

# National Weather Service Gray, ME SKYWARN® Amateur Radio Team

## Operations Manual



Version: 03.22

*Serving the County Warning Area (CWA) of the National Weather Service Forecast Office in Gray, ME*

*Including: Androscoggin, Cumberland, Franklin, Kennebec, Knox, Lincoln, Oxford, Sagadahoc, Somerset, Waldo, and York  
Counties in Maine & Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan  
Counties in New Hampshire*

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# **1. Introduction**

## **1.1 Purpose of this Manual**

This manual is designed to be used as a reference guide for NWS Gray SKYWARN Amateur Radio Team operations in the area that comprises the County Warning Area (CWA) of the National Weather Service (NWS) Weather Forecast Office in Gray, Maine. The NWS Gray and SKYWARN Amateur Radio Team have a large area of responsibility which includes numerous counties and cities in portions of two states. Some variation in local operating practices and tastes is expected and allowed, and this document serves only as a baseline reference to establish and ensure continuity of operations. Policies and procedures may vary slightly from one Operating Area to another and from time to time. These variances may not be immediately reflected in this Manual.

## **1.2 Purpose of SKYWARN**

SKYWARN is the NWS national network of trained volunteer severe weather Spotters. SKYWARN volunteers support their local community and government by providing the NWS with timely and accurate severe weather reports. These reports, when integrated with modern NWS technology, are used to issue timely and accurate warnings of impending dangerous weather conditions. In addition, working with emergency management officials, SKYWARN Spotters can help provide their communities with advance warning of impending hazardous weather and provide the real- time ground truth required to appropriately respond to these threats.

## **1.3 Role of Amateur Radio in SKYWARN**

Amateur radio has been, and probably always will be, a vital link in the NWS warning system. Fortunately, in the NWS Gray CWA there are hundreds of trained SKYWARN Spotters, a large percentage of which are amateur radio operators. Amateur radio operators possess many characteristics that make them ideal members of the SKYWARN team.

It is the desire of the National Weather Service to utilize, to the fullest possible extent, all the capabilities and technologies that amateur radio has to offer. The SKYWARN Radio Desk and all equipment is either donated by public service-minded amateurs or has been purchased by the National Weather Service. All equipment is maintained by amateur radio operators volunteering their time and expertise. The close working relationship between the NWS and the amateur radio community provides many special benefits to each group. These benefits are highlighted in the following goals for the NWS Gray SKYWARN Amateur Radio Team:

1. To provide the NWS with timely and accurate severe weather reports via amateur radio. This includes both incoming reports of severe weather per the NWS criteria and amateur radio operators making observations at specific locations in response to NWS requests.

2. To create and maintain an organized communication network for passing critical severe weather traffic in a timely fashion to and from the NWS in the event that normal communications are disrupted. The NWS has lost normal communications in the past and it is likely the SKYWARN Radio Desk would be activated in future communication emergencies.
3. To disseminate warnings, statements, and other products issued by the NWS to the amateur radio community. Every attempt is made to disseminate all statements and warnings issued by NWS over the SKYWARN Net to keep amateurs informed of developing situations and to practice for situations when normal communication channels fail.
4. To organize and train amateur radio operators to prepare themselves and their families for disaster or emergency weather related situations so that they make be available to assist in emergency net operations. This preparedness training is critical if the SKYWARN system is to operate reliably during true emergency situations.
5. To maintain a Spotter network that is transparent to jurisdictional and political boundaries and operates uniformly across the entire CWA. The Team is not directly affiliated with any club, group, or organization.

## **1.4 SKYWARN and Storm Chasers**

Storm chasing remains a secondary focus at best, and we continue to maintain a position in line with the NWS Gray Forecast Office. That is, we do not recommend, endorse, or encourage storm chasing. However, we will communicate with, and provide reporting channels, for qualified storm chasers who wish to participate in our nets.

For purposes of this program, the term “storm chasing” shall be applied to the intentional pursuit of severe weather, regardless of whether such activities are for purposes of severe weather reporting, photography, videography, research, or thrill.

The National Weather Service and the NWS Gray SKYWARN Amateur Radio Team consider the safety of all SKYWARN volunteers to be of paramount importance. SKYWARN Spotters and other persons who choose to engage in storm chasing do so at their own risk and completely independent of their involvement in the SKYWARN program. The National Weather Service and the SKYWARN program accept no responsibility for the decisions of SKYWARN program participants with regard to storm chasing and can assume no liability for damages arising from the use of SKYWARN reports in storm chasing or any other activities.

## **1.5 General Information**

The NWS Gray SKYWARN Amateur Radio Team is a public service organization dedicated to service to the National Weather Service during periods of severe weather. The NWS Gray SKYWARN Amateur Radio Team is open to all qualifying amateur radio operators and is an independent group not directly affiliated

with any other club, group, or organization. SKYWARN consists of several key elements. The first of these elements is the NWS SKYWARN Program Manager and Focal Point(s). These individuals are NWS employees who are responsible for overseeing the operation of the network, for selecting and appointing key SKYWARN personnel, and for acting as contact points for the NWS among the amateur radio community. The Warning Coordination Meteorologist (WCM) serves as the Program Manager and may appoint SKYWARN Focal Point(s) to perform day-to-day functions associated with the SKYWARN network.

## 1.6 Organization Name

The organization has in the past been known as “Yankee SKYWARN” or “Maine-New Hampshire SKYWARN.” Since neither of these accurately describes the scope or geographical region that NWS Gray is responsible for, the name “NWS Gray SKYWARN Amateur Radio Team” was chosen at the SKYWARN Strategy Meeting on December 7, 2019. The names “NWS Gray SKYWARN Team,” or simply, “NWS Gray SKYWARN” are the only acceptable variations.

## 1.7 Mission Statement

The NWS Gray SKYWARN Amateur Radio Team exists to provide communication services for the collection of severe weather reports and dissemination of critical weather information in support of the National Weather Service and its mission to protect life and property by improving warning accuracy.

## 1.8 Core Values

The NWS Gray SKYWARN Amateur Radio Team operates under seven Core Values which guide everything we do:

- **Dedication** - We serve the National Weather Service and each other with a spirit of commitment and dedication to our common mission to protect life and property.
- **Education** - We value each other’s interests, skills, and experiences and we actively and publicly share our talents and our knowledge.
- **Integrity** - We act honestly and in the best interest of the SKYWARN mission in everything we do.
- **Respect** - We recognize the duties each person on the team has volunteered to perform and we appreciate their hard work, even when things go wrong.
- **Teamwork** - No one person can carry the weight of the SKYWARN program. It takes many people working together with diverse skills and a common goal to achieve success.

- **Community Involvement** - We share our educational resources and our intellectual assets freely with the communities we serve and strive to be good neighbors and partners in the amateur radio world and our communities in general.
- **Continuous Improvement** - We aim to do a lot of things right and want to be the best, but in order to truly be the best we need to accept that sometimes we'll fail, and that's okay as long as we learn something from it and use that experience to make ourselves stronger.

## 1.9 Legal Structure

The team currently operates without formal legal structure. Each member is volunteering his or her time, resources, and efforts to the National Weather Service directly. While there is some formal leadership structure to the team, it is not its own distinct legal entity.

### 1.9.1 Financial Structure

The team does not have or manage its own finances. Occasional funding for equipment needs is accomplished through the normal budget and procurement process at the National Weather Service, though the primary source of equipment and supplies remains individual donations from team members and partners. The team does not maintain its own physical assets; radio equipment and operational supplies are considered property of the National Weather Service.

The giving of cash or cash-equivalent donations to the team is formally discouraged. Individuals and organizations wishing to donate physical goods such as radio equipment, accessories, or supplies should do so to the National Weather Service. This may be accomplished through the team's leadership structure or by direct contact with the SKYWARN Program Manager.

Lacking any financial structure or assets, the SKYWARN Amateur Radio Team is unable to reimburse its leadership, members, or other individuals for any equipment, supplies, services, or other purchases, or for mileage, insurance, or any other expenses.

### 1.9.2 Assets and Liabilities

In general, all equipment installed at NWS Gray is the property of the United States Department of Commerce. Certain incidental supplies, such as binders, notebooks, pens, paper, food, beverages, etc. at the SKYWARN amateur radio station are supplied by and at the sole expense of the purchasing Amateur Radio Coordinator, Responder, Net Control Operator, or other individual, and become the property of the SKYWARN Amateur Radio Team.

## 2. Operating Authority, Team Structure, and Roles

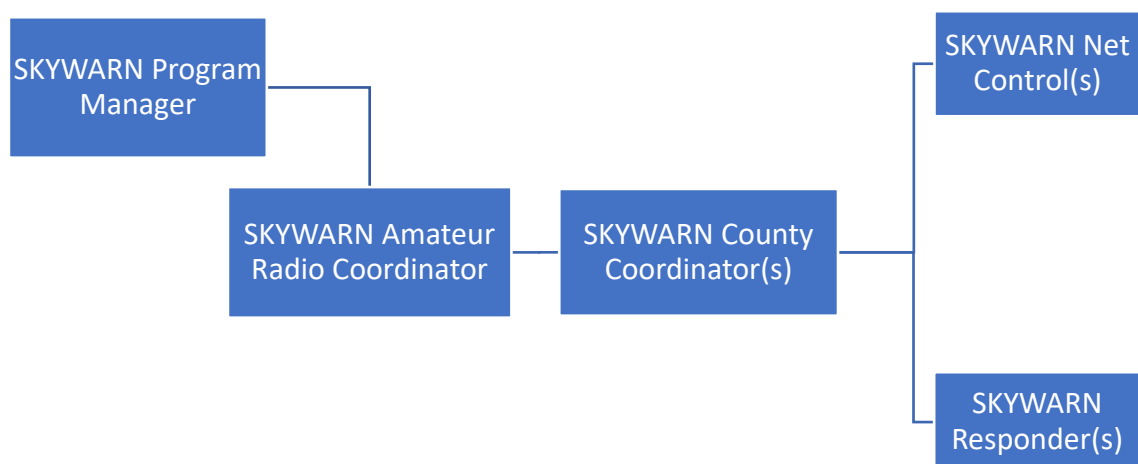
### 2.1 Operating Authority

The amateur radio operators' participation in the SKYWARN program is formally acknowledged and encouraged in a memorandum of understanding (MOU) between The American Radio Relay League (ARRL) and the NWS. This agreement indicates that the ARRL will encourage its local volunteer groups operating as the Amateur Radio Emergency Services (ARES) to provide the NWS with spotters and communicators as requested by the NWS during times of severe weather.

Many civil disasters are a direct result of severe weather and/or are worsened by severe weather. Accordingly, the NWS may utilize the SKYWARN amateur radio operators not only to obtain and disseminate severe weather observations and warnings, but may also use the amateur radio operators to maintain close coordination with Emergency Managers under Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Service (RACES).

Radio Emergency Associated Communications Teams (REACT) also supports SKYWARN. REACT nets may take reports of severe weather and relay them to the NWS either by normal communications modes (phone, Internet etc.) or by linking up with a REACT member who is also an amateur radio operator who can relay the severe weather information to a SKYWARN Net Control through the SKYWARN amateur radio frequencies. Although it may take some creativity and organization, the goal is to include all groups in the SKYWARN systems who wish to participate.

