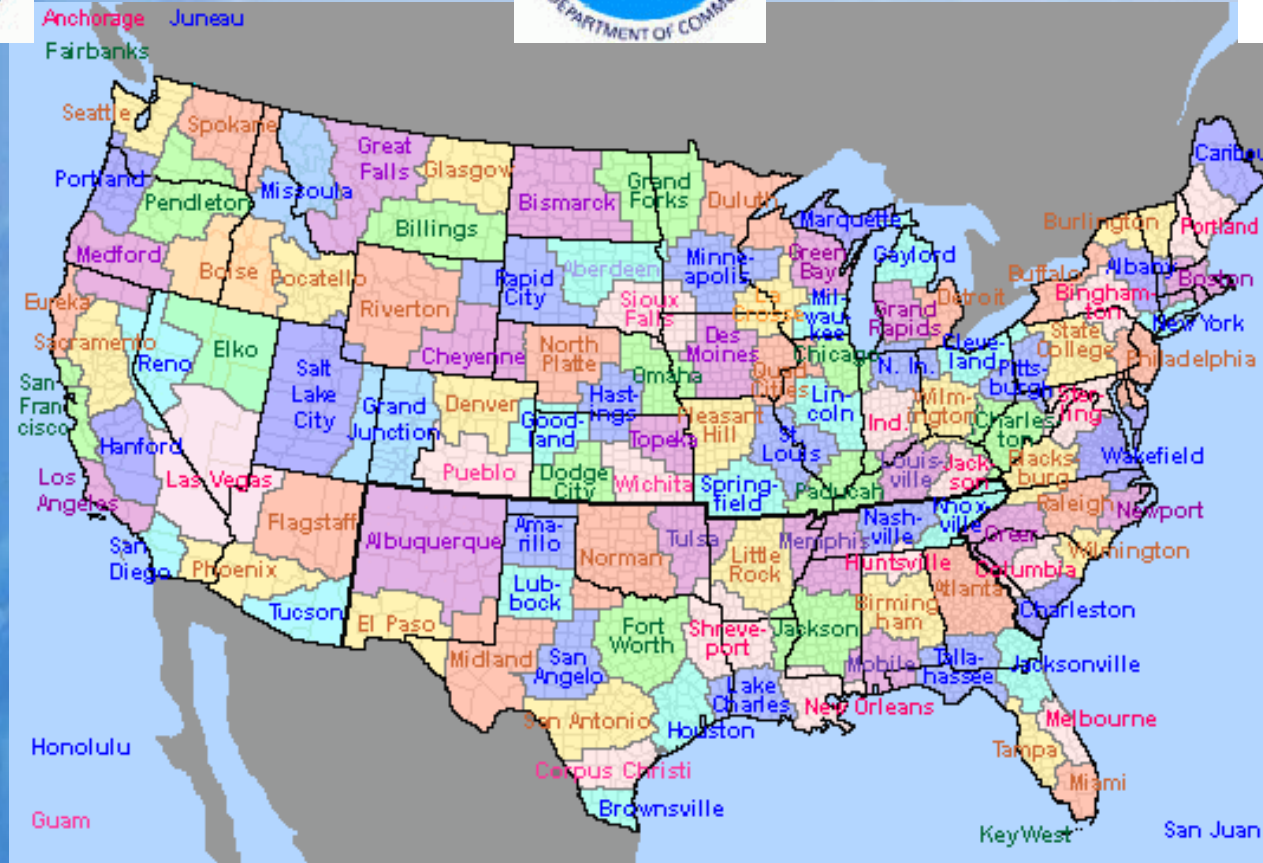


# Winter Weather Refresher



Marcia Cronce  
Marcia.Cronce@noaa.gov  
Aviation Focal Point  
National Weather Service  
Milwaukee/Sullivan

# NWS: A Federal Government Agency



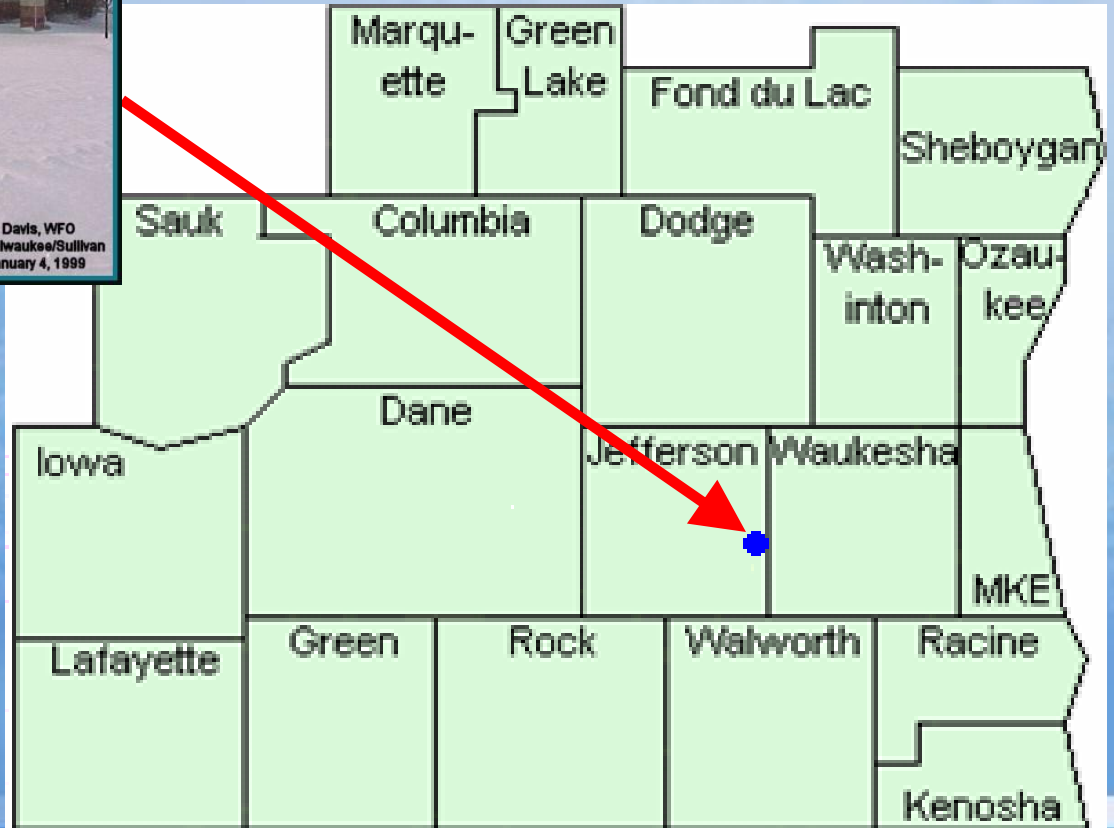


# WFO Milwaukee/Sullivan



S. Davis, WFO  
Milwaukee/Sullivan  
January 4, 1999

Watch/Warning responsibility  
for 20 counties in southeast and  
south-central Wisconsin.



# Goals of the Presentation

- Know what to include in your preparedness plan
- Know the different weather hazards and how to spot them
- Know where to find additional weather information







# Aviation Weather Products

# TAF Overview

- Concise statement of expected meteorological ground conditions to impact airport
- 24-hour forecast period (30-hr for KMKE)
- Airport defined as the area within 5 statute miles of the center of an airport's runway complex
- NWS Milwaukee/Sullivan (MKX) issues TAFs for
  - General Mitchell International Airport - Milwaukee (KMKE)
  - Dane County Regional Airport - Madison (KMSN)
  - Kenosha Regional Airport (KENW)
  - Waukesha County Airport (KUES)





# TAFs contain trends and “hints”

## TAF Overview

FTUS43 KMKX 211100

TAFMKE

TAF

KMKE 211120Z 2112/2218 24009KT P6SM BKN120

FM211500 24010KT P6SM OVC018

FM211800 24010KT P6SM **SCT007** OVC010

FM220600 25007KT P6SM SCT015=

FTUS43 KMKX 211600 AAB

TAFENW

TAF AMD

KENW 211602Z 2116/2212 23011KT P6SM SCT025

TEMPO 2119/2123 3SM -SN BKN010

FM212300 24010KT P6SM **SCT007** OVC010

FM220600 25007KT P6SM SCT015=

- All TAFs contain expected wind direction ( $\pm 30^\circ$ ), wind speed & gusts, visibility, reason for vis <6SM (SN, FG, etc.), and cloud cover/ceilings
- LLWS ( $\geq 20$  KT within 2000 ft of sfc), PIREPS help

# Flight Categories

Flight Category	Ceiling (feet)	Visibility (statue miles)
VLIFR	< 200 and/or	< ½ SM
LIFR	< 500 and/or	< 1 SM
IFR	≥ 500 to < 1,000 and/or	≥ 1 to < 3 SM
MVFR	≥ 1,000 to ≤ 3,000 and/or	≥ 3 and ≤ 5 SM
VFR	> 3,000 and/or	> 5 SM

We generally amend when we expect flight category to change





# Aviation Forecast Discussion

Found at bottom of Area Forecast

## Discussion (AFD)

.AVIATION...SNOW WILL BE ONGOING MOST PLACES THIS EVENING. AREA OF PRECIP TO THE SOUTHWEST AHEAD OF SHORTWAVE TROUGH AXIS CONTINUES TO EXPAND AS IT SLOWLY GETS PULLED NORTHWARD. THE MAIN CONCERN WITH THIS FEATURE IS HOW FAR NORTH THE SNOW GETS VS HOW FAR EAST THE WAVE TRAVELS. CURRENTLY THINK ALL AREAS WILL SEE SOME LIGHT SNOW THROUGH THE EVENING...WITH AREAS EAST OF MADISON HAVING THE BEST CHANCE TO BE AFFECTED BY THE NEXT ROUND OF SNOW. WILL HAVE TO WATCH THE RADAR THE NEXT COUPLE HOURS TO GET A BETTER HANDLE.

THINK IFR CONDITIONS WILL MAINLY PREVAIL THROUGH MOST OF THE EVENING...EVENTUALLY IMPROVING TO MVFR AS THINGS WIND DOWN WEST TO EAST. LIFR AND VLIFR VISBYS REMAIN WILL REMAIN POSSIBLE WITH THE HEAVIER SNOW LATE AFTERNOON AND EVENING. MVFR CIGS MAY LINGER THROUGH MUCH OF TOMORROW AS LLVL MOISTURE HANGS AROUND. THERE MAY BE SOME LIGHT SNOW IN THE EAST IN THE MORNING AS THE SHORTWAVE EXITS...WITH FLURRIES POSSIBLE ACROSS THE AREA THROUGH THE AFTERNOON.



# Other Helpful Websites

- HPC, Winter Weather Desk
  - <http://www.hpc.ncep.noaa.gov/>
- SPC, Severe Weather
  - <http://www.spc.noaa.gov>
- Observations, Model Data
  - <http://rap.ucar.edu/weather>





# Basic Weather Concepts

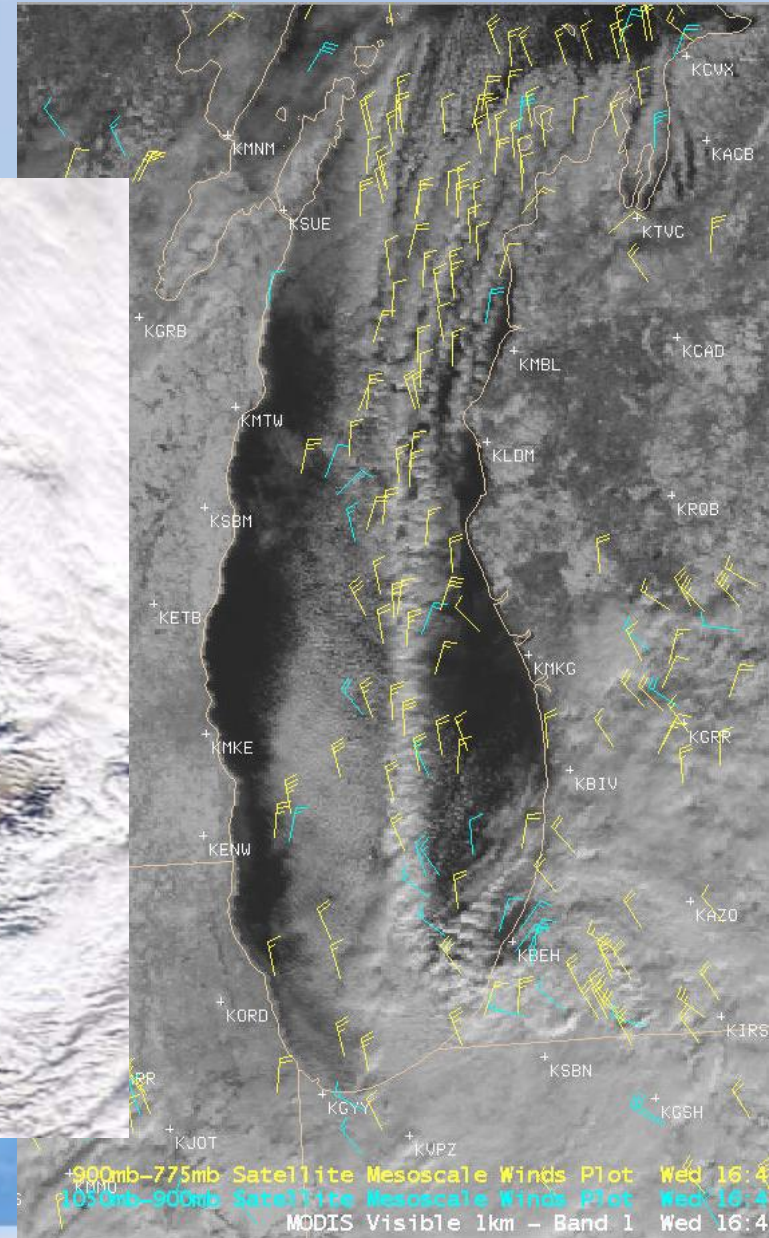
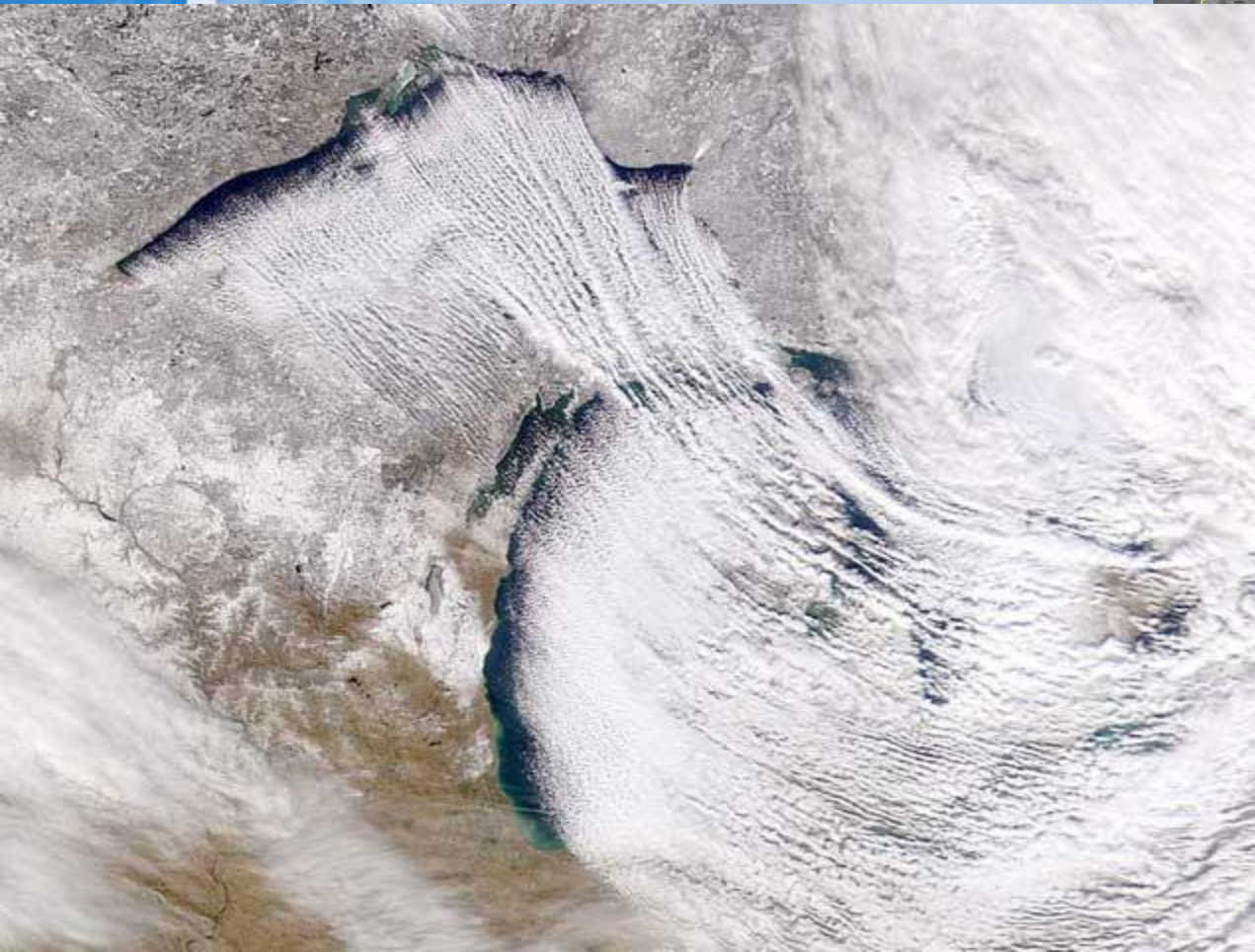
- Low Pressure Systems
  - Alberta Clippers
  - Colorado Lows
- Lake Effect Snow
- Precipitation Type
- Snow Ratios → Snowfall Amounts
- Icing

Winter Wx Hazards  
Snow, Sleet, Ice  
Wind, Blowing Snow  
Low Clouds, Fog





# Lake Effect Snow



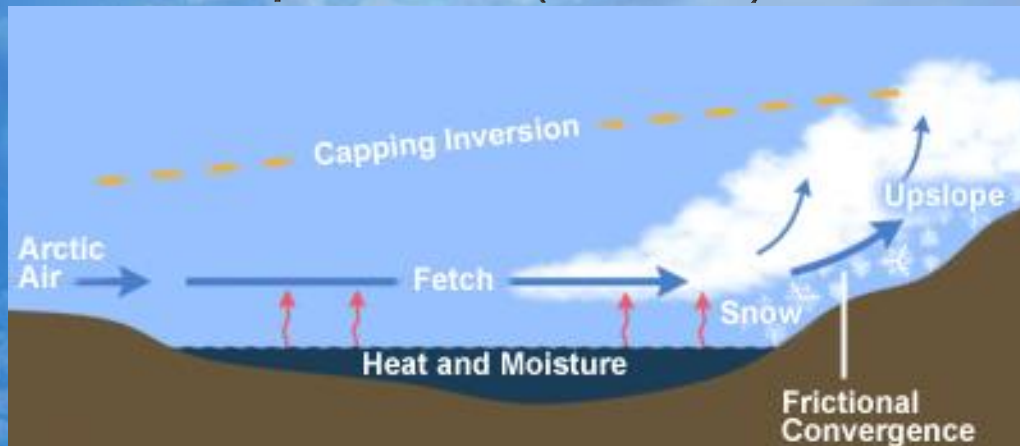
900mb-775mb Satellite Mesoscale Winds Plot Wed 16:4  
650mb-900mb Satellite Mesoscale Winds Plot Wed 16:4  
MODIS Visible 1km - Band 1 Wed 16:4





