

NATIONAL WEATHER SERVICE PHOENIX

Volunteer Spotter Program

Southeast California, Southwest Arizona, South-Central Arizona



Working Together to Protect Lives and Property

What you'll learn from this training

*NWS Services
&
Information Sources*

*How to Recognize
Hazardous
Weather in Your
Community*

*How to Report
These Conditions*

Working Together to Protect Lives and Property

Who is the National Weather Service?



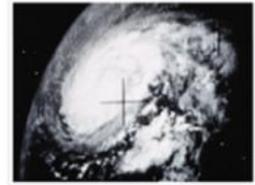
Our Mission

Provide weather, water, and climate data, forecasts and warnings for the **protection of life and property** and enhancement of the national economy.

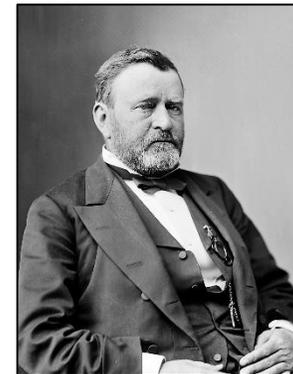
Our Vision

A Weather-Ready Nation

Protecting Life and Property for 150 Years.....



*Established on
February 9, 1870
as the Weather Bureau by
Ulysses S. Grant*



NWS Weather Forecast Offices

National Coverage 24/7 365



NWS Services



All Hazards
NOAA
Weather Radio
NOAA's National Weather Service



AT&T LTE 5:59 PM 32%

Today Notifications

Emergency Alerts

Emergency Alert 1m ago
Dust Storm Warning in this area til 8:00 PM PDT. Avoid travel. Check local media. -NWS

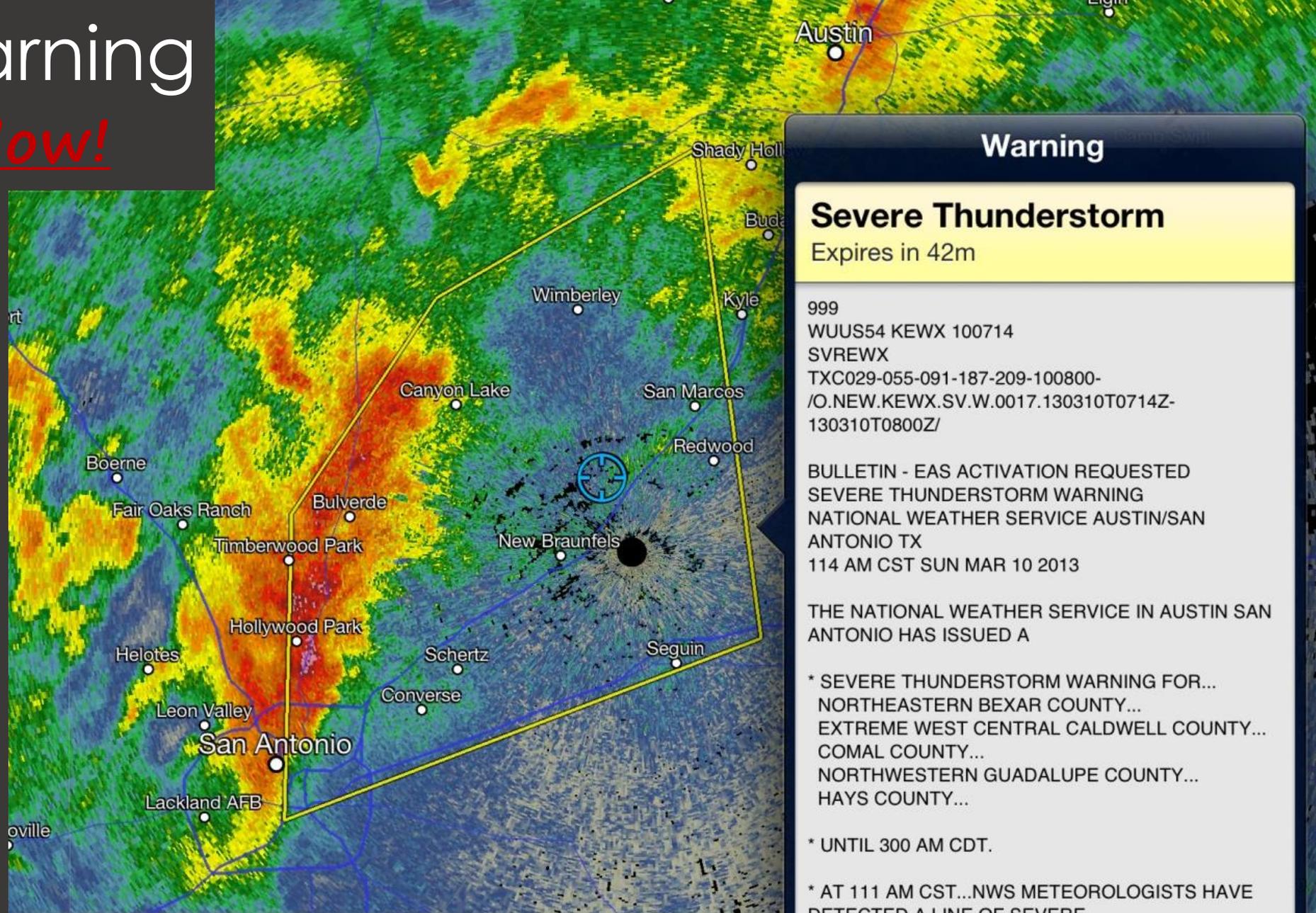
Extended Forecast for Phoenix AZ

Tonight	Saturday	Saturday Night	Sunday	Sunday Night	Monday	Monday Night	Tuesday	Tuesday Night
Mostly Clear and Breezy then Mostly Clear	Sunny	Clear	Sunny	Partly Cloudy	Mostly Sunny	Partly Cloudy	Sunny	Clear
Low: 57 °F	High: 79 °F	Low: 58 °F	High: 85 °F	Low: 61 °F	High: 88 °F	Low: 61 °F	High: 86 °F	Low: 62 °F



Weather Warning

Seek Shelter Now!



Warning

Severe Thunderstorm

Expires in 42m

999

WUUS54 KEWX 100714

SVREWX

TXC029-055-091-187-209-100800-

/O.NEW.KEWX.SV.W.0017.130310T0714Z-

130310T0800Z/

BULLETIN - EAS ACTIVATION REQUESTED
SEVERE THUNDERSTORM WARNING
NATIONAL WEATHER SERVICE AUSTIN/SAN
ANTONIO TX

114 AM CST SUN MAR 10 2013

THE NATIONAL WEATHER SERVICE IN AUSTIN SAN
ANTONIO HAS ISSUED A

* SEVERE THUNDERSTORM WARNING FOR...
NORTHEASTERN BEXAR COUNTY...
EXTREME WEST CENTRAL CALDWELL COUNTY...
COMAL COUNTY...
NORTHWESTERN GUADALUPE COUNTY...
HAYS COUNTY...

