

OSWEGO COUNTY EMERGENCY COMMUNICATORS/RACES SKYWARN OPERATING GUIDE



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Oswego County Skywarn™ Standard Operating Guidelines

Southeastern Lake Ontario Region

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Much of the following is provided by the National Weather Service, Buffalo and can also be found in their Skywarn™ Manual on their web site.

INTRODUCTION

SKYWARN™ is a national network of all-hazard weather spotters who provide real-time severe weather information to the National Weather Service forecasters and to other local agencies requiring current conditions.

The SKYWARN™ program is open to all that are interested in severe weather observations, especially to all Amateur Radio operators.

Storm spotters are an integral part of the NWS warning decision-making process. Their reports are invaluable in making accurate and timely forecasts and warnings. While current day radar's can indicate rotation in a thunderstorm, storm spotters can tell if it is a tornado and precisely where it is; while radar can indicate there is hail in a thunderstorm, spotters can tell how large it is.

In combination with radar, satellite and surface observations, spotter reports are critical for confirmation of weather forecasts and warnings.

The Oswego County Emergency Communicators/RACES SKYWARN™ operators are a group of volunteer severe storm spotters, trained by the National Weather Service of Buffalo, New York, to provide the NWS and local Government officials with timely and accurate warnings of impending dangerous weather conditions. These ground truth reports, when integrated with the modern NWS technology, are very helpful to the area population in preparing for severe storms.

Training Schedules

Annual training for spotters is held in the early spring and those interested in severe weather are encouraged to attend. Current training sessions are announced in the local newspapers and on the National Weather Service's Buffalo web site at <http://www.erh.weather.gov/buf/>.

Skywarn™ History

During the early 1940's the Weather Bureau cooperated with the military in setting up volunteer spotter networks to protect military installations. The value of first hand, real-time information was recognized.

After a tornado killed 80 and injured 273 people in Kansas in 1955, the Weather Bureau decided to train severe weather spotters. The decision was made to recruit severe weather spotters to help obtain real-time severe weather information in order to help extend the lead-time and increase the accuracy of severe weather forecasts.

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On March 8, 1959, in Wellinton, Kansas, the first training course for 225 severe weather spotters was held.

The National Weather Service currently has over 150,000 trained all-hazard weather spotters in the SKYWARN™ program nationwide.

Role of Amateur Radio in Skywarn™

Amateur radio has been, and always will be, a vital link in the NWS warning system. Within the Central and Northern New York area, there are hundreds of trained SKYWARN™ spotters who are also AMATEUR RADIO OPERATORS that can supply pertinent weather information quickly and from many areas for use by the NWS. The dependability of Amateur Radio to get information through during severe weather conditions has proven itself many times when normal communication routes are disrupted.

The close working relationship between the NWS and the Oswego County SKYWARN™ Amateurs requires that each station and operator:

1. Provide timely and accurate severe weather reports via AMATEUR RADIO.
2. Create and maintain an organized communications network for passing essential traffic to and from the NWS, especially in time of interruption of normal communications.
3. Disseminate warnings, statements and other material issued by the NWS to the Amateur Radio community and to the Emergency Management Office.
4. Maintain a spotter network that is transparent to jurisdictional and political boundaries and operates uniformly across the entire warning area.

SPOTTER TIPS

Definitions

Watch -- Conditions are favorable for the severe weather event in or near the watch area. Watches are issued for tornadoes, severe thunderstorms, and flash floods, as well as long term events like winter storms and floods.

Warning -- The severe weather event is imminent or occurring in the warned area. Warnings are issued for tornadoes, severe thunderstorms, flash floods, river flooding and winter storms.

Severe Thunderstorm -- A storm that produces hail 3/4 inch in diameter or larger and/or wind gusts of 58 mph or more.

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Tornado -- A violently rotating column of air attached to a thunderstorm and **in contact with the ground**.

Funnel Cloud -- A rotating, funnel-shaped cloud extending downward from a thunderstorm base but **not** touching the ground. Look for rotation.

Downburst -- A strong downdraft with an outrush of damaging wind on or near the ground.

Flash Flood -- A rapid rise in water, usually within 12 hours of a period of heavy rain or other causative agent (i.e., dam break).

