

NWS Des Moines Spotter Training 2020



Add to your phone!

800-SKYWARN (759-9276)
dmx.spotterreport@noaa.gov
Text: (515) 240-5515

Handout Overview...

National Weather Service Des Moines Spotter Training 2020

PREPARATION BEFORE SPOTTING

- A pro-active approach to spotting before storms enter a county is vital to the warning process.
- Stay informed before warnings are issued for your county utilizing radar data and National Weather Service (NWS) Products.
- Don't wait for a heads up call from the NWS.

Sources of Information

- National Weather Service Des Moines
 - weather.gov/desmoines or moble.weather.gov
 - weather.gov/desmoinesradio
 - [facebook.com/NWSDesMoines](https://www.facebook.com/NWSDesMoines)
 - twitter.com/NWSDesMoines
 - [youtube.com/NWSDesMoines](https://www.youtube.com/NWSDesMoines)
 - www.cfcop.noaa.gov/forecast
- Storm Prediction Center - sco.noaa.gov
- Iowa State University - Iowa Environmental Mesonet mesonet.agron.iastate.edu
- Mid-Iowa Skywarn Association midowaskywarn.org
- NOAA All-Hazards Weather Radio

How to report

More info - <http://no.uisa.gov/cSD6Y>

- 800-SKYWARN (800-759-9276)
- Text or email, including pictures/video, to dmx.spotterreport@noaa.gov or (515) 240-5515
- Twitter & Facebook (@NWSDesMoines) #iawwx
- Amateur Radio at K0DAX
- Online spotter report form
- Give location as precisely as possible with start

What to Report

- Who? [Source...trained spotter]
- What? [What are you seeing? Convey uncertainty]
- Where? [Reference the nearest city, street, or [90/90]]
- When? [If in the past, relay time of event]
- Damage? [Be descriptive]

To update your spotter information (address, phone number, e-mail) or other administrative purposes, please contact us via e-mail at dmx.spotteradmin@noaa.gov.

What to Report

- Strong Winds or damage.** Measured or estimate. Winds 50 mph or greater. Any tree or structure damage, either presently occurring or in the past.
 - <58 mph - Whole trees in motion; twigs and small limbs break off trees
 - 58-72 mph - Severe Thunderstorm criteria begins. Skingliss torn off or minor structural damage, breaks off large limbs; pushes over shallow rooted trees
 - 73-112 mph - Substantial roof and structural damage; windows broken; trailer houses overturned; large trees uprooted
 - 113-mph - Roofs torn off houses; weak buildings and trailer houses destroyed
- Large Hail.** Severe Thunderstorm criteria met in hail diameter. Report hail of ANY size. Avoid reporting as "marbles" which could be many sizes.

Diameter	Description	Diameter	Description
1/2"	Pin	1 1/2"	Soft Egg
3/4"	Quarter	2 1/2"	Medium Ball
1"	Half Dollar	3"	Big Egg
1 1/2"	Ping Pong	4"	Golfball
- Wall Clouds or Funnel Clouds.** Rotation, movement and consistency of inflow are important
- Tornadoes**
- Flash Flooding.** Water standing on, or flowing over road. Roads washed out. People or vehicles swept away by flowing water. Rivers or streams out of their banks. Heavy rains in excess of an inch per hour.
- Snowfall or ice accumulations and hazardous road conditions** reports are also appreciated.

REMEMBER, SAFETY FIRST! TRY TO SPOT IN PARKING LOTS IN YOUR TOWN. CLEAR THE SWEEP PLACE FROM PILES AND LIGHTS. DO NOT DRIVE INTO WATER OF ANY DEPTH, AND NEVER PLANNED ESCAPE ROUTE.

Tornado: "A violently rotating column of air attached to a nearby shower or thunderstorm, and in contact with the ground. Visible cloud or appearance of the funnel not needed."

Before you report a tornado consider the following:

- Is the cloud feature attached to the updraft?
- Is the feature rotating along a vertical axis?
- Is there debris underneath the feature?

Wall Clouds

- Suggest inflow/updraft
- Attached to rain-free cloud base
- Maintain position with respect to rain
- May contain tall cloud that slopes upward from precipitation into storm

Shelf Clouds

- Suggest downdraft/outflow
- Leading edge of gust front, moving away from rain
- Slope downward away from precipitation area
- Often with squall line

Watch vs. Warning

- WATCH** - Issued when conditions are favorable for the development of severe weather (4-6 hours in length & covers multiple counties). Goal - to heighten awareness.
- WARNING** - Issued when severe weather is occurring or imminent (30-60 minutes in length & covers portions of counties). Goal - take protective action now. Types of Warnings (Tornado, Severe Thunderstorm, & Flash Flood).
- TORNADO/FLASH FLOOD EMERGENCY** - Significant damage. Fatalities likely. High confidence.

SEVERE THUNDERSTORM WARNING CRITERIA - 1" DIAMETER HAIL OR .58" MPH WIND GUSTS

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Our Mission - Provide weather, water, and climate data, forecasts, and warnings for the protection of life & property and an enhancement of the national economy. 24x7x365!