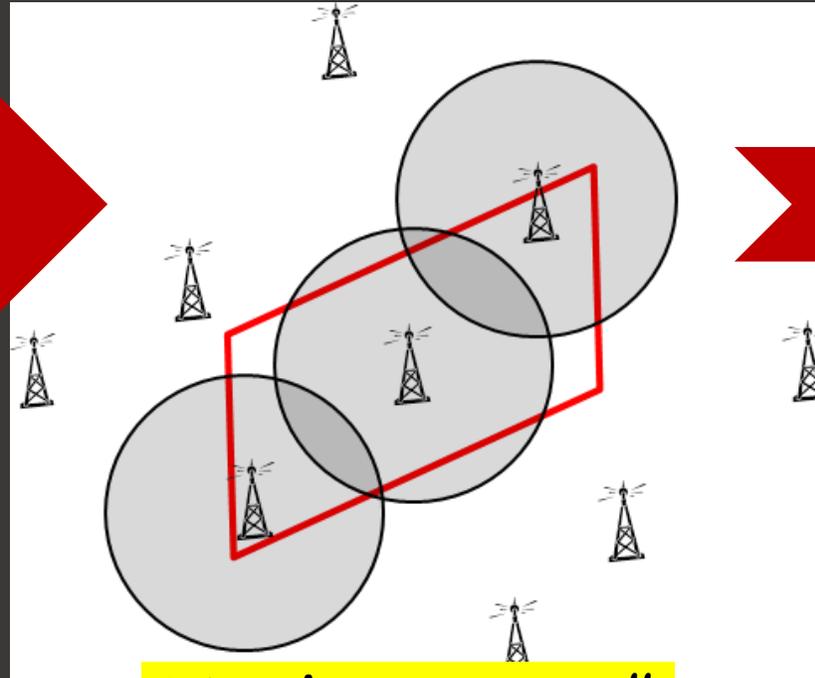
* UNTIL 300 AM CDT.

* AT 111 AM CST...NWS METEOROLOGISTS HAVE
DETECTED A LINE OF SEVERE

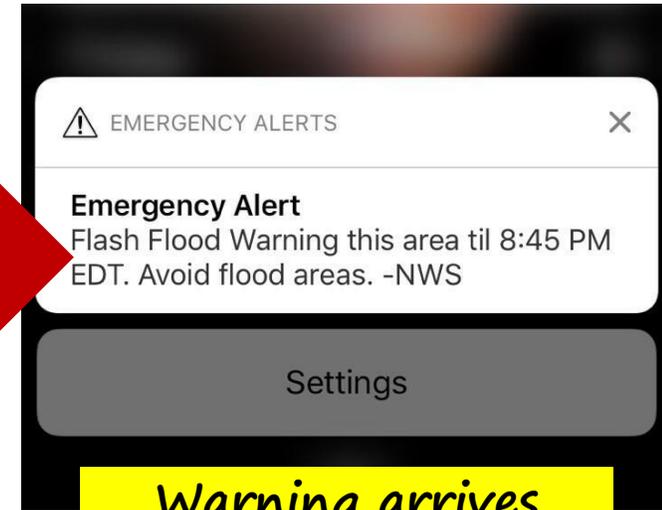
Wireless Emergency Alerts (WEA)



Warning issued by
NWS Forecaster



Warning sent to cell
phone towers



Warning arrives
within seconds

What is a SKYWARN Storm Spotter?

Working Together to Protect Lives and Property

SKYWARN Storm Spotter

A storm spotter's primary purpose is to observe and report severe weather within a local area.



Do: Report weather from your home or location

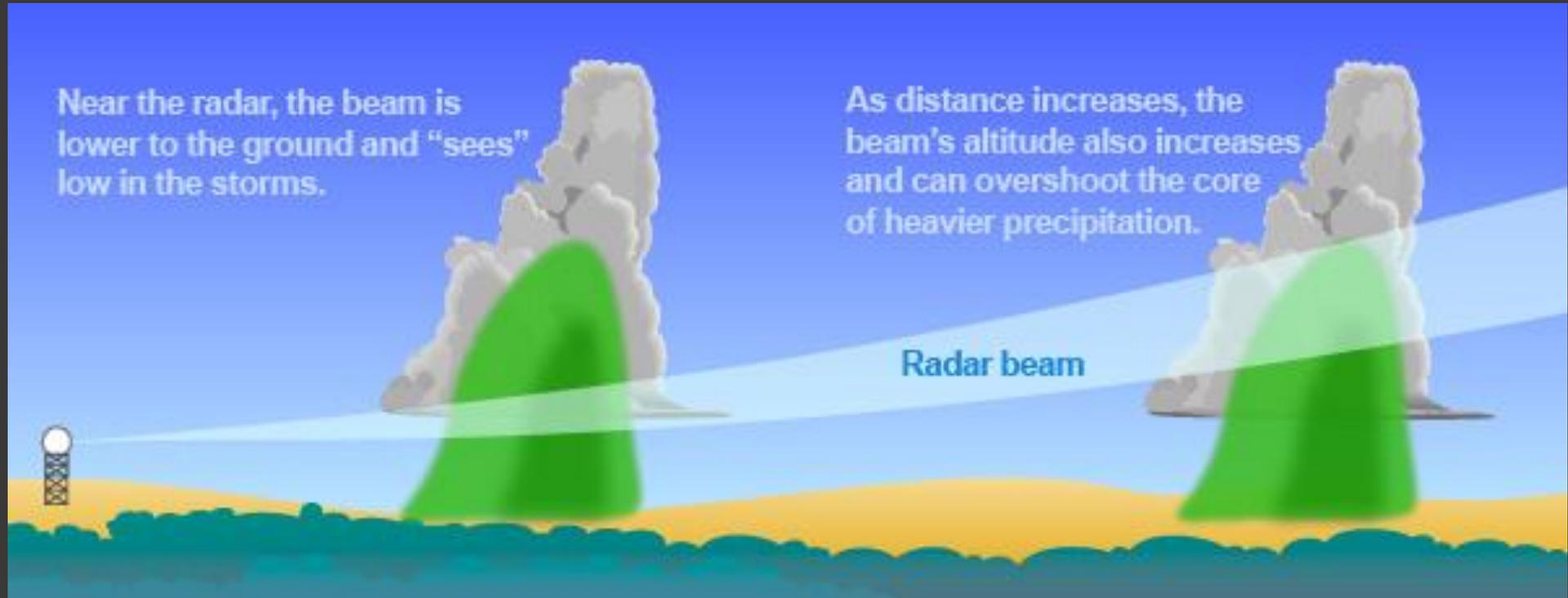


Don't: Storm Chase

Why are Spotters Important?

Working Together to Protect Lives and Property

Radar Can Only Tell Us So Much



Working Together to Protect Lives and Property

How Do Spotters Help?

Ground-truth information
of hazardous weather!

← Radar Beam is up here...



How strong
are the winds
down here?

How Does NWS Use These Reports?

Warning Decision Process

- Confirm or revise existing NWS forecasts
- Prompt the issuance of new warnings and advisories
- Alerting the general public of weather hazards

Passed along in timely statements to Emergency Management and Media

Becomes part of US Climate database

Working Together to Protect Lives and Property

Spotter Reports Add Credibility!

AZC005-025-092300-
/O.CON.KFGZ.SV.W.0079.000000T0000Z-180809T2300Z/
Yavapai-Coconino-
312 PM MST THU AUG 9 2018

...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 400 PM MST FOR YAVAPAI AND COCONINO COUNTIES...