Sky Conditions

Towering Cumulonimbus clouds with sharp, well defined edges indicates a growing storm.

An overshooting top extending above the anvil is an indicator of possible severe weather.

A thunderstorm tower that has a noticeable forward tilt is often stronger than other storms.

Look for layers of clouds to exhibit veering (clockwise) winds with increased height. This is a prime ingredient necessary for tornadic thunderstorms.

Watch for an isolated lowering in the clouds, usually found within the rain-free cloud base at the rear of the storm. This is a wall cloud.

Watch for funnel aloft or tornadoes on the ground.

A greenish tint within the cumulonimbus cloud is an indicator that hail may be present.

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Determining Wind Speeds

One of the critical elements of severe storm spotting is the ability to estimate wind speeds. Remember, the more accurate your wind speeds are, the more helpful they are to the forecasters. Here is a simple guide to use to help estimate wind speed.

<u>Wind Speed</u>	<u>Observed</u>
8-12 mph	Leaves and small twigs in motion. Small branches move.
13-18 mph	Dust and loose paper raised; small branches move.
19-24 mph	Small leafy trees sway, wavelets form on lakes and ponds.
25-31 mph	Large branches in motion; wires or link fences whistle.
32-38 mph	Whole trees in motion; difficult to walk against the wind.
39-46 mph	Twigs break off trees; wind impedes walking.
47-54 mph	Slight structural damage e.g. chimneys and shingles.
55-63 mph	Trees uprooted; widespread structural damage.
64-72 mph	Damage to structures major and widespread.

SPOTTER SAFETY

Flash Floods

Flash flooding is a major killer. Many flash floods occur at night, which makes them more difficult to see. As a storm spotter, you may encounter flash floods at any time. Heeding the following flash flood safety rules may save your life.

Do not attempt to drive or walk across a flooded roadway or low water crossing. Nearly half of all flash flood deaths are vehicle-related. Moving water 2 feet deep will carry away most cars.

If your vehicle becomes caught in high water and stalls, leave it immediately and seek higher ground if you can do so safely. Rapidly rising water may sweep a vehicle and its occupants away.

Be especially careful at night when flash floods are harder to recognize.

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Lightning

Lightning occurs in all thunderstorms and is also a significant threat to life. Storm spotters are especially vulnerable to being struck by lightning since they are often in prime strike locations, such as in open fields or on hilltops. The following lightning safety rules are important.

Lightning tends to strike the tallest object in an area...make sure it is not you. Remain in your vehicle or an indoor location whenever possible.

If you must go outside, crouch down to make yourself a poor lightning target. Do not lie flat on the ground since you will be more likely to be severely shocked if lightning strikes close to you.

Hail

Although large hail rarely causes fatalities, it is the most destructive element associated with severe local storms and can cause considerable property damage. If the storm you are observing produces a tornado, it will likely form very near the shaft of large hail. These hail safety tips can help minimize damage to your vehicle and possible injury to you.

Substantial structures and highway overpasses (out of traffic lanes) offer the best hail protection.

Hardtop vehicles offer fair protection from hail up to about golf ball sized, but significant windshield and auto body damage can result with hail larger than golf balls.

Estimating Hail Size

Pea	0.25"
Penny.....	.0.75"
Quarter.....	1.00"
Half Dollar.....	1.25"
Golf ball.....	1.75"
Tennis Ball.....	2.50"
Baseball.....	2.75"
Grapefruit.....	4.00"

Downburst and Outflow Winds

A downburst is defined as a strong downdraft with an outrush of damaging wind on or near the ground. Downbursts are responsible for most thunderstorm wind damage. Winds may exceed 100 mph in very strong downbursts. The following downburst safety rules are important.

Keep a firm grip on your vehicle's steering wheel to maintain control. Wind speed and direction can change rapidly in a downburst.

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Blowing dust or heavy rain may accompany downbursts. Be prepared for sudden changes in visibility that may create hazardous spotting conditions.

Point spotters observing from a substantial building should move away from windows as the downburst approaches.

Tornadoes

Tornadoes pose a significant threat to all spotters. High winds and flying debris can result in hazardous spotting conditions and significant damage to vehicles and buildings. Be especially alert for tornadoes when storm spotting. These safety rules could save your life.