### 2.2 NWS Gray SKYWARN Team Structure





### **2.2.1 Role of the SKYWARN Amateur Radio Coordinator (ARC)**

The SKYWARN Amateur Radio Coordinator organizes the operation of the entire SKYWARN Amateur Radio community within all counties for which the Gray, ME NWS office is responsible.

#### **The Amateur Radio Coordinator is responsible for:**

1. Keeping a set of recommended protocols and an operating manual up to date and ensure compliance.
2. Coordinating simple, effective and efficient procedures for passing traffic between local SKYWARN nets and the NWS forecasters.
3. Sharing information, ideas, and protocols to develop the best possible local SKYWARN program.
4. Coordinating the activities of SKYWARN with ARES, RACES, REACT, and government agencies to best fulfill SKYWARN's goals.
5. Assist County Coordinators in the execution of their duties and act as a liaison with the NWS and other agencies.

This volunteer position is appointed by the NWS SKYWARN Program Manager to ensure that the person chosen can work well with the NWS forecasters and management as well as the amateur radio community. The person chosen for this position must possess superior coordination and communication skills and should be readily available to the NWS.

The SKYWARN Amateur Radio Coordinator is also responsible for making sure that a County Coordinator, Assistant County Coordinator, or designated Net Control Station within each county (or Operating Area) is on duty at all times to receive the NWS notification and to take appropriate action as requested by the NWS. This will often involve passing the SKYWARN activation instructions and trained net control volunteer lists from coordinator to coordinator when an out-of-town trip is expected. It is imperative that this position be covered at ALL TIMES!

The SKYWARN Amateur Radio Coordinator may appoint assistants to help fulfill these duties.

### **2.2.2 Role of the SKYWARN County Coordinator (CC)**

The SKYWARN County Coordinator organizes the operation of the entire SKYWARN Amateur Radio community within a specified county (or Operating Area) for which the Gray, ME NWS office is responsible.

#### **The County Coordinator is responsible for:**

1. Keeping a set of recommended protocols and an operating manual up to date and ensure compliance.
2. Coordinating simple, effective and efficient procedures for passing traffic between local SKYWARN nets and the NWS forecasters.
3. Sharing information, ideas, and protocols to develop the best possible local SKYWARN program.

4. Coordinating the activities of SKYWARN with ARES, RACES, REACT, and government agencies to best fulfill SKYWARN's goals.
5. Assist SKYWARN Net Control Stations in the execution of their duties and act as a liaison with the NWS and other agencies.

This volunteer position is appointed by the SKYWARN Amateur Radio Coordinator and ARES, to ensure that the person chosen can work well with the NWS forecasters and management as well as the amateur radio community. The person chosen for this position must possess superior coordination and communication skills and should be readily available to the NWS.

The SKYWARN County Coordinator is also responsible for making sure that at least one Net Control Station is on duty at all times to receive the NWS notification and to take appropriate action as requested by the NWS. This will often involve passing the SKYWARN activation instructions and trained net control volunteer lists from the County Coordinator to an Assistant County Coordinator or to Net Control Stations when an out-of-town trip is expected. It is imperative that this position be covered at ALL TIMES!

The SKYWARN County Coordinator may appoint assistants to help fulfill these duties. County Coordinators may also be responsible for more than one county, especially if they share ARES duties which have jurisdiction over larger areas.

### **2.2.3 Role of SKYWARN Net Control (NCS) and Responders**

The Net Control Operator/Station (NCS) is the most critical position in any SKYWARN activation. It is a role that challenges amateur radio operators' communications and technical skills. It is also an extremely responsible position in that the safety of lives and property may rest on the amateur's skills. Although this role is challenging, with proper training and experience, it can also be extremely rewarding when a net is run effectively.

It is essential that SKYWARN Net Control Operators be familiar with NWS procedures, to be able to do an effective job. Listed below are the requirements to be designated by SKYWARN Leadership to operate as a Net Control Station for SKYWARN nets.

1. Maintain current SKYWARN spotter certification.
2. Be familiar with SKYWARN reporting criteria and NWS reporting procedures.
3. Assist the SKYWARN County Coordinator by acting as net control for weekly weather/training nets (if active).
4. Notify the SKYWARN County Coordinator of your contact information and availability to act as net control for SKYWARN nets.

#### **The Net Control Operator is responsible for:**

1. Operating the SKYWARN Net in accordance with prescribed operating procedure.
2. Managing net check-ins and check-outs and maintaining a list of stations currently checked in.
3. Appropriately managing the flow of traffic on the repeater during both informal and directed nets.

4. Exercising good judgment in the transition to and from a directed net as required based on traffic flow and current warnings.
5. Executing requests for reports from specific areas as may be received from NWS employees, Area Managers, or other channels.
6. Constructively and creatively working alongside other nets which may be active on the same frequency at the same time during large-scale or high-impact events, for example, ARES nets.
7. Ensuring the frequency remains clear for regular amateur radio use during informal nets and that the frequency remains clear for SKYWARN traffic during directed nets.
8. Disseminating new watches, warnings, advisories, and statements over the air and periodically providing a recap of existing products.
9. Handling other incidental emergency traffic as may occur from time to time. Net Control Operators are truly on the front lines of the SKYWARN program and are expected to conduct their nets in a professional and courteous manner at all times.

A *Responder* is a special type of Net Control, who may be deployed to operate at the NWS Radio Desk. Responsibilities and qualifications are identical to NCS, but since Responders are visitors at NWS, they must also be aware of any rules that are in place pertaining to guests. Please refer to the Radio Desk Operations section of this manual for more information.

## **2.3 SKYWARN Operating Areas**

To better organize the structure of the SKYWARN program and to ensure efficient operation and adequate network staffing during SKYWARN activations, the NWS Gray County Warning Area may be consolidated into Operating Areas. The boundaries of these Operating Areas may be a single county or contain more than one county. The ARES structure in New Hampshire, for example, groups counties into geographic regions, and it is encouraged that SKYWARN coordination in New Hampshire coincide with this structure.

### **2.3.1 SKYWARN Repeaters**

In the spirit of good amateur radio practice, the SKYWARN leadership will secure permission from the trustee of each Primary repeater prior to its designation as a Primary SKYWARN repeater. Generally, no such permission will be sought for repeaters periodically used to gather reports. Repeaters selected for Primary use should be wide-coverage repeaters readily accessible from handheld and mobile stations within the majority of the Operating Area the repeater will serve. The repeaters should have a track record of reliability and availability, and should be equipped with a minimum of four hours of battery and/or generator backup power. Additional consideration will be given to repeaters with any sort of linking capability.

### **2.3.2 Subnets**

Some Operating Areas may have Subnets in locations where the Primary SKYWARN Repeater or link system does not have adequate coverage. It is suggested, but not required, that each Subnet be under the direction of the County Coordinator for that area.

Staffing of the Primary Net takes priority; Net Control Operators should be assigned to a Primary Net first, and any remaining Net Control Operators may then be assigned to a Subnet. An exception exists for situations where severe weather is confined to the territory served by the Subnet, in which case it is only necessary to activate the Subnet for that event.

## **2.4 Recruiting and Outreach**

The continued success of the SKYWARN team depends on a non-stop cycle of teaching, developing, and advancing current members and bringing new members into the program. Outreach functions involve establishing and maintaining relationships with our partners in the communities we serve.

### **2.4.1 Spotter Outreach**

County Coordinators and Net Control Operators are encouraged to attend Spotter training classes held in their assigned Operating Area(s). While attending Spotter training classes, the person representing the team should:

1. Introduce himself/herself to the NWS employees conducting the session prior to its start.
2. Work with the NWS employees to find a convenient time to address the audience.
3. Talk briefly about what amateur radio is and what role it plays in the SKYWARN program.
4. Provide local frequency information.
5. Share contact information for those who are licensed and want to get involved in the ham radio team or who are unlicensed and are considering getting licensed.
6. Answer any audience questions.
7. Remain available after the class to talk one-on-one with class participants. The person representing the team is expected to dress appropriately and provide a professional appearance and attitude on behalf of the team at all times.

### **2.4.2 Club Outreach**

In order to remain visible and maintain a good relationship with the amateur radio community it is imperative that both the Amateur Radio Coordinator and County Coordinators frequently engage in basic outreach work throughout their assigned County or Operating Area.

This outreach work can be anything from simply being present at club meetings to put a face on SKYWARN, up to full outreach presentations that discuss how club members can support the SKYWARN program with their reports and by volunteering as Net Control Operators.

Whenever feasible, County Coordinators and the Amateur Radio Coordinator are encouraged to maintain a personal membership with as many local amateur radio clubs as possible and participate in as many club activities as possible as a means of developing a mutual support system between the club and SKYWARN.

### **2.4.3 Public Outreach**

Public outreach opportunities most frequently come in the form of presentations to the community, including Community Emergency Response Teams (CERT), and a presence at local hamfests. Many hamfests offer no-charge tables to non-selling organizations such as SKYWARN, and the team maintains a display board and a collection of printable materials which can be used for any sort of public outreach opportunity.

County Coordinators are encouraged to get SKYWARN involved in these sorts of activities and should work through the Amateur Radio Coordinator to get NWS employees involved whenever possible.

### **2.4.4 NWS Outreach**

NWS Outreach opportunities occur whenever there is an interaction between a SKYWARN amateur radio team member and an NWS employee. In particular, there should be an effort to familiarize new forecasters with the team and our procedures for activation. Journeyman Forecasters cycling into the WFO represent a prime opportunity for education on amateur radio and how it supports NWS operations through the SKYWARN program. Additional outreach opportunities can be coordinated between the Amateur Radio Coordinator and the NWS.

### **2.4.5 Partnerships**

The Amateur Radio Coordinator is encouraged to maintain a close relationship with our emergency service partners in several key organizations:

1. Amateur Radio Emergency Services (ARES).
2. Maine Emergency Management Agency (MEMA).
3. New Hampshire Homeland Security and Emergency Management (NHHSEM)
4. County and Local emergency management personnel.

These partnerships can be accomplished by:

1. Serving as an ARES Official Emergency Station (OES) as SKYWARN Liaison.
2. Participating in EMA meetings, training, and drills.

3. Sharing report data with decision makers and emergency managers.
4. Involving local emergency management personnel in the SKYWARN training process.

It is absolutely critical that these relationships be developed and nurtured to ensure cooperation and interoperability during emergency situations.

## **3. Activating SKYWARN**

### **3.1 Activation Criteria**

The team is “on standby” 24 hours a day, 7 days a week and should be able to provide emergency communications services and collection of spotter reports any time of the day or night.

To better utilize its human resources the team has implemented activation criteria which specify the circumstances under which routine report collection services will be provided to the NWS.

In general, amateur radio support services will be provided between 6 AM and 10 PM local time, according to the Daytime Activation Criteria. Nighttime Activation Criteria applies to operation outside these hours, and there is also a separate SKYWARN Radio Desk Activation Criteria.