Who can make spotter training better each year? You, that's who! Local pictures and video of wall clouds, funnel clouds, large hail and other features provide examples that Iowa spotters are more likely to see. New pictures and video also make the talk more interesting. Send your pictures and/or video to dmx.spotterreport@noaa.gov. Your contribution could end up in our spotter newsletter or next year's presentation.

Spotter Registration Information

Spotter registration can be completed one of two ways, either on-line or via email.

Method #1 (Preferred) - Visit <http://midowaskywarn.org>. See front page link in yellow banner. Register as a spotter or update your registration.

Method #2 - Send the following information to dmx.spotteradmin@noaa.gov.

- Name
- Mailing address
- Residence address (if different)*
- Phone numbers available to spot (home, work, cell)

* Residence address is needed to plot your location so we can cross-reference your information to what we are seeing on radar.

Once your information has been received, your application will be confirmed and spotter number assigned via return e-mail. Please allow up to one month for a reply.

Question #1

To be considered “severe”, a thunderstorm must possess which of the following?

- A. 0.25” diameter (quarter-inch) hail and/or 58 mph wind gusts
- B. 1.75” diameter (golf-ball) hail and/or 70 mph wind gusts
- C. 1” diameter (quarter-sized) hail and/or 58 mph wind gusts
- D. Very heavy rain, frequent lightning, and hail (any size)

Question #2

What method will you most likely use to submit your spotter reports?

- A. Phone: 800-SKYWARN (759-9276)
- B. Social Media: Twitter or Facebook
- C. Email: dmx.spotterreport@noaa.gov
- D. Amateur Radio: K0DMX
- E. Online spotter form (weather.gov/desmoines)
- F. Text message (515) 240-5515

Question #3

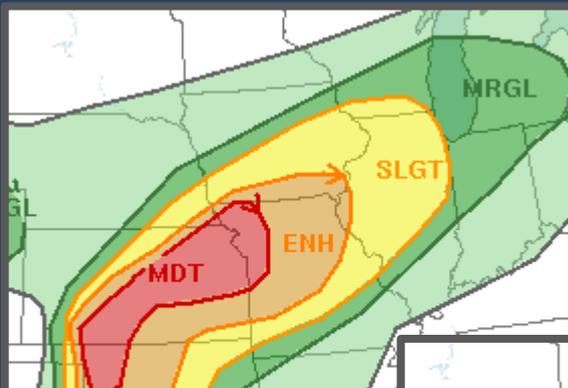
A Tornado or Severe Thunderstorm Watch
means...

A. It's headed my way. Take cover!

B. Conditions are favorable for severe weather
development

Before Severe Weather Strikes

Days 3, 2, 1 Outlooks (SPC)



Facebook/Twitter (@NWSDesMoines)

Today's Severe Weather Threat

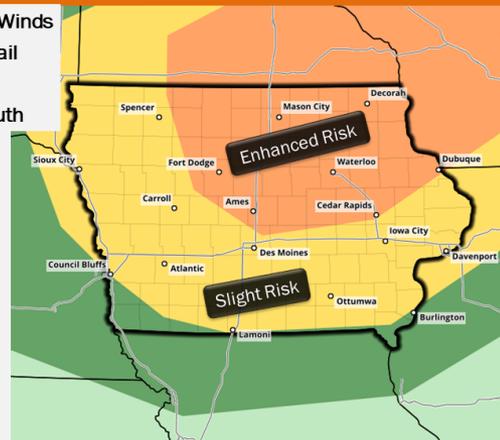
Primary Threat: Damaging Winds
 Secondary Threat: Large Hail
 Timing: 6 to 11 PM north
 9 PM to 1 AM central & south

