakers who shared information about the organizations they represent, as well as updates and insights from the 2024 Hurricane Season and how to prepare for the upcoming 2025 Atlantic Basin Hurricane Season. Speakers included:

- **Bob Robichaud, VE1MBR** – Canadian Hurricane Centre
- **Julio Ripoll, WD4R** – Assistant Coordinator, WX4NHC
- **Rob Macedo, KD1CY** – Director of Operations, VoIP Hurricane Net
- **Bill Feist, WB8BZH** – Salvation Army SATERN Net
- **Josh Johnston, KE5MHV** – ARRL Director of Emergency Management
- **Matt Anderson, KD5KNZ** – Louisiana Emergency Preparedness Association
- **Bobby Graves, KB5HAV** — Net Manager, Hurricane Watch Net

The event was scheduled to be livestreamed and recorded for YouTube, but, as often happens at live events, we ran into some technical issues with the internet connection. Fortunately, the team worked quickly to get things back on track and the forum continued with only minor adjustments. Two of our speakers were unable to attend in person but were able to present live via the internet.

You can watch the recording of the livestream here: https://www.youtube.com/live/6eFztSOliEU

I also brought along my own video cameras and a digital audio recorder to capture the event. However, it seems I wasn't spared from the tech gremlins – when I got home, I discovered the files on my memory cards had been corrupted. Coincidence? Maybe! I'm still working to recover the data, and if successful, I'll upload the footage to our official YouTube channel: https://www.youtube.com/HurricaneWatchNet

After the forum, a few of us were interviewed by Molly Bentley for an upcoming episode of the "*Big Picture Science"* podcast titled **"Hurricane Comms."** This episode explores communications before, during, and after Hurricane Katrina in 2005. Participants in the interview included Julio Ripoll, WD4R (WX4NHC), Matt Anderson, KD5KNZ (Louisiana SEOC), and myself, Bobby Graves, KB5HAV (HWN). You can listen to or download the episode here: https://bigpicturescience.org/episodes/hurricane-comms

In June, we celebrated a very special milestone – **the 60th Anniversary of the Hurricane Watch Net.** On June 7–8, we held an on-air celebration on 14.325 MHz and 7.268 MHz. A huge *"Thank You"* to everyone who checked in and participated! We made 582 contacts across 39 U.S. states, Puerto Rico, Aruba, Belize, Canada, and Trinidad and Tobago. Of those, 425 were on 20 meters and 157 on 40 meters. We also received 156 requests for Special Event Certificates. What a celebration!

Earlier this year, we announced we would begin hosting a new video podcast on our YouTube Channel, www.youtube.com/HurricaneWatchNet, starting in March. Unfortunately, life and other circumstances got in the way causing us to put this plan on hold. We now plan to post our first episode on "Labor Day Weekend", which will be our "official" 60th Anniversary of the Hurricane Watch Net. We hope you will find our programming of interest and value!

If you have ideas, suggestions, or would like to contribute an article for a future issue of *"The HWN Report"*, I'd love to hear from you. Drop me a line at: editor@hwn.org

The Critical Role of Weather Spotters During Hurricanes

By Bobby Graves, KB5HAV

We live in a time of unprecedented access to information. Between 24-hour news channels, social media, weather apps, and government websites, it is easy to believe we always know what is going on – especially during a major storm.

But when a hurricane makes landfall, all that high-tech data can fall short. That is where *you* – the trained weather spotter and amateur radio operator – make a critical difference.

Why Ground Truth Still Matters in the 21st Century
Whether the weather is calm or severe, forecasters rely on a wide array of tools to create the most accurate forecast possible, including:

- NOAA and NASA weather satellites
- Doppler radar
- Hurricane Hunter aircraft
- Remote sensing stations and weather buoys
- Numerical weather models

These technologies are powerful, but each has limitations. Radar beams can overshoot surface-level conditions at long distances. Satellites provide a broad view from space, but they can't detect floodwaters entering homes or measure winds tearing through neighborhoods. And while models can predict trends, they rely on real-world data—ground truth—to remain accurate.