#### **3.1.1 Daytime Activation Criteria**

The team will make itself available to the NWS upon request under any weather conditions and will self-activate under any one or more of the following conditions:

**Severe Thunderstorm Watch or Tornado Watch Issued, plus one or more of the following on the SPC Day 1 Convective Outlook:**

1. Damaging Wind Risk at or above 15%.
2. Severe Hail Risk at or above 15%.
3. Tornado Risk at or above 2%.
4. Winter Storm/Blizzard/Ice Storm Warning issued.
5. Flood Watch for Flash Flooding (make sure to look at valid times of Watch as the lead time on issuance of these can be a day in advance unlike Severe/Tornado Watches which are usually only 3 to 6 hours)
6. Hurricane Warning issued.
7. Tropical Storm Warning issued.

8. Upon request from the National Weather Service via Hazardous Weather Outlook (HWO) and/or email notification.

When any of these conditions are met, SKYWARN nets will **prepare to activate** and will go on the air once severe or potentially severe weather is impacting or about to impact the area, provided such weather conditions are occurring between the hours of 6 AM and 10 PM local time. The team will activate anytime there is a formal request from the NWS.

The team may be placed in a "standby" status when there is a threat of severe weather but the criteria provided here are not met. Generally, if the wind, hail, and/or tornado risks levels are met on the Day 1 Convective Outlook, this should place the team in a standby status, with the issuance of a Watch, or the presence of locally severe weather conditions, serving as the trigger for net activation.

### **3.1.2 Nighttime Activation Criteria**

Overnight activations of SKYWARN nets, between 10 PM and 6 AM local time, may occur under the following conditions:

1. Particularly Dangerous Situation (PDS) Tornado Watch issued.
2. Hurricane Warning issued.
3. Tropical Storm Warning issued.
4. Upon request from the National Weather Service

It bears repeating that any formal request from the NWS for overnight support overrides any specific weather criteria stated here.

## **3.2 Activation Forecasting**

Amateur Radio Coordinators and County Coordinators are responsible for monitoring NWS products to determine the general need for SKYWARN activation and amateur radio support over the next 24 to 36 hours. Some recommended products are:

1. SPC Day 1 and Day 2 Convective Outlooks (SWO).
2. HPC winter precipitation products.
3. NHC tropical products.
4. WFO GYX Area Forecast Discussion (AFD).
5. WFO GYX Hazardous Weather Outlook (HWO).
6. Direct guidance from NWS forecasters.

In the short term (4-12 hours) the HWO and discussion with NWS forecasters are some of the best tools for determining the local need for SKYWARN support.

Based on this guidance and the Activation Criteria specified above, the Amateur Radio Coordinator should determine the potential needs for SKYWARN net activation and communicate this with the leadership team.

### **3.3 Use of Local Discretion for Activation**

Often there are weather situations which warrant activation of a SKYWARN net but fall below the mandatory activation criteria listed in the previous two sections. All currently certified SKYWARN Net Control Operators and Leadership Team members have the authority to start a net at any time. Team members are encouraged to monitor weather situations closely and evaluate the likelihood of localized severe weather events which may justify calling a net.

Net Control Operators do not need to obtain permission to start a net, however, they are encouraged to consult with their County Coordinator prior to going on the air if time permits.

***For urgent situations, such as a tornado warning, available Net Controls should get on the air and start a net immediately!***

### **3.4 SKYWARN Radio Desk Activation Criteria**

In many high-impact weather events such as tornado outbreaks and tropical weather systems it is important that we have a qualified Responder at the SKYWARN Radio Desk. Typically, the SKYWARN Radio Desk is activated for large-scale or outbreak type weather events that have the potential to produce widespread damage or that will impact a large portion of the CWA, and at the request of either the NWS or Amateur Radio Coordinator. The Responder's ability to travel safely to and from the WFO is always taken into consideration.

History has shown that the amount of radio traffic drops off sharply overnight except in the worst of weather conditions and attempting to keep SKYWARN on the air overnight is usually counterproductive. It may become necessary, however, during very severe or dangerous weather events.

#### **3.4.1 Coordination with NWS Employees**

A decision to activate local nets will generally be an easy one when using the criteria and resources outlined above. Usually there will be no need to contact NWS employees for guidance on whether to activate local nets, and there is no need to notify the WFO of local net activations.

NWS employees, however, should be consulted on the activation of the SKYWARN Radio Desk. For the majority of severe weather events there will be no substantial benefit to activating the SKYWARN Radio Desk. However, for large-scale or outbreak type weather events that have the potential to produce widespread damage or that will impact a large portion of the CWA simultaneously, activation of the SKYWARN Radio Desk is a possibility.



A phone call to the WFO before the expected onset of severe weather will allow for discussion of the threat and will help make a decision to activate the SKYWARN Radio Desk. If either the Amateur Radio Coordinator or NWS employees determine the activation of the Radio Desk would be beneficial, the Amateur Radio Coordinator will use the Responder roster to develop a list of volunteers to staff the Radio Desk and should provide a list of names to the NWS employees as soon as possible.

### **3.5 Team Activation Notifications**

The Amateur Radio Coordinator should send out an Activation Notification via e-mail or other electronic system to notify the team when SKYWARN is pending activation, or already activated in any Operating Area. At a minimum this should be sent to the impacted County Coordinators.

### **3.6 Notification of Partners**

Notification of SKYWARN activation should be made to the appropriate SKYWARN partners including state, county and local emergency managers, and others who have requested to be notified of SKYWARN amateur radio activations.

Notification may be made electronically or over the air. The activation notification should include the anticipated date and time of activation (if future) and the frequencies on which SKYWARN will be active, if they differ from standard frequencies and protocols. For example, if there is a need to activate a net on HF, this will be indicated.

### **3.7 Activation Steps**

#### **SKYWARN County Coordinator (CC) Activation Steps**

1. The SKYWARN County Coordinator, or his designate, receives notification and calls the NWS as necessary. The CC is briefed by the forecaster on:
  2. Nature of expected severe weather;
  3. Expected onset of severe weather (Immediate or later in day)
  4. Expected duration of event;
5. The SKYWARN County Coordinator or his designate, assesses the situation and takes the appropriate action for his/her county SKYWARN operations, activating a SKYWARN net or contacting personnel to run a net.
6. Meanwhile, if a SKYWARN County Coordinator or designate determines that a severe weather report, such as a funnel cloud, needs to be made known to the forecasters IMMEDIATELY, and a SKYWARN Amateur Radio Net has not yet been activated, please make sure that the NWS is informed of the traffic by telephone, and activate the net as soon as possible.

### 3.7.1 Net Control Operator Personnel List

SKYWARN County Coordinators are responsible for maintaining a list of personnel available at specific times to run a SKYWARN net.

## 4. Net Operations

### 4.1 Operating Rules for County or Regional SKYWARN Nets:

Above all else, common courtesy must be exercised. The NWS relies on SKYWARN spotters for critical information which could impact life and property.

In most instances, normal amateur communications can continue with only an informal SKYWARN net in operation. Only during particularly severe weather such as a tornado on the ground or significant damage from severe thunderstorms or flooding, should the SKYWARN net transition to a formal (directed) net.

The operator of a SKYWARN net, when roving for reports, may check into specific nets within their County or Operating Area for reports or to read warnings or statements, following net protocols. If no net is in progress, the operator will make a general call for information, or make an announcement that specific information is available and ask if anyone is present to receive it.

The most efficient way to relay weather reports to NWS is to enter them directly into the **GYX SKYWARN Net Reporting Form**, which is a Google Sheet that is shared real-time with NWS Forecasters. Access to this sheet is only available to NWS Net Control Operators and Leadership and should not be shared with the public for personal reporting.

There may be instances when access to internet or power and communications outages could impact the ability to enter data into this sheet. When this occurs, Net Control Operators should be familiar with the other methods of communicating with the NWS. This may include:

- Telephone
- Winlink or NBEMS data communications
- Voice relays via repeaters, simplex, or HF

WX1GYX participates in several communications exercises, including MARS interoperability and Simulated Emergency Tests (SET), in order to practice these methods, and all Net Control Operators, Responders, and Leadership, should be proficient in their use.

## **4.2 Situational Awareness/Disaster Intelligence**

During SKYWARN activations spotters may become aware of significant storm related damage that has occurred within a community or county. Awareness/intelligence may come from a spotter's own observations or from confirmed reports of damage from other sources.

Examples of significant damage that spotters may become aware of are:

1. Major roadways leading into or out of a community that becomes blocked or impassable due to downed trees, power lines, utility poles, major snowfall or flooding conditions.
2. Loss of power and/or telephone communication to large portions of or an entire community.
3. Loss or damage to community infrastructure including buildings for public safety, government, schools, and hospitals, public safety radio communications equipment, and damage to bridges or roadways washed out from flooding.
4. Evacuations from storm damaged areas and the opening of shelters within a community.
5. Spotters should report this type of information to a SKYWARN net or directly to NWS so it can be passed onto State Emergency Management Officials.

## **4.3 Handling Non-Severe Weather Reports**

Many of the reports received are for non-severe weather. Please be courteous to the report giver and note the amateur's location as you may need to contact them if the storm moves in their direction. As the moment dictates, it may be necessary in periods of extremely severe weather to only take reports from specific areas of interest to the NWS or only reports of severe weather. If the situation arises, please do not be shy about informing the net participants of the exact nature of the information needed and that the only report you will take must meet the severe weather criteria. Please indicate when the net is reopened for all traffic.

### **4.3.1 Probing for Clarity**

As a part of the core Net Control training curriculum, Net Controllers should be trained in asking probing questions to better develop a suspect or incomplete report. Often, suspicions surrounding an unexpected report can be alleviated by asking questions that prompt the Spotter to take a closer look at the situation and provide more details about what they are seeing. Asking the Spotter to describe the shape and movement of clouds, or asking about where and how snowfall measurements were taken, and then providing some brief guidance to the Spotter not only serves us immediately by getting a better-quality report, but it also improves the Spotter's reporting capabilities in the long-term.

It is extremely important that the Spotter not be “challenged” or ridiculed on the air, and that any questions asked are done so in such a way as to not convey any inherent disbelief or suspicion about the report. Questions from Net Control should be tactful and courteous in nature.

#### 4.3.2 Closing SKYWARN Operations

When the severe weather situation calms down the station operating a SKYWARN net can secure the net. At that time, the operator should perform the following shutdown steps:

1. Ask for any additional reports of severe weather.
2. Notify all amateur stations monitoring the net that SKYWARN operations are ending and that any further reports of severe weather should be telephoned into the NWS.

### 4.4 Information Collected

Reports should include the call sign of the Spotter, the location of the event, the date and time of the event, and the details of the report. If the station calling in the report is a trained Spotter, it should also be indicated on the report.

#### 4.4.1 Logging Requirements

All reports received by the SKYWARN net should be logged, regardless of whether the report meets SKYWARN reporting criteria. The **GYX SKYWARN Net Reporting Form** should be used to log all reports, unless internet access is not available to Net Control.