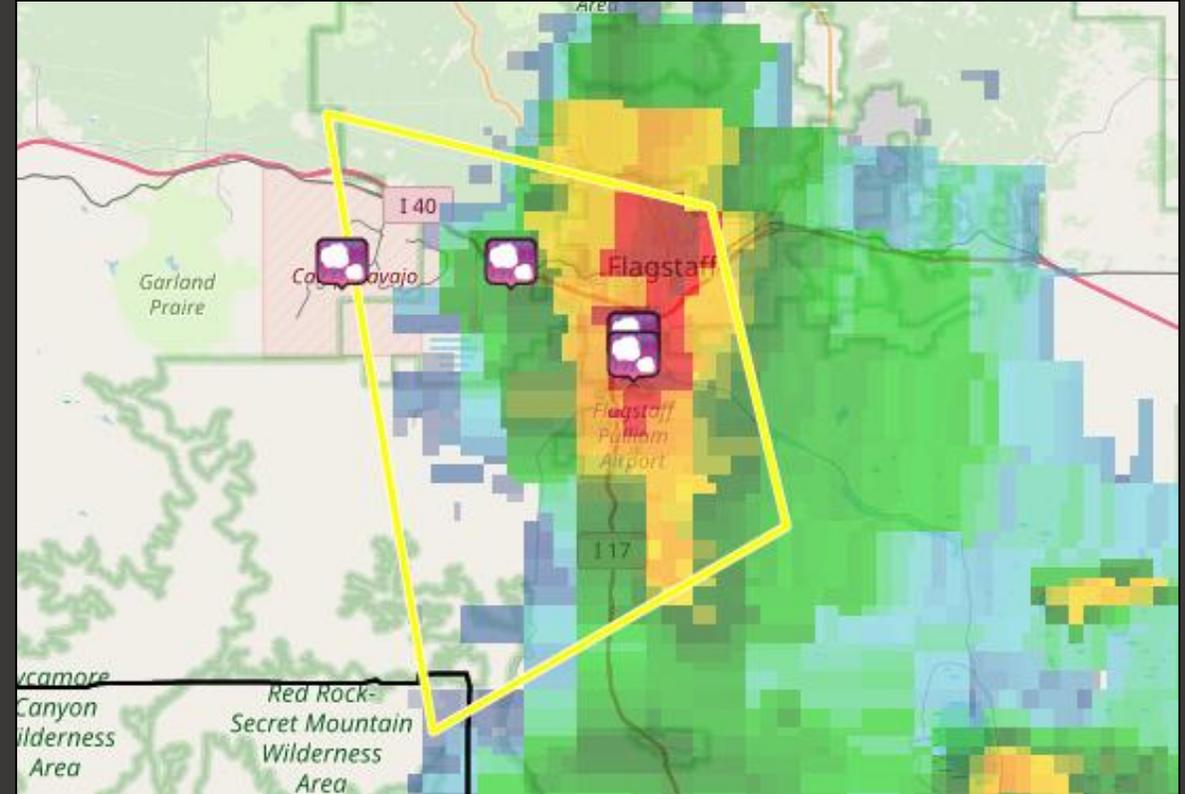
At 311 PM MST, a severe thunderstorm was located near Kachina Village, or near Flagstaff, moving west at 10 mph.

HAZARD...60 mph wind gusts and half dollar size hail.

SOURCE...Trained weather spotters.

IMPACT...Hail damage to vehicles is expected. Expect wind damage to roofs, siding, and trees.

Locations impacted include...
Flagstaff, Bellemont, Mountainaire, Downtown Flagstaff, Kachina Village, Cave Springs Campground, Pine Flat Campground, Sterling Fish Hatchery, West Fork Of Oak Creek and Canyon Vista Campground.



Working Together to Protect Lives and Property

Severe Weather: *Definitions*



Working Together to Protect Lives and Property

Severe Thunderstorm

Hail



1 Inch in Diameter or Greater

Damaging Winds



58 mph or Greater

Tornado



In Contact With Ground

Lightning is NOT included in this definition.

Flash Flood



An inundation of a normally dry area or rapid rise in a waterway that causes a direct threat to life or property.

Usually within 6 hours of the causative event.

Severe Weather: *The Monsoon*



Credit: Ryan K

Working Together to Protect Lives and Property

Monsoon

Definition:

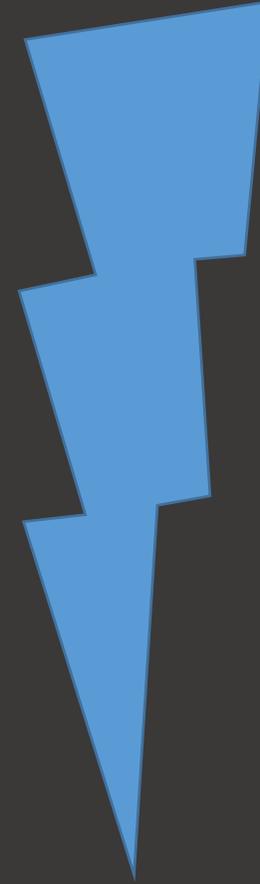
A seasonal reversal in the prevailing wind flow patterns.



Tends to occur:

June 15th -
September 30th

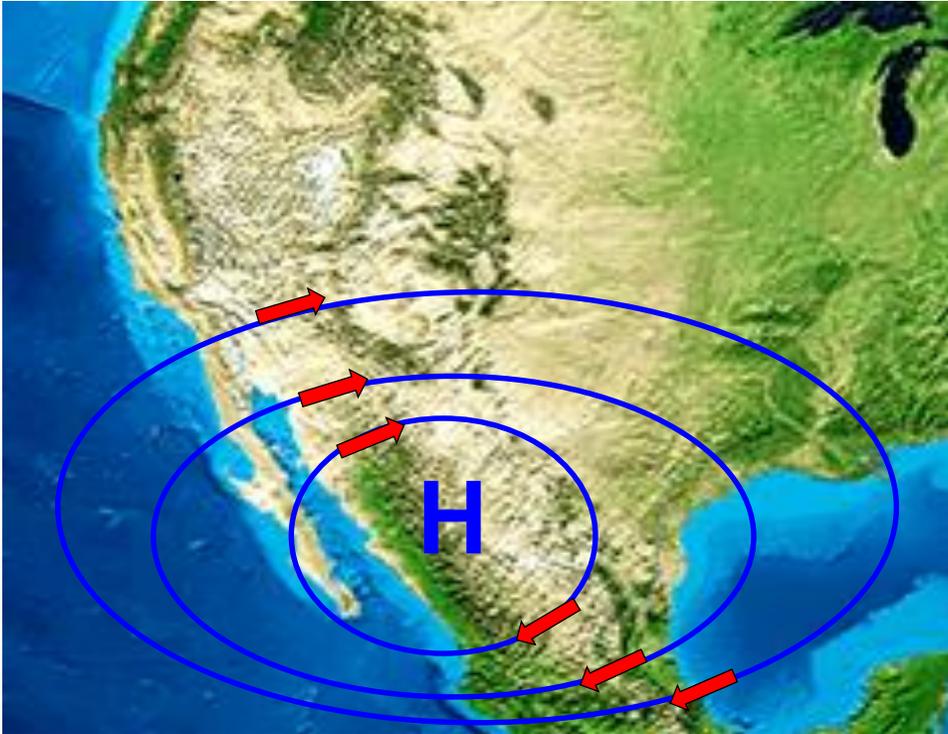
calendar based definition



The Arizona Monsoon is part of the North American Monsoon.