For the public, access to weather tools like satellite imagery, Doppler radar, and public advisories increasingly depends on electricity, cell service, and internet access—all of which can fail in areas impacted by hurricanes.

Ground truth – the real-time observations from people on the ground – is irreplaceable. It tells forecasters what is actually happening *right now*, especially when conditions change rapidly or deviate from projections. **This is not theoretical – it's real. Your reports matter!**

The Life-Saving Value of Weather Spotters and Radio Operators
When hurricanes make landfall, the environment often becomes unobservable by traditional means. Torrential rain, high winds, power outages,

and overwhelmed infrastructure make it difficult for emergency managers and meteorologists to see what is happening on the ground. That is when your report becomes a lifeline.

That is when your report becomes a lifeline.

Amateur radio operators are often well-prepared, with backup power sources and portable equipment that allow them to stay on the air when other forms of communication have failed. Their ability to transmit ground truth in real time—often from areas no one else can reach—makes them an indispensable part of the emergency communications network.

We Need You, Weather Reporting Stations

Whether you are 10 miles inland or directly in the path, your report could be the only one from that area. It could be the difference between issuing a timely warning – or missing a critical development.

These reports help:

- Confirm storm surge, flooding, and wind conditions
- Refine the placement and urgency of tornado or flash flood warnings
- Support emergency resource deployment
- Provide validation for federal disaster declarations
- Feed into real-time decision-making at the local, state, and national level

Here are additional reasons why ground truth observations are so important:

- Verification of remotely sensed data: While radar and satellite provide broad coverage, ground truth observations (like those from volunteer storm spotters or automated surface observation systems) confirm what is happening on the ground and validate the information from remote sensors.
- Improved forecast accuracy: Ground truth helps initialize and refine numerical weather models, leading to better predictions of precipitation, temperature, wind, and other crucial weather elements.
- Enhanced severe weather warnings: Reports of tornadoes, hail size, wind damage, and flooding from trained spotters and emergency managers provide critical real-time information for issuing timely and specific warnings, potentially saving lives.
- Better understanding of weather phenomena: Long-term ground observations contribute to climate databases and help analyze trends, improving understanding of weather and climate patterns.
- Filling observational gaps: Ground observations are particularly valuable in areas with limited advanced equipment, providing crucial data that wouldn't otherwise be available.

How Amateur Radio Fits In

When cell towers fail and power grids go dark, amateur radio remains operational. Battery-powered and independent of commercial infrastructure, ham operators become the communication backbone for many emergency efforts.

Several key nets activate during hurricanes, relaying ground truth to agencies like the National Hurricane Center (NHC):

Hurricane Watch Net (HWN)

- **Frequencies:** 14.325 MHz (day) and 7.268 MHz (night). Both frequencies may be active simultaneously when conditions warrant.
- **Activation:** Operates before, during, and after hurricane landfall
- **Primary Roles:**
  - Collects surface-level weather reports and damage assessments
  - Supports WX4NHC (the amateur radio station at NHC)
  - Assists the Salvation Army's SATERN Net with Health & Welfare Traffic
- **More info:** www.hwn.org

VoIP Hurricane Net

- **Access:** Operates via EchoLink, IRLP, D-Star, YSF, etc., and linked repeater systems
- **Primary Roles:**
  - Facilitates storm-related communications between affected areas and NHC
  - Supports broad geographic participation, including international stations
- **More info:** www.voipwx.net

WX4NHC at the National Hurricane Center

- **Function:** Receives surface reports from amateur radio operators, storm spotters, ships, and automated weather stations
- **Contribution:** Plays a direct role in NHC operations and public warnings
- **More info:** www.wx4nhc.org

Salvation Army SATERN

- **Name:** Salvation Army Team Emergency Network (SATERN)
- **Affiliation:** A division of the Salvation Army Emergency Disaster Services
- **Net Schedule:**
  - Monday, Wednesday, and Friday at 10:30 AM Central on 14.325 MHz
  - Saturday at 10:30 AM Central on 14.320 MHz
- **Roles and Partnerships:**
  - Works closely with HWN during Net Activations
  - Assists with on-air relays
  - Handles positive-only outgoing Health & Welfare Traffic and facilitates delivery to the addressed parties
- **More info:** www.saternusa.org

What to Report – And How

Your report should be timely, specific, and truthful. You do **not** need to be in the eye of the storm to contribute. In fact, some of the most useful data comes from areas *surrounding* the storm – where impacts may be less anticipated.