If no Internet access is available to Net Control, or if RMS is down, paper forms and log sheets should be used. Once service is restored, logs should be entered into the Google Sheet. When entering this information care should be exercised to avoid re-notifying NWS with any duplicate reports, and attention to detail is necessary to ensure that the dates and times are entered correctly.

Net Controllers who require assistance getting their paper logs entered, may relay their reports by voice or Winlink, or call them in directly to the NWS by telephone.

Responders operating from the Radio Desk at the NWS should always use the **GYX SKYWARN Net Reporting Form** to enter their reports, but also log their contacts in the station log (usually at the end of their shift). NWS Gray SKYWARN has a long history, with the earliest log entries dating back to 1986 (which precedes construction of the current NWS building), so this is a tradition that we’d like to keep going.

**IMPORTANT: Urgent reports (such as tornadoes and funnel clouds) should be called in by telephone in addition to being entered into the electronic reporting form. This phone call must be made right away.**

## 4.5 Handling Sensitive Information

Occasionally a Net Controller will be faced with the task of taking a report of an injury or death due to weather. It is extremely important that this information be handled carefully. Here are the guidelines for handling sensitive information:

1. Only request the minimum amount of information required to form the report. The location (address, nearby intersection or landmark), number and type of injuries (for example, two adults with injuries to the legs and one child trapped under debris) will suffice.
2. If this is an initial report for an injury or fatality, gather as much information as possible and immediately relay the information to emergency officials by telephone or radio. Call 911 and request a transfer to the appropriate county or city.
3. If the internet is down or unavailable and the report must be relayed over the air to the NWS, only give the minimum information necessary to convey the report. Do not give names or other specifics unless requested by NWS, and upon receiving such a request it should go by telephone or Winlink RMS to avoid sending the information for the public to hear.
4. Do not dwell on the situation. Keep the net moving. If Net Control is personally (emotionally) affected by the report, they should contact their County Coordinator, or another Net Controller for temporary relief.
5. Do not discuss the information with anyone not immediately a party to the transmission. Of course, the exception is law enforcement and emergency crews responding to the incident.

In other words, get every piece of information necessary to summon aid if still needed, but only relay the bare minimum information over the air to the NWS.

## 4.6 NCS or WFO Under Direct Threat

If a local Net Control Operator comes under a direct threat, the threatened station is to cease operation immediately. A simple announcement such as "I'm under a tornado warning, gotta go!" is sufficient. Drop the microphone and take cover immediately.

When under a direct threat of severe weather, Net Control should not be concerned with taking time to hand off the net to someone else. Often, someone else (NCS or not) will take over the net, but if not, SKYWARN simply goes off the air for a few minutes.

**While operating a net during a thunderstorm, especially be aware of the proximity of lightning, and shut down the net to protect yourself and equipment. *Do not jeopardize your safety for SKYWARN!***

If NWS Gray is under a direct threat, such as a Tornado Warning, all operations at the WFO may temporarily cease. Control of the Gray CWA is passed to an adjacent NWS. NWS Staff will likely place volunteers' safety over their own; cooperate, do not delay... immediately go off the air and take shelter until directed otherwise!

If operations at NWS Gray are turned over to NWS Norton for any reason, that office can be reached at (508) 622-3250.

Net Control Operators forced off the air due to storm damage or another emergency should notify any County Coordinator or other member of the SKYWARN Leadership team as soon as possible once the threat has passed.

## **4.7 Widespread Loss of SKYWARN Repeaters**

In the event of a widespread loss of access to primary SKYWARN Repeaters (for example, if all designated SKYWARN Repeaters in a given Operating Area are off the air) all available Net Control Operators should monitor the designated SKYWARN FM Simplex Frequency for their Area. The Primary Simplex frequency for SKYWARN is 146.595. The idea is to blanket as much of the area as possible with NCS coverage.

Reports may also be collected via the NWS Gray SKYWARN HF Frequencies, which are shared by Maine ARES. Please check the frequency to be sure ARES is not currently active before starting a net. HF can be used to relay reports to the SKYWARN Desk in the event of a major communications emergency. In the event that ARES is active, check into the net, announce yourself as the SKYWARN Net Control, and the ARES NCS will announce that SKYWARN has checked in and ask others on the net to direct any weather reports or other traffic for the NWS to SKYWARN.

## **4.8 SKYWARN HF OPERATIONS**

HF Amateur Radio equipment is installed at the NWS Forecast Office in Gray, for use as a communications backup during major outages, and also serves as a backup for other NWS Forecast Offices.

## **4.9 Local Weather Nets**

The weather is very difficult to predict! Local severe weather, such as flooding or severe thunderstorms, may develop suddenly without the NWS issuing a watch or warning, or be too localized for the NWS to activate SKYWARN.

The following is the recommended procedure for implementing local area weather nets:

The activation of a local area weather net may be coordinated on the local level with an ARES EC and the repeater licensee, preferably in advance of the weather emergency, or it may be a regularly scheduled net.

Upon receiving reports of a serious local weather situation developing while the net is in progress, the Net Control station should:

- Continue to gather reports, especially if they meet SKYWARN reporting criteria

- Relay the weather reports by phone, radio, Winlink, or the ***GYX SKYWARN Net Reporting Form***, if you have access.
- Contact a forecaster at NWS Gray to find out if SKYWARN is activated and what the expected duration of the storm is.

Please give the forecaster your name, call sign and telephone number and indicate that you are the contact person for running a local weather net on a particular frequency in a particular area. If SKYWARN is activated while a local area weather net is in progress, the local area net should transition to a SKYWARN Net.

## **5. Radio Desk Operations**

### **5.1 Decision to Activate**

The amateur radio station at the Weather Forecast Office will be staffed with one or more volunteers whenever it's determined that it could provide an operational advantage for the ham radio team or NWS employees. Weather events which are expected to last only a couple of hours, or impact only a small portion of the CWA generally do not warrant the activation of the SKYWARN Radio Desk.

### **5.2 Staffing Considerations**

Activation of the SKYWARN Radio Desk for short-duration and low-probability events will only serve to wear down the team of Responders. Travel time, activation duration, and frequency of activations must be taken into consideration, along with the size of the Responder crew and their apparent willingness to come to the WFO for any given activation.

Travel conditions must also be taken into consideration. Safety of SKYWARN volunteers takes precedence over all other considerations. Hazardous travel conditions before and after the activation (including the likelihood of being stranded at the WFO for an extended period of time) must be assessed before deciding to send volunteers to the WFO. NWS employees will respect any request to withhold staffing of the SKYWARN Radio Desk based on volunteer safety considerations.

### **5.3 Guests**

Guests should not be brought along to the Forecast Office during activations. The NWS office is not the place for guests or sightseers during SKYWARN activations. Due to United States Department of Homeland

Security and Department of Commerce regulations, all visitors including amateur radio operators, may be requested to present identification and state their reason for entry into the government facility. The NWS would be pleased to give a tour of the office during quiet weather and upon prior arrangement. This can be arranged by calling the office; contact information can be found on the WFO website at <https://www.weather.gov/gyx/>

Special advance arrangements can be made for visitation of emergency management partners and certain SKYWARN team members wishing to observe SKYWARN and/or NWS operations during an activation. The Amateur Radio Coordinator must make these arrangements with the Meteorologist in Charge (MIC) or Warning Coordination Meteorologist (WCM).

## **5.4 NWS Office Operating Conditions**

When SKYWARN is activated, NWS personnel are usually operating under high tension in a critical weather mode. Forecasters and other staff members are under intense pressure. This means:

1. Any distractions or interruptions of NWS or SKYWARN operations may mean the loss of life or property.
2. Sensitive information such as reports of severe damage, deaths, or injuries may be openly discussed and such information should not be repeated by SKYWARN volunteers on the air or outside the NWS.
3. No more than three SKYWARN volunteers should be in the Operations area at any time. All other volunteers in the building should be staged in the Conference Room or other designated location. The Operations area is very busy during severe weather and traffic through this area should be kept to an absolute minimum.

## **5.5 Volunteering for Responder Duty**

Responders should not go directly to the NWS office or call the NWS office at the first sign of severe weather. To be an effective and well-coordinated system, we must follow protocol:

1. NWS and/or the Amateur Radio Coordinator determines the need for SKYWARN activation and notifies the appropriate personnel.
2. The Amateur Radio Coordinator contacts Responders to man the NWS station and will notify the County Coordinator(s) in the Operating Area(s) where severe weather is expected, who will in turn contact the individual Net Control Operators to begin preparations for local nets.
3. Responders may contact the Amateur Radio Coordinator to inform him/her of their availability during a quiet time in net operations. Do not be insulted if your services are not needed at that time. As the situation evolves, staffing needs may also change.

SKYWARN Team Members should never go directly to the National Weather Service Office without official activation instructions.



## 5.6 Interaction with NWS Employees

Upon arrival at the NWS, the Responder should immediately identify himself/herself to a forecaster or other staff member as a SKYWARN amateur radio operator and ask a forecaster for a briefing on the severe weather situation, attempting to get the following information:

- Where storms are located and in which direction they are moving.
- Characteristics and history of the storm(s) (hail, damaging winds, tornadoes, etc.)
- What geographic locations are of primary concern to the forecasters.
- The latest statements, watches, and warnings to be read over the net. If another Responder is already on site, he or she should provide this information to incoming volunteers if time and operating conditions permit.

The forecaster who briefs the Responder upon arrival at the NWS will likely be the contact person until the NWS shift changes. Please follow your instincts on how and when to pass information to the forecasters. If the information is critical, bring this to the forecaster's attention immediately. Otherwise, enter your reports in the ***GYX SKYWARN Net Reporting Form*** as usual. As the storm develops, you may be asked to focus your attention on different areas or to seek specific information that would be helpful to the forecasters.

## 5.7 Access to the Weather Forecast Office

SKYWARN Officials and Responders operating from NWS Gray should park in the main parking lot. Use the front entrance to gain entry to the NWS office. This door is locked at all times. To gain entry, push the button on the wall and a buzzer will sound inside.

SKYWARN Officials and Responders must sign in at the front desk and note the time of their arrival and time of departure, when they leave.

## 5.8 Personal Items

Responders are required to provide their own food, drink, and hygiene items in a sufficient quantity to make it through the activation, but please keep the amount of personal items brought into the WFO to a bare minimum. In general, clothing and other items should be kept in a backpack. A refrigerator, freezer, microwave, oven, and coffee maker are available for SKYWARN use in the break room.

A sleeping bag and/or mat, pillow, and change of clothes is a good idea if there is any chance the activation may run into the late evening or overnight hours.

## 5.9 Security Policies

SKYWARN personnel must abide by all posted policies regarding the security of the Forecast Office, including regulations regarding building access, visitor sign-in and identification, entry and exit policies. Failure to do so may result in immediate and/or permanent removal from the office.

All Responders are required to take an IT Security and Awareness Course before using any WFO computer equipment. This course can be taken online and should be renewed on an annual basis.