# Lake Effect Snow

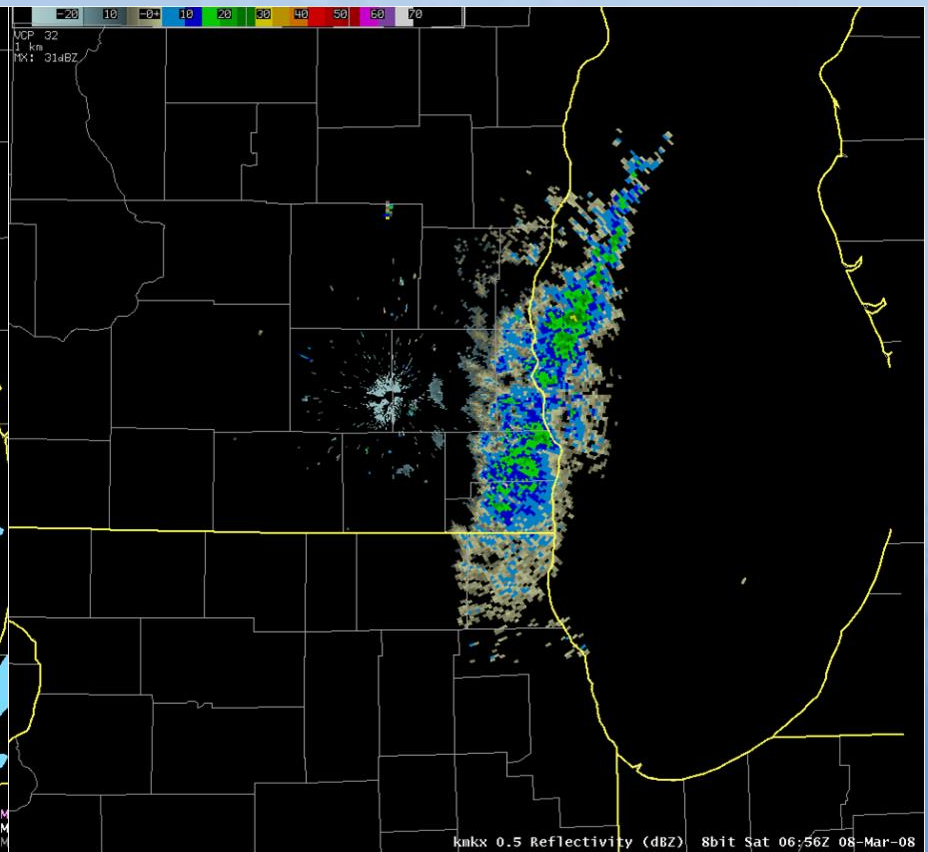
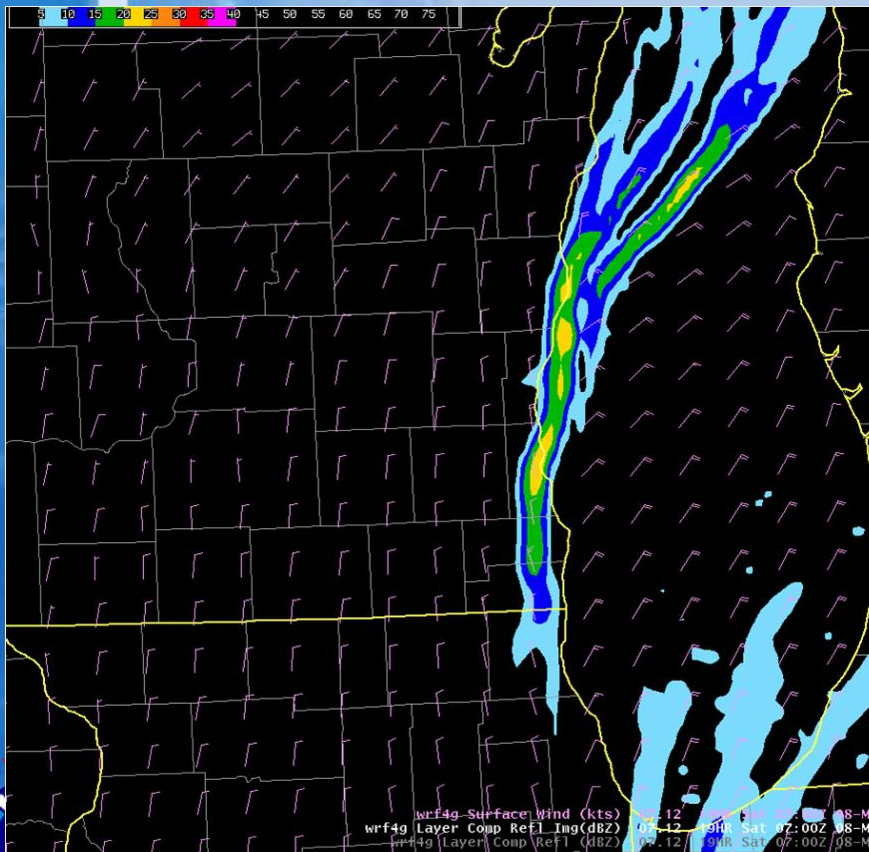
- Depends
  - Wind Direction
    - Air residence time over the lake (Fetch)
  - Temperature
    - Difference between lake temperature and air temperature (delta-T)



# March 7-8, 2008

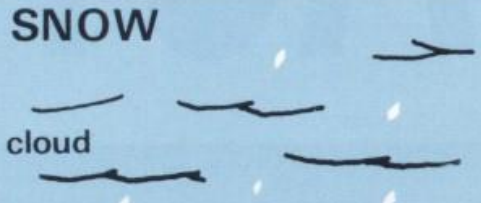

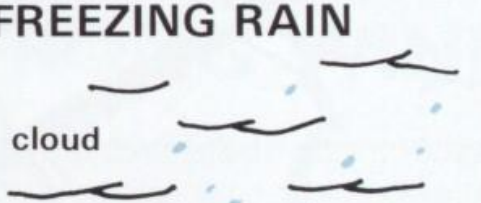



## Model Forecast Reflectivity

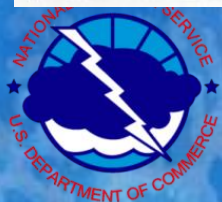
## Actual Radar Reflectivity





# What Kind of Precipitation?

SNOW	SLEET	FREEZING RAIN
 <p>cloud</p>	 <p>cloud</p>	 <p>cloud</p>
<p>28°</p> <p>29°</p>	<p>34°</p> <p>33°</p> <p>32°</p>	<p>36°</p> <p>35°</p> <p>34°</p>
		
<p>30°</p> <p>31°</p> <p>31°</p> <p>30°</p>	<p>31°</p> <p>30°</p> <p>30°</p> <p>30°</p>	<p>33°</p> <p>32°</p> <p>31°</p>
<p>Cloud temperature is cold enough for snow to form; air above the ground does not melt it.</p>	<p>Rain freezes to ice pellets which do not stick to surfaces, but accumulate on the ground.</p>	<p>Glaze of ice forms over surfaces.</p>
<p>30°</p>	<p>30°</p>	<p>30°</p>



# Precipitation Type



## Rain

Frozen precipitation melts into rain

## Freezing Rain

Frozen precipitation melts in warm air...  
...rain falls and freezes on cold surfaces as a sheet of ice

## Sleet

Frozen precipitation melts...  
...refreezes into sleet before hitting ground

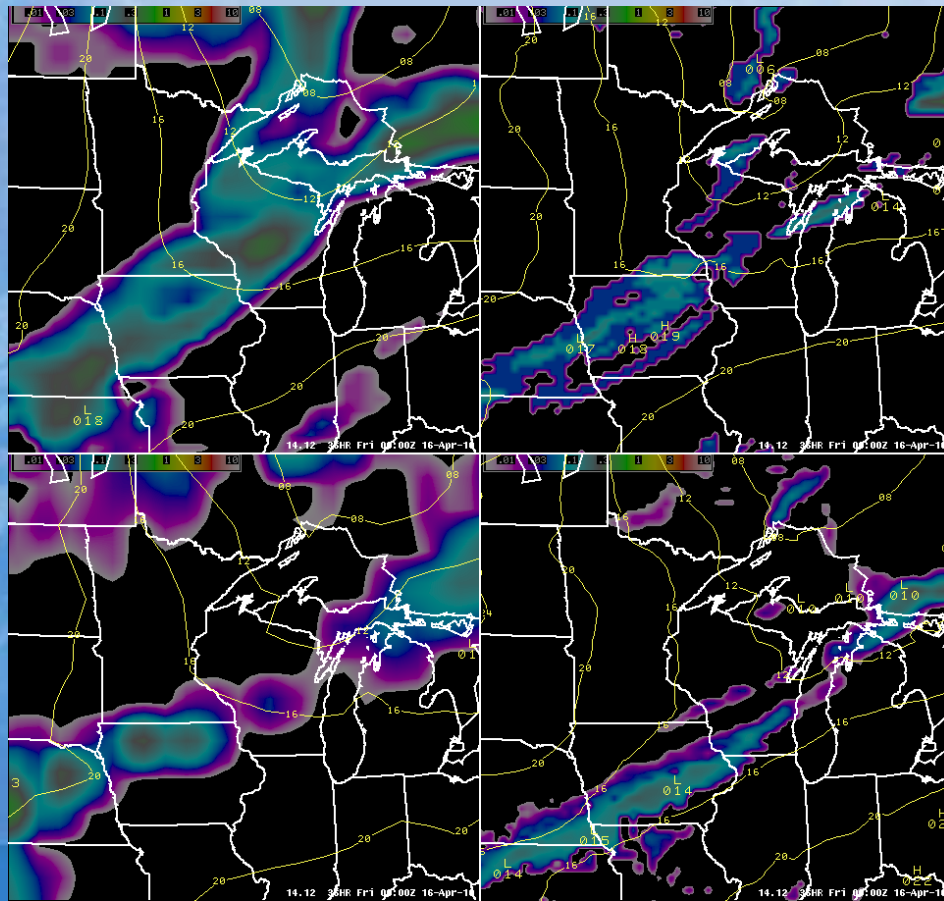
## Snow

Snow falling into cold air never melts



# How Much Snow?

- We obtain model quantitative precipitation forecasts (QPF)





# How Much Snow?

- Use this quantity to estimate liquid equivalent over a 6-hour period
- Convert liquid equivalent amount to snowfall total

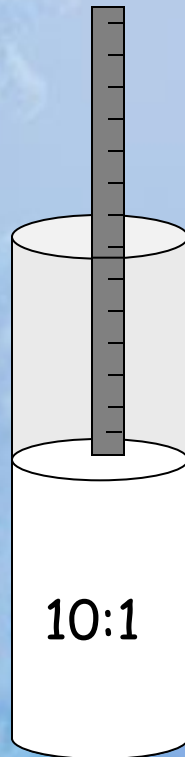
How do we know the conversion?



# Snow to Liquid Ratio



Rain/snow  
Gauge

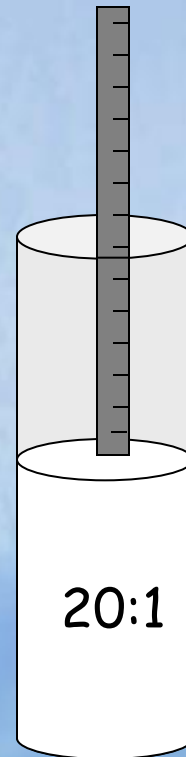


10:1

5"  
snow



0.5"  
precip



20:1

5"  
snow



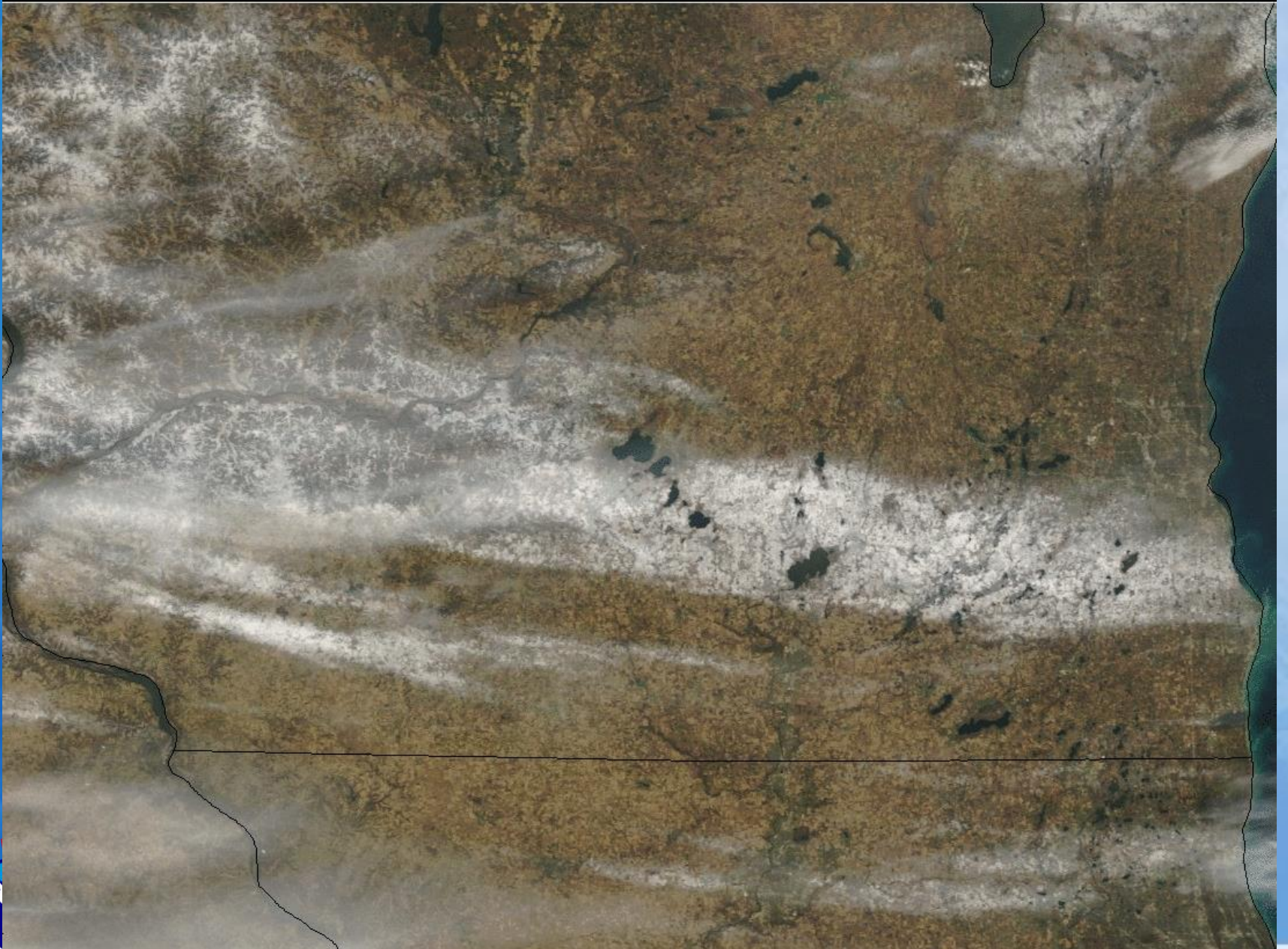
0.25"  
precip

Colorado Low

Alberta Clipper









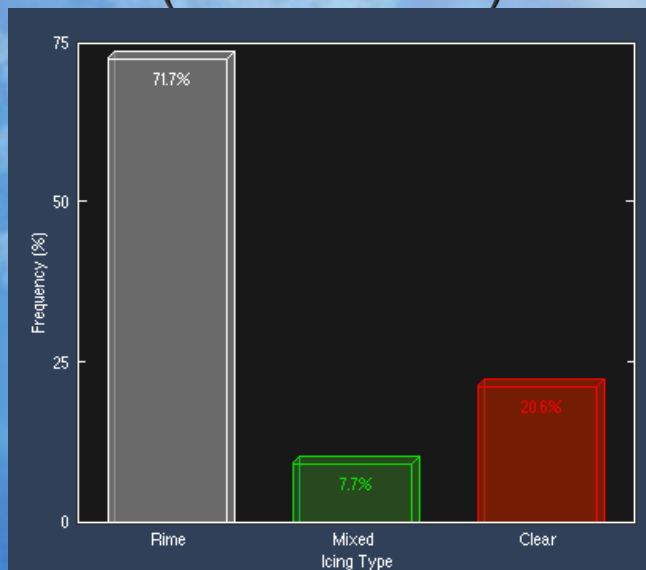
# Brief Icing Overview

## Types of Icing

- Rime (most common)
- Clear
- Mixed
- Induction (Carburetor)

## Causes of Icing

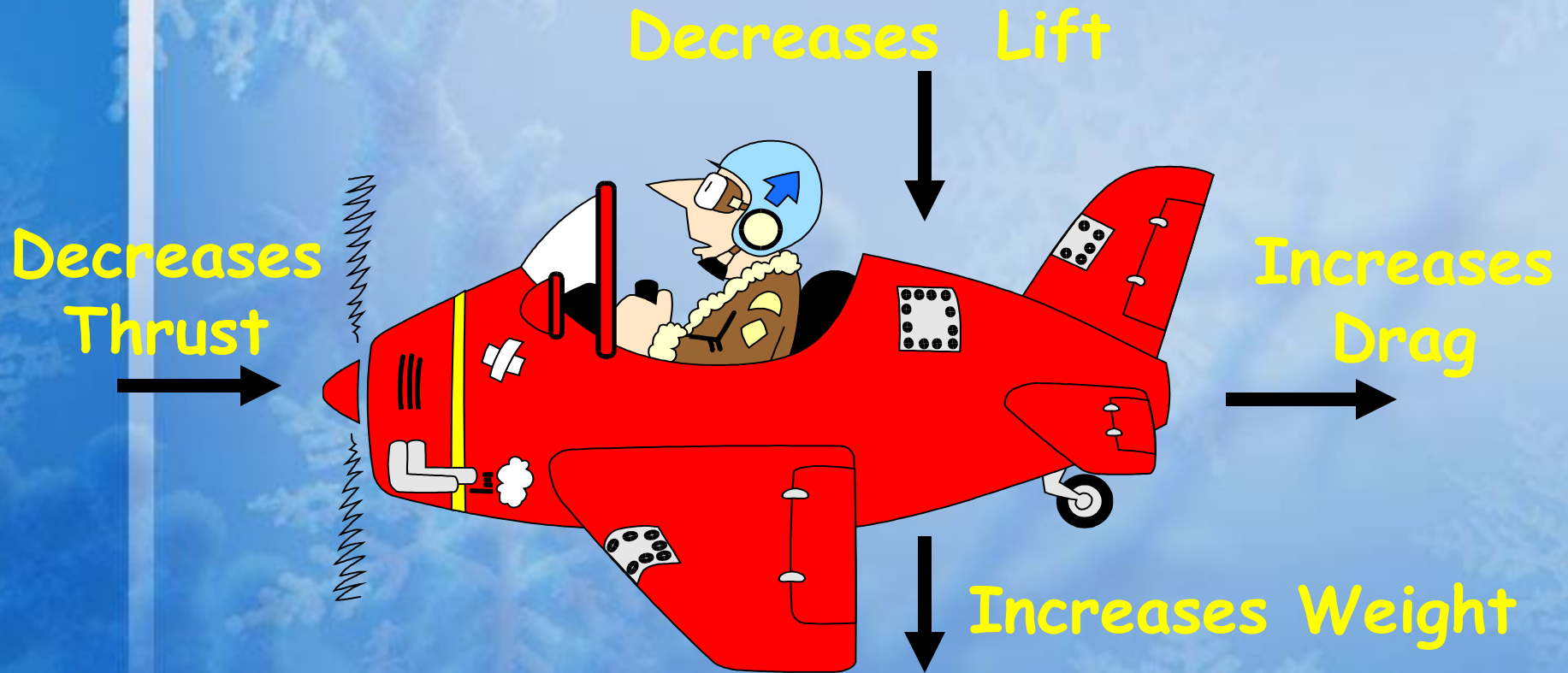
- Supercooled Liquid Water Droplets
  - Strike leading edge of airfoil
  - Freeze on impact
- Residence time in cloud
- Forms 0°C to -20°C
- Common Temp -8 to -12C



Icing Type Frequency of Occurrence  
Modified from Omeron Bernstein



# Cumulative Affects of Icing



from Sally Pavlow, NWS Louisville

[www.weather.gov/mkx](http://www.weather.gov/mkx)