Key Data to Report:

- Measured or estimated wind speeds and gusts
  - ≥ 35 mph, 56 km/h, or 30 kts or greater.
  - If using a weather station, please report the exact wind speed shown, do not round (eg.: report 48 mph, not 50 mph).
- Wind Direction
- Barometric pressure (preferably with a quality station)

- Flooding (location, depth, rising/steady/receding)
- Storm surge height and location
- Structural damage (homes, infrastructure, trees, powerlines)
- Tornado sightings or damage
- Roads blocked or impassable
- Power, water, or communication outages

Pro Tip: Reports are most helpful when they include time, location (city or latitude/longitude), and whether the data is measured or estimated.

Safety First – Always
Reporting conditions during a storm is valuable—but never at the cost of your safety. The most effective spotters are those who remain safe, capa

ble, and able to report throughout the event and well into the recovery phase.

Never Do the Following:

- Walk out onto an emptied bay. Before landfall, strong onshore or offshore winds can push water out of bays—a phenomenon observed during storms like Hurricane Keith (2000) in Belize, t and Hurricanes Irma (2017), Ian (2022), and Milton (2024), all 3 in Tampa Bay. This can create the illusion of dry ground, but the water *will* return—often rapidly and with deadly force.
- Attempt to chase hurricanes or enter eyewalls.
- Drive through floodwaters. Just six inches of moving water can cause you to lose control, and a foot or more can carry most vehicles away. Even more dangerous—you may not know if the road beneath the water is still there. Fast-moving water can erode or wash away pavement, leaving behind hidden drop-offs or sinkholes.
- Climb trees, towers, or rooftops during or immediately after the storm.
- Rely on hearsay, social media rumors, or unverified third-party reports.

Stay alert. Stay safe. Stay on the air.

Your Report Could Save Lives – Real Examples
Here is how amateur reports have made a difference in recent years:

- **Hurricane Michael (2018):** Inland wind reports helped confirm Cat 5 intensity and scope of damage.
- **Hurricane Harvey (2017):** Volunteer flooding reports led to earlier flash flood emergencies and rescues.
- **Hurricane Ian (2022):** Surge depth reports helped verify landfall timing and behavior.
- **Hurricane Helene (2024):** Spotter data in the Carolinas gave forecasters ground truth amid disrupted networks.

These moments highlight the **real-world impact** of volunteer observers. When it matters most, trained weather spotters and radio operators stand in the gap – and help protect their communities.

Final Call to Action
If you are an amateur radio operator or trained spotter in or near a hurricane-affected area, **you are part of the public warning system.** You are the ground truth. You are the eyes and ears of forecasters, emergency managers, and first responders.

So charge your batteries, prep your station, test your equipment, and be ready. **Your voice on the air could make all the difference.**

Ham Stories – Echoes of the Storm: A Reflection on Irma and Maria

By Federico "Freddie" Garcia Bravo – KP4GBF
Ponce, Puerto Rico

In early September 2017, our island of Puerto Rico braced for the fury of Hurricanes Irma and Maria. Although Irma spared the island a direct hit, its effects extended to the northeast, particularly impacting the islands of Vieques and Culebra, as well as the U.S. and British Virgin Islands. It served as a wake-up call—a chance for members of the Hurricane Watch Network (HWN) to sharpen their skills in submitting weather reports to the National Hurricane Center in Miami. Little did we know it was merely the prelude to an unimaginable storm.

Days later came Hurricane Maria—an experience forever etched in my memory. It remains the most intense hurricane I've ever witnessed. The day before landfall, our station KP4GBF received troubling reports from Monserrate, Antigua, and Guadeloupe. We relayed this information to the National Hurricane Center in Miami, Florida. The forecast was grim. As night fell on September 21, the storm began its onslaught.