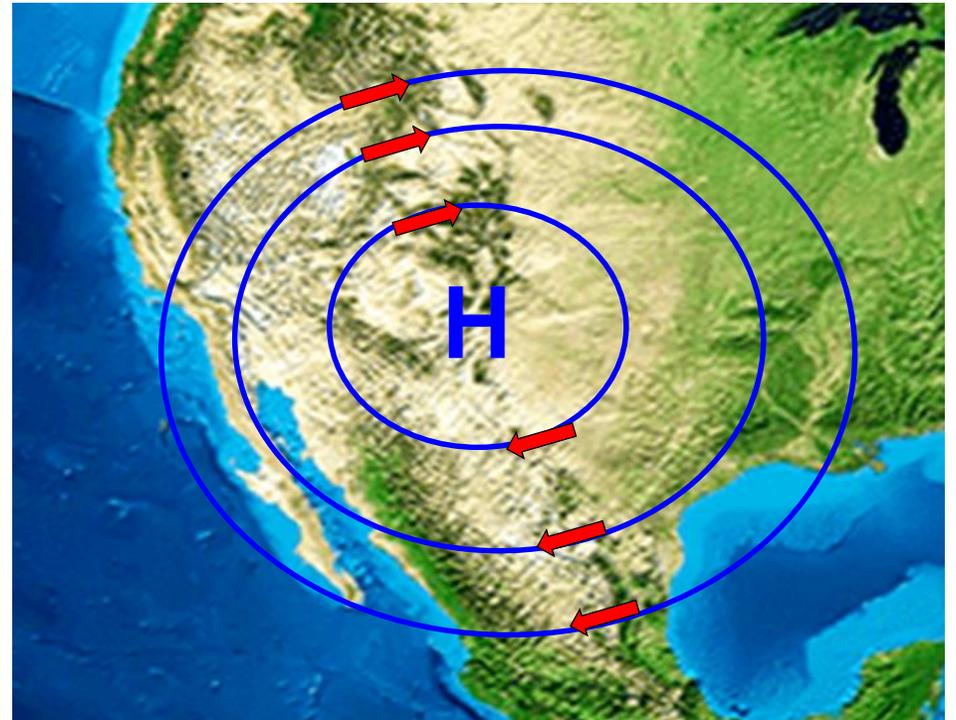
Monsoon – Wind Pattern Change

June avg. flow pattern (18,000 feet ASL)



Southwesterly Flow - Dry

July avg. flow pattern (18,000 feet ASL)



- *Easterly flow over Mexico*
- *South-southeasterly flow over Arizona*
- *Winds bring moisture → thunderstorms*

Monsoon – Lower Levels

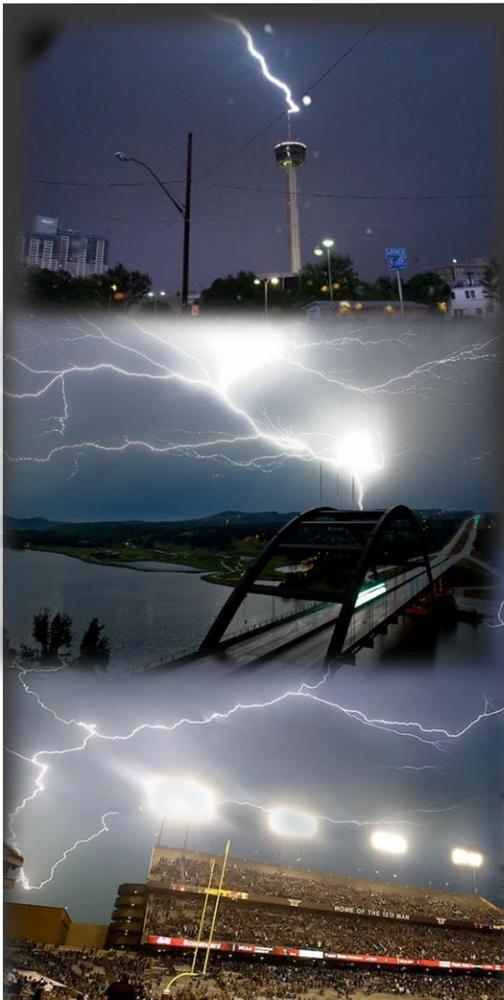


*Factors influencing
day-to-day
storm activity*

- Heating
- Rugged Terrain
- Complex Moisture Fluxes

Thunderstorm Hazards

Lightning



Thunderstorm Winds



Hail



Tornadoes



Flash Flooding



Thunderstorms: *The Basic Ingredients*



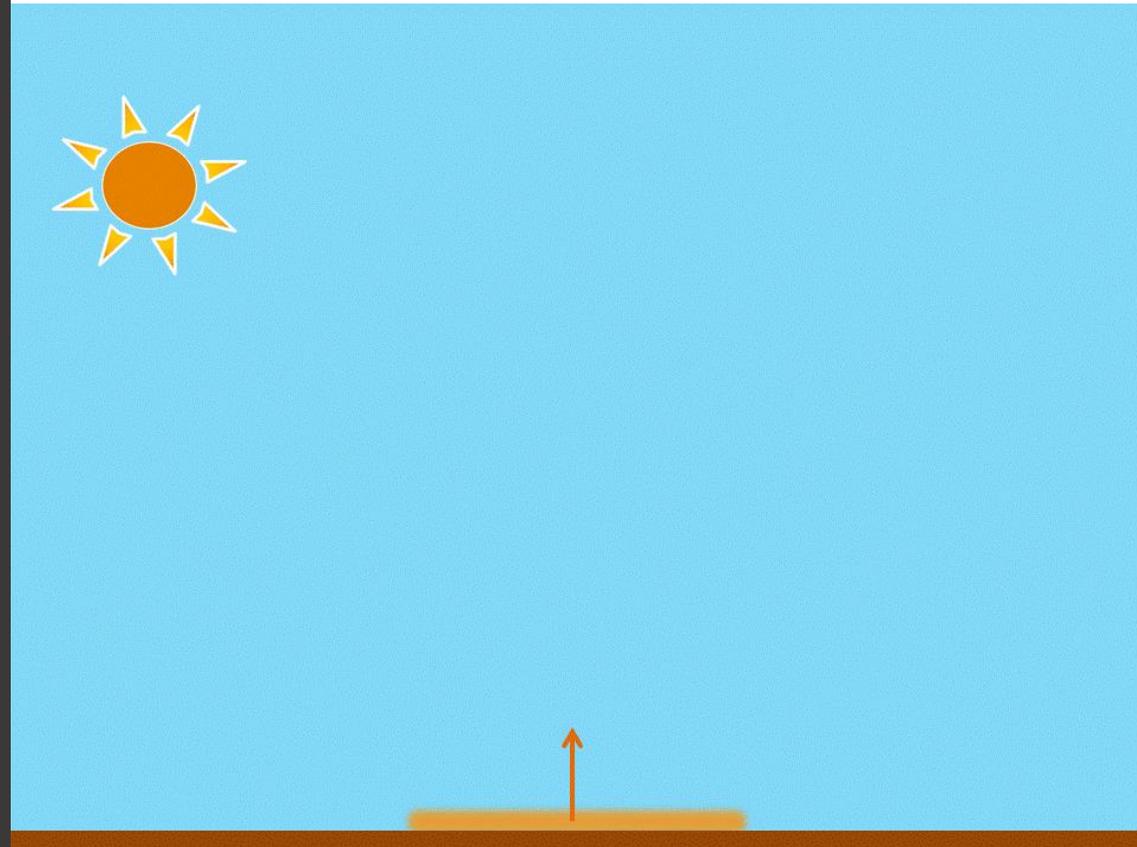
Working Together to Protect Lives and Property