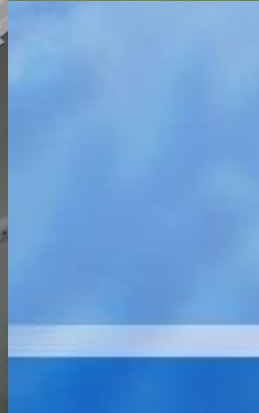




# Radar and Satellite Interpretation



**Radar dish looks like satellite dish, inside dome for protection**

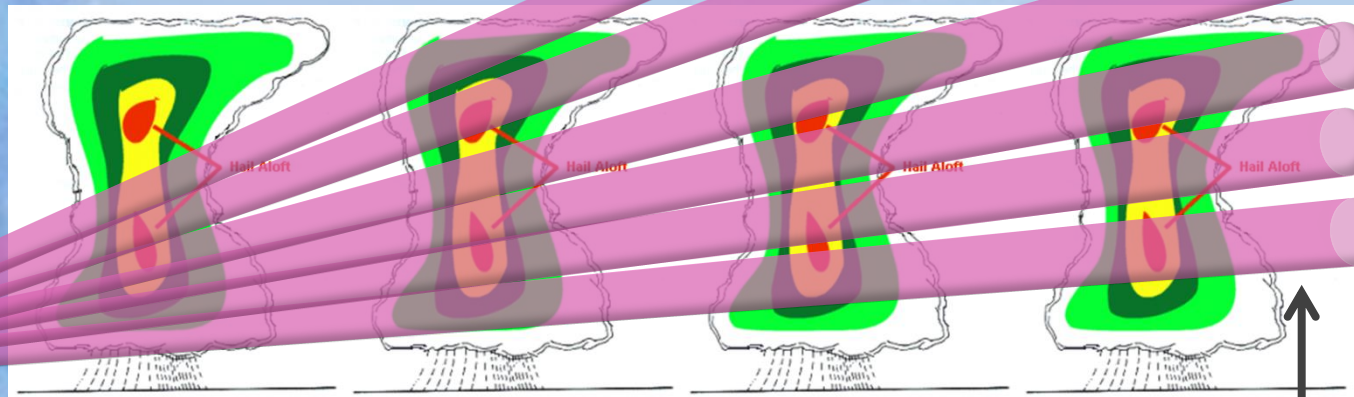




# How Radar Works



# How Radar Works

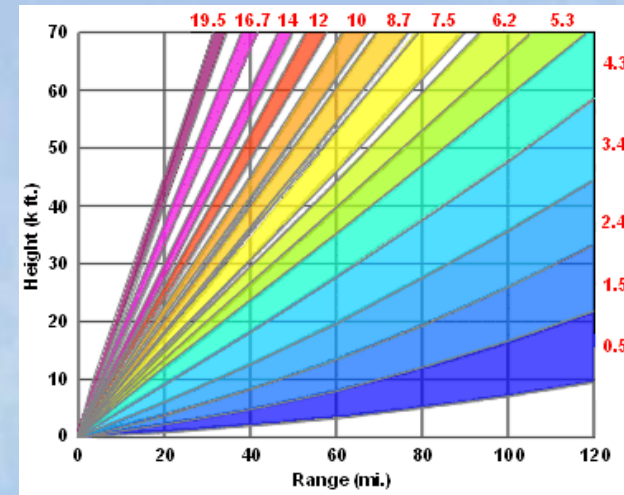
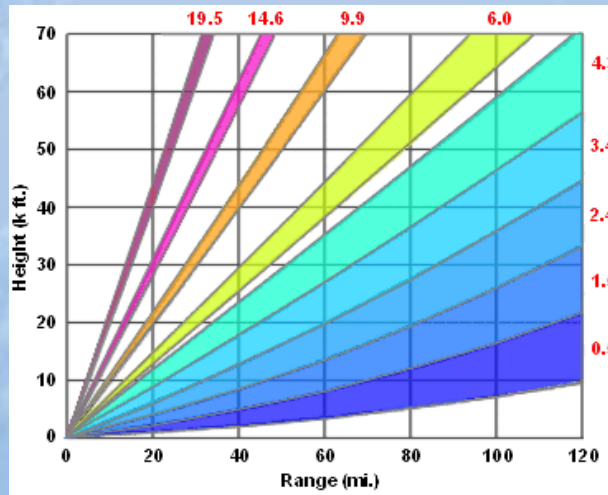
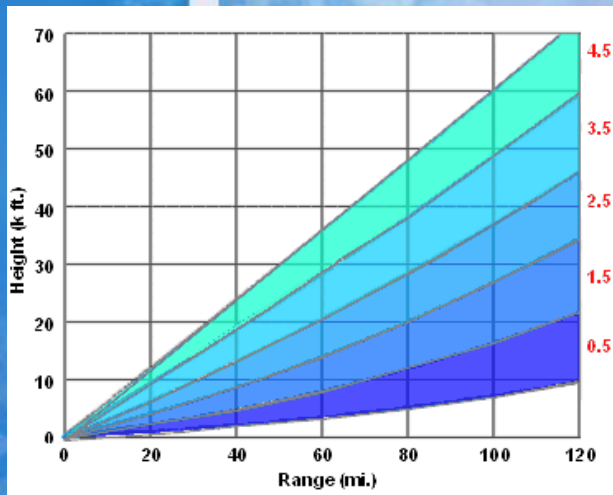


Base  
Reflectivity





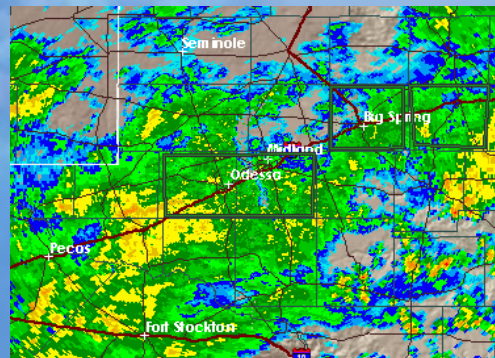
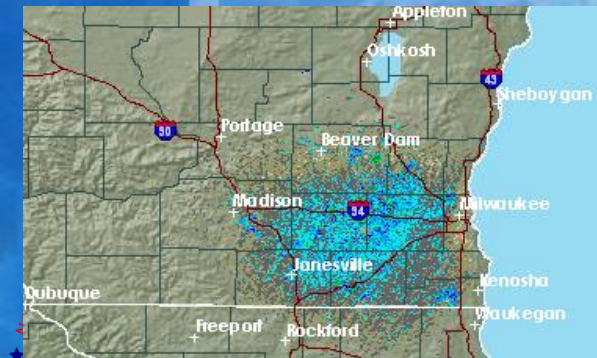
# Radar Sampling Patterns



Clear Air Mode

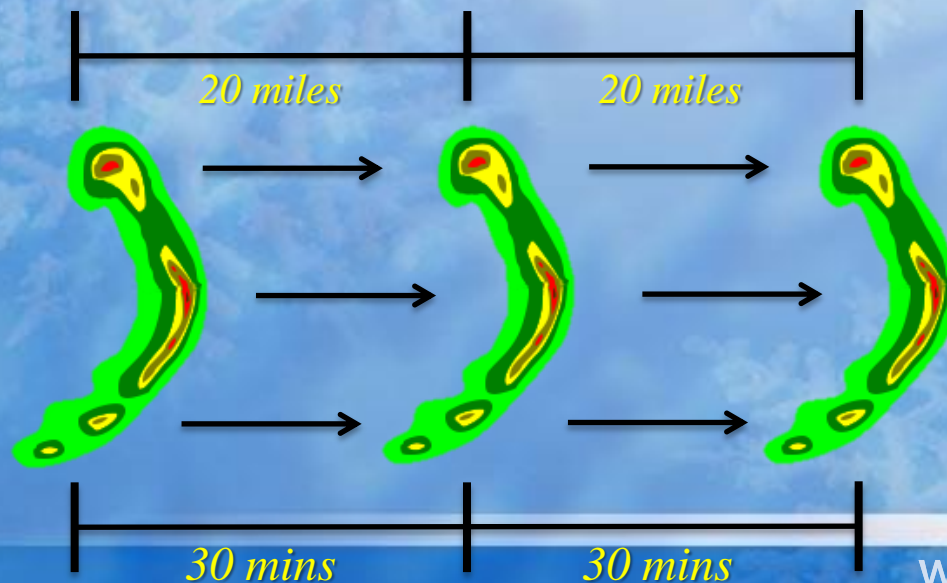
Precip Mode

Storm Mode



# Radar

- How to figure timing or onset of precip using radar
- Use time of radar and your fingers
- Look out your window for “calibration”







# Milwaukee, WI Radar

Go to: [Enhanced Version](#)

Local weather forecast by "City, St"

[Radar Status Message](#)

### Adjacent Radars:



### Short Range Images

Reflectivity:

Composite [Loop](#)

Base [Loop](#)

Velocity:

Storm Relative [Loop](#)

Base [Loop](#)

Rainfall:

1-Hour Total [Loop](#)

Storm Total [Loop](#)

### Long Range Images

Reflectivity:

Base [Loop](#)

### U.S. Views

Reflectivity:

National [Loop](#)

Alaska [Loop](#)

Hawaii [Loop](#)

Guam [Loop](#)

Puerto Rico [Loop](#)

[Radars by State](#)

### Additional Info:

[Radar FAQ](#)

[Downloading Images](#)

[Mobile Users](#)

[GIS Users](#) [KML](#)

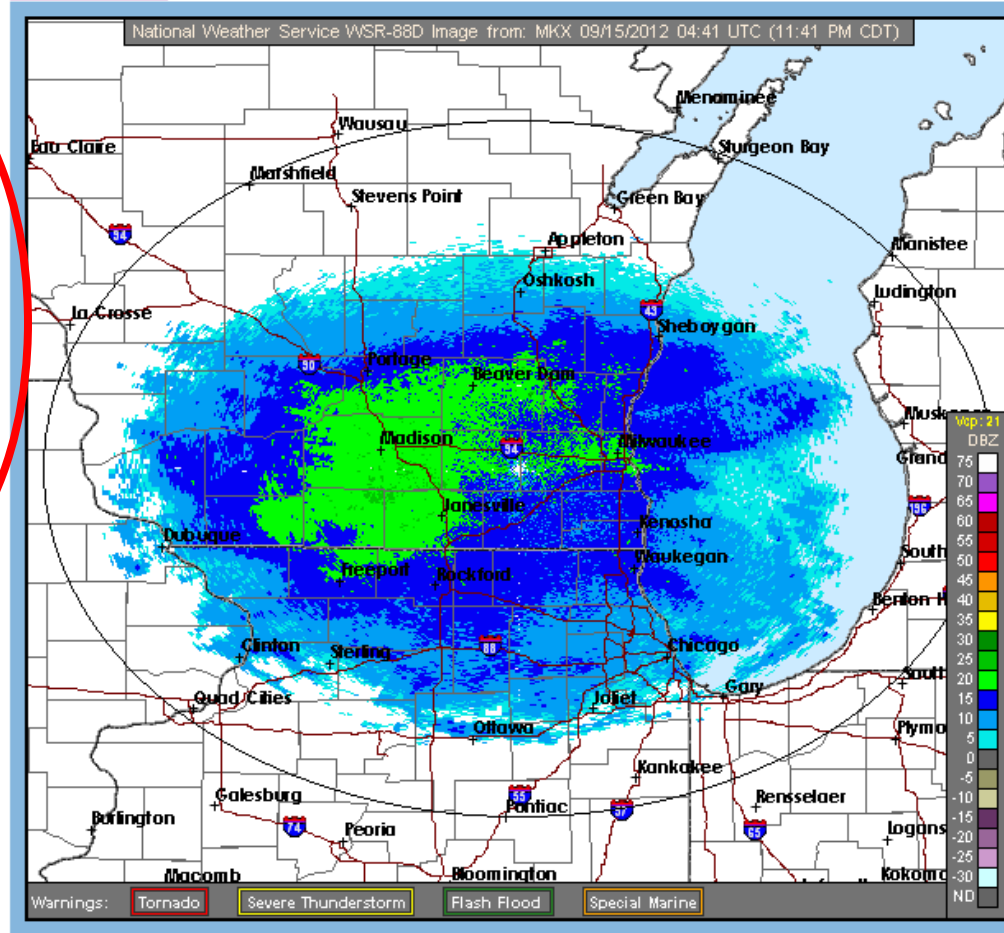
[Doppler University](#)

[Color Blindness Tool](#)

[Credits](#)

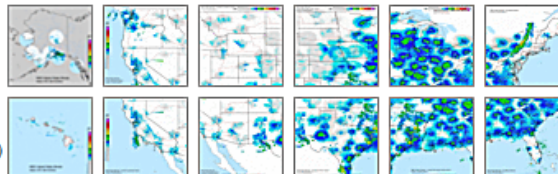
## Base Reflectivity

[NWS Milwaukee, WI](#)

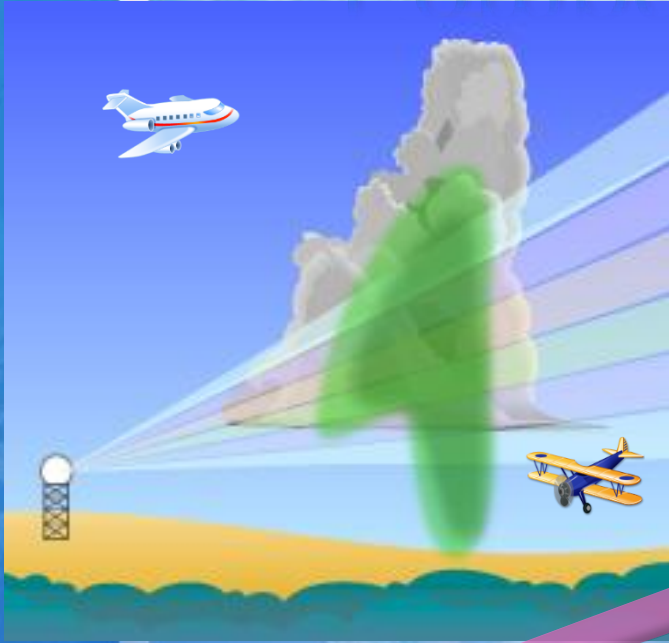


National  
Radar  
Mosaic  
Sectors

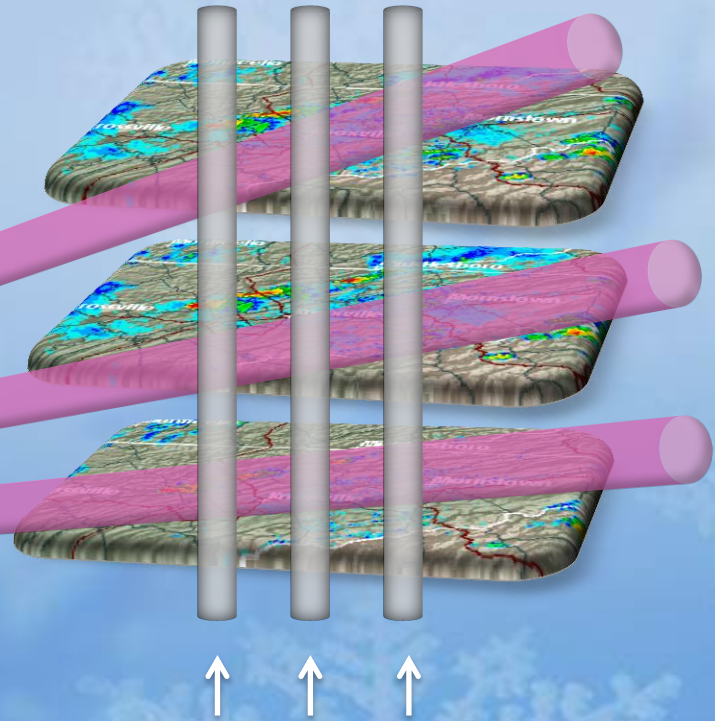
(click image)