By dawn, the island was silent. First, we lost the internet. Then, the cellular network collapsed. VHF and UHF repeaters followed, vanishing one after the other. I turned to my wife, Carmen, and said, *"Get up—this is the one we've been waiting for!"*

From my weather station in Ponce, on the southern coast, winds roared at 177 km/h (110 mph). The north faced even greater fury. For 12 relentless hours, we endured the storm's wrath. Communications were severe, and the island plunged into darkness. It was overwhelming. It was terrifying.

The next morning felt surreal, like waking from a nightmare—but it was real. The devastation was widespread. Roads were impassable. Communi

cation was only possible via simplex or HF radios. Yet, we recovered. We began relaying critical information to whoever we could reach.

In the following days, new challenges emerged. Fuel supplies dwindled, even for emergency generators. Banks remained shuttered, paralyzed by the lack of internet. Chaos loomed. Still, Puerto Ricans stood firm—responding with resilience and unity.

Lessons Learned
Today, Puerto Rican amateur radio operators are better equipped to face future crises. A robust network of VHF and HF RMS nodes spans the entire island, including Vieques and Culebra—led by NP4D Emanuel Cruz. Citizens now pay closer attention to weather warnings, recognizing the power of preparation.

How Propagation is Affected by Tropical Systems

By Bobby Graves, KB5HAV

When amateur radio operators prepare for hurricane season, our focus usually includes emergency planning, gear checks, and making sure backup power is available. But one vital element of readiness that often goes underappreciated is *"Radio Wave Propagation"* – especially how it is influenced by Tropical Weather Systems and Space Weather events like Solar Flares and Geomagnetic Storms.

Understanding how HF propagation behaves during tropical activity and in the presence of solar disturbances can mean the difference between successful emergency communications and frustrating radio silence.

What Is Propagation, and Why Does It Matter During Hurricanes?
Propagation is the behavior of radio waves as they travel from one point to another. HF (High Frequency) communication depends on the ionosphere to reflect signals back to Earth over long distances. During hurricanes and tropical storms, changes in the Earth's lower and upper atmosphere, combined with solar activity, can significantly impact how these signals behave.

For the Hurricane Watch Net and other emergency nets, knowing how propagation is affected by both "Terrestrial" and "Space Weather" is crucial to maintaining reliable contact during severe weather events.

How Tropical Systems Affect Propagation

1. **Atmospheric Absorption and Signal Attenuation**
   Hurricanes bring heavy rain, high humidity, dense cloud cover, and lightning. While VHF and UHF are more directly affected by precipitation, HF can also be impacted due to:
   - **Increased atmospheric moisture**, which can slightly attenuate signals.
   - **Elevated noise levels** from lightning (QRN), making it harder to copy weak stations.
   - **Possible antenna detuning** caused by wind, rain, or changes in ground conductivity.

2. **Ionospheric Layer Disruption**
   Tropical systems affect pressure, temperature, and wind dynamics, which can impact the ionosphere:
   - **Lower D-layer absorption** during stormy, overcast conditions may make 40 and 80 meters more usable during daylight hours than normal.
   - **F-layer irregularities** can lead to unpredictable skip zones and shifting MUFs (Maximum Usable Frequencies).
   - **Sporadic E-layer** openings – sometimes enhanced by strong wind shears – can result in brief, highly directional propagation on 10 and 6 meters.

How Solar Flares and Geomagnetic Storms Impact Propagation
Tropical storm season often coincides with periods of increased solar activity, which brings its own set of challenges for HF operators.

1. **Solar Flares and Radio Blackouts**
   Solar flares are sudden bursts of radiation from the sun that affect the Earth's ionosphere almost instantly. The most notable effects are:
   - **D-layer overload**: A strong X-Class Flare can cause a sudden increase in ionization in the lower ionosphere, absorbing HF signals instead of reflecting them, especially on the sunlit side of Earth.
   - **High-frequency radio blackouts (R1–R5 class)**: These can range from minor signal fading to complete HF communication loss on all lower bands.

   ***Tip*:** During a solar flare, the first sign may be the sudden disappearance of entire bands – like 20 or 40 meters – followed by intense static.