Moisture



Instability

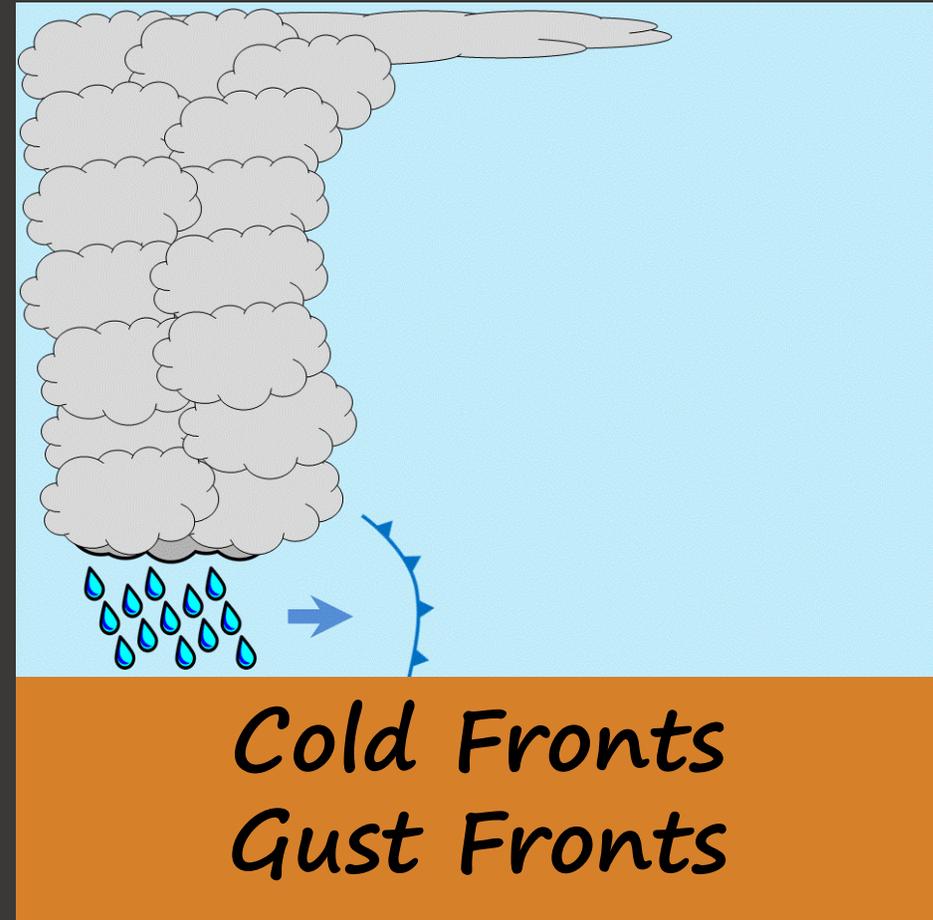
Buoyant air rises



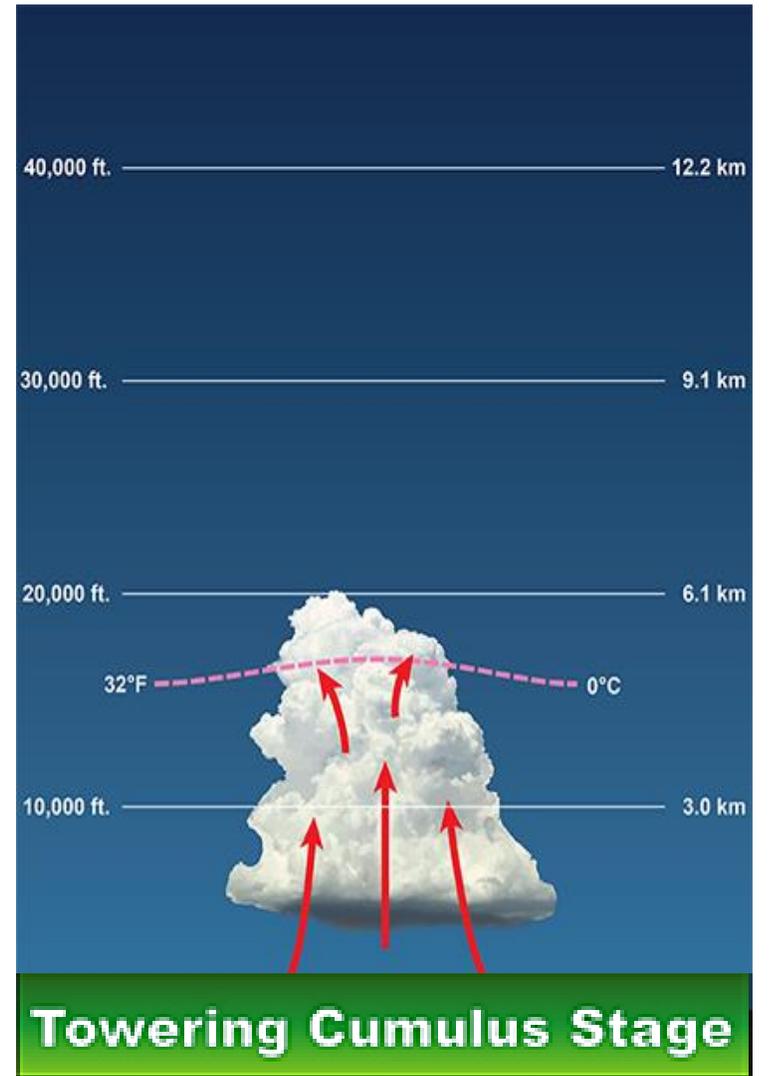
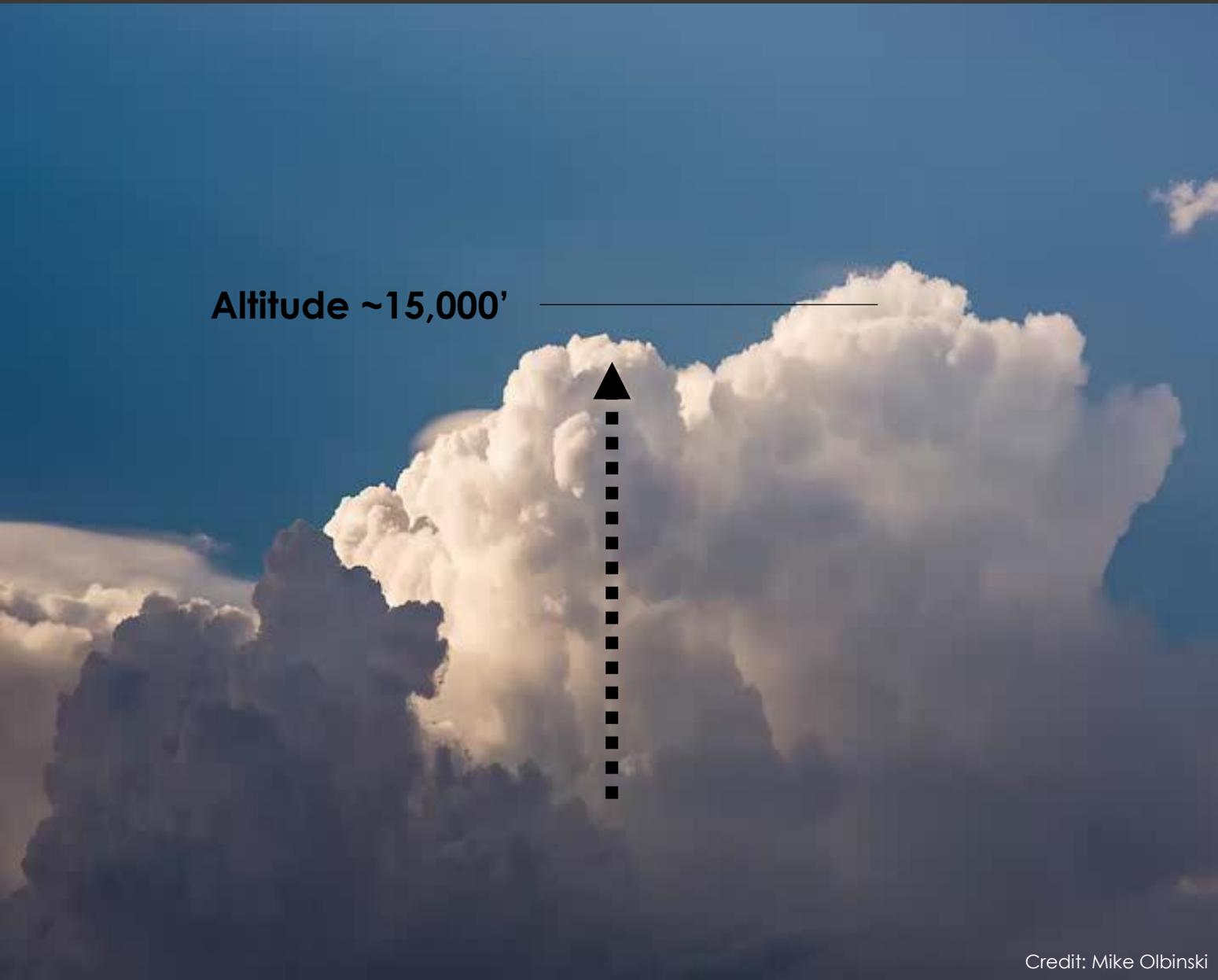
Similar to boiling water