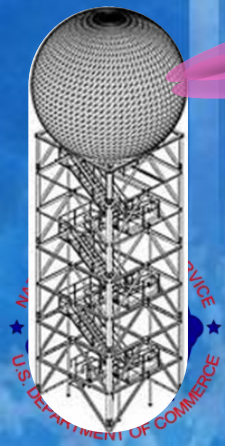
# Composite Reflectivity



Some precipitation may not be reaching ground

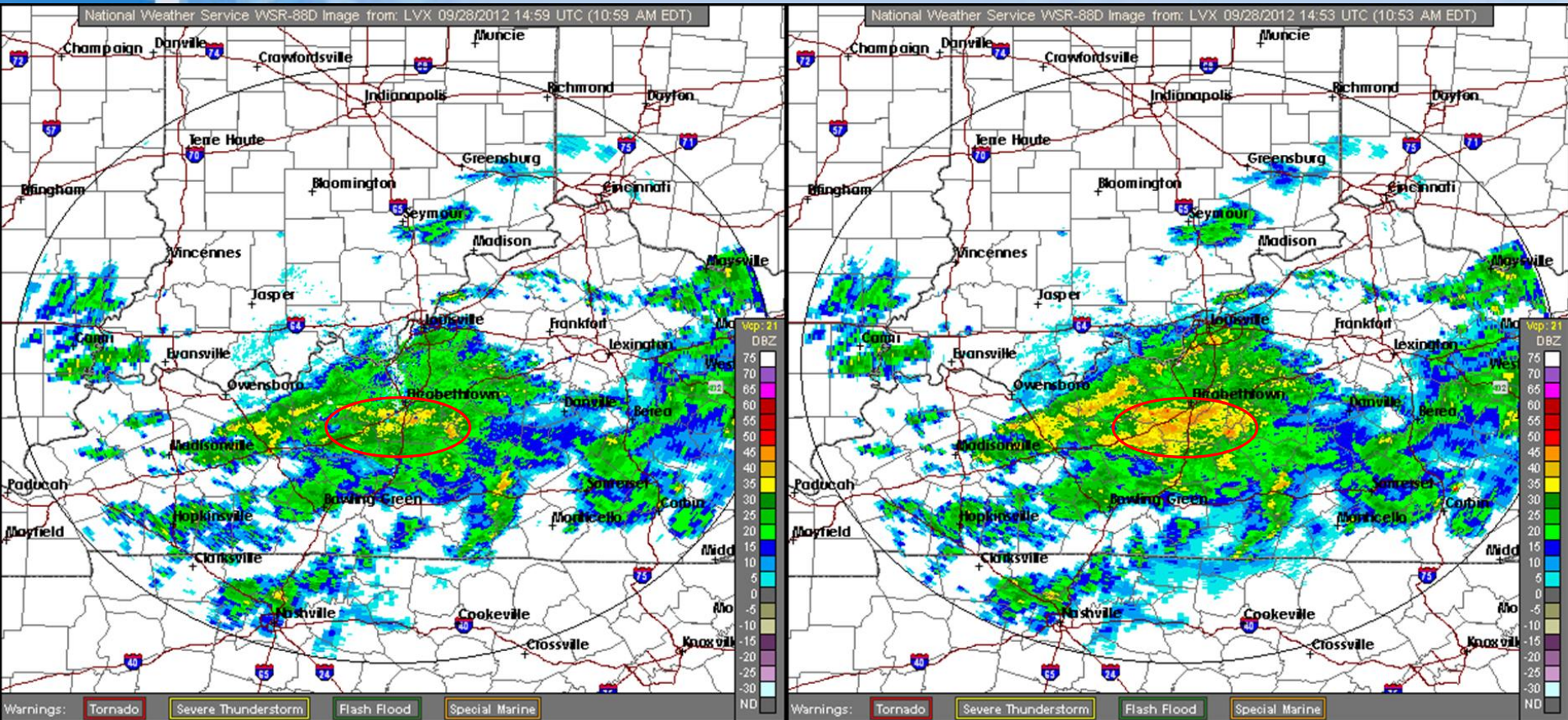


Shows highest reflectivity in a column



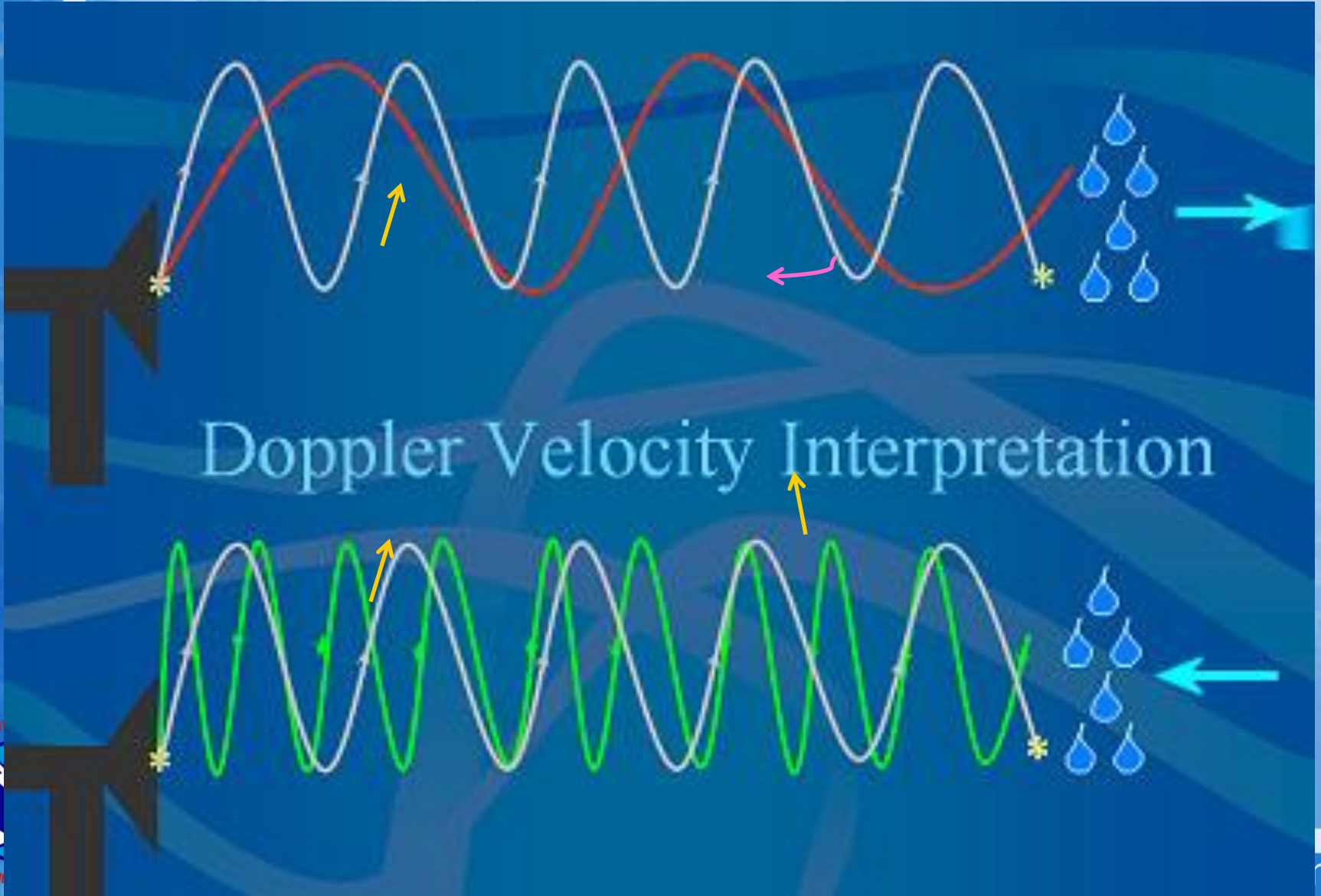


# Base vs. Composite Reflectivity





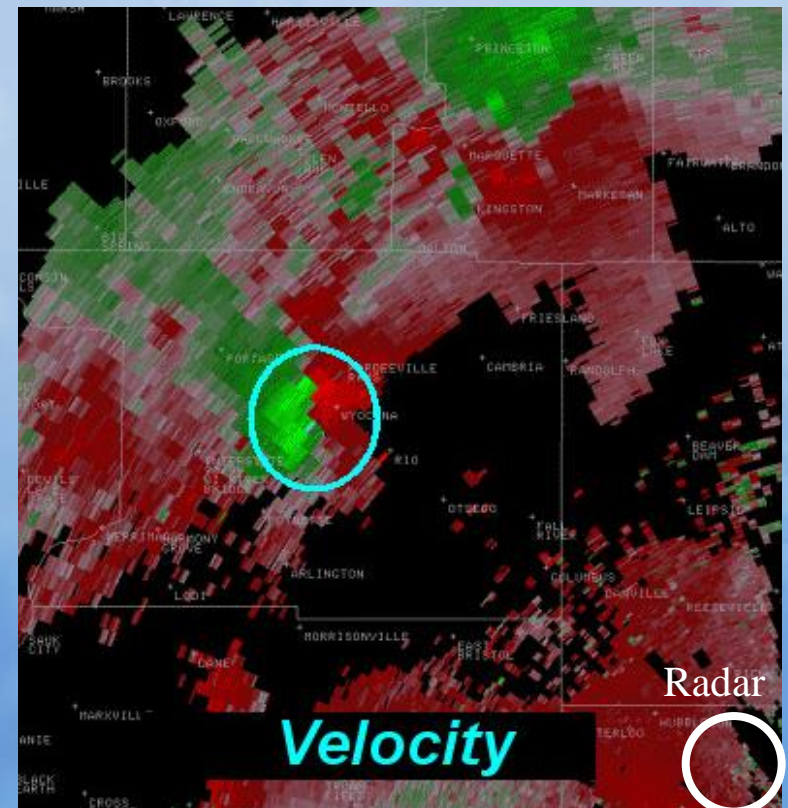
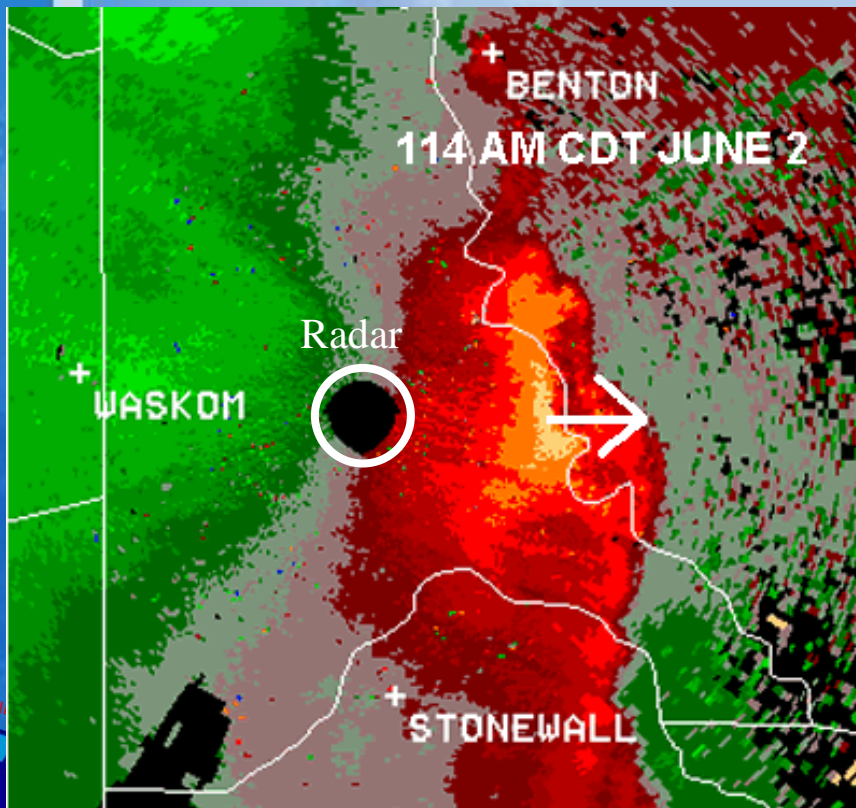
# Radar Velocity



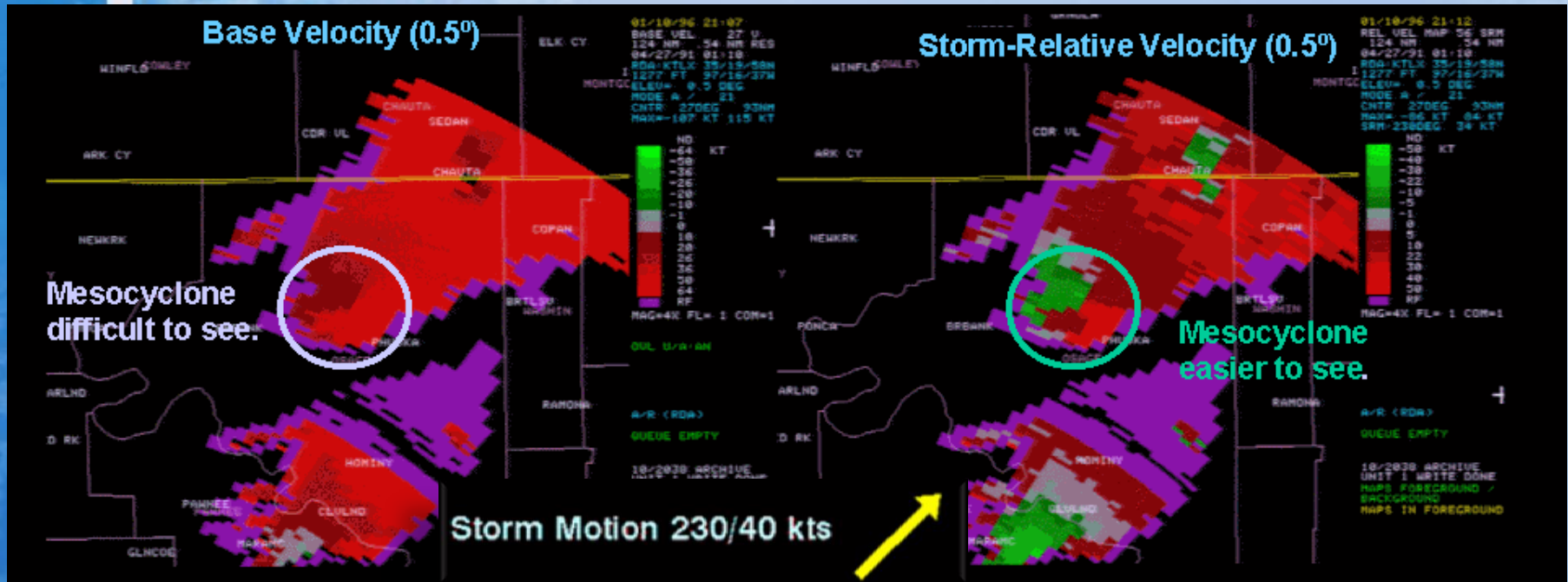


# Radar Velocity Interpretation

- Green: Toward the radar
- Red: Away from the radar



# Base vs. Storm Relative Velocity



- The motion of the storm is removed from the mean velocity
- Storm-relative velocity shows velocity in the storm as if it were stationary



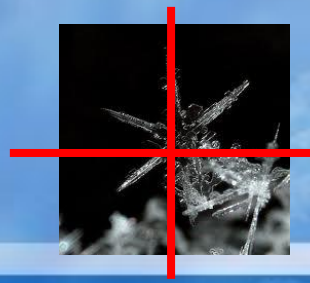
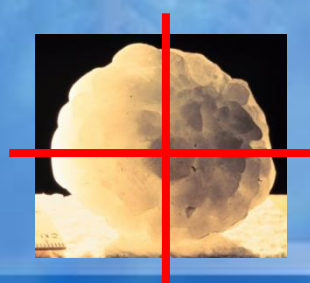
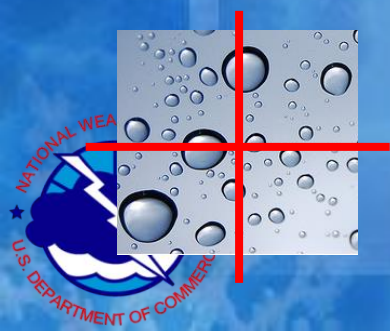
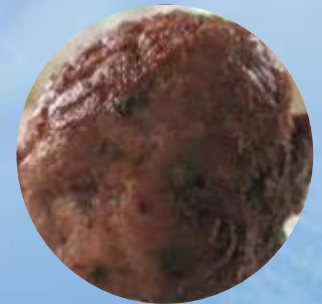
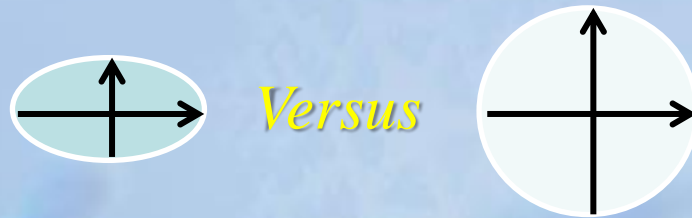
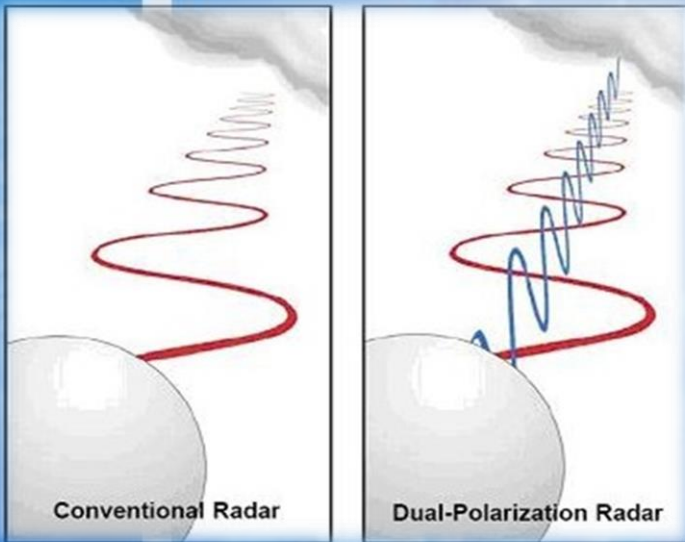
Source: <http://okfirst.mesonet.org/train/materials/radar/srm1.gif>





# Dual-Pol Radar

- Transmits pulses in two orientations





# Dual-Pol Radar Products

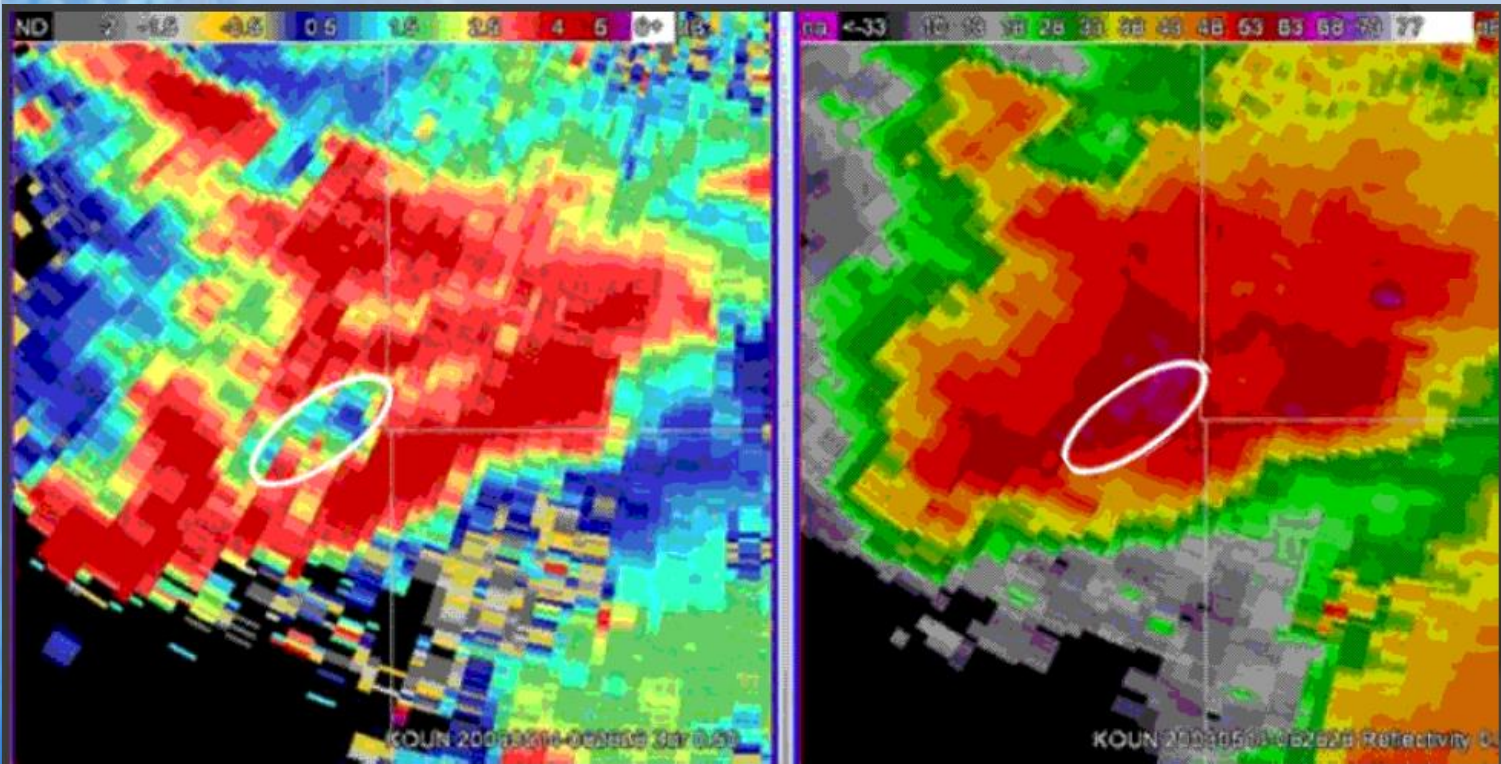
- Reflectivity
- Velocity
- Spectrum Width
- Differential Reflectivity
- Correlation Coefficient
- Specific Differential Phase
- Hydrometeor Classification Algorithm







# Differential Reflectivity



Differential Reflectivity (ZDR)

Reflectivity (Z)

The new differential reflectivity product will allow to more closely pinpoint location of largest hail in supercells (areas of ZDR near zero)



# Correlation Coefficient

- Shows us similarities or differences between the scatterers

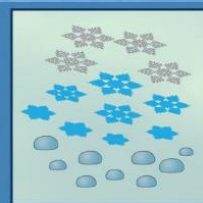
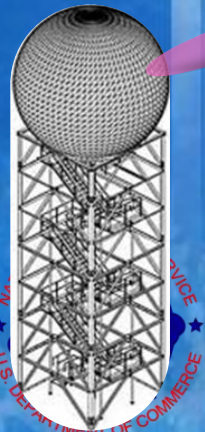
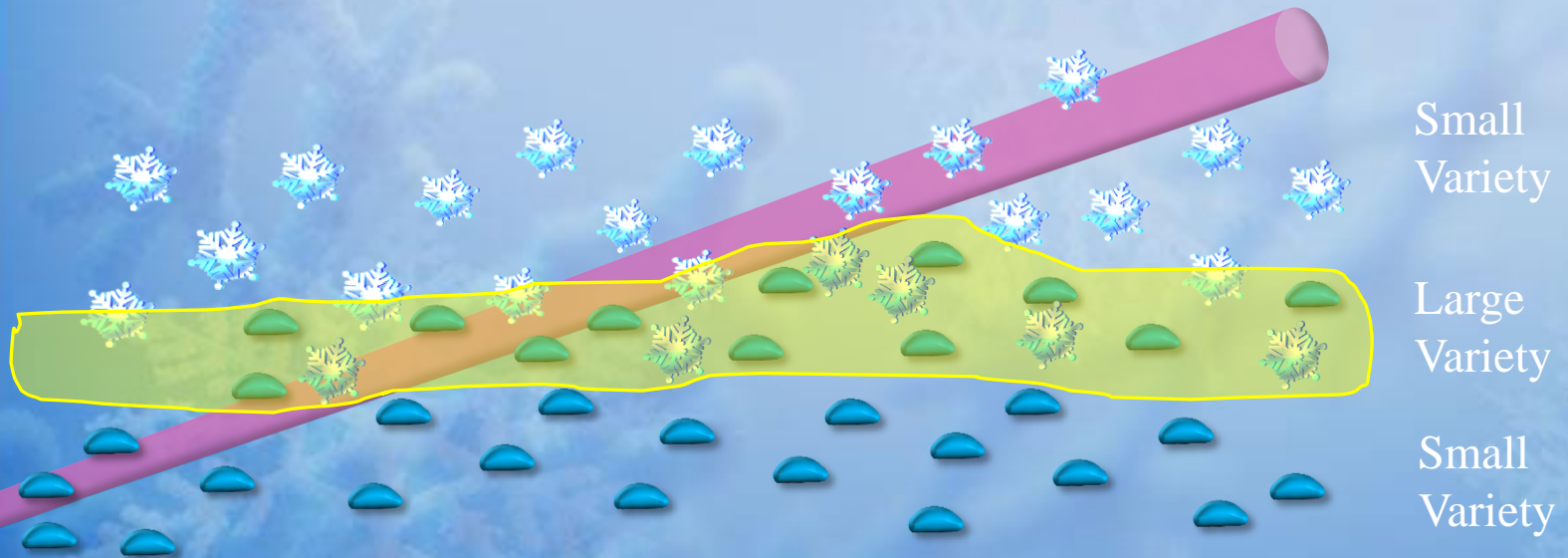






# Correlation Coefficient

- Helps identify the melting layer
- Icing usually occurs just above the melting layer