Severe Threats

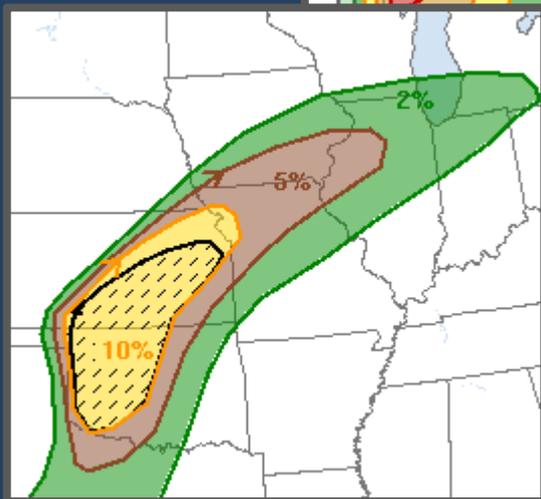
Low Med High



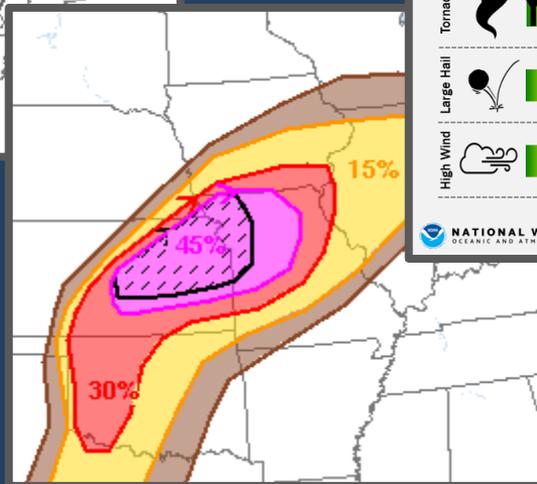
NATIONAL WEATHER SERVICE
 OCEANIC AND ATMOSPHERIC ADMINISTRATION



Thunder Slight Moderate
 Marginal Enhanced High



Day 1 Tornado



Day 1 Hail

<http://spc.noaa.gov>

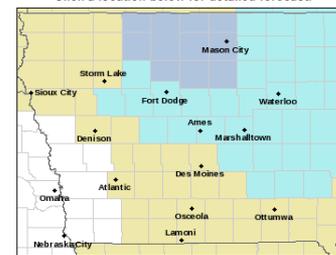
Weather.gov/desmoines

NWS Forecast Office Des Moines, IA

Weather.gov > Des Moines, IA

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past W](#)

Click a location below for detailed forecast.



Matches, Warnings & Advisories

- Flood Warning
- Wind Chill Warning
- Wind Chill Advisory
- Hazardous Weather Outlook

Last Map Update: Thu, Feb. 13, 2020 at 1:16:08 pm CST

When Severe Weather Strikes



Have multiple ways to get warnings
weather.gov



INTERNET



LOCAL TV
AND RADIO



WIRELESS EMERGENCY ALERTS
AND WEATHER APPS



OUTDOOR
SIRENS



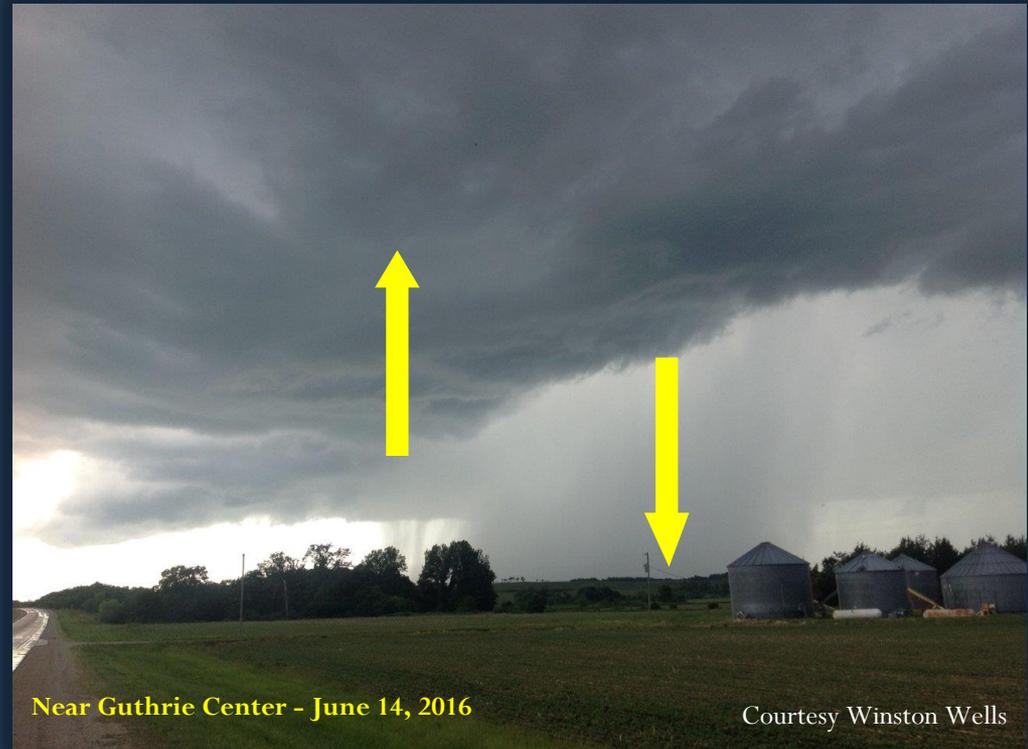
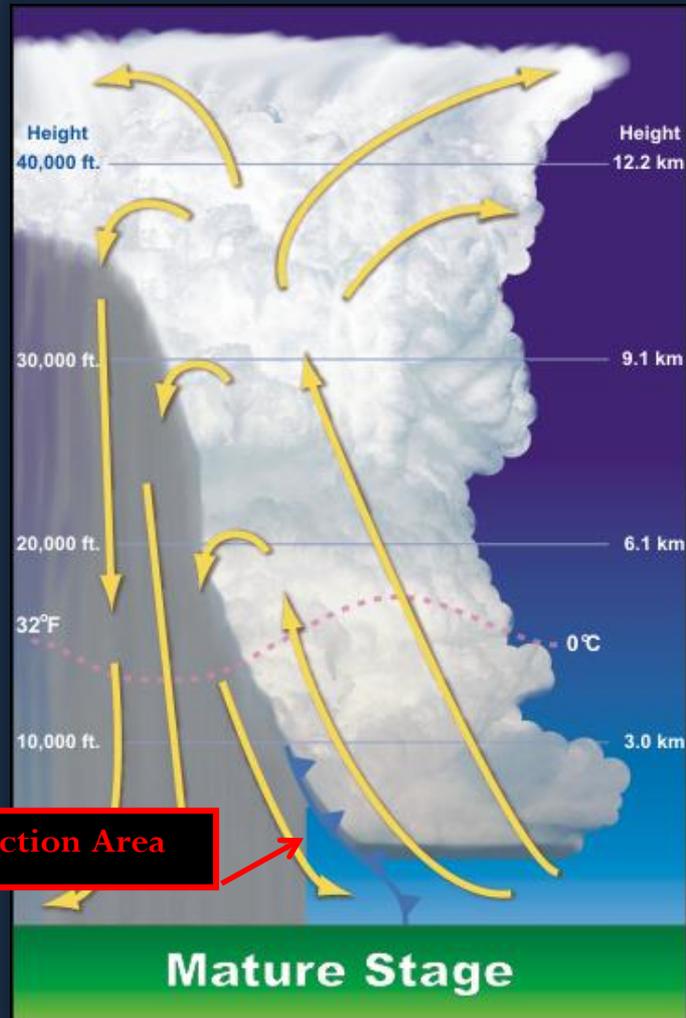
NOAA
WEATHER
RADIO