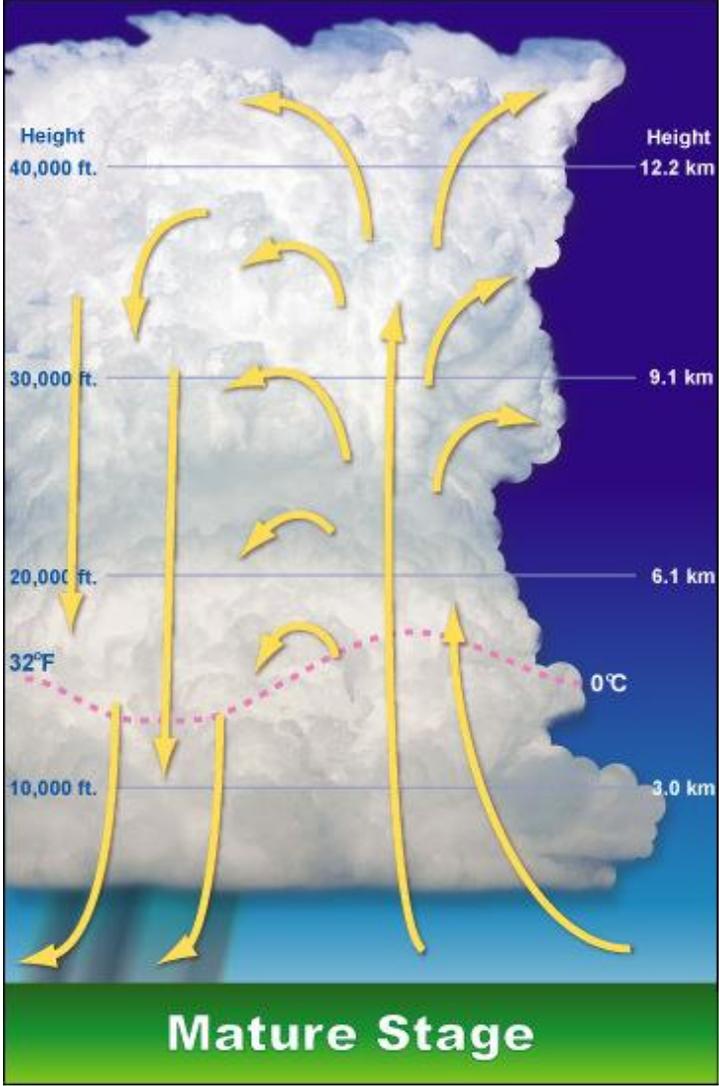
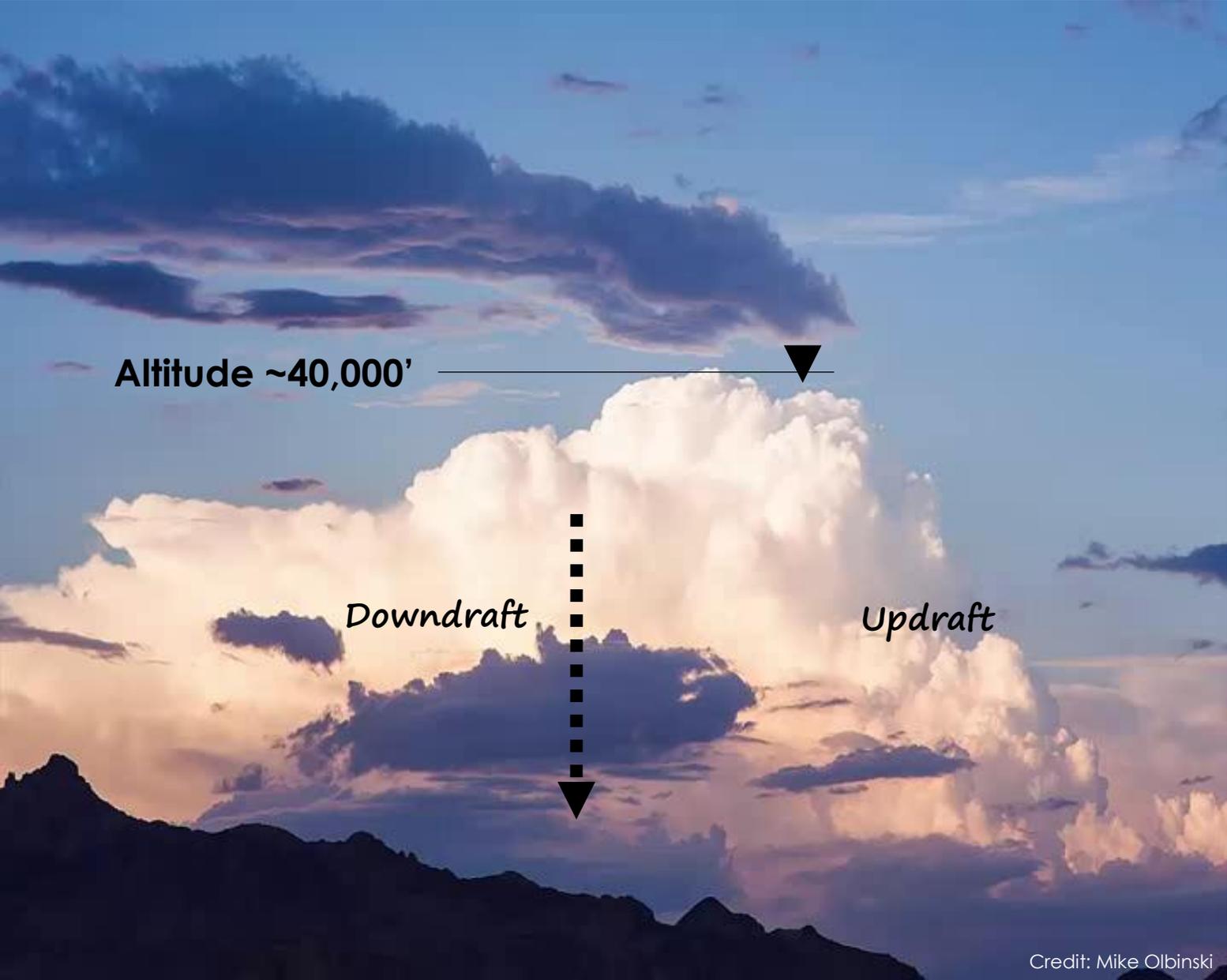
A Lifting Mechanism