More than one precipitation type



Differentiating biological from weather targets

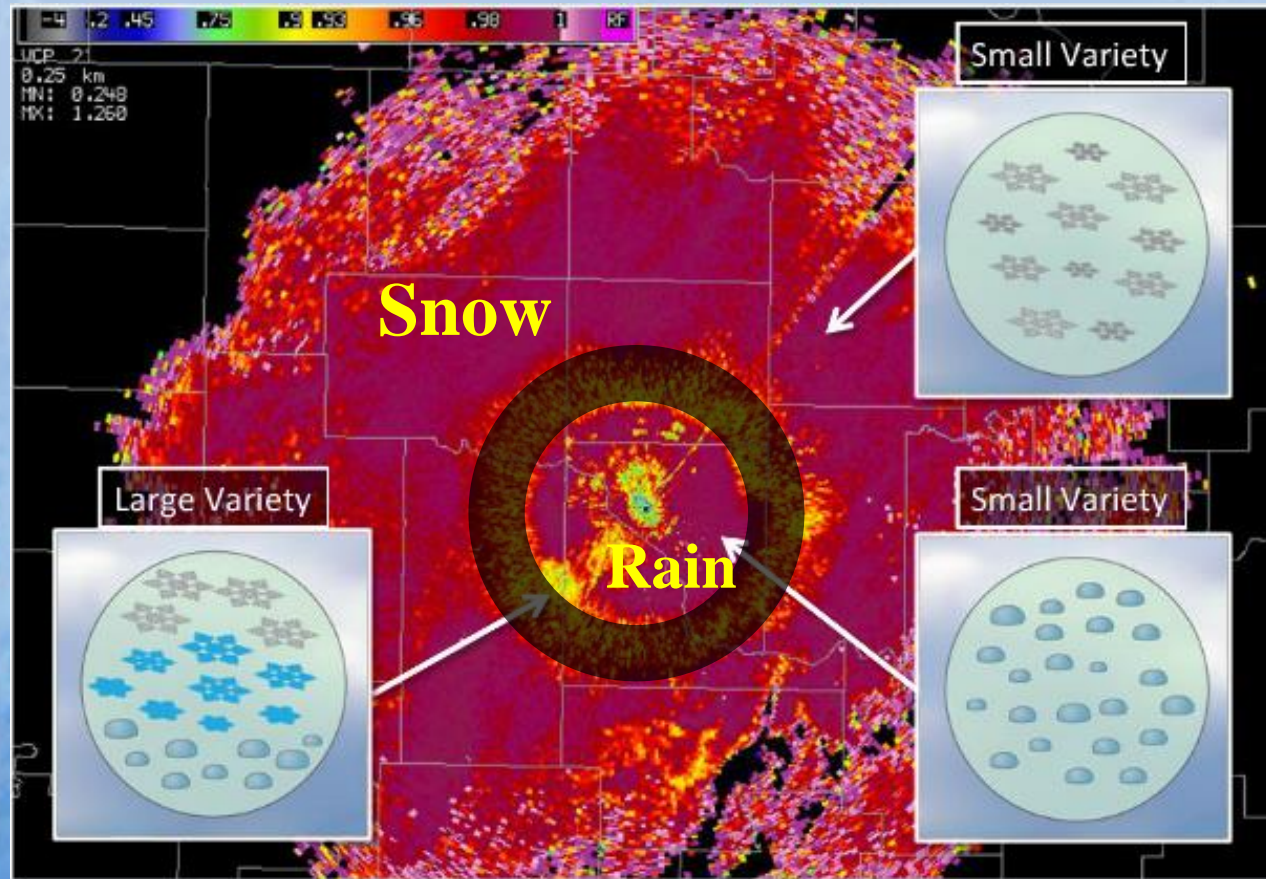


Identifying debris from significant tornadoes



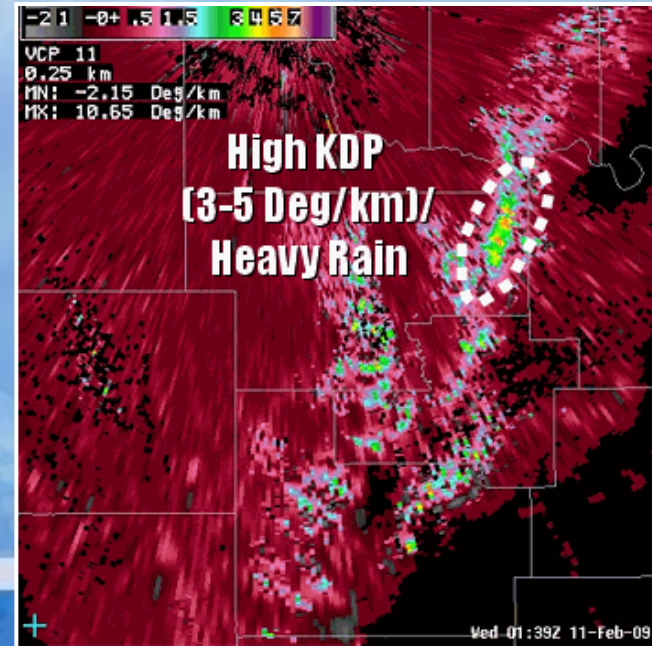
# Correlation Coefficient

- Where's the melting layer?
- If no melting layer: expect all snow or freezing drizzle



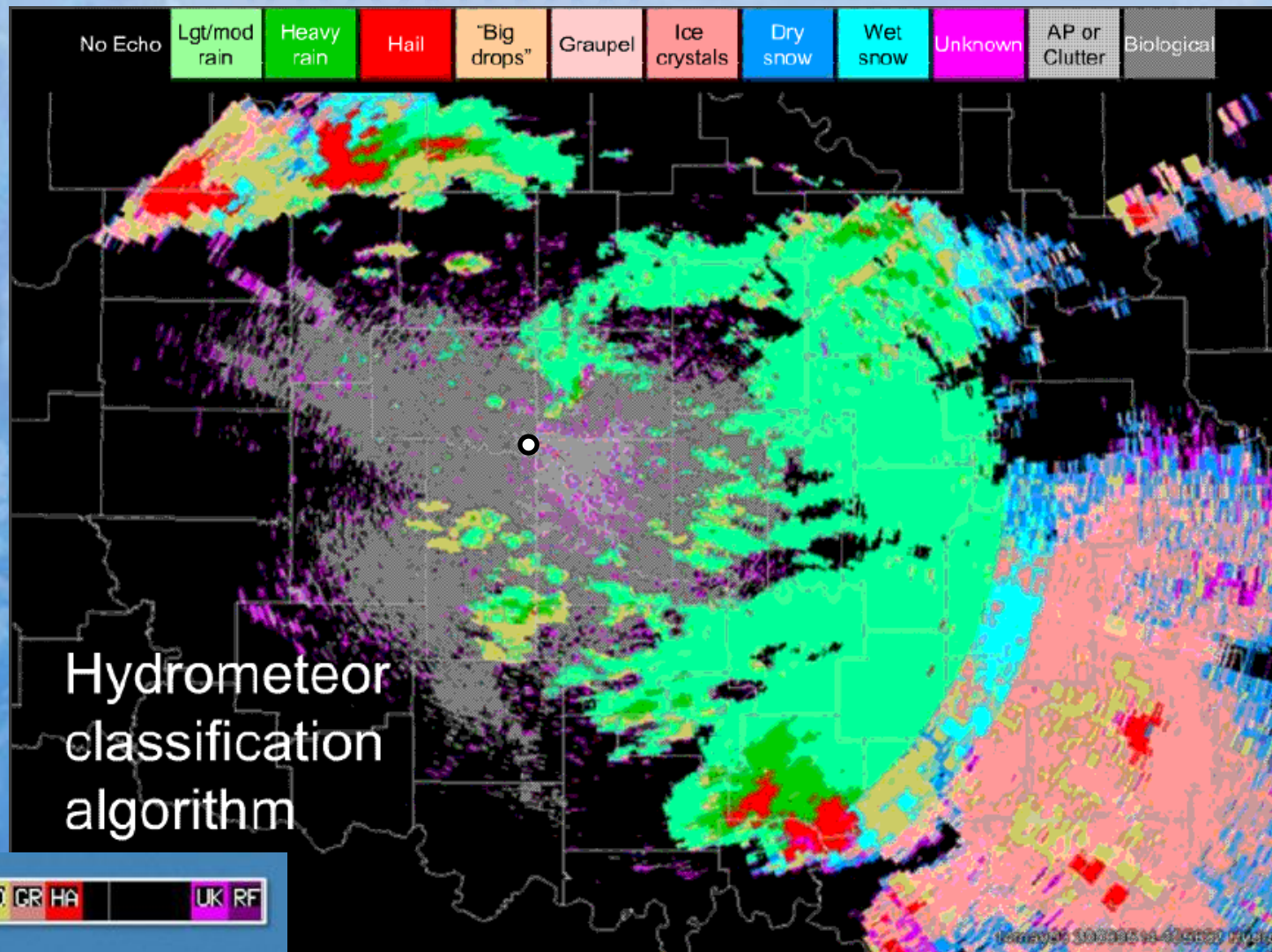
# Specific Differential Phase

- Tells us how much liquid water is present in an area of precipitation
- Heavy Rain Detection
- Higher in hamburger buns than in meatballs





# Hydrometeor Classification Algorithm



- BI - Biological
- GC - Ground clutter
- IC - Ice crystals
- DS - Dry snow
- WS - Wet snow
- RA - Rain
- HR - Heavy rain
- BD - Big drops
- GR - Graupel
- HA - Hail-rain
- UK - Unknown
- RF - Range folded

Hydrometeor  
classification  
algorithm

BI GC IC DS WS RA HR BD GR HA UK RF

Non-weather Winter Rain

10/10/2008 10:00:00 AM

www.weather.gov/mkx

# More Information

- <http://www.wdtb.noaa.gov/courses/dualpol/outreach/>



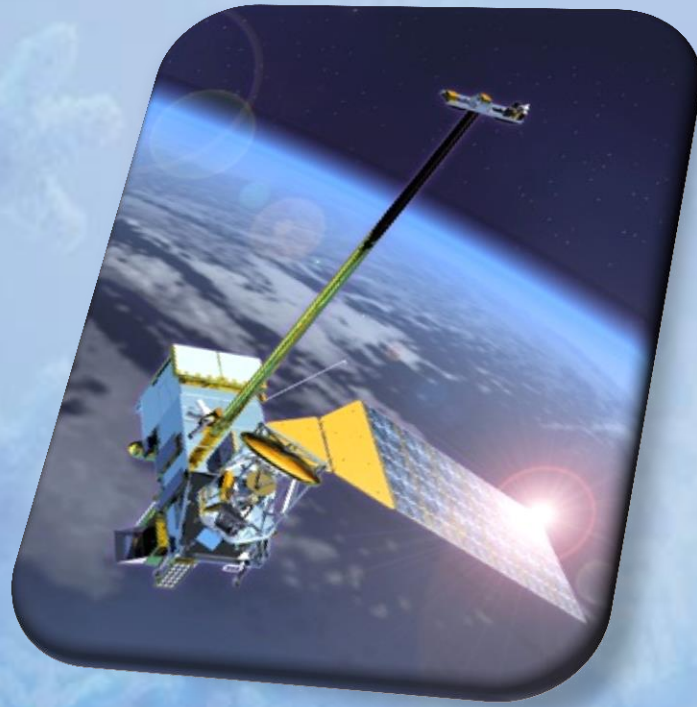
## Training for the Non-Meteorologists:

The following lessons were developed to help non-meteorologists who rely on WSR-88D data to make weather-related decisions. These lessons are available in a streaming format that uses [Adobe Flash Player](#) and can be viewed using the links below. We recommend that students attempt these lessons **no more than 1 month prior** to the installation of dual-polarization technology at their local WSR-88D site.

- [Dual-Polarization Technology Overview](#) **Download**
- [Best Uses for the Hydrometeor Classification Product](#) **Download**
- [Best Uses for the Dual-Polarization Estimated Rainfall Amount Products](#) **Download**





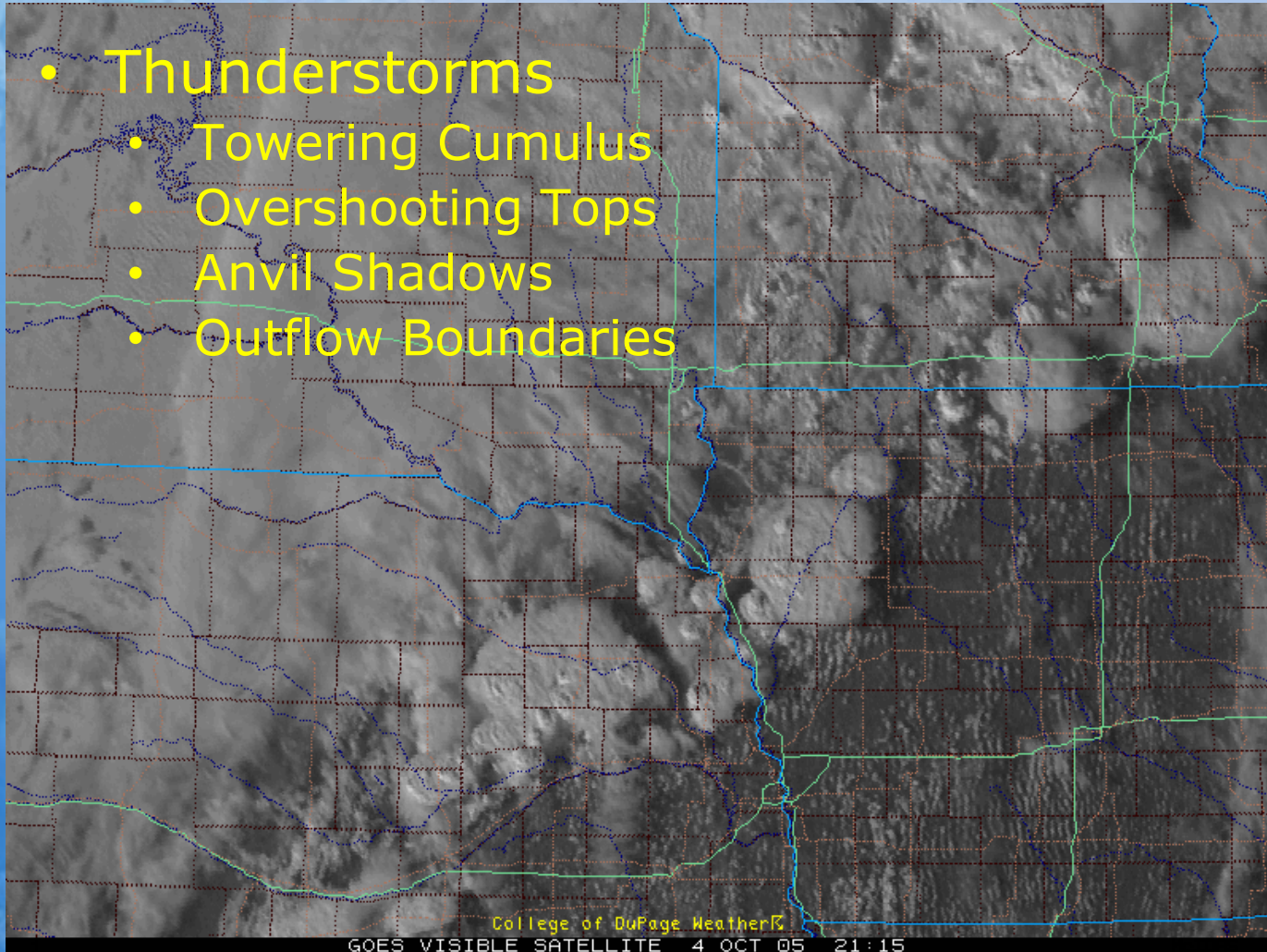


# Satellite Interpretation



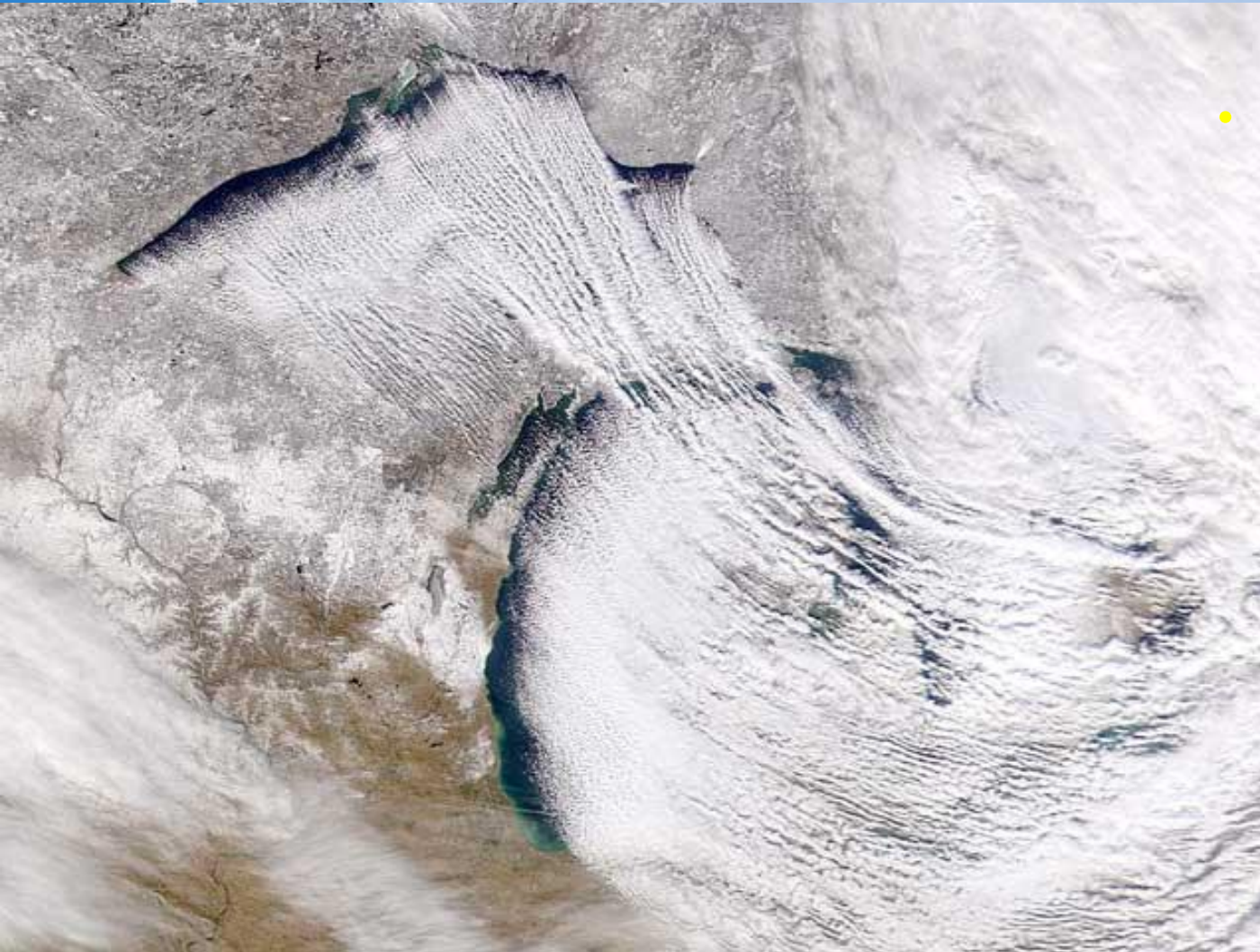
# Visible Satellite (VIS)

- Thunderstorms
  - Towering Cumulus
  - Overshooting Tops
  - Anvil Shadows
  - Outflow Boundaries