FROM YOUR FAMILY,
FRIENDS, AND COWORKERS



Updrafts and Downdrafts



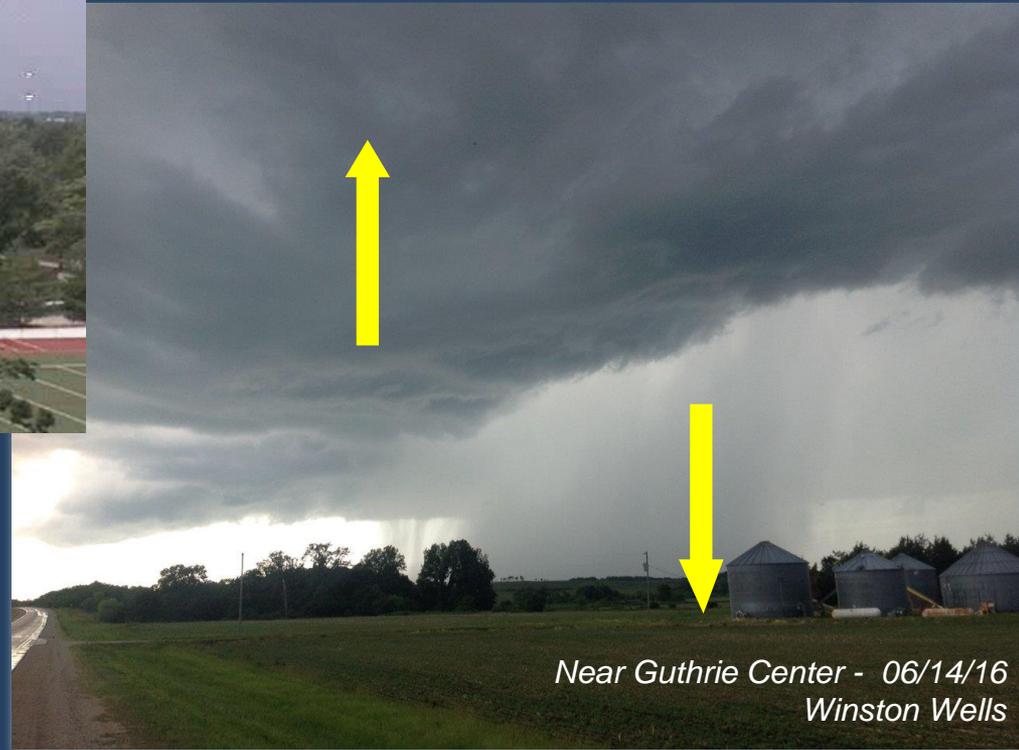
Most basic elements spotters need to identify are updrafts (rising) and downdraft (sinking)

Updrafts and Downdrafts

Most basic elements spotters need to identify are updrafts (rising) and downdrafts (sinking).



*Indianola, IA - June 2008
Iowa Environmental Mesonet
KCCI- TV*



*Near Guthrie Center - 06/14/16
Winston Wells*

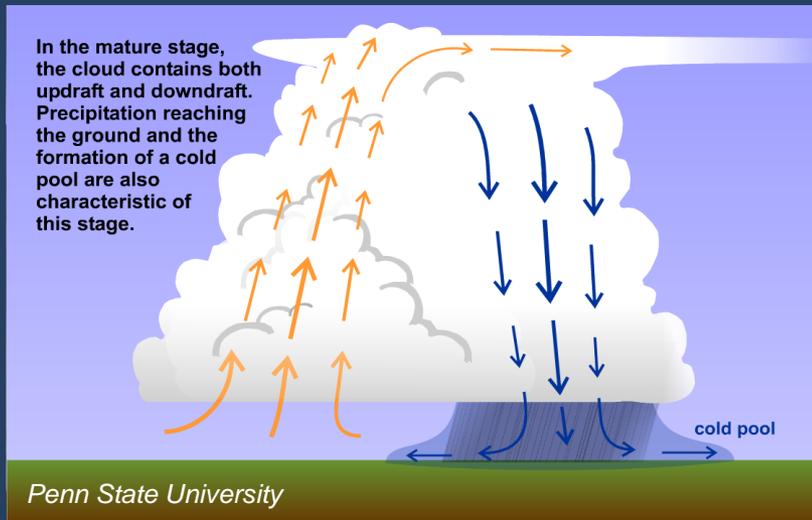
Updrafts and Downdrafts

Updrafts (rising) features

- Scud clouds
- Wall clouds
- Funnel clouds
- Tornadoes

Downdrafts (sinking) features

- Scud clouds
- Gustnadoes
- Shelf clouds
- microbursts



Updraft Features: Wall Clouds



- Isolated cloud attached to the bottom of the updraft
- Can be associated with both severe and non-severe storms
- Slopes downward toward the rain