2. **Geomagnetic Storms and Ionospheric Turbulence**
   Triggered by **coronal mass ejections (CMEs)**, geomagnetic storms arrive a day or two after a solar flare and have longer-lasting effects:
   - **Auroral absorption**: During strong geomagnetic storms, areas near the auroral zones may experience complete HF blackout due to particle collisions with the upper atmosphere.
   - **Disturbed F-layer**: This can severely degrade long-distance propagation paths, often lowering MUF and causing signals to be bent or scattered in unpredictable ways.
   - **Polar blackout zones**: HF signals across polar paths may be unusable for hours or even days during a major storm.

The Double Trouble: When Space Weather and Tropical Systems Combine
A tropical cyclone occurring during a geomagnetic storm or major solar event can create a **worst-case scenario** for HF operators:

- **HF blackouts** from solar flares + QRN from thunderstorms = very poor copy on low bands.
- **Sporadic propagation** windows may suddenly open on higher bands like 15 or 17 meters – but disappear just as fast.
- **Reliance on NVIS or digital modes** may become necessary to maintain reliable short-range communication.

This is why it's critical for emergency communicators to monitor both the weather and the space weather forecast when tropical activity is approaching.

Why Distributed Net Control Stations Are Essential
Given all the unpredictable variables that come with tropical systems **and** space weather – such as shifting skip zones, fading HF paths, and regional blackouts – it becomes clear that **no single station** can carry the load of emergency communications alone.

This is why the **Hurricane Watch Net** maintains and encourages the development of **Net Control Stations (NCS)** strategically **scattered across the United States, Canada, Mexico, Central America, and the Caribbean** – with a special emphasis on **20 meters**, our primary long-haul band during daylight hours.

Here's why this broad distribution matters:

- **Propagation is rarely uniform**: A strong signal into the Southeast may mean a total dead zone into the Gulf or Caribbean, depending on real-time ionospheric behavior.
- **Redundancy ensures continuity**: If one NCS is experiencing poor propagation, local weather disruptions, or electrical noise, another NCS can maintain the link.
- **Improved coverage of affected areas**: Stations in different regions increase the likelihood that at least one station has usable propagation into the impact zone and back out to the wider network.
- **Multiple real-time paths**: Having NCS stations across North and Central America lets us monitor, test, and adjust to changing HF

conditions instantly, instead of relying on theoretical models or forecasts.

The 20-Meter Factor: Large Skip Zones and the Need for Multiple NCS Stations

One of the challenges unique to **20 meters** is its **relatively large skip zone –** often 300 to 800 miles, depending on the time of day, solar conditions, and ionospheric state. This means that:

- A station located in one part of the U.S. may be completely unable to hear or be heard in a wide ring-shaped area around them – potentially including the storm-impacted region.
- During tropical cyclones, **critical stations near the storm center may fall into this skip zone** for certain NCS operators.

We Need You, Net Control Stations

To overcome this, **we must maintain multiple Net Control Stations operating simultaneously on 20 meters**, spread across different regions. This overlapping coverage helps:

- **Fill in the gaps** caused by each station's skip zone.
- Ensure **more reliable signal paths** into the affected area.
- Allow **smoother coordination** across long distances, especially when relaying information to the National Hurricane Center, Regional Weather Offices, Emergency Management Officials, or other nets.

This isn't just good operating practice – it's **mission-critical** when lives and property are at risk.

Monitoring Tools and Resources

In today's digital age, amateur radio operators have powerful tools at their fingertips to help anticipate and respond to rapidly changing propagation conditions—especially during tropical systems and space weather disturbances.

Online SDR (Software-Defined Radio) Receivers

Online SDR platforms allow operators to "listen" from remote locations—giving real-time insight into how their signals are being received in different parts of the world, regardless of local conditions.

- **WebSDR.org** – Offers global SDR receivers you can tune and use directly from your browser.
- **KiwiSDR Network** – Map-based access to hundreds of HF receivers worldwide.

These tools are especially useful during a storm when a Net Control Station is uncertain about band conditions or wants to monitor affected regions outside their own skip zone.