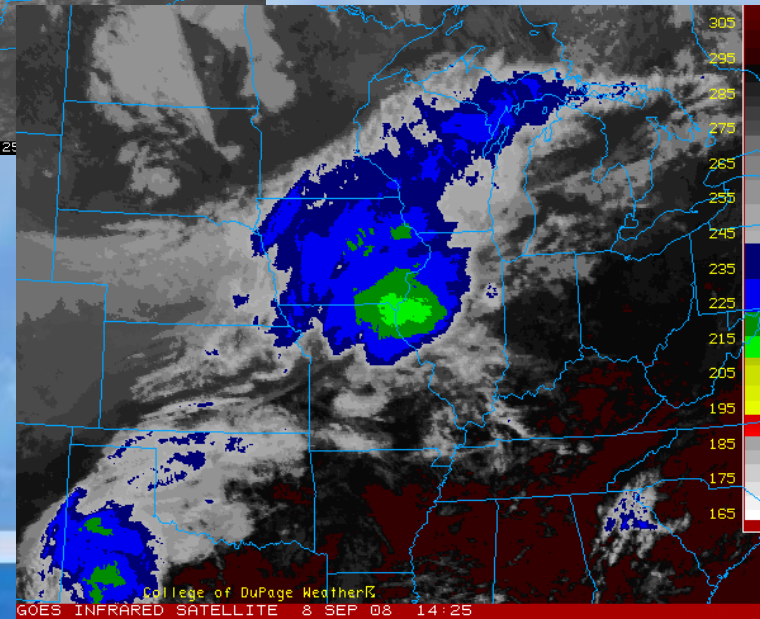
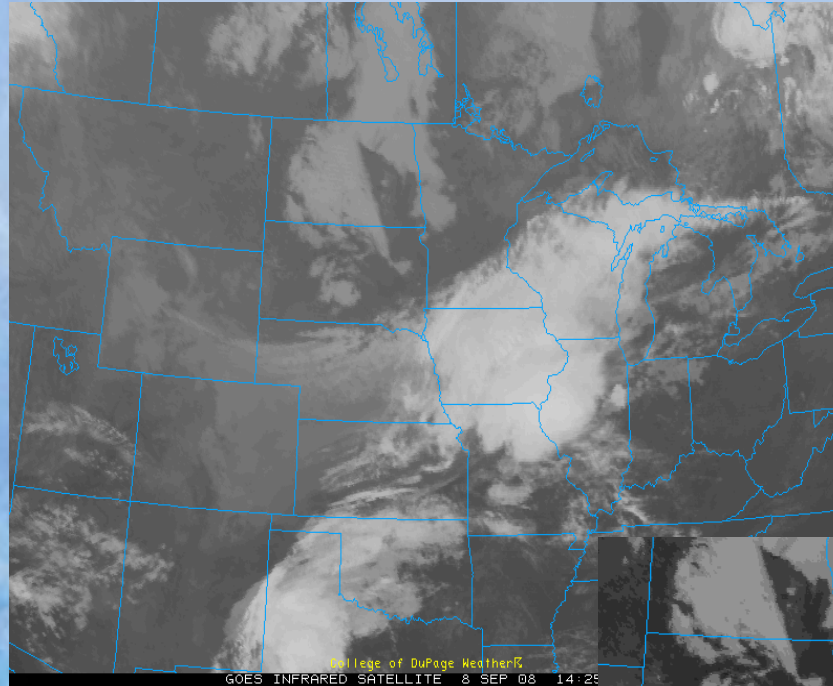
# Visible Satellite (VIS)



- Other Features
  - Lake Effect Clouds
  - Snow Cover
  - Fog
  - Marine Layer Clouds/Fog
  - Cirrus streaks (Jet Stream Features)
  - Hurricane Features

# Infrared Satellite (IR)

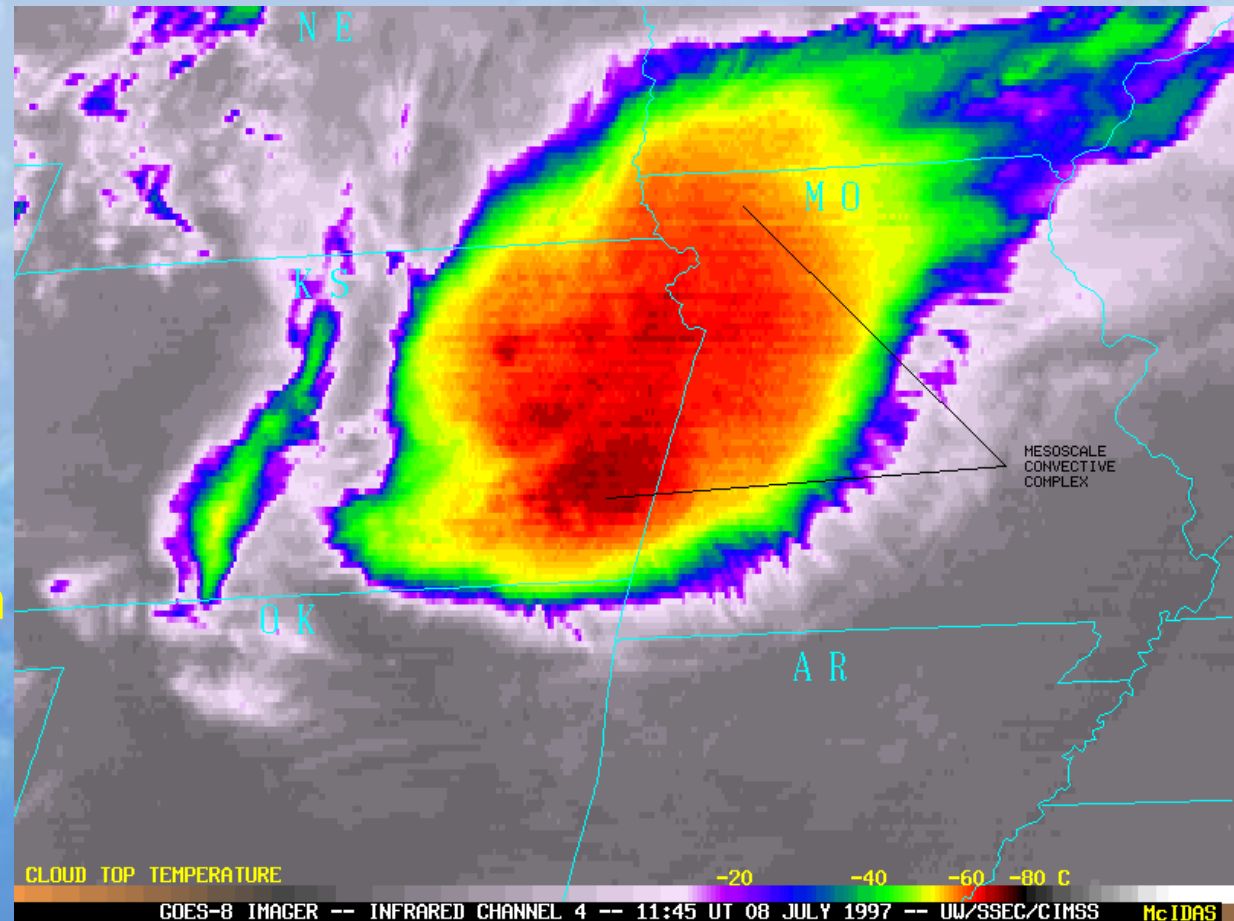
- Measures Temperature of Cloud Tops
  - Colder is Brighter (higher clouds)
  - Warmer is Darker (lower clouds)
- *Now...  
Use an  
enhancement*





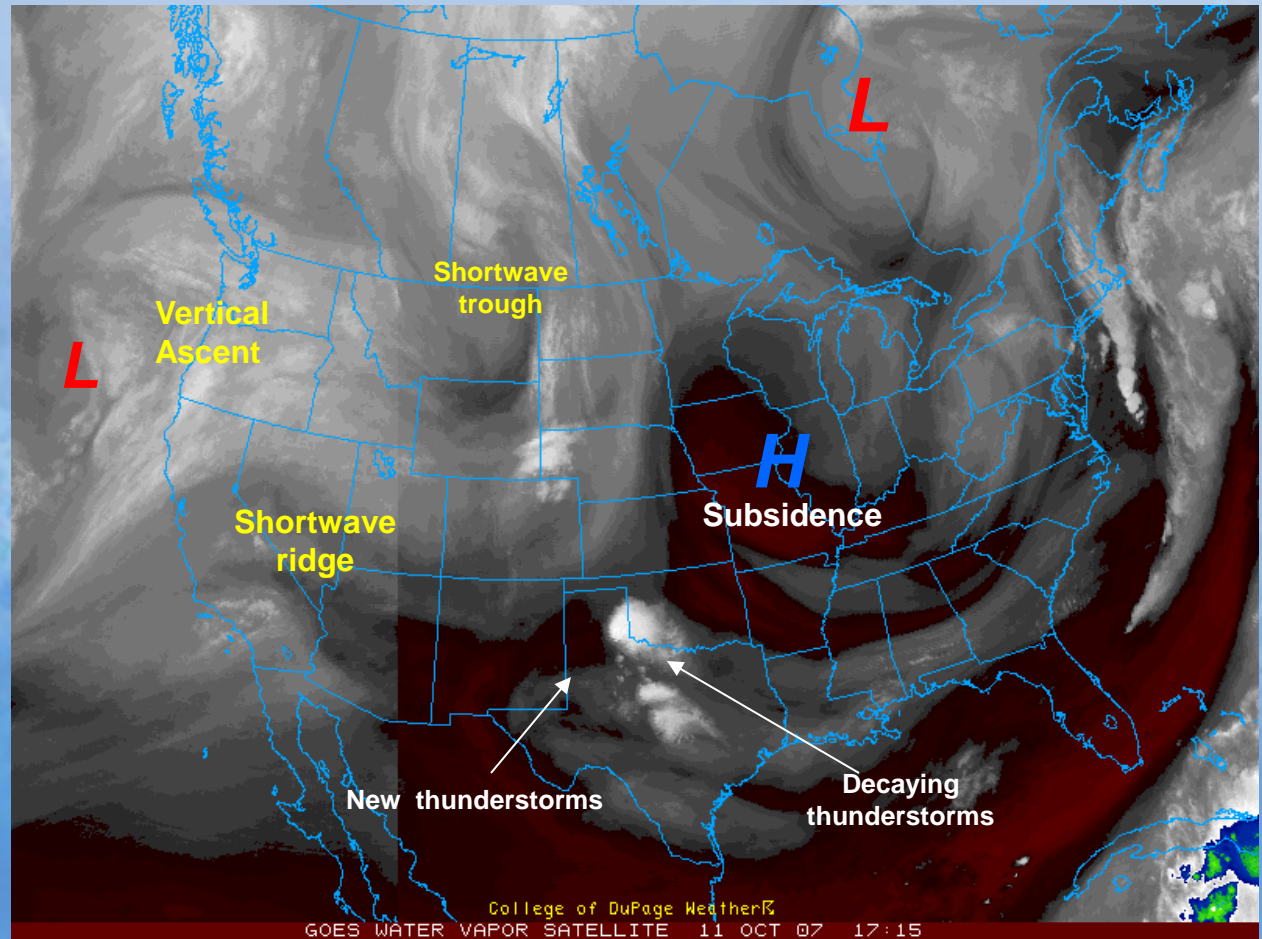
# Infrared Satellite (IR)

- Many Uses for IR
  - Convection Strength
  - Afternoon Drylines
  - Cyclone Development
  - Approach of Cold Airmasses
  - Hurricane Strength & Analysis



# Water Vapor Satellite (WV)

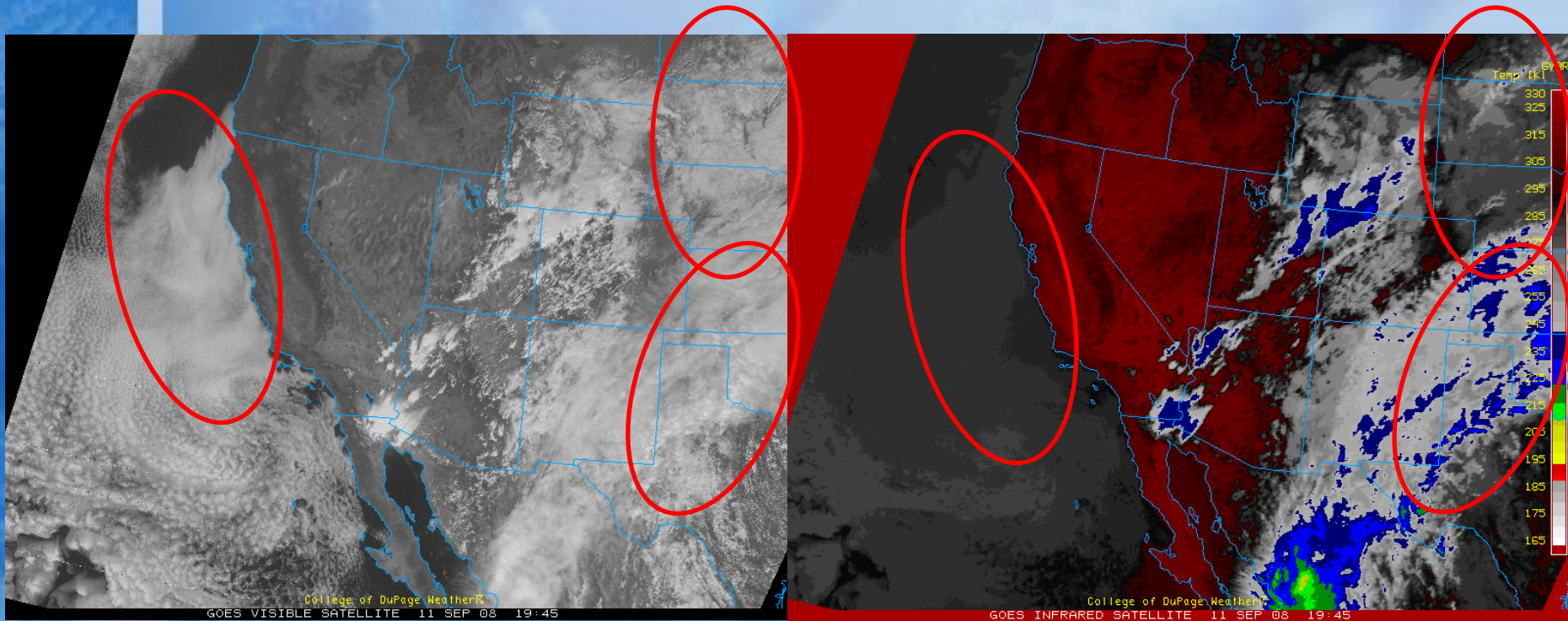
- Mid and Upper Levels of Atmosphere
  - **Brighter** → **More Moisture**
  - **Darker** → **Drier Air**





# Applications of Satellite Products

- CA Coast: Marine Layer
- Dakotas/NE: Low Clouds
- Mexico → TX → KS: High Clouds



# Website Resources





# Weather.gov

Local forecast by  
\*City, ST\* or ZIP code  
Enter location ...   
[Location Help](#)

### 2013 National Tsunami Preparedness Week

It is National Tsunami Preparedness Week (March 24-30, 2013). If you live near or visit a coastal area, would you know what to do if a tsunami hit? Learn how to become TsunamiReady: [Read More...](#)

**Customize Your Weather.gov**

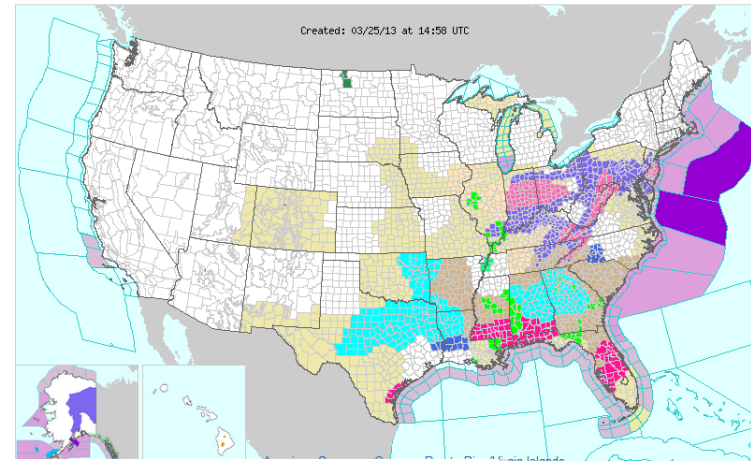
City, ST

Enter Your City, ST or ZIP Code

Remember Me

[Privacy Policy](#)

- ACTIVE ALERTS
- FORECAST MAPS
- RADAR
- RIVERS, LAKES, RAINFALL
- AIR QUALITY
- SATELLITE
- PAST WEATHER



Winter Hazards Simplification



Confused by winter

### ACTIVE ALERTS

- Warnings By State
- Excessive Rainfall and Winter Weather Forecasts
- River Flooding
- Latest Warnings
- Thunderstorm/Tornado Outlook
- Hurricanes
- Fire Weather Outlooks
- UV Alerts
- Drought
- Space Weather
- NOAA Weather Radio
- NWS CAP Feeds

### CURRENT CONDITIONS

- Radar
- Climate Monitoring
- River Levels
- Observed Precipitation
- Surface Weather
- Upper Air
- Marine and Buoy Reports
- Snow Cover
- Satellite
- Space Weather

### INFORMATION CENTER

- Space Weather
- Tsunami
- For Developers
- Storm Spotters
- Cooperative Observers
- GIS
- Water
- Forecast Models
- Aviation**
- Fire Weather
- Climate
- Marine
- Daily Briefing
- Facts and Figures

### WEATHER SAFETY

- NOAA Weather Radio
- StormReady
- Heat
- Lightning
- Hurricanes
- Thunderstorms
- Tornadoes
- Severe Weather
- Rip Currents
- Floods
- Winter Weather
- Ultra Violet Radiation
- Air Quality
- Damage/Fatality/Injury Statistics
- Red Cross
- Federal Emergency Management Agency (FEMA)
- Brochures

### NEWS

- Newsroom
- Social Media
- Events
- Pubs/Brochures/Booklets

### EDUCATION

- NOAA Economics
- NOAA Education Resources
- Glossary
- JetStream
- NWS Training Portal
- NOAA Library
- Play Time for Kids
- For Students
- For Teachers
- Brochures
- Other Links

### ABOUT

- Organization
- Strategic Plan
- For NWS Employees
- International
- National Centers
- Products and Services
- Glossary
- Contact Us

### PAST WEATHER

- Past Weather
- Climate Monitoring
- Heating/Cooling Days
- Monthly Temps
- Records
- Astronomical Data
- Certified Weather Data

### FORECAST

- Local Forecast
- Severe Weather
- Current Outlook Maps
- Drought
- Fire Weather
- Fronts/Precipitation Maps
- Current Graphical Forecast
- Maps
- Rivers
- Marine
- Offshore and High Seas
- Hurricanes
- Aviation Weather
- Climatic Outlook

ports in XML/CAP v1.1 and ATOM Formats

- Beach Hazards Statement
- Flood Watch
- Freeze Watch
- Fire Weather Watch
- Special Weather Statement



# Milwaukee/Sullivan, WI

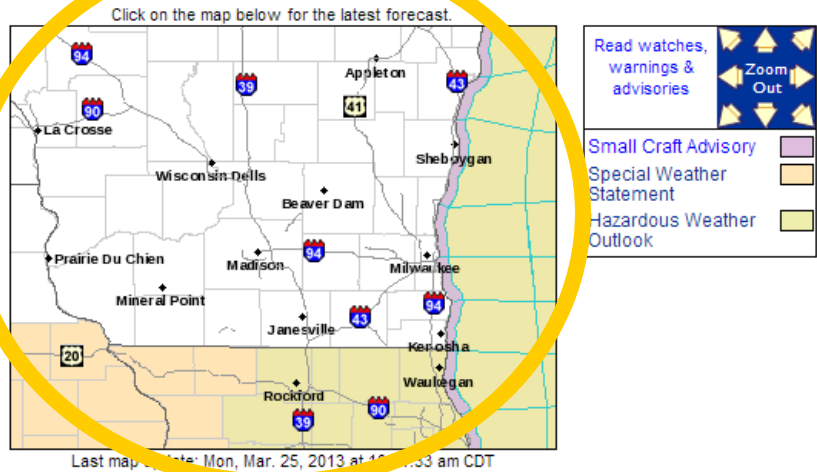


Home Site Map News Organization Search for: [input] NWS All NOAA

### Top News of the Day

- Sheboygan Weather Radio Transmitter Is Down
- March 2012 vs. March 2013 - A Tale of Very Different Temperature Regimes (Updated 3/24/13)
- Drought Has Ended Over Southern Wisconsin
- Additional News Headlines

Watches & Warnings Observations Graphics Rivers & Lakes Climate Marine



### Latest Conditions in Milwaukee, WI Choose Your Front Page City

Mar 25 9:52 am **33°F** (1°C) Select A City: [dropdown]

Weather Story Radar Satellite Weather Map

Web Page Tutorials: [Climate Page](#) [Activity Planner](#) [Hourly Weather Planner](#)

Four Areas of Interest

Local forecast by "City, St" or Zip Code

City, St [input] Go

XML RSS Feeds

- Current Hazards
- Watches/Warnings
- Outlooks
- Submit Report
- Current Conditions
- Observations
- Radar
- Satellite
- Snow Cover
- Snowfall Analysis
- Precip Analysis
- Forecasts
- Forecast Discussion
- Activity Planner
- Aviation Weather
- Fire Weather
- Marine Weather
- Severe Weather
- Winter Weather
- Hurricane Center

- Hydrology
- Rivers & Lakes
- Climate
- Local
- National
- Drought
- More...
- Local Drought Info
- Weather Safety
- Preparedness
- Weather Radio
- StormReady
- SkyWarn
- Additional Info
- Other Useful Links
- Education Resources
- Coop Observer
- Top News Archives
- Our Office
- Contact Us
- Contact Info
- Feedback





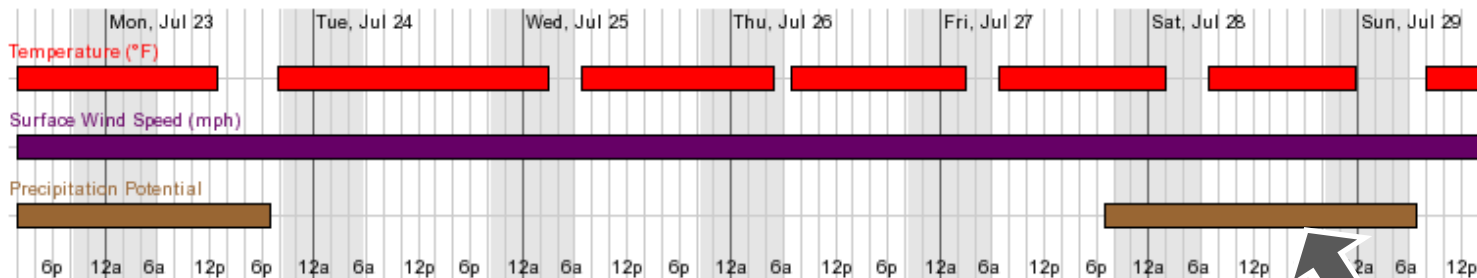
Point Forecast: Madison WI

**Weather Activity Planner**

This interactive forecast display is intended for general planning purposes. Data entered may have been changed for accuracy. Please verify the below data is appropriate. All wind direction information should be entered in a clockwise direction (using compass directions i.e. E, ESE, SE, etc). Public **comments and suggestions** are encouraged.