*All National Weather Service Forecast Offices were closed to the public during the COVID-19 pandemic. For over 2 years, the NWS Gray SKYWARN Amateur Radio Team operated nets from their own homes. Although this was a challenge at first, it provided an opportunity for Net Control Operators to improve their station capabilities and proved that concepts such as the **GYX SKYWARN Net Reporting Form**, which was introduced in December of 2019, was very effective.*

## 6. WX1GYX Station Regulations

### 6.1 Call Sign Usage

The WX1GYX call sign is to be used for all SKYWARN operations taking place from the SKYWARN Radio Desk located at the NWS Gray Weather Forecast Office. Net Control Stations operating the local nets from their own homes, portable, or mobile, should identify with their personal call sign.

The WX1GYX call sign may also be used for SKYWARN-related special events, such as ARRL Field Day, SKYWARN Recognition Day, and other events as authorized by the license Trustee.

The WX1GYX call sign may also be used on any SKYWARN-owned and operated repeater or relay station, including APRS and packet nodes, as authorized by the Trustee.

FCC rules apply, so the operator must also identify himself/herself using the WX1GYX call sign once every ten minutes and at the end of each contact.

### 6.2 Operating Privileges, Control Operators

The use of the WX1GYX club call sign does not provide any operating privileges. Operating privileges (frequencies, emissions, etc.) are determined by the privileges of the Responder's personal license class, or those of the station control operator(s).

As a matter of our policy, the Responder(s) holding the highest class of amateur license are considered the control operators for the station. For example, if one Technician and two General licensees are present, the two General licensees share the responsibility as control operator, and the General Class license privileges may be used by the Technician operator while under the direct supervision of one or both of the General Class operators. As an additional example, if one Technician, one General, and one Extra Class operator are present, the Extra Class operator is considered the control operator and is responsible for all station activities.

In accordance with FCC regulations, at no time may an amateur operate outside his or her license privileges without a control operator present, and at that point operation is limited to the privileges of the control operator, and all such transmissions shall be at the direction and under the supervision of the control operator.

### **6.3 WX1GYX License Trustee**

The Amateur Radio Coordinator shall be listed as the Trustee on the WX1GYX station license. If there is a change in leadership, the incoming Amateur Radio Coordinator and Warning Coordination Meteorologist are responsible for updating the FCC records with the name and call sign of the new Trustee. An Assistant Amateur Radio Coordinator may also be listed as the Trustee if agreed upon by the NWS Gray SKYWARN Amateur Radio Team.

#### **6.3.1 Modification or Renewal of WX1GYX License**

From time to time it will be necessary to make changes to the WX1GYX license, such as a Trustee change, address change, or renewal. Because WX1GYX is a vanity club call sign, a Club Station Call Sign Administrator (CSCSA) such as W5YI-VEC must be used to process these changes. While administrative changes are usually performed free of charge, standard vanity call sign renewal fees apply to license renewals.

In general, when making changes to a club call sign, supporting documents in the form of club constitutions or other similar material must be submitted. Because NWS Gray SKYWARN is not organized as a club and is instead serving the National Weather Service as a support organization, a special procedure is in place to handle these changes.

The Trustee (or incoming Amateur Radio Coordinator if changing Trustees) must sign off on the modification paperwork. The Warning Coordination Meteorologist will prepare a brief statement on National Weather Service letterhead stating that the call sign is used for purposes of SKYWARN. The letter must also authorize you, by name and call sign, to become the Trustee or make the other administrative changes.

This letter must be submitted along with the application paperwork to the CSCSA, along with any required processing fee(s). Processing fee(s) are generally paid by the National Weather Service Forecast Office directly.

## **6.4 WX1GYX Station Equipment**

The SKYWARN Amateur Radio Station consists of three radios. There are two VHF/UHF transceivers (one is analog FM and the other is capable of DMR). There is also a Kenwood TS- 570D HF transceiver for monitoring and communicating with the National Hurricane Center and other HF nets. Instructions on the operation of all equipment in the SKYWARN amateur radio station can be found near the operating position.

Responders are encouraged to become familiar with the operation of these radios prior to responding to the NWS office for an activation. Where possible, electronic versions of the equipment manuals are kept on the SKYWARN computer and on the NWS Gray SKYWARN Amateur Radio Team web site.

## **6.5 WX1GYX Equipment Maintenance**

All volunteers using the SKYWARN amateur radio station have a responsibility for assisting with maintenance of station equipment. This responsibility is best carried out by notifying the SKYWARN Amateur Radio Coordinator of any problems with the equipment. The Amateur Radio Coordinator will pursue repair or replacement of equipment as necessary.

The Amateur Radio Coordinator may designate a Tech Team consisting of qualified individuals willing to assist with the periodic maintenance of the station equipment, as needed.

# **7. Interoperability Plan**

Our ability to function alongside other EMCOMM organizations requires advance planning and careful coordination to ensure efficient sharing of limited band space. In addition, the team must adhere to established communication protocols to ensure effective communication with other agencies.

This Interoperability Plan ("Interop Plan") describes our plans for coordinating our activities with other organizations and communicating with other agencies. This plan uses a two-part approach depending on the type of activation: "routine event" and "major event."

## 7.1 Activation Types Defined

A "routine event" activation is any activation meeting these criteria:

- Local nets are activated in one or more Operating Areas.
- The SKYWARN Radio Desk may or may not be activated.
- State Emergency Operations Centers (EOC's) are not activated.
- Local EOC's may or may not be activated.
- Event duration is generally 6 hours or less.

Examples include most summertime severe weather, short periods of freezing rain or snow which cause brief disruptions to travel, localized flooding, etc.

A "major event" is an activation meeting two or more of these criteria:

- Local nets active in two or more Operating Areas.
- SKYWARN Radio Desk is activated.
- At least one state EOC is activated.
- Event duration is generally 6 hours or more.

Examples include tropical storms, hurricanes, major winter storms, and large-scale severe weather outbreaks such as large squall lines.

## 7.2 Routine Event Interop Plan

During most routine events, SKYWARN is the only EMCOMM group on the air. ARES teams may be on standby or in the early stages of activating, or, in perhaps a rare case, could have nets on the air. The greatest concern for potential on-air conflicts would be local club nets, traffic nets, etc.

For these events, coordination with other nets is best handled by the SKYWARN Net Controller or the SKYWARN County Coordinator. It is not practical to hold a club net alongside a SKYWARN net, so most club nets will gladly yield to SKYWARN activity by delaying or canceling the net or by moving it to an alternate frequency. SKYWARN generally takes precedence in these situations, but if we are asked to move to another frequency, we will honor that request.

The SKYWARN Amateur Radio Coordinator or County Coordinator should be engaged by Net Control to work out any disagreements that might arise.

Interagency communication is typically not a concern for these routine events. While several localities might experience a widespread loss of utilities such as power or telephone, communications are not often impacted at such a time and in such a manner as to require an alternate communication path be established between the National Weather Service and one of those localities. In the unlikely event such a need arises, the SKYWARN Radio Desk can be activated to provide that link.

Standard SKYWARN frequency plans will typically be used. The team will maintain both “plain language” and ICS 205 formatted standard frequency plans for each Operating Area and make them available on the team web site. Frequency changes necessitated by cooperation with other repeater users may result in temporary changes to alternate, unpublished frequencies. In this instance, the user of the standard SKYWARN repeater will be asked to help direct SKYWARN traffic to the new frequency. HF frequencies may be used to collect reports from outlying areas not served by VHF/UHF SKYWARN repeaters. These nets would be operated by regular SKYWARN Net Control Operators.

### **7.3 Major Event Interop Plan**

Major events involve significant severe weather over a large portion of the County Warning Area. State and local EOC's are likely active and this plan includes establishing a communications link between the National Weather Service and the EOC's.

In all instances, if the Maine ARES Net is active, the SKYWARN Radio Desk will check in to that net and will maintain a presence there to send and receive formal message traffic from served agencies. Under no circumstances will Spotter reports be handled across this net unless specifically requested by the ARES NCS.

If Maine ARES is not active but MEMA is active, WX1GYX will establish an HF communications link with that EOC via any statewide emergency net or other designated frequency. If the MEMA EOC is not active but New Hampshire's state EOC is active, an HF link will be established with New Hampshire's EOC via any statewide emergency net or other designated frequency.

If no state EOC is active, the Maine ARES frequency will be monitored for traffic bound for NWS Gray.

NOTE: Consult the latest WX1GYX Standard Communications Plan ICS 205 documents for the current frequencies assigned to Maine and New Hampshire emergency nets.

Communication with local or county EOC's will be coordinated through the appropriate statewide emergency net whenever voice communication is required. In all instances, the preferred method by which formal message traffic should be passed is Winlink, and all messages shall be in standard ICS 213 format.

Prior to the activation of WX1GYX, an ICS Compliant communication plan (ICS 205) will be prepared and transmitted to all team members and emergency management partners and will be posted on the team web site.

During major events, there is a high likelihood that SKYWARN will be sharing VHF/UHF band space with other nets. It is very easy to run two emergency nets side-by-side on one frequency: the two Net Controls alternate calls for check-ins and take turns handling traffic for their respective nets. Stations breaking into a net should indicate which of the nets they need to communicate with. Should a frequency become too congested trying to share, one net will need to move to another frequency. If SKYWARN's

alternate/backup repeater(s) are available, SKYWARN will move to those frequencies. Whichever net stays behind on the original frequency will be asked to assist in directing traffic to the other net.

The SKYWARN Amateur Radio Coordinator is responsible for working out communication conflicts during major event activations and should be consulted immediately if any on-air conflict cannot be promptly resolved to the satisfaction of all parties involved. Historically, good sense and common courtesy have prevailed and there have been no major issues. We expect this to continue.

## 8. SKYWARN Reporting Criteria

The following is SKYWARN reporting criteria that should be followed and the type of reports that should be gathered across the entire SKYWARN network via Amateur Radio:

- Tornadoes or funnel clouds (be very wary of look-alikes; watch for rotation)
- Wall clouds, especially if they are rotating
- Hail (Be specific with regard to size; DO NOT report MARBLE size)
- Winds (40 mph or greater; specify whether estimated or recorded)
- Trees/power lines downed
- Structural damage to buildings (roof, windows, etc.)

### Rainfall

- 1 inch or greater in an hour (NOT a 1"/hr. rate for 10 minutes)
- 2 inches or greater storm total

### Flooding

- Streams/Rivers — also, when nearing bankful
- Coastal
- Street (Road Closures/Washouts, Cars Stuck due to flood waters. Minimum of 6" of water
- covering an entire roadway or lane of a major route/highway)

### Winter Weather

- Precipitation type change (rain to sleet/freezing rain/snow, when the change has "taken hold")
- Thunder, when accompanied by snow
- 1/4" radial ice accretion (from twig outward; not circumference)

### New Snowfall

- First 2 inches; every 2-3 inches thereafter
- 1 inch per hour or greater

- If less than 2 inches total, give final total only
- Give final total (don't leave us hanging with a partial report)
- Report any snow/sleet/freezing rain if not in NWS forecast!



## Appendix A.

### Hurricane Watch Net

The Hurricane Watch Net (HWN) operates in cooperation with the National Hurricane Center (NHC) in much the same manner that SKYWARN operates with the National Weather Service Forecast Office, in Gray, ME.