Updraft Features: Wall Clouds



Mike Hollingshead - Stormandsky.com



**Sings of a severe
wall cloud**

- Visible rising motion into the cloud
- Lasts for at least 10 minutes
- Rising motion into the updraft

Updraft Features: Observing rotation in wall cloud



Roger Hill
www.silverliningtours.com

Signs of a rotating wall cloud

- Vertical rotation in the updraft
- Rotation left to right (foreground) or right to left (background)
- Lasts several minutes
- If in doubt, probably not rotating

Updraft Features: Rotating Wall Clouds

*Local 5
WOI-TV*



Signs of a severe wall cloud

- Visible rising motion into the cloud
- Lasts for at least 10 minutes
- Rising motion into the updraft

Question #4

Wall clouds
typically...



- A. Slope downward toward the precipitation
- B. Always originate from Wall Lake, IA
- C. Slope downward away from the precipitation
- D. Produce tornadoes each time

Updraft Features: Funnel Clouds

- Narrow, often **vertical** tube-like cloud extending down from the base of a storm or wall cloud
- Will be rotating
- Often smooth in appearance
- If the funnel circulation comes in contact with the ground, it becomes a tornado
- Look below the funnel for swirling dust or debris as a tip off that it has become a tornado



Question #5

Funnel clouds typically...



- A. Are vertical more than horizontal
- B. Rotate
- C. Are smooth and laminar
- D. All of the above

Updraft Features: Tornadoes

Definition of a tornado:

“A violently rotating column of air attached to a nearby shower or thunderstorm and in contact with the ground. A visible cloud or appearance of funnel is not needed.”



Marshalltown tornado - 07/19/18
Lynn Davenport-Atcher

Updraft Features: Tornadoes

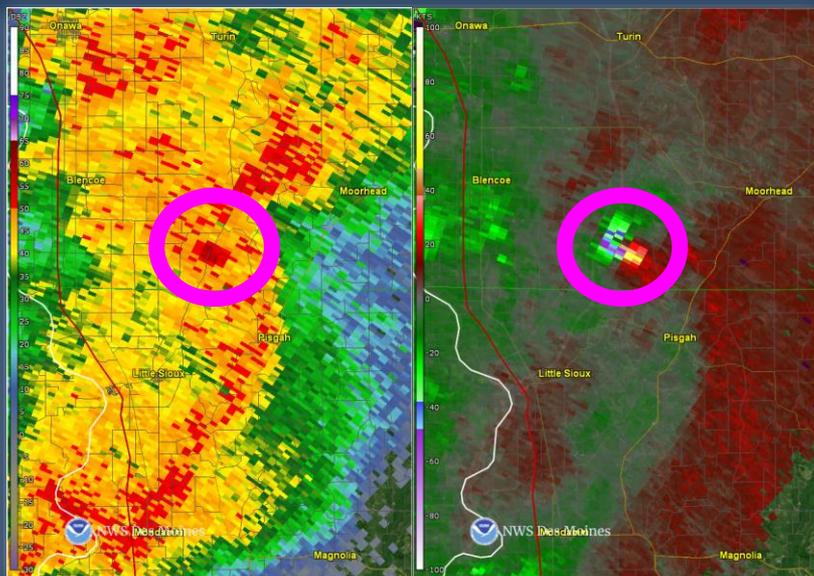


Bondurant, IA - 07/19/18

Iowa DOT

Two tornadoes here. Obvious one in the background, but one in the foreground meets the definition even though there is not a complete cloud/condensation funnel. (violent rotation of air from ground to cloud)

Updraft Features: Rain-Wrapped Tornado - *Little Sioux/Moorhead, IA - 06/11/08*



NWS Omaha KOAX 6:42pm CDT



SevereStudios - YouTube



Tornadoes can be rain-wrapped and difficult to see, even during the daytime.

Tornado spotting tips:

Questions to ask yourself



1. Is feature *rotating*?
2. Is the rotating column *connected* to cloud?
3. Is there *Dust or debris* observed on ground?
4. Cloud may or may not be fully present between the base & ground.



Jeff Halverson - Hardy , IA - June 16, 2014

The answer to these questions needs to be “yes” before calling in feature as a tornado.