Mobile spotters in high visibility areas, such as rural areas, may be able to drive away from an approaching tornado. **Remember, this does not apply to spotters in urban areas, inexperienced spotters, spotters in low visibility locations such as in heavily wooded areas, or members of the general public.** Spotters should be familiar with their area and have planned escape route.

If you can't avoid an oncoming tornado, you could take shelter in a substantial building, ditch, ravine, or other low spot (but be cautious of flash flooding).

Fujita Tornado Scale

F0	40 - 72 MPH	Gale Tornado
F1	73 - 112 MPH	Moderate Tornado
F2	113 - 157 MPH	Significant Tornado
F3	158 - 206 MPH	Severe Tornado
F4	207 - 260 MPH	Devastating Tornado
F5	261 - 318 MPH	Incredible Tornado

INTERPRETING AND UNDERSTANDING RADAR IMAGES

Weather radar can detect most precipitation within approximately 80 nautical miles (nm) of the radar, and intense rain or snow within approximately 140 nm. However, light rain, light snow, or drizzle from shallow cloud weather systems is not necessarily detected.

Under highly stable atmospheric conditions (typically on calm, clear nights); the radar beam can be refracted almost directly into the ground at some distance from the radar, resulting in an area of intense-looking echoes.

Keep in mind that while the energy emitted by the radar travels in a straight line the curvature of the earth results in the beam being higher off the ground with distance from the radar. Thus at 100 nautical miles from the radar, the center of the beam is about 10,000 feet off the ground.

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The radar is limited close in by its inability to scan directly overhead. Therefore, close to the radar, data is not available due to the radar's maximum tilt elevation of 19.5°. This area is commonly referred to as the radar's "Cone of Silence".

Image updates are based upon the operation mode of the radar at the time the image is generated. The radar is operated in one of two modes -- clear air mode or precipitation mode. In clear air mode, images are updated every 10 minutes. In precipitation mode, images are updated every 5 or 6 minutes.

Base Reflectivity

This is a display of echo intensity (reflectivity) measured in dBZ (decibels of Z, where Z represents the energy reflected back to the radar). "Reflectivity" is the amount of transmitted power returned to the radar receiver. The base reflectivity image currently available on the website is from the lowest "tilt" angle (0.5°).

The maximum range of the base reflectivity product is 124 nautical miles (about 143 miles) from the radar location. This view will not display echoes that are more distant than 124 nautical miles, even though precipitation may be occurring at greater distances.

Composite Reflectivity

This display is of maximum echo intensity (reflectivity) from any elevation angle at every range from the radar. This product is used to reveal the highest reflectivity in all echoes. When compared with Base Reflectivity, the Composite Reflectivity can reveal important storm structure features and intensity trends of storms.

The maximum range of the composite reflectivity product is 248 nautical miles (about 285 miles) from the radar location. The blocky appearance of this product is due to its lower spatial resolution on a 2.2 * 2.2 nautical miles grid. It has one-fourth the resolution of the Base Reflectivity and one-half the resolution of the Precipitation products.

Although the Composite Reflectivity product is able to display maximum echo intensities 248 NM from the radar, the beam of the radar at this distance is at a very high altitude in the atmosphere. Thus, only the most intense convective storms and tropical systems will be detected at the longer distances.

Because of this fact, special care must be taken interpreting this product. While the radar image may not indicate precipitation it's quite possible that the radar beam is overshooting precipitation at lower levels, especially at greater distance.

1 Hour Precipitation

This is an image of estimated one-hour precipitation accumulation on a 1.1 nautical miles by 1 degree grid. This product is used to assess rainfall intensities for flash flood warnings, urban

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flood statements and special weather statements. The maximum range of this product is 124 nautical miles (about 143 miles) from the radar location. This product will not display accumulated precipitation more distant than 124 nautical miles, even though precipitation may be occurring at greater distances.

Remember that hailstones and ice can contaminate this product. This can be most noticed as a “ring” of higher precipitation estimates equidistant from the center of the radar.

Storm Total Precipitation

This image is of estimated accumulated rainfall, continuously updated, since the last one-hour break in precipitation. This product is used to locate flood potential over urban or rural areas, estimate total basin runoff and provide rainfall accumulations for the duration of the event.