This application generates products from a digital forecast data base. It is intended to allow a user to define and produce a forecast for general planning purposes only. As any weather or hydrologic event evolves, updated forecasts and warnings are issued by the NWS. Customers are urged to obtain the latest official forecast information prior to engaging in any weather sensitive activity, and to monitor forecasts for updates during such activities.

The **Weather Activity Planner** is NOT meant to replace a spot forecast request. **Weather Activity Planner** surface winds are a gridded representation of projected, local surface winds at a 5km or 2.5km resolution. The surface winds returned do NOT account for fuel type, sheltering or slope aspect. Users can select either surface wind speeds or 20 foot winds (if the 20 foot wind grid is available). If precise wind forecasts are needed, please submit a spot forecast request to your servicing Weather Forecast Office.



**Saturday, July 28 at 6pm**  
 Temperature: 81 °F Surface Wind: NW 7mph  
 Precipitation Potential: 12%

**Hazardous weather condition(s):**  
[Hazardous Weather Outlook](#)

Element	Min	to	Max	Element	Min	to	Max
Temperature (°F) ▼	70	to	90	Surface Wind Speed (mph) ▼		to	
Relative Humidity ▼		to		Sky Cover ▼		to	
Surface Wind Speed (mph) ▼	0	to	15	Precipitation Potential ▼	0	to	25

# Activity Planner

Let's say we want certain weather conditions

NOT TO REPLACE A SPOT FORECAST

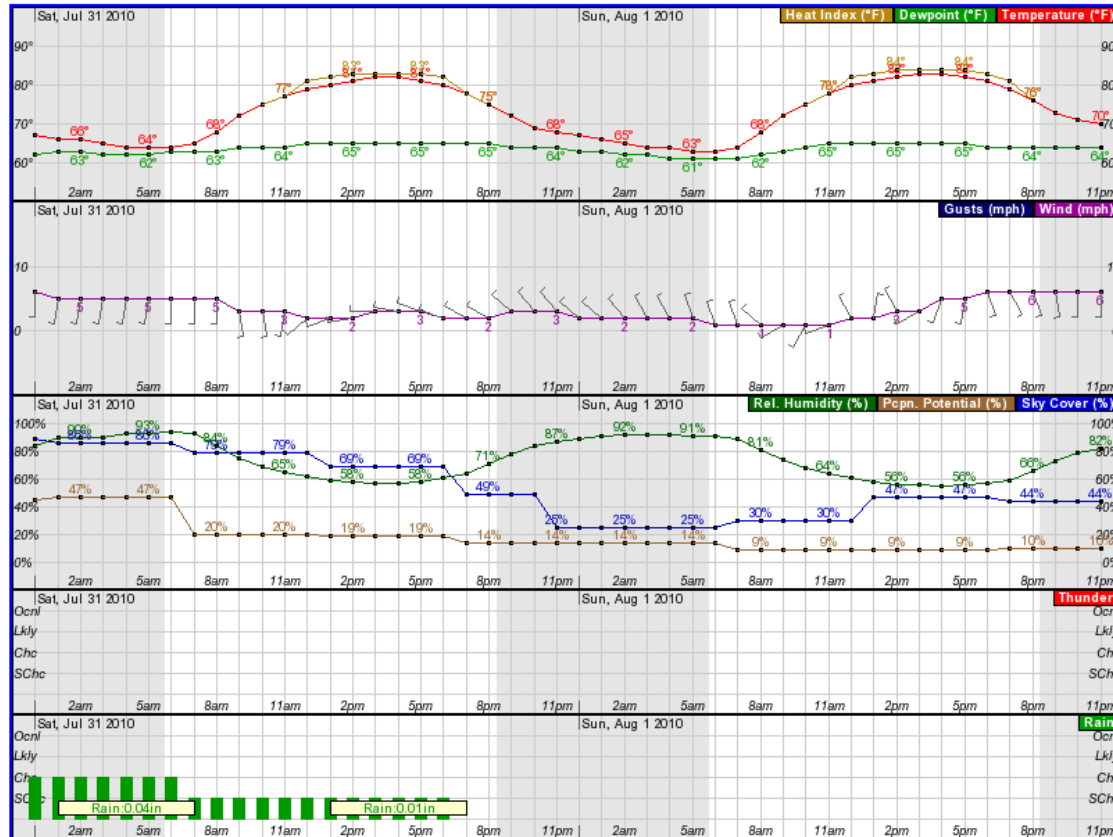
# Hourly Weather Graph

Hourly Weather Forecast Graph

[\[dashes/dots\]](#) | [\[b/w\]](#) | [\[hide menu\]](#)

Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input checked="" type="checkbox"/> Surface Wind <span>mph</span> <input type="text" value=""/>	<input checked="" type="checkbox"/> Thunder
<input checked="" type="checkbox"/> Dewpoint (°F)	<input checked="" type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input checked="" type="checkbox"/> Heat Index (°F)	<input checked="" type="checkbox"/> Precipitation Potential	
	<input checked="" type="checkbox"/> Relative Humidity	

48-Hour Period Starting:



Sunday, August 1 at 4pm

Temperature: 83 °F Dewpoint: 65 °F Heat Index: 84 °F Surface Wind: SSW 5mph

Sky Cover: 47% Precipitation Potential: 9% Relative Humidity: 55%

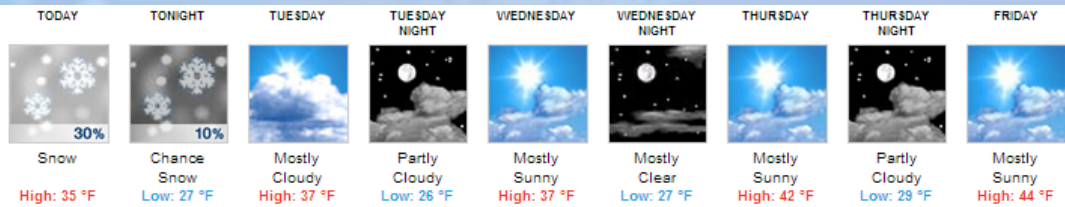
Thunder: <10% Rain: <10%

## Variables:

- Temp
- Dewpoint
- Wind
- RH
- Sky Cover
- Probability (Precip. & Thunder)
- Precip. Amount







## 7-DAY FORECAST

Today	Flurries before 1pm, then a chance of snow showers. Cloudy, with a high near 35. North wind around 15 mph, with gusts as high as 25 mph. Chance of precipitation is 30%.
Tonight	A slight chance of snow showers before 7pm, then a chance for flurries before ending. Cloudy, with a low around 27. North wind 10 to 15 mph. Chance of precipitation is 10%.
Tuesday	Mostly cloudy, with a high near 37. Northwest wind 10 to 15 mph.
Tuesday Night	Partly cloudy, with a low around 28. Northwest wind around 10 mph.
Wednesday	Mostly sunny, with a high near 37. Northwest wind around 10 mph.
Wednesday Night	Mostly clear, with a low around 27. Northwest wind 5 to 10 mph.
Thursday	Mostly sunny, with a high near 42. Northwest wind around 5 mph.
Thursday Night	Partly cloudy, with a low around 29. North wind around 5 mph becoming west after midnight.
Friday	Mostly sunny, with a high near 44.
Friday Night	Partly cloudy, with a low around 31.
Saturday	Mostly sunny, with a high near 47.
Saturday Night	A 30 percent chance of rain. Mostly cloudy, with a low around 36.
Sunday	A 40 percent chance of rain. Mostly cloudy, with a high near 49.

### NWS Milwaukee, WI

Point Forecast: Milwaukee, General Mitchell International Airport WI  
42.95°N 87.89°W (Elev. 699 ft)

Last Update: 10:10 am CDT Mar 25, 2013

Forecast: 11am CDT Mar 25, 2013-6pm

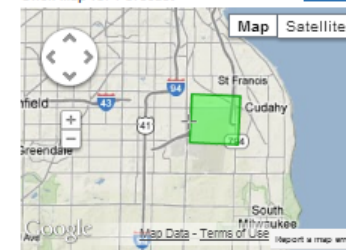
Valid: CDT Mar 31, 2013

[Forecast Discussion](#)

[KML](#) [XML](#)

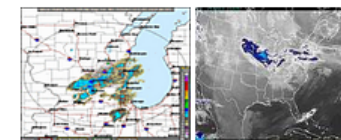
Click Map for Forecast

[Disclaimer](#)

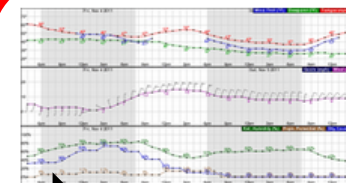


Requested Location: Milwaukee, WI  
Forecast Area: Milwaukee, WI  
Lat/Lon: 42.95°N 87.89°W Elevation: 699 ft

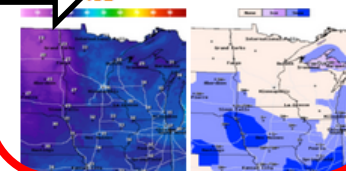
### RADAR & SATELLITE IMAGES



### HOURLY WEATHER GRAPH



### ADDITIONAL DIGITAL FORECAST



## ADDITIONAL FORECASTS AND INFORMATION

[ZONE AREA FORECAST FOR MILWAUKEE COUNTY, WI](#)

[Forecast Discussion](#)  
[Printable Forecast](#)  
[Text Only Forecast](#)

[Hourly Weather Graph](#)  
[Tabular Forecast](#)  
[Quick Forecast](#)

[Air Quality Forecasts](#)  
[International System of Units](#)  
[About Point Forecasts](#)

[Hazardous Weather](#)  
[Hourly Weather](#)

[Current Weather](#)

[Michigan Nearshore Forecast](#)  
[Climate Graphs For Milwaukee](#)  
[Madison](#)

**Graphical  
Depiction**



# National Digital Forecast Database

## Graphical Forecasts - Upper Mississippi Valley

Public  
Marine  
Fire Weather  
Tropical  
Hazardous

Zoom Out

Daily View | Weekly View | Loops

[Image List](#) | [Page Help](#) | [Metric Units](#) | [Key](#)

Go to Region  Zoom In  Get Text Forecast

Mouse over the table below to change the forecast image.

None Rain Fog

▶ Today	◀ -12Hrs	+12Hrs ▶
Max/Min Temperature	Low	
Probability of Precip.	12 hr. probability	
Weather	8pm	11pm
Hazards	2am	5am
Temperature	8pm	11pm
Dewpoint	2am	5am
Wind Speed & Direction	8pm	11pm
Wind Gust	2am	5am
Sky Cover	8pm	11pm
Amount of Precip.	QPF	QPF
Snow Amount	Snow Amount	Snow Amount
Wave Height	Wave Height	Wave Height
Apparent Temperature	8pm	11pm
Relative Humidity	2am	5am
Next Image	◀	▶

Predominant Weather For Sat Jul 31 2010 5AM EDT  
(Sat Jul 31 2010 09Z)

**National Digital Forecast Database**

08z issuance    Graphic created-Jul 31 4:13AM EDT

Table MouseOver Effect On







# Milwaukee/Sullivan, WI

Home Site Map News Organization Search for:  NWS All NOAA Go

Local forecast by "City, St" or Zip Code

City, St  Go

**XML** RSS Feeds

Current Hazards

Watches/Warnings

Outlooks

Submit Report

Current Conditions

Observations

Radar

Satellite

Observed Precip

Forecasts

Forecast Discussion

Activity Planner

Aviation Weather

Fire Weather

Marine Weather

Severe Weather

Winter Weather

Hurricane Center

Hydrology

Rivers & Lakes

## Top News of the Day

- November 8 -12 is Wisconsin Winter Awareness Week
- NOAA: Winter Outlook For 2010-2011
- Fond du Lac NWR Running at Half-power

- Watches & Warnings
- Observations
- Forecast Graphics
- Rivers & Lakes
- Climate
- Marine

Click on the map below for the latest forecast.



Read watches, warnings & advisories

Zoom Out

Small Craft Advisory

Hazardous Weather Outlook

Last map update: Sun, Nov. 7, 2010 at 11:31:41 am CST

## Latest Conditions in Milwaukee, WI

Choose Your Front Page City

Nov 7  
10:52 am **53°F**  
A Few Clouds (12°C)

Select A City:

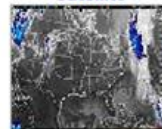
Weather Story



Radar



Satellite



Weather Map



Local Historical Weather Events Search Page

Graphical Weekend Weather Forecast

Winter Weather Page

NWS on Facebook!



**Caveat!**  
**Aviation**  
**Pages**  
**May Be**  
**Different**

## Forecasts

Forecast Discussion

Local Area

Activity Planner

Aviation Weather

Fire Weather

Marine Weather

Severe Weather

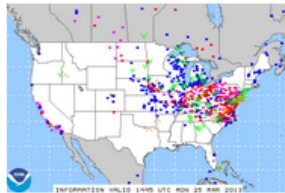
Winter Weather

Hurricane Center

# Aviation Page

- XML** RSS Feeds
- Current Hazards**
  - Watches/Warnings
  - Outlooks
  - Submit Report
- Current Conditions**
  - Observations
  - Radar
  - Satellite
  - Snow Cover
  - Snowfall Analysis
  - Precip Analysis
- Forecasts**
  - Forecast Discussion
  - Activity Planner
  - Aviation Weather**
  - Fire weather
  - Marine Weather
  - Severe Weather
  - Winter Weather
  - Hurricane Center
- Hydrology**
  - Rivers & Lakes
- Climate**
  - Local
  - National
  - Drought
  - More...
  - Local Drought Info
- Weather Safety**
  - Preparedness
  - Weather Radio
  - StormReady
  - SkyWarn
- Additional Info**
  - Other Useful Links
  - Education Resources
  - Coop Observer
  - Top News Archives
  - Our Office
- Contact Us**
  - Contact Info
  - Feedback

## Tools for the Aviator:



Aviation Digital Data Service (ADDS)

### ADDS:

- METARS
- TAFS
- PIREPS
- Satellite

[Other Java Tools](#)



Hot Air Balloon Forecast (May-Oct)



Tactical Decision Aid

### TDA for:

- KMKE**
- KMSN
- KENW
- KUES
- KORD
- KMSP



### TAFS:

Using the pull down menu to the right, you can retrieve TAFS for Wisconsin, Michigan, Illinois, Minnesota and Iowa. Go here for help in [Decoding the TAF](#)

- Local and Surrounding TAFs

Aviation Forecast Discussions  
(scroll down to AVIATION section)

[MKX](#)

[GRB](#)

[ARX](#)

[LOT](#)

[DVN](#)

[MSP](#)

[DLH](#)

[MQT](#)

[APX](#)

[GRR](#)

[DTX](#)

[IWX](#)

[ILX](#)

[DMX](#)

Anywhere in the U.S.





# Tactical Decision Aid

## Tactical Decision Aid(TDA) for General Mitchell International Airport

Based on 12Z TAF last updated @ 1416Z  
 This page will auto refresh every 5 minutes.  
 Last refreshed on Monday , March 25, 2013 @ 15:33Z  
 Enter 3 Letter ICAO Station Identifier Below:



ZULU TIME: LOCAL TIME  
 CROSS WIND: TAIL/HEAD WIND, ALL COMPONENTS, NO RUNWAY WINDS

### CURRENT OBS.      12 HOUR FORECAST

	1452 Z	15 Z	16 Z	17 Z	18 Z	19 Z	20 Z	21 Z	22 Z	23 Z	00 Z	01 Z	02 Z
CIG PREVAILING	044	040	040	040	040	040	020	020	020	020	020	020	020
TEMPO		022	022										
VSBY PREVAILING	10SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM	P6SM
TEMPO		58M	58M										
PCPN PREVAILING		-SH8N	-SH8N	-SH8N	-SH8N	-SH8N							
TEMPO		-SN	-SN										
WIND PREVAILING	350° 12KT	360° 14KT	360° 14KT	360° 14KT	360° 14KT	360° 14KT	360° 16KT	360° 16KT	360° 16KT	360° 16KT	350° 11KT	350° 11KT	350° 11KT
GUST	G18KT	G24KT	G24KT	G24KT	G24KT	G24KT	G25KT	G25KT	G25KT	G25KT	G17KT	G17KT	G17KT
TEMPO													

### WIND COMPONENTS FOR RUNWAY 01/19

CROSS WIND	4KT	2KT	2KT	2KT	2KT	2KT	2KT	2KT	2KT	2KT	3KT	3KT	3KT
GUST	5KT	G3KT	G3KT	G3KT	G3KT	G3KT	G3KT	G3KT	G3KT	G3KT	G5KT	G5KT	G5KT
TAIL/HEAD WIND	11KT	14KT	14KT	14KT	14KT	14KT	16KT	16KT	16KT	16KT	11KT	11KT	11KT
GUST	17KT	24KT	24KT	24KT	24KT	24KT	25KT	25KT	25KT	25KT	16KT	16KT	16KT

### WIND COMPONENTS FOR RUNWAY 07/25

CROSS WIND	12KT	13KT	13KT	13KT	13KT	13KT	15KT	15KT	15KT	15KT	11KT	11KT	11KT
GUST	18KT	G23KT	G23KT	G23KT	G23KT	G23KT	G24KT	G24KT	G24KT	G24KT	G17KT	G17KT	G17KT
TAIL/HEAD WIND	2KT	4KT	4KT	4KT	4KT	4KT	5KT	5KT	5KT	5KT	2KT	2KT	2KT
GUST	3KT	7KT	7KT	7KT	7KT	7KT	8KT	8KT	8KT	8KT	2KT	2KT	2KT

### WIND COMPONENTS FOR RUNWAY 13/31

CROSS WIND	7KT	10KT	10KT	10KT	10KT	10KT	12KT	12KT	12KT	12KT	7KT	7KT	7KT
GUST	11KT	G18KT	G18KT	G18KT	G18KT	G18KT	G19KT	G19KT	G19KT	G19KT	G10KT	G10KT	G10KT
TAIL/HEAD WIND	9KT	9KT	9KT	9KT	9KT	9KT	11KT	11KT	11KT	11KT	9KT	9KT	9KT
GUST	14KT	16KT	16KT	16KT	16KT	16KT	17KT	17KT	17KT	17KT	13KT	13KT	13KT



# ADDS Highlights

- Java Tools
  - SIGMETs
  - TAFs
  - METARs
  - Flight Path Tool (now a Java APP!)

The screenshot displays the 'METARs Java Tool' interface. At the top, there are navigation tabs for 'Home', 'Turbulence', 'Icing', 'Convection', 'Winds/Temps', 'Prog Charts', and 'Java Tools'. Below these are sub-tabs for 'METARs', 'TAFs', 'PIREPs', 'AIR/SIGMETs', 'Satellite', and 'Radar'. The main area is a map of the United States with numerous METAR data points represented by colored circles and squares, each labeled with a station code and a number (e.g., 68, 69, 71, 73, 75). A status bar at the bottom of the map indicates 'METARs Loaded: 07/31/10 0448Z Latest Shown: 07/31/10 0439Z'. Below the map is a control panel with 'Map:' and 'METAR Data Options:' sections. The 'METAR Data Options' section includes checkboxes for 'Temp', 'Weather', 'Dewpoint', 'Ceiling', 'Visibility', 'Sky Cover', 'Altimeter', 'Wind', and 'Station ID'. The 'Show METARs:' section has radio buttons for 'All', 'More', 'Default', and 'Fewer'. The 'Overlays:' section includes checkboxes for 'TAFs', 'ARTCC Boundaries', 'Counties', 'Highways', and 'Rivers'. A 'Data Key...' button is also present.