Space Weather and Propagation Apps

Mobile and desktop apps can give real-time alerts, forecasts, and diagnostics that are invaluable during tropical events:

- **Space Weather Live** (iOS/Android) – Real-time solar flare alerts, geomagnetic indices, and aurora forecasts.
- **HF Propagation & Solar Data** (Android) – Offers K-index, solar flux, SFI, and band condition indicators.
- **Ham Clock** – A desktop tool providing propagation graphs, MUF estimates, and sunspot tracking.

Propagation Forecast and Mapping Tools

Use these to check band openings, MUFs, and active DX paths before and during storm operations:

- **NOAA Space Weather Prediction Center**
- **HamQSL Propagation Page**
- **VOACAP Online** – Point-to-point HF propagation predictions.
- **DXMaps** – Live band activity and propagation paths based on real QSOs.
- **PSKReporter** – Great for digital mode ops to see who's hearing your signal.

By integrating these tools into routine operating habits, Net Control Stations and emergency operators can improve their decision-making, better assess signal conditions, and adapt in real time to changing propagation windows.

Conclusion: Awareness Is Preparedness

Propagation may not be something we can control, but we can prepare for it. Tropical systems and solar disturbances will continue to challenge our ability to communicate reliably—but the tools to overcome those challenges have never been more accessible.

With a deeper understanding of propagation dynamics, a geographically distributed network of Net Control Stations, and access to real-time SDRs and space weather data, amateur radio operators can continue to serve as the vital link when other systems fail.

As the saying goes: *It's not just about having a signal – it's about knowing where it will go, and who can hear it.*

WX4NHC – New Coordinator

By Julio Ripoll, WD4R

It has been a wonderful, unique, and fulfilling experience as a volunteer at the National Hurricane Center for 45 years. And I want to let you all you know that I am very grateful for your support. I truly believe that your work has helped NHC, and has helped save lives during hurricanes. That is why, I have spent so many years volunteering at NHC and asking you and your Nets to volunteer your time and skills to help NHC, and help those affected by hurricanes. THANK YOU ALL!!!

And special thanks to John McHugh K4AG, WX4NHC Coordinator, that has worked, side-by-side with me, for 29 years! John, your help, your collaboration, your support, your kindness, has been invaluable to me and to our WX4NHC operations and equipment maintenance. THANK YOU JOHN!!!

But all good things must come to an end, *eventually*… I am planning on retiring from *everything* by the end of this year. *Everything* = my volunteering at NHC and as an Architect for UM Medical (31 years).

It is with great pleasure and confidence that I introduce Lloyd Kurtzman N4LJK as the new WX4NHC Coordinator. Lloyd has been one of our most reliable and qualified WX4NHC Operator for the past 23 years.

Lloyd is a retired Firefighter, Battalion Chief and Fire Rescue Paramedic, amongst a dozen more titles. I trust Lloyd and know him as a dedicated volunteer and good Samaritan. I believe he is the best person to carry on the WX4NHC mission and spirit for many more years.

John and I will still be around as Assistant Coordinators to help Lloyd and to ensure a smooth transition.

"We may be dinosaurs, But we are not yet extinct."

WX4NHC Radio mic transfer: (L to R) Julio WD4R, Lloyd N4LJK, John K4AG

Thank you,
Julio Ripoll, WD4R

Tropical Cyclone Seasonal Forecast Update

By Bobby Graves – KB5HAV

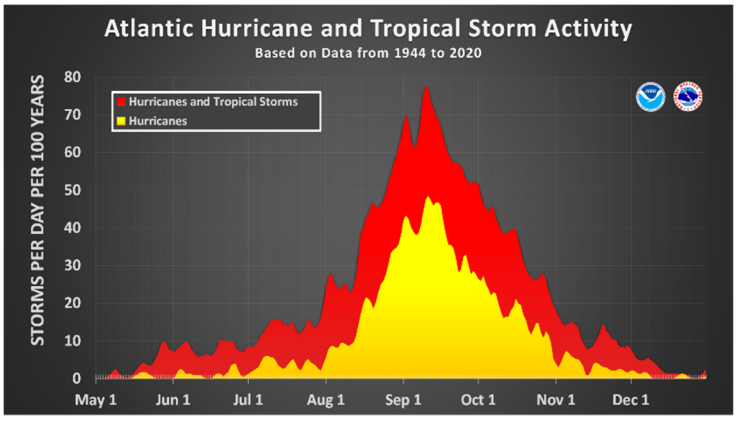
On August 6th, 2025, Dr. Klotzbach, with Colorado State University, released his August forecast update.