The maximum range of this product is 124 nm (about 143 miles) from the radar location. This product will not display accumulated precipitation more distant than 124 nm, even though precipitation may be occurring at greater distances. To determine accumulated precipitation at greater distances, link to an adjacent radar.

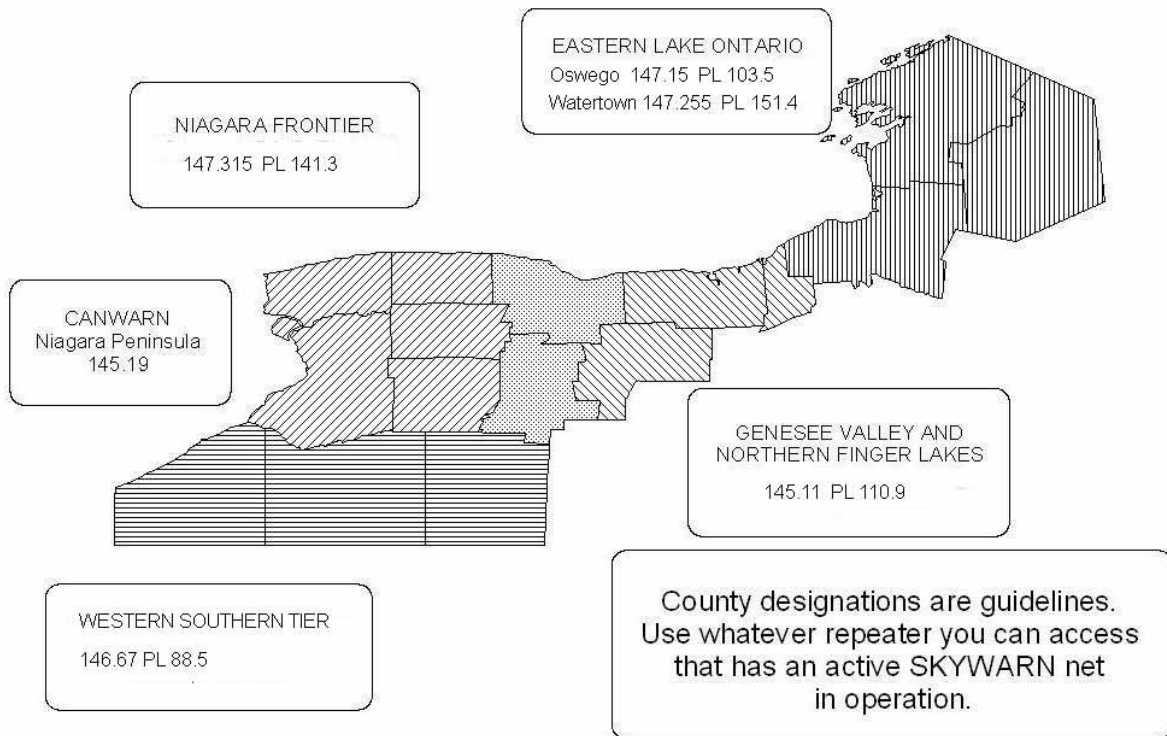
Always check the valid time of this product. Remember, the last 1-hour break in precipitation within the range of the radar could have been several days.

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NWS BUFFALO SKYWARN™ FREQUENCIES

REPEATER FREQUENCIES



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OSWEGO COUNTY SKYWARN™ NETOPERATING PROCEDURES

The purpose of this guide is to provide a framework for SKYWARN™ net operations. While consistency of procedures from net to net is important, no two SKYWARN™ activations are exactly the same. Therefore, net control has the authority to do everything necessary within FCC rules to ensure that the SKYWARN™ mission is performed to the best of its ability.