This screenshot shows a menu titled 'Ceiling and Visibility'. The menu items are: 'Flight Planning»', 'Data Services', 'Text Data Server', 'Related Information', and 'Home »'. A sub-menu is open under 'Flight Planning»', listing: 'Flight Path Tool', 'AIR/SIGMETs', 'Convection', 'TAFs', 'PIREPs', and 'METARs'.

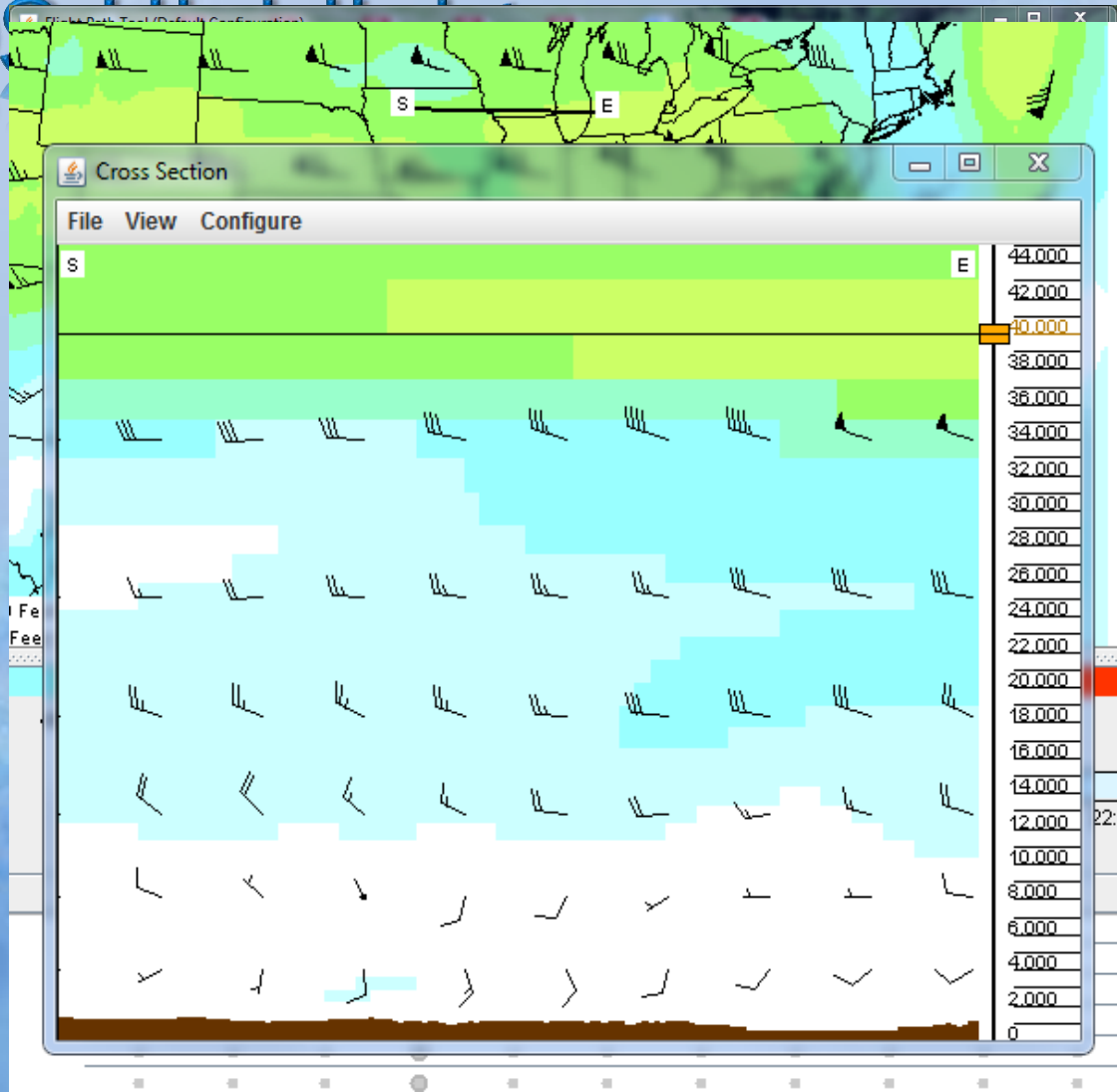


# ADD

- Java Tools

Flight Path Tool  
has many new  
features!

(now a Java APP!)



Ceiling and Visibility

Flight Planning»

Data Services

Text Data Server

Related Information

Home »

Flight Path Tool

AIR/SIGMETs

Convection

TAFs

PIREPs

METARs

# Mobile Web Services

## Weather Information







# Mobile web services

- NWS Mobile Weather Website
- CWSU Mobile Weather Website





# NWS Mobile Weather Website


 **National Weather Service**

**2 Miles SSE Greenville WI** 







**Current Conditions**


Appleton / Outagamie  
Lat: 44.26 N Lon: -88.52 W Elev: 919 ft  
Last Updated: Jul 12 2012 12:45:00


 <b>Partly Cloudy</b> 84°F	<b>Wind Speed</b> SE 7 MPH 
---	--


**Quick Forecast** 


11:15 am CDT Jul 12  
Periods 1-3 of 13

This Afternoon	Tonight	Friday
 Mostly Sunny Hi 87°F 	 Mostly Clear Lo 65°F 	 Sunny Hi 89°F 

**Full Forecast** 

**Radar** 

**Satellite** 

**Forecast Discussion** 

[mobile.weather.gov](http://mobile.weather.gov)



2 Miles SSE Greenville WI

Current Conditions

Appleton / Outagamie  
Lat: 44.26 N Lon: -88.52 W Elev: 919 ft  
Last Updated: Jul 12 2012 12:45:00



Partly Cloudy  
84°F

Wind Speed  
SE 7 MPH



Quick Forecast

11:15 am CDT Jul 12  
Periods 1-3 of 13

This Afternoon



Mostly Sunny  
Hi 87°F



Tonight



Mostly Clear  
Lo 65°F



Friday



Sunny  
Hi 89°F



Full Forecast

Radar

Satellite

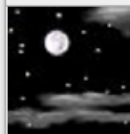
Forecast Discussion

3 Miles SE Evansville WI



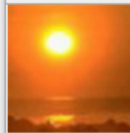
This Afternoon

Mostly sunny and hot, with a high near 91. Southeast wind 5 to 10 mph.



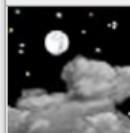
Tonight

Mostly clear, with a low around 62. Southeast wind around 5 mph.



Friday

Mostly sunny and hot, with a high near 93. Light southeast wind becoming south 5 to 10 mph in the morning.



Friday Night

Partly cloudy, with a low around 70. South wind around 5 mph.



Saturday

A 40 percent chance of showers and thunderstorms. Partly sunny and hot, with a high near 90. Southwest wind 5 to 10 mph.



Saturday Night

A 30 percent chance of showers and thunderstorms. Mostly cloudy, with a low around 70. Southwest wind around 5 mph.



Sunday

A 40 percent chance of showers and thunderstorms. Partly sunny and hot, with a high near 91. Southwest wind around 5 mph.





# CWSU Mobile Weather Website

- A plethora of aviation and weather products


 1. Aviation text

 2. HAZARDs

 3. RADAR

 3. Local RADARs

 4. SATELLITE

 5. Discussions Map *updated!*

## TAF/METAR:

Translated  Raw

Example: KSFO KORD KATL EDDR @CA (all California)

METARs  TAFs

past 6 hours ▾

Submit

## Search PIREPs:

KSFO

Distance (radius):

250 SM (402 KM) ▾

Past 4 hours ▾

Get PIREPs

***[www.wrh.noaa.gov/zoa/MOBILE/ZOA2.htm](http://www.wrh.noaa.gov/zoa/MOBILE/ZOA2.htm)***

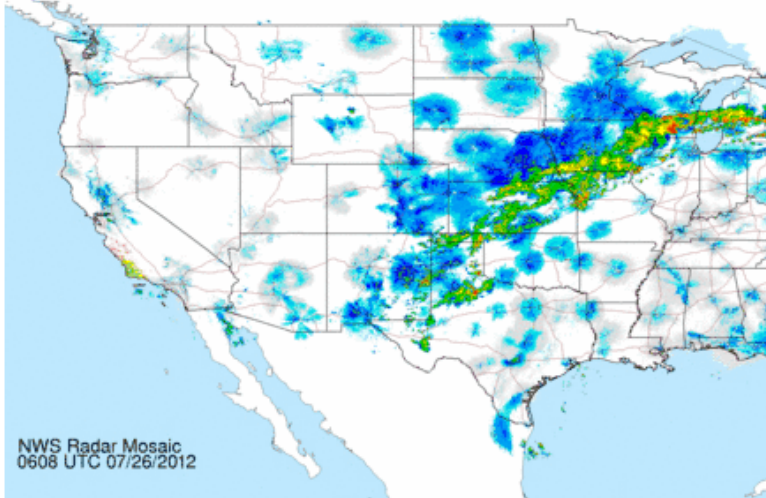


# CWSU Mobile Weather Website

<http://www.wrh.noaa.gov/zoa/MOBILE/ZOA2.htm>

**RADAR** > smartphone NWS RADARs:

Tap for YOUR Local Radar:



1. Back to top
5. RADAR main
0. CWSU Mobile Main Menu

[Feedback](#) | [Privacy Policy](#) | [Disclaimer](#)

**NOAA National Weather Service**

*htm*



**Radars**

**Local**

**Radars**

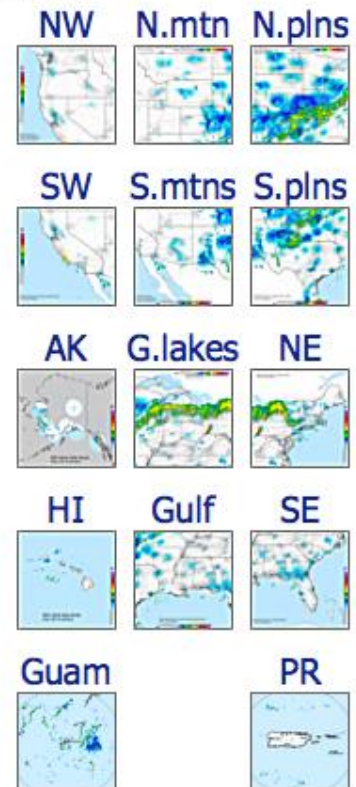


Home > Radar Page:

**CONUS Local RADARs** (for Smartphones)

**Alaska Local RADARs** (for Smartphones)

Select Location:



# CWSU Mobile Weather Website

<http://www.wrh.noaa.gov/zoa/MOBILE/ZOA2.htm>

htm




AFD

Weather

Forecast Map



 **NWS•Mobile**

**AREA FORECAST DISCUSSION...UPDATED**  
National Weather Service Twin Cities/chanhassen MN  
1218 AM CDT THU JUL 26 2012

.UPDATE...

UPDATED FOR THE 06Z AVIATION DISCUSSION BELOW.

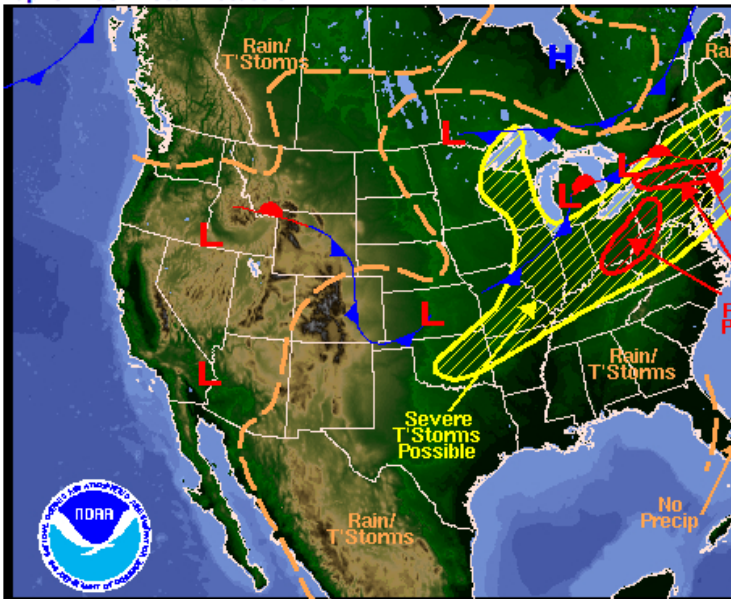
.DISCUSSION...

THE MAIN ISSUE IN THE SHORT TERM IS OBVIOUSLY THE CHANCES FOR SHRA/TSRA LATE THIS AFTERNOON INTO THIS EVENING AS THE SURFACE LOW SLIDES EAST AND THE FRONTAL BOUNDARY DROPS THROUGH THE AREA. LATEST MSAS ANALYSIS AND SURFACE OBS SHOW A WELL DEFINED WIND SHIFT CURRENTLY BISECTING THE FORECAST AREA FROM SOUTHWEST TO NORTHEAST... AND SOME CONVECTION HAS TRIED TO DEVELOP NEAR THIS OVER THE PAST SEVERAL HOURS... BUT HAS THUS FAR BEEN UNSUCCESSFUL. THE ACTUAL FRONTAL BOUNDARY IS STILL WELL TO THE WEST OVER THE DAKOTAS... WHERE THE DEWPOINT GRADIENT CAN BE FOUND. THIS WILL EVENTUALLY BE PUSHED EAST THIS EVENING AS THE MAIN UPPER SHORTWAVE CURRENTLY SEEN NEAR THE SASKATCHEWAN/MANITOBA BORDER PUSHES SOUTHEAST. AT THIS POINT... IT/S QUESTIONABLE AS TO WHETHER THE FORCING ASSOCIATED WITH THE ACTUAL UPPER WAVE AND COLD FRONTAL BOUNDARY WILL MANAGE TO GET ANY CONVECTION GOING. CONTINUED CHANCE POPS OF THE AFTERNOON OVER

<http://mobile.wrh.n...p?pil=afd&sid=arx/>

HOME > NWS Forecast Discussions/Map:

Tap for YOUR Local Discussion:



Weather Forecast for Thu, Jul 26, 2012, issued 3:19 AM EDT  
DOC/NOAA/NWS/NCEP/Hydrometeorological Prediction Center  
Prepared by McReynolds based on HPC, SPC, and NHC forecasts

1. Back to top
5. RADAR main



# Webcams

WISCONSIN DEPARTMENT OF TRANSPORTATION

## Travel Information

[Drivers & Vehicles](#) | [Safety](#) | [Travel](#) | [Plans & Projects](#) | [State Patrol](#) | [Doing Business](#) | [Programs for Local Gov't](#)

[Milwaukee-area current travel information](#)

[Travel times](#)

[Freeway camera images](#)

[Lane and ramp closures](#)

[Congestion maps](#)

[Travel](#) > [Travel by](#) > [Road](#) > [Milwaukee-area current travel info](#) >

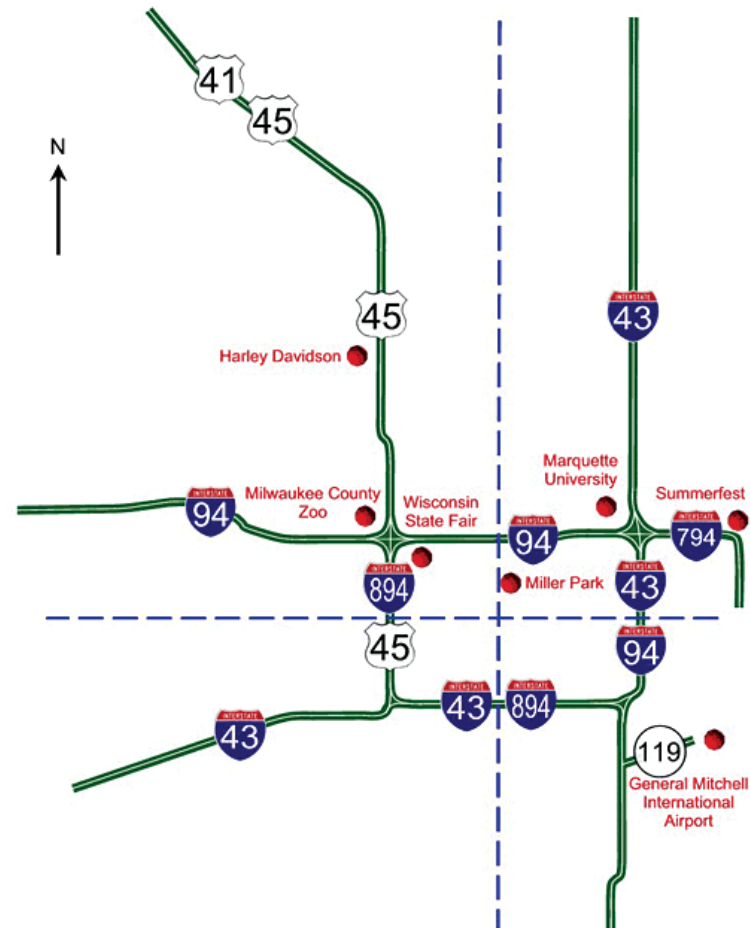
### Milwaukee-area freeway camera images

Images from the Milwaukee area cameras are available to help travelers check freeway conditions. timestamp appears at the bottom of each camera image.

Select a quadrant below to view the current conditions.

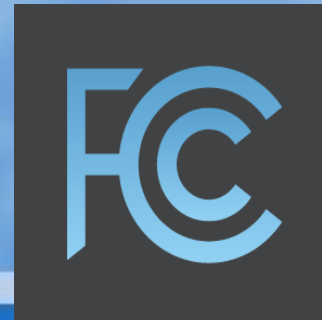


Tuesday, May 12, 2009 10:20:28 AM



# Wireless Emergency Alerts (WEAs)

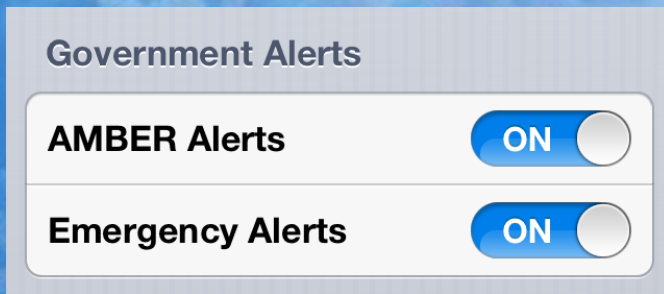
- Warnings automatically sent to your mobile device when you may be in harm's way
  - Types of alerts:
    - Extreme weather warnings
    - Local emergencies requiring immediate action
    - AMBER Alerts
    - Presidential Alerts during a national emergency
- Tornado
  - Flash Flood
  - Blizzard
  - Ice Storm
  - Hurricane
  - Dust Storm
  - Extreme Wind
  - Tsunami





# Receiving WEAs

- Sent from area cell towers
- Looks like a text message
- Special tone and vibration goes off twice
- Can opt out of AMBER and Emergency Alerts



# Any Questions?



## Remember:

- weather.gov
- mobile.weather.gov
- aviationweather.gov

National Weather Service

2 Miles SSE Greenville WI

**Current Conditions**

Appleton / Outagamie

Lat: 44.26 N Lon: -88.52 W Elev: 919 ft  
Last Updated: Jul 12 2012 12:45:00

**Partly Cloudy**  
84°F

**Wind Speed**  
SE 7 MPH

+

NATIONAL WEATHER SERVICE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PASTWEATHER WEATHER SAFETY INFORMATION CENTER NEWS SEARCH ABOUT

Location:   [Location Help](#)

**Slight Risk of Severe Thunderstorms for Northern Plains**

The NWS Storm Prediction Center is forecasting a Slight Risk of severe thunderstorms for this afternoon and evening across parts of the northern Plains, from northeastern South Dakota across eastern North Dakota and northwestern Minnesota. The primary threats are large hail and damaging winds. [Read More...](#)

ACTIVE ALERTS FORECAST MAPS RADAR SEVERE LARCS HANP-ALL AIR QUALITY SATELLITE

Customize Your Weather.gov

On: 27

Enter Your City, ST or ZIP Code

Remember Me

[Privacy Policy](#)

Created: 07/12/12 at 14:03 UTC

Click on the map above for detailed alerts. Warnings By State  [Sign Up Alerts in XML/ICAP v1.1 and ATOM Formats](#)