The purpose of the HWN is to:

- Disseminate hurricane advisory information to marine interests, Caribbean Island nations, Emergency Operating Centers (EOC's) and other interests for the Atlantic and Eastern Pacific as promulgated by the NHC in Coral Gables, Florida.
- Obtain weather information for the NWS from reporting stations who are not part of the routine network of the World Meteorological Organization and forward the information to the NHC.
- Function as a backup communications link for the NHC, EOC's and NWS and other vital interests involved in the protection of life and property before, during and after hurricane events.
- Relay initial hurricane damage assessments to the NHC.

HWN operations normally commence anytime a hurricane is within 350 nautical miles of an inhabited land mass and will continue in operation until the storm is no longer a threat. The net DOES NOT handle health and welfare type communication.

Operation will normally take place on 14.325 MHz +/-, however the operation may shift frequency at the request of stations in the hurricane affected area or to take advantage of shifting propagation conditions.

Priority is given to those stations representing the NWS and emergency management organizations. The net control volunteer of the SKYWARN station should identify that they are located at the National Weather Service Forecast Office in Gray, ME when checking into the HWN.

The Dade County, Florida Amateur Radio Public Service Corps operates station W4EHW located in the forecast office of the NHC. Most traffic is passed to this station via the HWN or through a landline computer link to

Additional information, such as primary and secondary HWN frequencies, and websites, are listed below:

HWN Website: <http://hwn.org>

WX4NHC Amateur Radio Station: <http://w4ehw.fiu.edu>

## Appendix B.

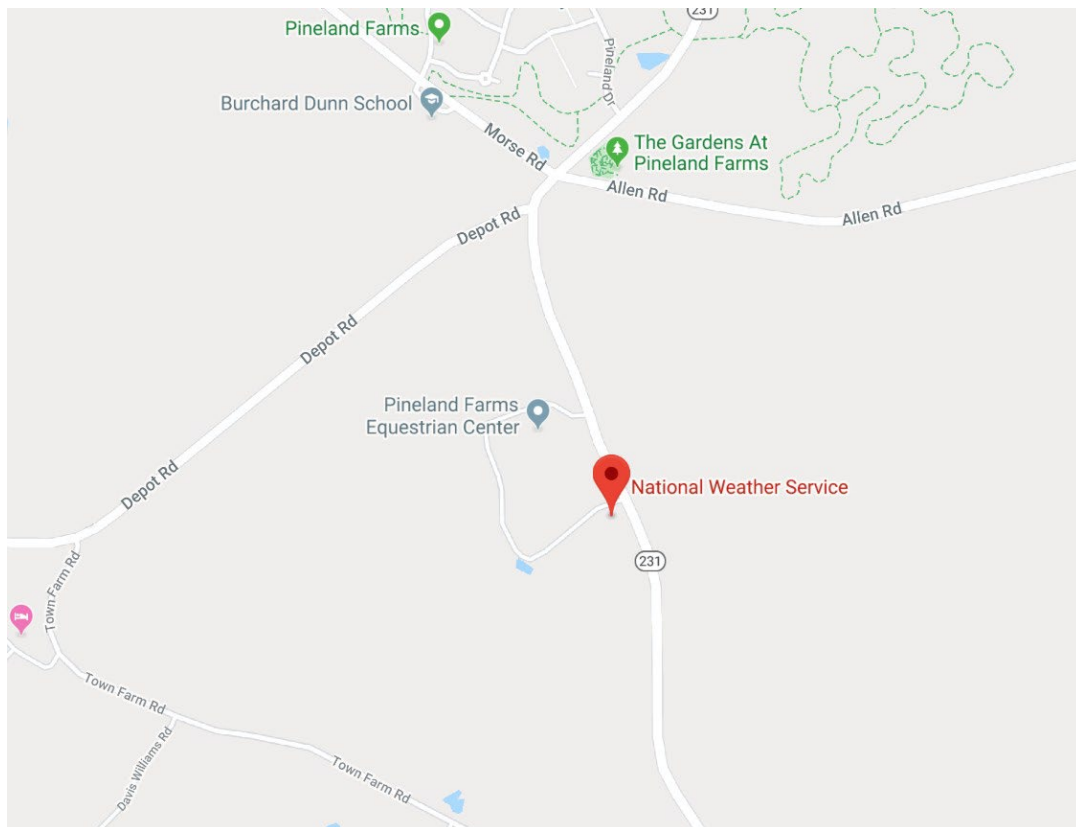
### Directions to NWS Gray

The NWS Gray, Maine Weather Forecast Office is located on Route 231, near Pineland Farms. From the Maine Turnpike exchange in Gray, take a right onto ME-4/ US-202 / ME-115 (Gray Road), and take a slight right onto ME-115 (Yarmouth Road) at the first intersection. Continue about 1.8 miles, and take a left onto Depot Road. In about 2.8 miles, turn right onto ME-231 S. Follow for about .4 miles and take a right onto Weather Lane. Destination will be on the left.

GPS Address: 1 Weather Lane, Gray, ME 04039 Local Telephone number: (207) 688-3216

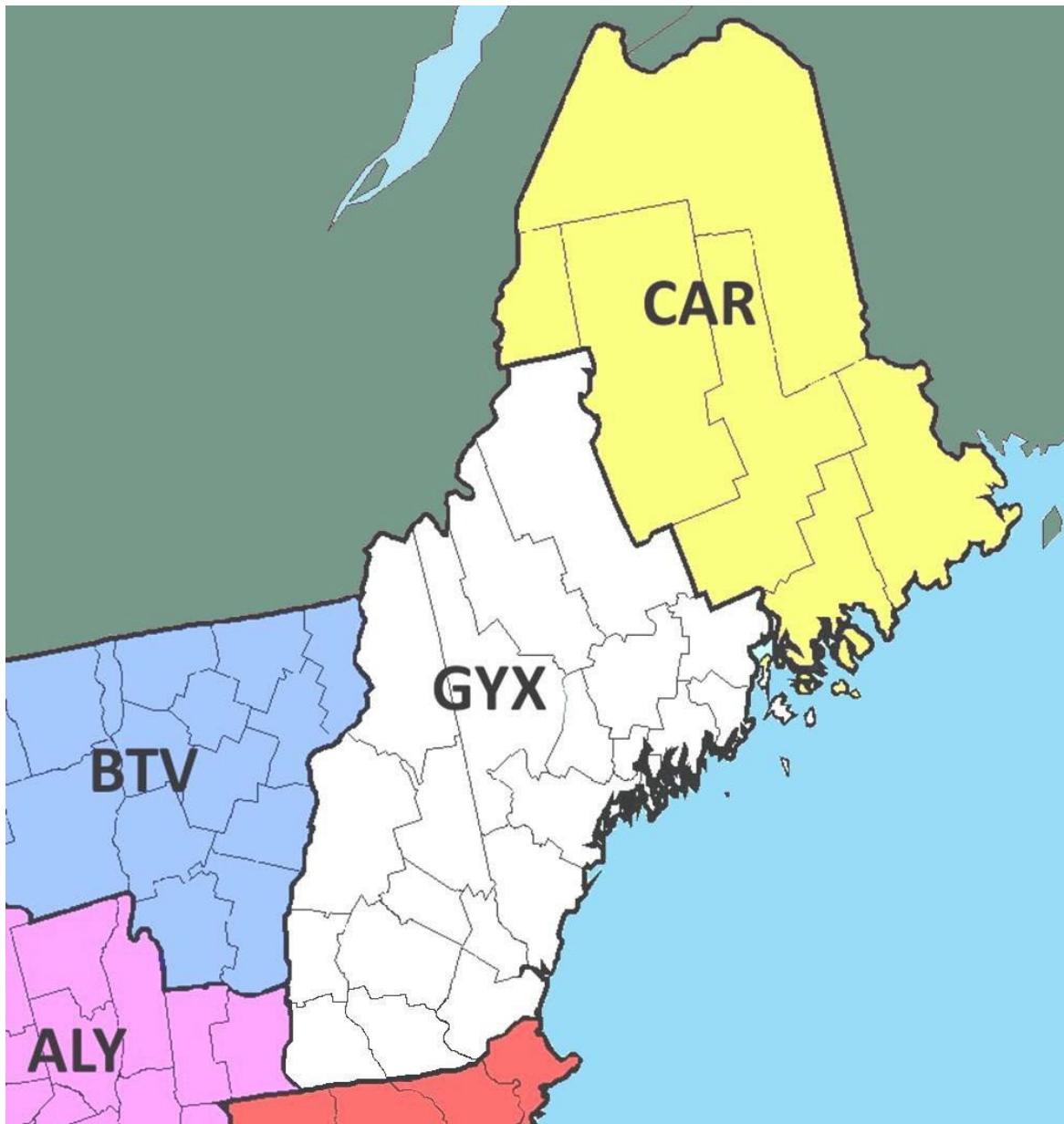
To report severe weather:

- Call: 1 (800) 482-0913
- Email: [gyx.skywarn@noaa.gov](mailto:gyx.skywarn@noaa.gov)
- Twitter: @NWSGray
- ***NWS Gray SKYWARN Net Reporting Form***



## Appendix C

### Map of County Warning Areas (CWA) for NWS Gray and Adjacent Forecast Offices



**ALY (Magenta)** – Albany, NY, **BTV (Violet)** – Burlington, VT  
**GYX (White)** – Gray, ME, **CAR (Yellow)** – Caribou, ME,  
**BOX (Red)** – Norton, MA

## Appendix D

### ARES Frequency Allocations

#### 1. Maine ARES

County	Primary Simplex	Secondary Simplex	Tertiary Simplex	Primary Repeater	Secondary Repeater
Androscoggin	146.460	147.540	146.430	146.610 - / 88.5	145.290 - / 100.0
Aroostook	146.475	147.510	146.505	146.730 - / NO PL	
Cumberland	146.580	146.595	147.585	147.090 - / 100.0	449.225 - / 103.5 TS
Franklin	146.535	147.570	146.580	147.180 + / 123.0	
Hancock	146.565	147.495	146.535	146.910 - / 151.4	
Kennebec	147.480	146.475	147.450	145.390 - / 100.0	
Knox	147.540	146.475	147.450	145.490 - / 91.5	
Lincoln	147.510	146.505	147.450	146.985 - / 100.0	
Oxford	146.550	147.435	146.505	146.880 - / 100.0	
Penobscot	147.565	146.550	147.555	145.450 - / 67.0	
Piscataquis	146.400	147.450	146.565	147.105 + / 103.5	147.150 + / 71.9
Sagadahoc	146.490	147.555	146.565	147.210 + / 100.0	
Somerset	147.420	146.430	147.525	146.730 - / 91.5	
Waldo	146.430	147.465	146.460	147.270 + / 136.5	
Washington	147.525	146.460	147.570	147.330 + / 118.8	
York	147.570	146.445	147.540	147.345 + / 123.0	
Statewide Coord.	52.525	146.520	223.500	446.00	KQ1L Link System
Statewide DMR	145.790	145.510			
SKYWARN (Gray)	146.595			147.090 - / 100.0	147.045 + / 103.5
SKYWARN (Caribou)	146.475			146.730 - / NO PL	