Downdraft Features: Gustnadoes



- Swirl of dust along the ground at edge of a gust front
- Caused by winds surging out from a storm. **Not** connected to cloud base. Clouds above often higher.
- Gustnado winds can still be strong and damaging however.
- If unsure, don't be afraid to report that uncertainty

Downdraft Features: Shelf Cloud



Courtesy Willard Sharp – intothameso.com

- Often associated with squall lines, but can occur with individual storms regardless of updraft position
- Typically located on leading edge of the line or near gust front with updraft above
- Long, flat cloud which slopes ***down, away from the rain.***

Downdraft Features: Shelf Cloud



*Iowa Environmental Mesonet
KCRG-TV webcam
Iowa City - August 28, 2018*

- Caused by winds surging out from a storm.
- Long, flat cloud along the front of storm (resembles a shelf)
- Can be mistaken for funnel cloud or wall cloud
- Any rotation horizontal, but not vertical

Updraft or Downdraft Feature: Scud clouds

- Often formed by leading edge of cooler and/or moister air
- Can be within updrafts or downdrafts
- Often mistaken for tornadoes or funnel clouds
- Always check for vertical rotation, connection to parent cloud and connection to ground with debris.



*Iowa Environmental Mesonet
KCCI TV
Stratford, IA Aug 14, 2008*

Downdraft Features: Downbursts/Microbursts



*Dan McKemy
Hermosa, SD
July 29, 2016*

- Rain and strong winds hit the ground and spread outward
- Notice scud development on the leading edge of the cool, moist outflow
- Can produce damaging straight line winds

Apply our knowledge! Quiz #6



1. Shelf cloud
2. Wall cloud
3. Brief funnel cloud
4. Tornado

*Iowa Environmental Mesonet
KCRG TV
Marengo, IA Oct 9, 2018*

Apply our knowledge! Quiz #7



1. Tornado
2. Funnel cloud
3. Wall cloud
4. Shelf cloud

Spotter Safety



Courtesy Severe Studios, Inc

- **Maintain situational awareness at ALL times**
 - Avoid “tunnel vision”
- **ALWAYS have an escape route**
- Seek a sturdy structure if you are in danger
- **Avoid night spotting**
 - Hard to see anything
 - Very dangerous!
- If your car is struck by even a weak tornado, your life is in danger!

Tornado Safety at Home

Know Where to Go

When Sheltering from a Tornado

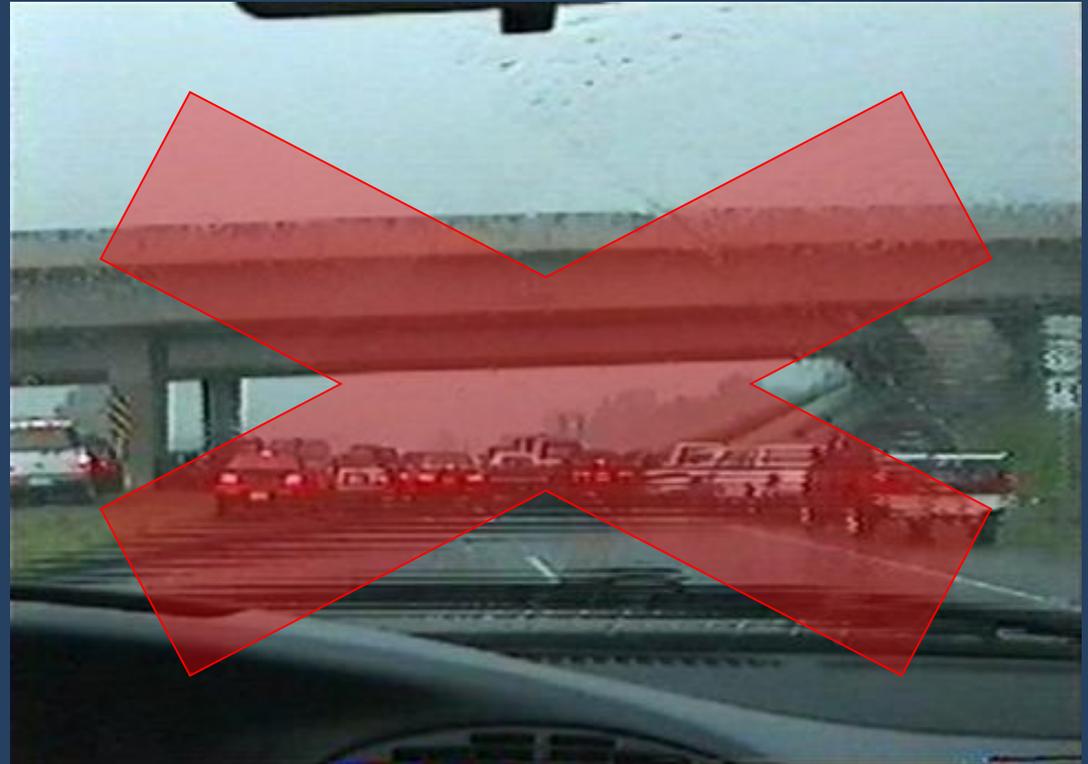


weather.gov/tornado

Tornado Safety in a Vehicle

NEVER take shelter under an overpass

- You're exposed to higher wind speed with no protection
- Wind and flying debris are channeled underneath
- Your parked car blocks traffic and puts others at risk



Tornado Safety in a Vehicle



**Still not
convinced?**



Night Spotting Safety



Lightning Safety



- Lightning is by far the most common hazard facing spotters
- Be careful on ridge tops and open areas
- Stay in vehicle if mobile
- Tires don't protect you, the vehicle frame does!