Skywarn™ Activation

1. A Skywarn™ net may be activated by any one of the following methods:
 - a. A request from the NWS Buffalo to the OCEC/RACES Skywarn™ Coordinator, the OCEC/RACES Radio Officer, or a base station operator designated to receive a call for activation. **If severe weather is imminent and pagers are activated, you will hear a request for a Sierra response. Respond on air immediately.**
 - b. Upon activation of the 147.15 repeater with a message from the NWS via **their** weather radio alert system.
 - 1) Activation of the repeater weather radio for a "**watch**" condition is to be treated as an **ALPHA** activation. Operators to monitor the repeater for a possible net.
 - 2) Activation of the repeater weather radio for a "**warning**" condition is to be treated as a "**BRAVO**" activation. Operators to report for a roll call if a net is started. Actual net start will be determined by the Skywarn™ Coordinator and/or the Radio Officer after consulting information from the NWS and local observations. Monitor the repeater for the start time or information.
 - c. Observation of severe weather conditions by any Skywarn™ trained spotter.
2. The OCEC/RACES Skywarn Coordinator and/or the Radio Officer, will contact the Director of Emergency Management and advise of the status of the activation.
3. When activating a net, the net control operator will fill out the SKYWARN™ script, see *Addendum* and call a net by using the "tone alerts" on the 147.150 repeater. If the 147.150 repeater is not operating, the operator will use the next closest assigned repeater for SKYWARN operations, -ie. 442.350, etc. (THE TONE ALERTS OPERATE ONLY ON THE 147.150 REPEATER.
4. After taking any "Priority/Emergency Traffic" and taking roll call the NCS will assign an ALTERNATE NCS and an Alternate frequency.
5. The NCS will assign an operator to relay all pertinent information to the NWS via telephone or an assigned radio frequency used by the NWS for relaying information.
6. Operators should use the OPERATORS LOG, for keeping track of weather status. This form only requires time and description for the particular station.

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7. Net Control is to use the OPERATORS LOG for keeping track of weather status being reported. In addition to time and status there is room to record Spotter Number or the nearest crossroads of the reporting station. This is beneficial to the NWS when tracking severe weather.
8. If at any time an operator sights severe weather that he/she determines may have an adverse effect on the area, DO NOT HESITATE to call up a SKYWARN™ NET and report it to the NWS as quickly as possible.
9. THE NET MAY BE ACTIVATED, AS NEEDED, 24 HOURS A DAY, 365 DAYS A YEAR.
10. At the close of the net, the Net Control Operator should collect all the reports and logs and forward them to the COORDINATOR for preparing a report to the Emergency Management Office.

Base Station Operators

Base Station Operators are volunteers who make themselves available to receive activation requests from the National Weather Service. A list of Base Station Operators is posted at the Buffalo Office and can be found as "Addendum A". Anyone having questions about severe weather can also contact these individuals for advice or guidance.

If the severe weather status is "warning", contact the Director of Emergency Management at 591-9150 during normal business hours. If the status indicates a very high level of severity, contact the RACES Radio Officer for pager activation.

Information to be Recorded

We will be looking for reports of:

1. Tornadoes or funnel clouds. Confirm rotation.
2. Hail, any size, particularly dime size or larger.
3. Damaging winds: Extent of damage, trees, power lines, etc.
4. Flooding: Closed roads, river/streams that are close to or out of their banks.
5. Heavy rain: 1 inch or more in 3 hours or less.

WINTER:

1. Snow, 6 inches in 12 hours or less.
2. Freezing Rain, Sleet, Hail any size. (Especially dime size or larger!)

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How to Report the Weather Data

When making a report, remember to give your Skywarn™ Spotter Number.

Time of occurrence.

Event (Tornado...downed trees...etc.).

Location of event (town or city...portion of county).

Amateur Call (if applicable.)

When wind instruments are not available, use the guide DETERMINING WIND SPEEDS. When reporting hail—relate hail size to that of a coin. Marbles and berries come in different sizes and this eliminates the guesswork. Avoid tying up precious airtime with reports of “dark clouds”, “rain”, and “nothing happening here”. Use common sense when making a report. Put yourself in the place of the person receiving the report—how will the information be interpreted?

There will be times when there is the threat of severe weather or severe weather can occur without SKYWARN™ being activated. In this case, trained spotters are to report directly to the NWS Buffalo office on the toll free number provided during the training class. (Remember this is an unlisted number for weather spotters only. Be sure to identify yourself with your Spotter Number.