"We have maintained our forecast for a slightly above-normal 2025 Atlantic basin hurricane season, although noting lower-than-normal confidence with this outlook. Sea surface temperatures across the eastern and central Atlantic have anomalously warmed over the past few weeks and are now somewhat warmer than normal. Multiple indicators anticipate likely cool ENSO neutral conditions during the peak of the Atlantic hurricane season. Warm sea surface temperatures and ENSO neutral conditions typically provide a more conducive dynamic and thermodynamic environment for hurricane formation and intensification. The primary reason for the uncertainty in the outlook is the high observed Caribbean shear over recent weeks. Typically, high levels of Caribbean shear in June July are associated with less active hurricane seasons. We anticipate a slightly above average probability for major hurricanes making landfall along the continental United States coastline and in the Caribbean for the remainder of the hurricane season. As with all hurricane seasons, coastal residents are reminded that even one hurricane making landfall nearby results in an impactful season. Thorough preparations should be made every season, regardless of predicted activity."

2025 Hurricane Season Outlook
Atlantic Basin
Updated August 6, 2025

	1991-2020 Average	CSU Apr 3	CSU June 11	CSU July 9	CSU Aug 6
Named Storms	14	17	17	16	16
Hurricanes	7	9	9	8	8
Major Hurricanes*	3	4	4	3	3

* Major Hurricane - Category 3 or higher
Note: Total forecast includes
Andrea and Barry which formed in June
Chantal which formed in July
Dexter which formed in August



By the Numbers: 2025 Forecast (Unchanged)

- **16 Named Storms**
- **8 Hurricanes**
- **3 Major Hurricanes (Category 3 or higher)**

Why This Matters – And Why You Should Prepare Now
Despite some uncertainty, the forecast still points to a slightly above-average season—and conditions are favorable for intense storms. It's worth repeating: it only takes **one** landfalling hurricane to disrupt lives, damage communities, and strain emergency services.

- **If you haven't prepared yet, don't wait.**
- **Review your evacuation plan.**
- **Check your emergency supplies.**
- **Make sure you can receive reliable weather alerts.**

The bottom line:
Whether it's the first named storm or the fifteenth, **now is always the right time to prepare**.

Do You Have Ideas or Articles for this Newsletter?

If you have ideas or articles you would like to see in this newsletter, as well as have any questions or comments, they are most welcomed and can be sent to editor@hwn.org

When submitting an article, please adhere to the following: guidelines:

- Articles should be of general interest to readers if possible.
- Articles should be in MS Word format (.doc) or plain text files. (.txt)
- Vulgar or offensive language should be avoided.
- No copyrighted materials.

HWN, Inc. reserves the right to edit submissions for content or length. HWN, Inc. reserves to right to refuse submissions for any reason.

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Upcoming Events

HamX - The Northeast HamXposition
August 21-24, 2025

For complete details, visit https://hamxposition.org

Skywarn® Recognition Day

December 6, 2025

SKYWARN® Recognition Day is observed annually on the first Saturday in December to honor the dedication of volunteer storm spotters across the country. These individuals serve as the eyes and ears of the National Weather Service (NWS), providing real-time, ground-level observations during severe weather events.

SKYWARN® volunteers and amateur radio operators report conditions such as tornadoes, hail, flooding, or damaging winds. Their timely reports help forecasters issue more accurate and lifesaving warnings, often giving communities the critical minutes needed to prepare and take shelter.

This special day recognizes the vital role these volunteers play in building a Weather-Ready Nation. Without their commitment and vigilance, many severe weather threats would go undetected until it's too late.

February 13th – 15th, 2026
For complete details, visit https://www.hamcation.com

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