**Hear Thunder?
You are at risk!**

Wind Safety



YouTube video by user mconwxdr



- Frequent with squall lines, but can occur with any type of storm
- Often on the storm's leading edge
 - However, can travel far from the actual storm
- **Do not** seek shelter under trees or in small structures that might collapse!

Hail Safety



- Hail can fall at speeds of over **100 mph!**
- Even small hail can cause damage and injury
- Take shelter in a walled structure and stay away from windows
- Wind-driven hail is very dangerous and destructive



Carter Lake, IA – August 2011 - YouTube user J0ibis

Flood Safety



- The #1 severe weather-related killer in the US!
- Heavy rainfall combined with saturated soils
- Impacts amplified by terrain or poor drainage (e.g. cities)

Remember:
Turn around, don't drown!

Your SAFETY is our #1 concern!



Courtesy Tim Wagner and Mark Schnackenberg

- Keep an eye to the sky
- Prepare for all hazards
- Watch for flooding & lightning
- Drive smart & safely
- Use common sense



Remember, the National Weather Service does not “officially” deploy spotters. Spotting is done at one’s own risk!

Safety Wrapup! Quiz #8

A Severe Thunderstorm Warning is issued for your area with 70 mph wind and baseball sized hail. You should...

- A. ...run outside to pick up a hail stone! Hail that size doesn't happen often.
- B. ...move to an interior room away from windows
- C. ...stand at the window and take pictures/video
- D. ...grab a bat and start swinging!

Putting it All Together

A Simulated Severe Weather Event...

Imagine the “big day” is July 6th, 2020...

Before We Start, Recall...

What products and sources of information are you using? Are they reliable?

What is report worthy? How will you relay storm reports?

Are you taking any safety precautions?

Spotter Info Quiz #9

You've heard storms are coming. Where are you turning for information ahead of time?
(3 days out)

A. Storm Prediction Center

B. Random weather Facebook page

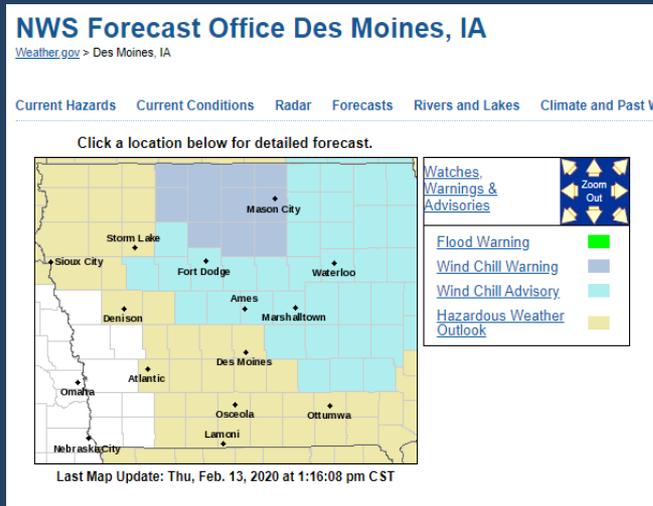
C. Trusted TV meteorologist

D. Local NWS Facebook, Twitter or webpage
(weather.gov)

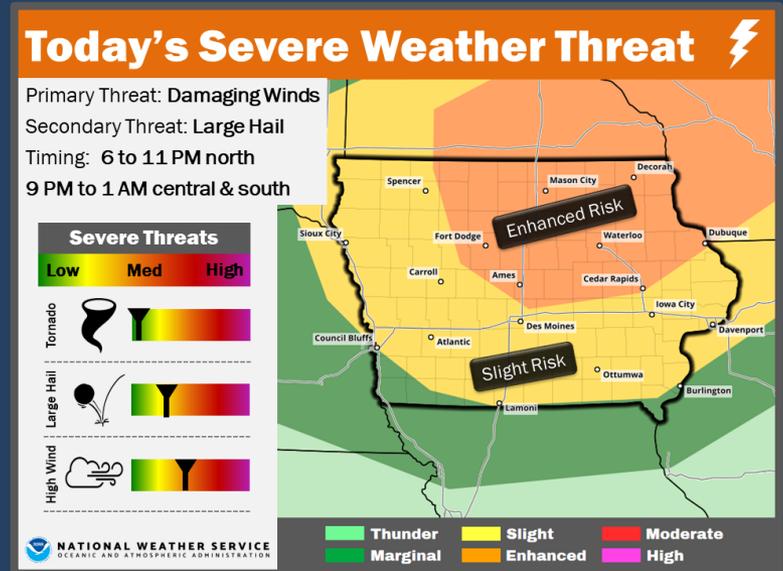
E. Tornado Prediction Center

Ahead of the Event...