After the fact, severe weather events can be reported also. Call them into the NWS on the toll-free number, give your report to our Skywarn™ Coordinator or you can submit your storm reports through the NWS Buffalo website at <http://www.erh.noaa.gov/buf>

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Addendum A.

BASE STATION OPERATORS LIST

STONE ALERT CODE

The following Base Station Operators are listed with the National Weather Service in Buffalo and may be called upon by them to activate a Skywarn Net.

Please cooperate with them at all times. If you have a severe weather condition, do not hesitate to request guidance or activate the tone alerts.

Judy LaMay KC2SUM OCEC/RACES Skywarn™ Coordinator Bob LaMay WA2AFF 315-343-2212 4903 Rt. 104 East, Scriba Crossroads Cnty Rte 29 & Scriba Town Line	John Darling K2QQY RACES RO 315-342-1723 (or via page thru 911 center) Klocks Corners Rd., Scriba Crossroads: State Rte 104 and O'Connor Road
Mark Lewis KC2JNI 315-343-5816 Southwest Oswego State Route 104A Crossroads Chapel Hill Rd and State Rte 104	Brien Mathews KA2AON 315-592-2198 Dexterville, Peat Bed Road Crossroads: County Rte 7 and Phinney

National Weather broadcast frequencies that can be heard in the Oswego County area:

162.40 MHz from Rochester; 162.475 MHz from Watertown and 162.55 MHz from Syracuse. The Specific Area Message Encoding for Oswego County is 036075. This tone will open the newer weather radios for weather bulletins.

Syracuse and Watertown will give conditions for Oswego County.

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Addendum B

Tone Alerts
Activation code

SKYWARN™ NET SCRIPT

THIS IS _____ (call sign)

This script can be used when receiving a call from the National Weather Service with a request to activate a Skywarn™ net.

THE NATIONAL WEATHER SERVICE AT BUFFALO IS REQUESTING THE ACTIVATION OF A SKYWARN™ NET. SEVERE WEATHER, CONSISTING OF (A SEVERE THUNDERSTORM), (TORNADO), (ETC.) _____ IS APPROACHING OUR AREA, A (WATCH), (WARNING) HAS BEEN ISSUED UNTIL _____ (TIME)

OSWEGO COUNTY SKYWARN™ IS ACTIVATING A SKYWARN™. A POSSIBILITY OF SEVERE WEATHER HAS BEEN OBSERVED IN THE FORM OF A VISUAL SIGHTING, WEATHER RADAR DATA AND/OR LOCAL METEOROLOGISTS REPORTING.

We are looking for reports of severe weather including:

1. **Funnel clouds** or tornado. Confirm rotation.
2. **Hail**---particularly dime size or larger.
3. **Damaging winds**---generally 50 MPH or higher.
4. **Flooding**---examples closed roads. Creeks and streams that are approaching or past their banks.
5. **Rain** in excess of an inch an hour.
6. **Downed trees or power lines**---or structural damage to buildings.

First, any station with severe weather information, please contact **SKYWARN™** net control. This is _____. (Take reports and respond accordingly)

We will now take general check-ins. Please give your call, name Spotter number and location.

(Take check-ins and appoint a net control or a liaison to the National Weather Service. Collect weather data and pass to NWS periodically or immediately if a significant weather change occurs).

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STORM READY



StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To be officially StormReady a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars.

For more information on StormReady, go to <http://www.nws.noaa.gov/stormready>

The role of the Oswego County SKYWARN™ group is to assist in meeting the criteria for a StormReady community. The Oswego County Emergency Communicators/RACES SKYWARN™ Coordinator will:

1. Respond to activation requests from the NWS in Buffalo
 - ❖ Assign operators to the EOC.
 - ❖ Establish communication links with the NWS and other warning points.
2. Monitor weather information from the NWS via radio
3. Obtain current weather status from local operators, consisting of wind speed and direction, amount and type of precipitation, and other as requested.
4. Assist EOC in activating warnings of severe weather, tone alerts and/or paging.
5. Arrange for and encourage attendance to SKYWARN™ training sessions.

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6. Follow response plans dealing with severe weather.
 - ❖ Maintain a roster and training record of spotters.
 - ❖ Submit a quarterly report of SKYWARN™ activity to the Director of Emergency Management.