3940.0 kHz 7262.0 kHz	Night Day	Statewide HF Coordination. 1900L: MECN (Sun); SGN (M-Sat). 0900L: MPSN (Sun)
3583.0 kHz Unassigned	Night Day	Digital Modes (NBEMS) +1000 Hz Olivia 8/500 keyboard net ops; Thor 50x1 file transfer

An updated PDF of this chart is available here:  
[http://maineares.org/Frequency\\_Chart\\_Jan\\_05\\_2017.pdf](http://maineares.org/Frequency_Chart_Jan_05_2017.pdf)

## 2. New Hampshire ARES

County	Primary Simplex	NBEMS Simplex	Backup Simplex	Primary Repeater	Secondary Repeater
Capital Area	147.450	145.750 NBEMS		146.940 - / 114.8	147.225 + / 100.0
Capital Area (Henniker)	147.450	145.750 NBEMS			146.895 - / 100.0
Central (Guilford)	147.540	145.670 NBEMS		146.985 - / 123.0	147.390 + / 123.0
Central (Franklin)	147.540	145.670 NBEMS		147.300 + / 88.5	147.390 + / 123.0
Cheshire	147.540	145.530 NBEMS		146.805 - / 100.0	146.760 - / 110.9
Coos (Berlin)	147.420	145.710 NBEMS	146.580	146.685 - / 100.0	146.655 - / 100.0
Coos (Bethlehem)	147.420	145.710 NBEMS	146.580	147.105 + / 100.0	146.655 - / 100.0
Eastern Rockingham	147.465	145.550 NBEMS		145.150 - / 127.3	146.700 - / 88.5
Western Rockingham	147.435 (100.0)	145.690 NBEMS	445.550 (100.0)	146.850 - / 85.4	147.210 + / 107.2
Greater Manchester	146.535	145.730 NBEMS		147.135 + / 100.0	444.200 + / 186.2
Hillsborough	147.405	145.610 NBEMS		146.730 - / 88.5	449.375 - / 88.5
Mt. Washington Valley	147.495	145.590 NBEMS		145.450 - / 100.0	448.975 - / 141.3
Southern Grafton	146.580	145.630 NBEMS		145.330 - / 100.0	146.760 - / 110.9
Strafford	147.570	145.530 NBEMS		147.000 - / 100.0	146.685 - / 88.5
Sullivan (Claremont)	147.555	145.650 NBEMS		147.285 + / 103.5	
Statewide Coord.	147.510	446.075	51.600		
NBEMS (State EOC & Section)	145.570				
State EOC Team	446.075				

3973.0 kHz 7273.0 kHz	Primary Night Primary Day	Statewide HF Coordination. Net: Saturday at 8:30am local
3582.0 kHz 7072.0 kHz	Primary Backup	NH ARES Digital (PSK125 pri). Net: Saturday at 7:30am local NH ARES Digital (PSK125 pri)

An updated PDF of this chart is available here:

<http://nhradio.org/nhares/CommPlan/AttachmentB-Nets&Frequencies.pdf>

## Appendix E

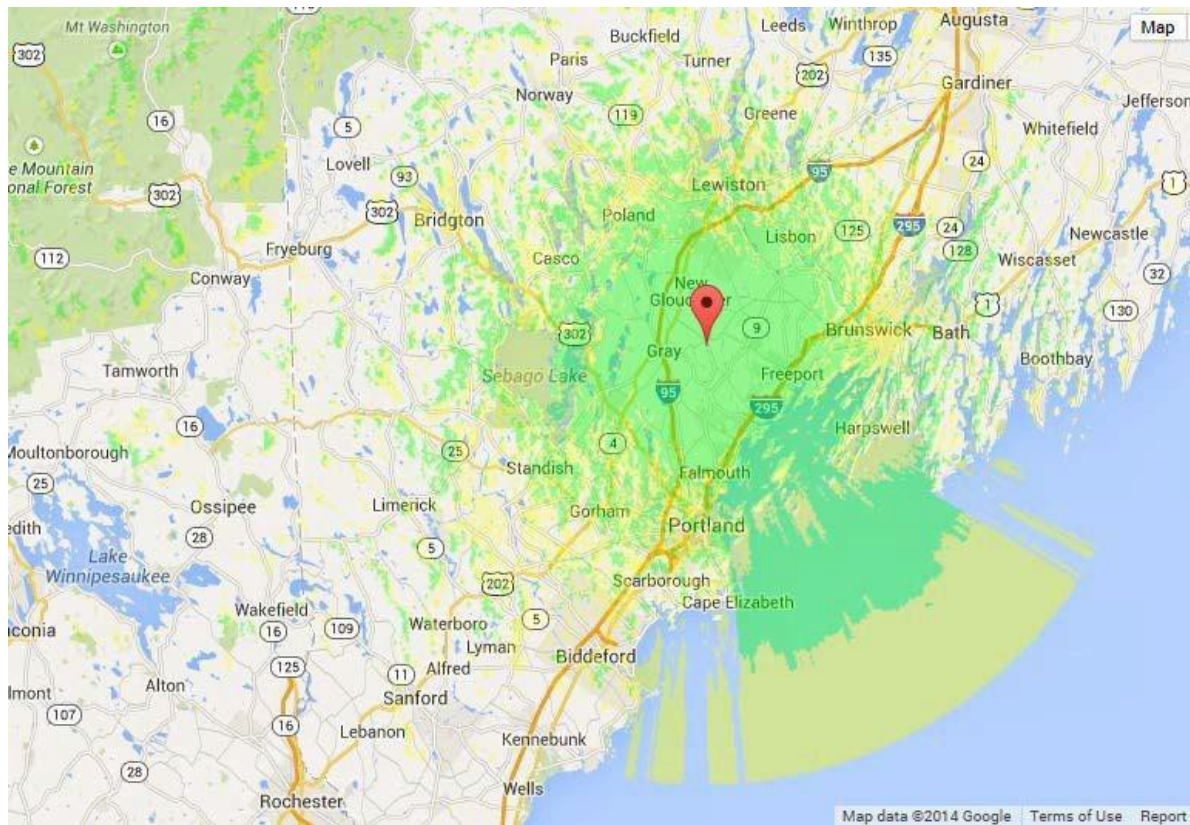
### Traffic, Weather, ARES and RACES Nets

Frequency	Net Name & Location	Mode	Offset / PL	Local Time	Net Manager	Notes
3539	VT/NH CW Traffic Net	CW		7:00 pm	Joe Burke W1INC	Daily
3539	VT/NH CW Traffic Net (Slow Net)	CW		7:15 pm	Joe Burke W1INC	WED & THUR
146.940	Granite State Traffic Net (NTS)	FM	- / 114.8	9:00 pm	John Gotthardt K1UAF	Daily
147.225	Granite State Traffic Net (NTS)	FM	+ / 100.0			Alternate
3973	Granite State Phone Net	LSB		8:00 pm	John Gotthardt K1UAF	MON - FRI
3980	VT RACES HF Phone	LSB				Night
7280	VT RACES HF Phone	LSB				Day
448.125	VT RACES UHF Linked System	FM	- / 110.9			As Needed
444.700	VT RACES UHF Linked System	FM	+ / 110.9			As Needed
146.520/55	VT RACES 2m Simplex	FM	Simplex			As Needed
3976	VT ARES HF Phone	LSB				Night
7275	VT ARES HF Phone	LSB				Day
3940	ME ARES HF Phone	LSB				Night
7275	ME ARES HF Phone	LSB				Day
146.520	ME ARES Statewide Coord.	FM	Simplex			Coordination
3943	EMA ARES HF Phone	LSB				Primary
7228	EMA ARES HF Phone	LSB				Backup
7245	EMA ARES HF Phone	LSB				Backup
145.230	EMA Traffic Net	FM	- / 88.5	8:00 pm		Daily
3948	NTS 1 <sup>st</sup> Region Net – Cycle 2 (Early)	LSB		2:30 pm	N1UMJ	Daily
3948	NTS 1 <sup>st</sup> Region Net – Cycle 2 (Late)	LSB		4:00 pm	N1UMJ	Daily
3570	NTS 1 <sup>st</sup> Region Net – Cycle 3	CW		6:30 pm	W1KX	Daily
3598	NTS 1 <sup>st</sup> Region Net – Cycle 4 (Early)	CW		7:45 pm	W1UD	Daily
3598	NTS 1 <sup>st</sup> Region Net – Cycle 4 (Late)	CW		9:30 pm	W1UD	Daily
3937	WMA ARES HF Phone	LSB				As Needed
146.910	WMA ARES Net	FM	- / 162.2	9:00 pm		SUN Weekly
3973	NH ARES HF Phone	LSB				SAT Weekly
3582	NH ARES NBEMS Net	USB	Digital	7:30 am		SAT Weekly
7273	NH ARES HF Phone	LSB		8:30 am		Day
3965	Connecticut ARES HF Phone	LSB				As Needed



## Appendix F

### 2 Meter FM Simplex Coverage (NWS Radio Desk)





## 1. Log Sheet (Legacy Paper Log)

[illegible][illegible]

[http://www.ws1sm.com/Images/WX1GYX\\_Logsheet.pdf](http://www.ws1sm.com/Images/WX1GYX_Logsheet.pdf)



## 2. Severe Weather Report Form (Legacy Paper Form)

	<b>WX1GYX SKYWARN® Severe Weather Report Form</b>	
---	---	---

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time of Occurrence: \_\_\_\_\_ Reporting Station: \_\_\_\_\_

Report Source: (Circle One): PERSONAL OBSERVATION, MEDIA, SCANNER, OTHER: \_\_\_\_\_

Location of Reported Event: \_\_\_\_\_

*Report Description:*

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature / Call Sign: \_\_\_\_\_

Download a fillable PDF version of this form here:  
[http://www.ws1sm.com/Forms/WX1GYX\\_SKYWARN\\_FORM.pdf](http://www.ws1sm.com/Forms/WX1GYX_SKYWARN_FORM.pdf)

## Appendix H.

### NBEMS and Digital Messaging

#### 1. NBEMS

The radio desk at the National Weather Service in Gray accommodates NBEMS messaging on both HF and VHF, and also Winlink communications.

For NBEMS (FLDigi), the recommended form is the *Storm Report* form which is available in flmsg:

This form is very close to our legacy paper form and contains all the necessary information. Simply fill in the time, date, and location information, and select one of the weather events.

If this is all you need to report, then save the form and send it along, but if you need to include additional information, such as storm-related damage, etc., be sure to click the “Details” tab and type in your additional information.

The screenshot shows the FLMSG 4.0.7 application window. The title bar reads "FLMSG: 4.0.7". The menu bar includes "File", "Form", "Template", "Config", "AutoSend", "ARQ", and "Help". The main window has a tabbed interface with "Report" and "Details" tabs. The "Report" tab is active, showing a "Storm Report" form. The form includes fields for "Date", "Time", "--Zone--", "State --Select State--", "County --Select County--", and "Location". There are "Store" and "Default" buttons. Below these are several checkboxes for weather events: "Flood", "Hail", "High Wind Speed", "Tornado/Funnel cloud", "Wind Damage?", "Snow", "Freezing Rain/Icing", and "Heavy Rain". Each checkbox is followed by a dropdown menu for selecting specific details (e.g., "Flood" has "--Select flooding category--", "Snow" has "--Select snow tot--" and "--Select duration--"). At the bottom, there are fields for "Name", "Phone", "Email", and "Profile --Select Profile--". A "Comp" checkbox is also present, followed by a dropdown menu showing "8PSK125" and a "\*" button.