Weather.gov/desmoines



Facebook/Twitter (@NWSDesMoines)



None Gen Storms Marginal Slight Enhanced Moderate High

Risk for Severe Weather

Watches Issued

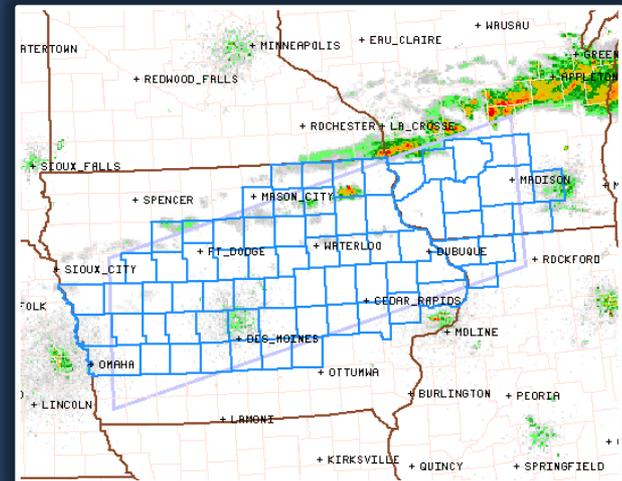
Watch the Skies

- Issued when conditions are favorable for the development of severe weather
- In effect for 4 to 6 hours ahead and cover large areas of the state

Tornado Watch

Severe Thunderstorm Watch

Flash Flood Watch



Spotter Quiz #10



Farmer Ron
@ronfarmer50555

Following

Hail in my backyard! #iawx



8:50 PM - 7 Aug 2017



Farmer Ron
@ronfarmer50555

Following

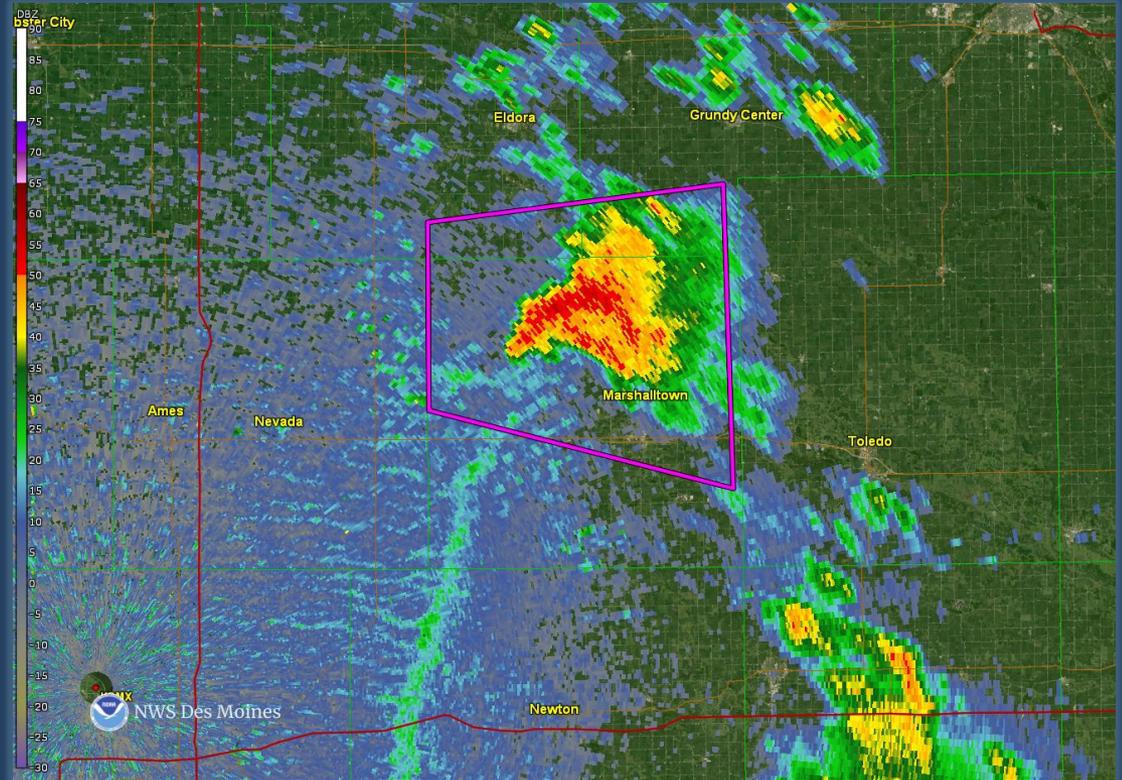
Quarter sized hail 4 miles north of Ottumwa in my backyard at about 8:35pm.
@NWSDesMoines #iawx



8:50 PM - 7 Aug 2017

Which is the better report? A or **B?**

Tornado Warning Now!



What's the first thing you'll do as a spotter if you encounter this?

Tornado Warning Now!



- A. Camera/video/live stream/selfie time!
- B. Report it to the NWS?
- C. Pull off the road and/or seek shelter
- D. Get as close as possible
- E. Nothing to see here, carry on

Tornado Warning!

You're safe now. What's next?

A. Post it to social media

B. Report it to the NWS

C. Still nothing to see here

D. Chase it!



After the event

You see this damage as well driving home

- A. Online spotter form
- B. Facebook/Twitter
- C. Text message
- D. Phone call
- E. Email
- F. Ignore. Not my problem.



NWS Des Moines Spotter Training 2020



**Thank
You for
Attending!**

Add to your phone contacts before leaving!

800-SKYWARN (759-9276)

dmx.spotterreport@noaa.gov

Text: (515) 240-5515