Towering Cumulus Phase

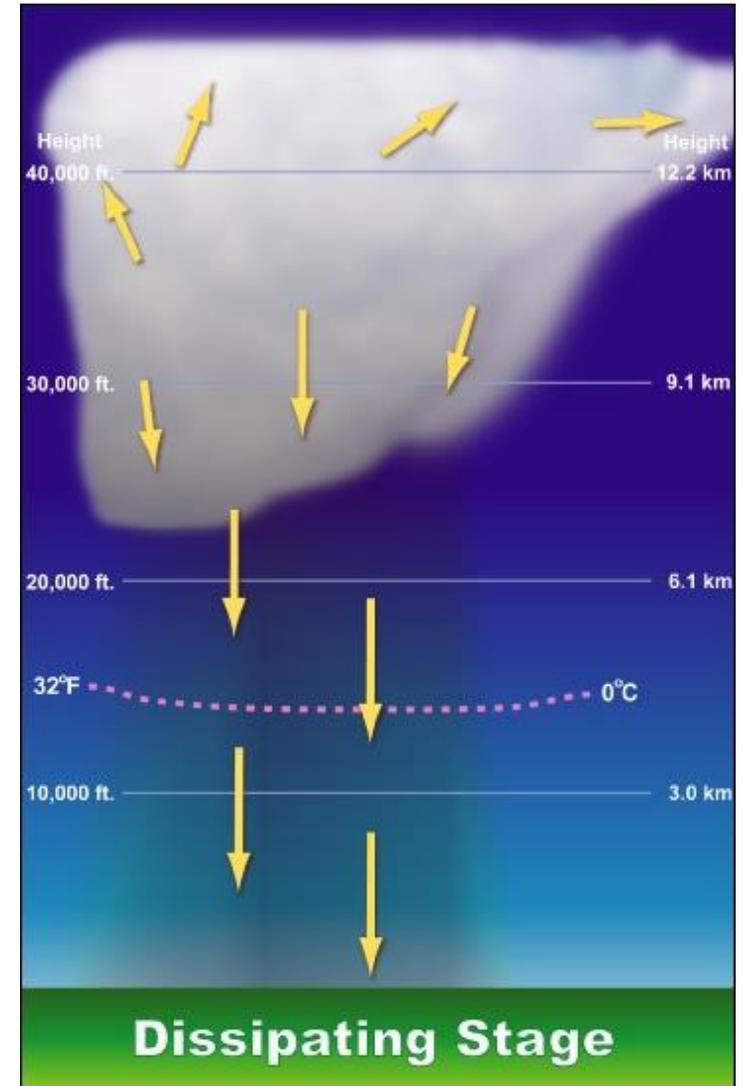


Mature Phase

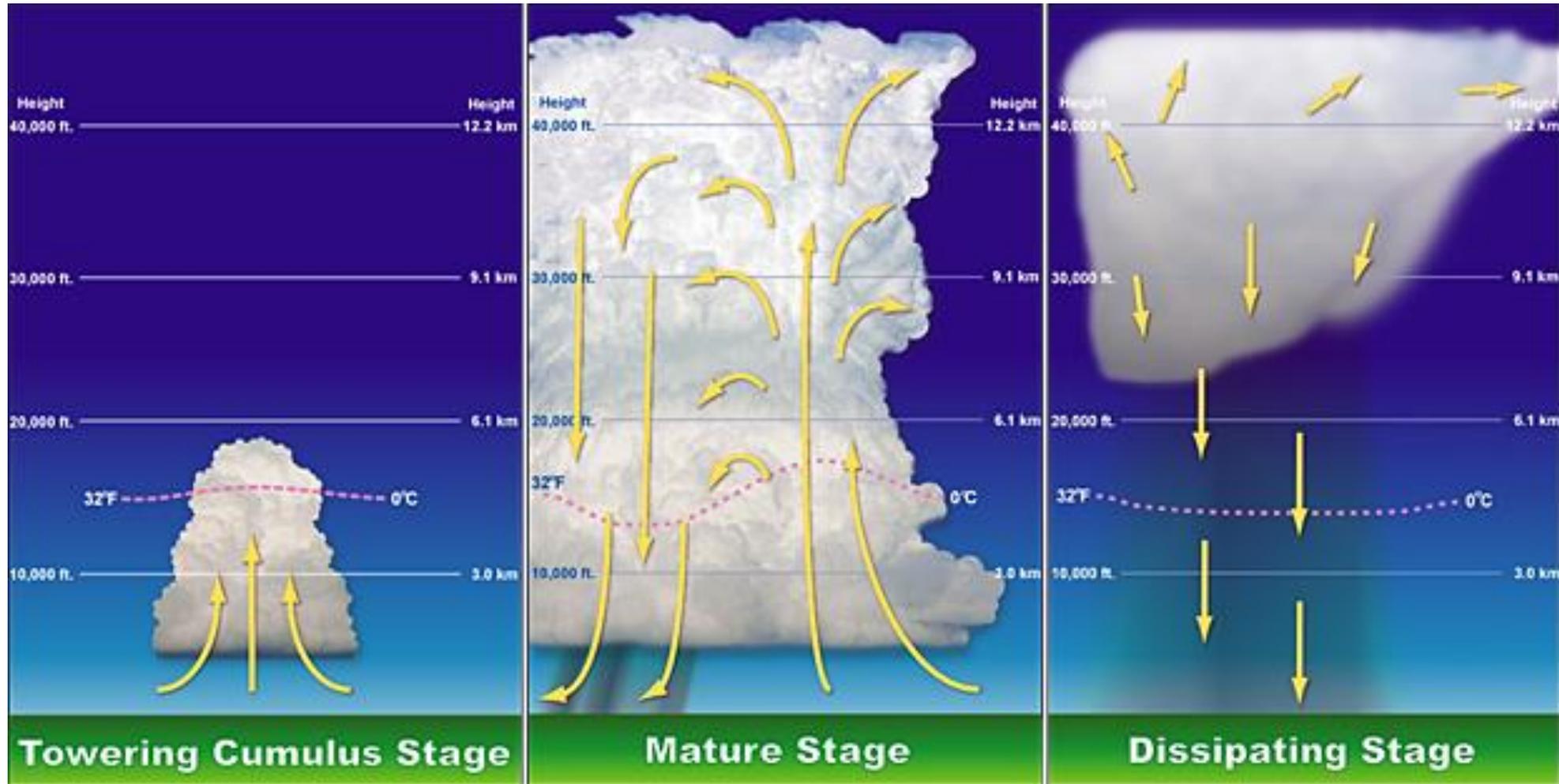


Credit: Mike Olbinski

Dissipating Phase



Thunderstorm Lifecycle - Review



Visual Characteristics

Strong Thunderstorms, Downbursts, and Tornadoes



Strong Updraft Visual Clues



Billowy

Cauliflower Look

Crisp, Distinct Edge

Thick, sharp-edged anvil

Strong Updraft Visual Clues



Strong Updraft Visual Clues