To download FLDigi, or to learn more about the program, click here:  
<http://www.w1hkj.com/>

## 2. Winlink

For Winlink, the recommended form is the *Severe Weather Report* form, which is available by expanding *Standard Templates*, and then *Weather Forms*.

SEVERE WEATHER REPORT			
<a href="#">Load Severe WX Data</a>			
Sender: <input type="text" value="KB1HNZ"/>			
Report Date/Time (local): <input type="text" value="2022-04-09 10:52:50"/>		Report Version (Select one): <input checked="" type="radio"/> First Report <input type="radio"/> Update Report <input type="radio"/> Final Report	
Reporting Party Name: <input type="text"/>			
Reporting Party Phone Number: <input type="text"/>			
Reporting Party Email Address: <input type="text"/>			
EVENT AREA			
City: <input type="text"/>		State/Province/Region: <input type="text"/>	
County: <input type="text"/>		Other: <input type="text"/>	
Latitude and longitude: LAT <input type="text" value="43.5208"/>		LON <input type="text" value="-70.4583"/>	MGRS <input type="text" value="19TCJ8214419684"/>
		Grid <input type="text" value="FN43sm"/>	
<small>LAT/LON and MGRS default to the center of the grid square listed in Express Settings, unless a GPS is used or Lat/LON or MGRS are entered manually.</small>			
<small>If sending report for someone else, do not use your GPS Lat/Lon, obtain theirs if available and manually enter in decimal format.</small>			
OBSERVED EVENT CONDITIONS			
<small>Check All That Apply:</small>			
Flood: <input type="text" value="Choose"/>			
Hail: <input type="text" value="Choose"/>			
High Wind Speed: <input type="text" value="Choose"/>		<a href="#">View Wind Speed guidelines</a>	
Tornado / Funnel Cloud: <input type="text" value="Choose"/>			
Wind Damage: <input type="text" value="Choose"/>			
Winter Precipitation: <input type="text" value="Choose"/>			
Snow: <input type="text" value="Choose"/>			
Freezing Rain: <input type="text" value="Choose"/>			
Heavy Rain: <input type="text" value="Choose"/>		Time period: <input type="text"/> <small>Report 1" or greater in an hour and every inch thereafter, 2 inches or greater storm total.</small>	
Additional Information or Damage Descriptions (Be Brief)			
<div>Anything of importance or damages noted. No names or specific addresses</div>			
<a href="#">Save Severe WX Data</a>		<a href="#">Submit</a>	<a href="#">Reset Form</a>
Ver 3.2			

To download Winlink Express, or to learn more about the program, click here:

<https://www.winlink.org/>

SKYWARN operators should be familiar with both ICS- 213 and ARRL Radiogram forms as well, and be proficient in their use, especially during exercises and ARES/RACES activations. The Storm Report forms should be used during stand alone SKYWARN activations and weather nets.

### **Digital Communications Proficiency**

It is recommended that all SKYWARN radio operators, especially those who activate from the National Weather Service in Gray, become proficient in digital communications.

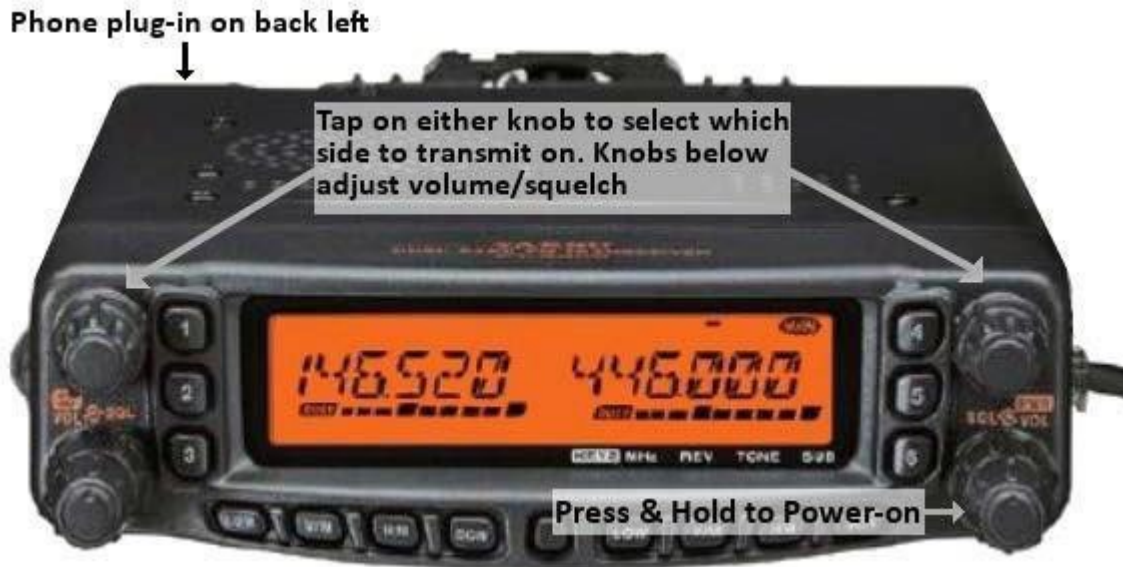
Please familiarize yourselves with the equipment available at WX1GYX, and also take advantage of the helpful information that Steve Hansen KB1TCE, has compiled on the subject:

<http://www.maine-ares.org/digital.htm>

## Appendix I.

### Radio Equipment at the NWS Gray Radio Desk

The SKYWARN Amateur Radio Station consists of three radios – a Yaesu FT-8900 Quad-Band FM Transceiver, a Kenwood TS-570D HF/6m all-mode transceiver, and a Connect Systems CS801 VHF DMR transceiver.



#### 1. Yaesu FT-8900

The FM Transceiver has the ability to monitor two channels simultaneously, and will always be used in the memory mode, which features pre-programmed repeater and simplex frequencies. This radio is used to establish the primary SKYWARN Net and to seek reports from areas in which the forecasters have expressed an interest because of indications of severe weather.

Identify as “WX1GYX, National Weather Service - Gray”

After operations, leave the radio on 147.090 and 147.045 so non-licensed staff can turn the radio on to monitor remote nets or incoming operators who are called in to activate the station.

**Click on the following link to download the FT-8900 manual:**

<https://www.yaesu.com/downloadFile.cfm?FileID=14837&FileCatID=150&FileName=FT%2D8900R%5FOM%5FENG%5FEH008M109%5F1605c%2DFM%2D1.pdf&FileContentType=application%2Fpdf>

It's good to be familiar with the radio functions BEFORE operating during a deployment. A Quick reference guide as well as a channel guide are also available in a binder located near the operating position.



## 2. Kenwood TS-570 HF Transceiver

SKYWARN HF frequencies are listed in this manual and also on laminated cards near the station. It is usually recommended to use 40 meters for daytime operations and 80 meters at night, although the radio can be tuned up on several of the HF bands.

The TS-570 is an exceptional HF/50 MHz transceiver with high-end features, including: 2 Beat Cancellation Modes (SSB/AM), Adaptive Filtering/Dual Mode, Noise Reduction Function, AF-Stage DSP, Attenuator, Built-in Auto ATU (1.81 MHz to 29.9 MHz coverage), Built-in CW Keyer with Message Memories, COM Port D-sub 9-pin, CTCSS Encoder/Decoder, CW Auto-tune Mode, Data Connection for External TNC, Direct Frequency Entry, Front Panel KeyPad, Internal VOX, Key Beep On/Off, Large Amber-colored Backlit LCD Display, 105 Memory Channels, and more!

A CW key, Kenwood MC60 Desk Mic, and External Speaker, are part of the installation.

**Click on the following link to download the Kenwood TS-570 manual:**

<https://www.kenwood.com/usa/Support/pdf/TS-570-English.pdf>





### 3. Connect Systems CS801 DMR Transceiver

**BEFORE USE:** If you're using the CS801 installed at NWS Gray, always check the coax position switch, mounted behind and to the left of the radio, and be sure it's in the DMR position.

**POWERING ON:** First, be sure the power supply is on. To power the radio on, hold down the round red power button for 2-3 seconds. The LCD screen should glow amber and display the call sign briefly, before returning to a screen displaying a frequency, time slot, and talk group. Please refer to the CS801 Channel guide to find the desired repeater and Talk Group.

The knob on the left is used to adjust the volume.



#### Changing between Talk Groups

Use the arrow buttons, located to the right of the display, to toggle between Talk Groups. Using these arrows will only toggle between pre-programmed Talk Groups or frequencies within the selected Zone.

#### Changing between Zones (Repeaters)

Use the P2 and P3 buttons to change the pre-programmed frequencies. These buttons are similar to the arrow buttons, except they allow you to scroll through the different repeaters that are programmed in the radio, instead of only the Talk Groups. Once you find one, select an appropriate Talk Group, using the arrow keys.

If you know the specific Zone that you want to go to, choose by pressing P4, then P3 to move to the second position, and then press P4 again to select. A long press of the up and down arrow keys will also change zones.

Most of the time, you should keep the radio on: 145.340 SKYWARN which is the Falmouth, ME repeater, on Time Slot 1, Talk Group 759 (SKYWARN).



#### 4. Signalink USB

Two Signalink USB sound card interfaces are installed (one for VHF and one for HF), to provide digital communications capability to the NWS Gray Radio Desk.

Virtually ALL sound card Digital and voice modes are supported by the Signalink USB. This includes traditional modes such as RTTY, SSTV and CW (to name a few), as well as newer modes such as FT8, PSK31, JT65, WSPR, WINMOR, VARA FM 1200 and EchoLink.

Ease of operation is provided by front panel controls that let you adjust Transmit Audio, Receive Audio and Transmit delay "on the fly". The Signalink USB works with virtually ALL radios and can be attached to the Mic jack, Data Port or Accessory Port.

Most likely, the settings will not have to be adjusted, but fine tuning can be done via the front panel of each device. The Transmit delay (DLY knob), is typically the only one that needs fine tuning when switching between modes.



## **Appendix J.**

### **NWS Gray SKYWARN Amateur Radio Team Leadership**

#### **SKYWARN Amateur Radio Coordinator:**

Eric Emery, KC1HJK

Email: [kc1hjk@maine.rr.com](mailto:kc1hjk@maine.rr.com)

Phone: (978) 761-5315

#### **Assistant SKYWARN Amateur Radio Coordinator(s):**

Tom Berman, N1KTA

Email: [wxtomb@yahoo.com](mailto:wxtomb@yahoo.com)

Phone: (207) 838-8188

Tim Watson, KB1HNZ

Email: [kb1hnz@yahoo.com](mailto:kb1hnz@yahoo.com)

Phone: (207) 831-8132