Flat/smooth cloud base

Little visible precipitation

May see updraft tower above

Strong Updraft Visual Clues



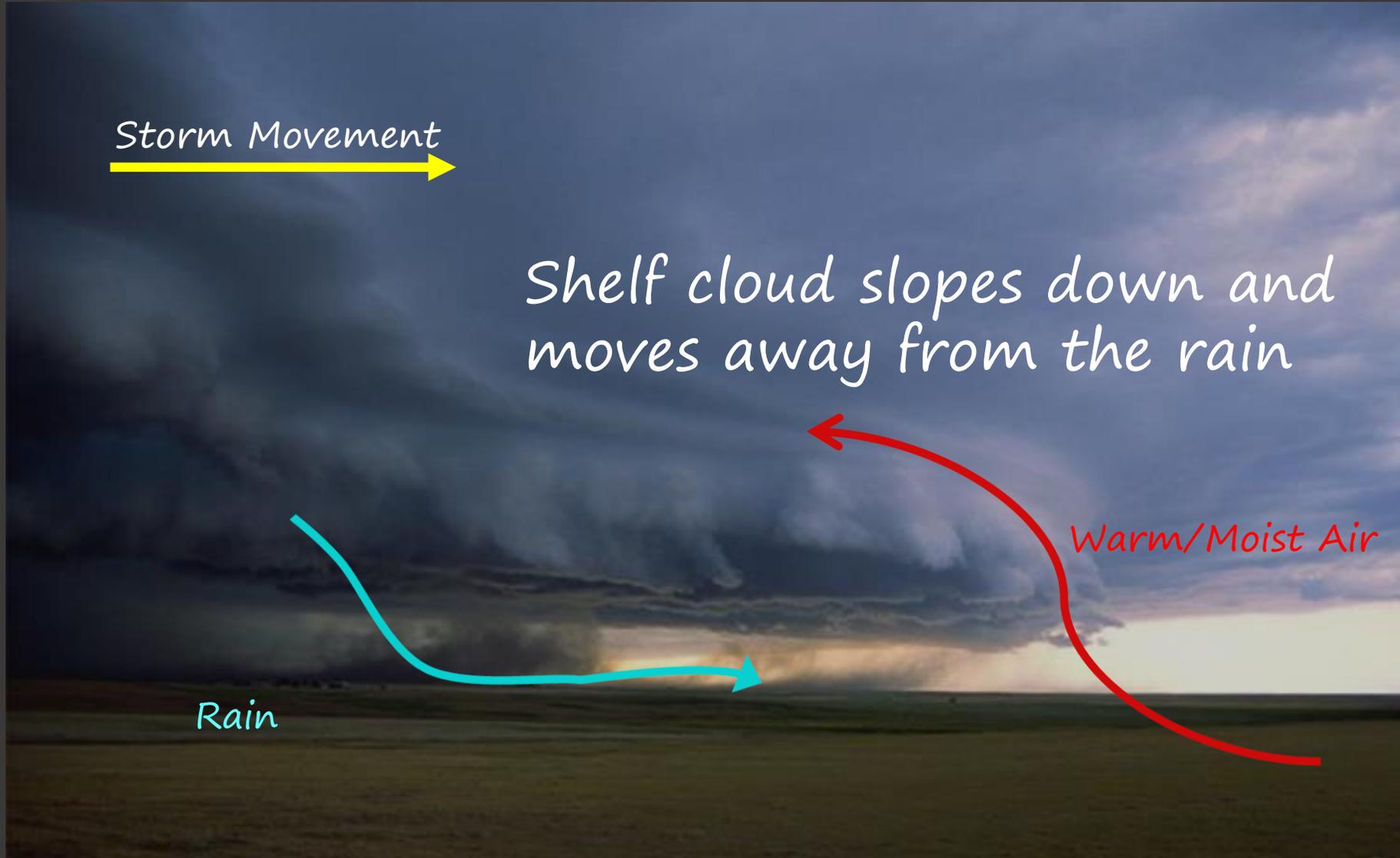
Wall Cloud

Sean Benedict



- *Enhanced lowering within rain free base*
- *Slow rotation may be present*
- *Persistent feature*

Strong Downdraft Visual Clues



Shelf cloud more likely with faster moving storms

Shelf Cloud



Shelf Cloud

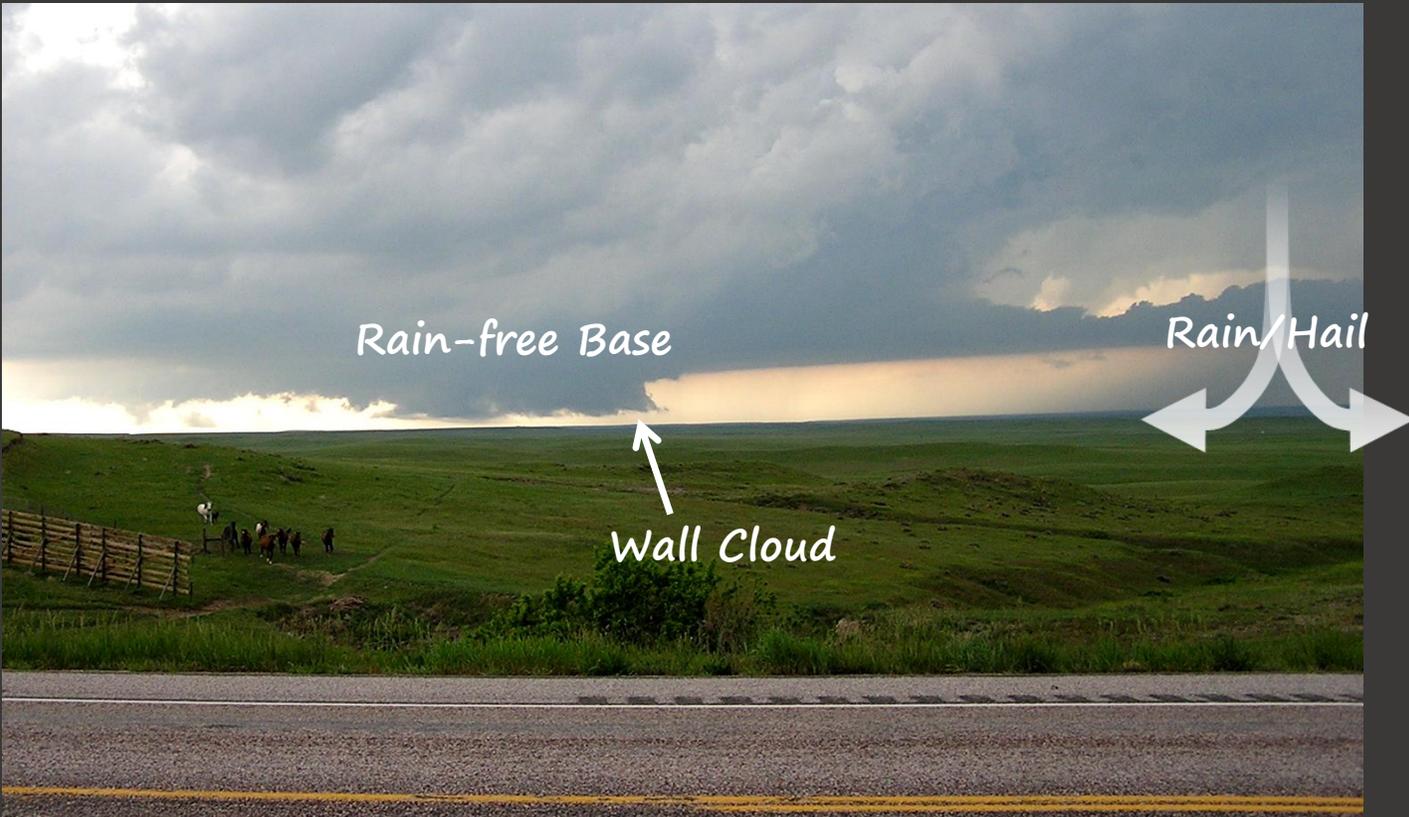


Shelf Cloud



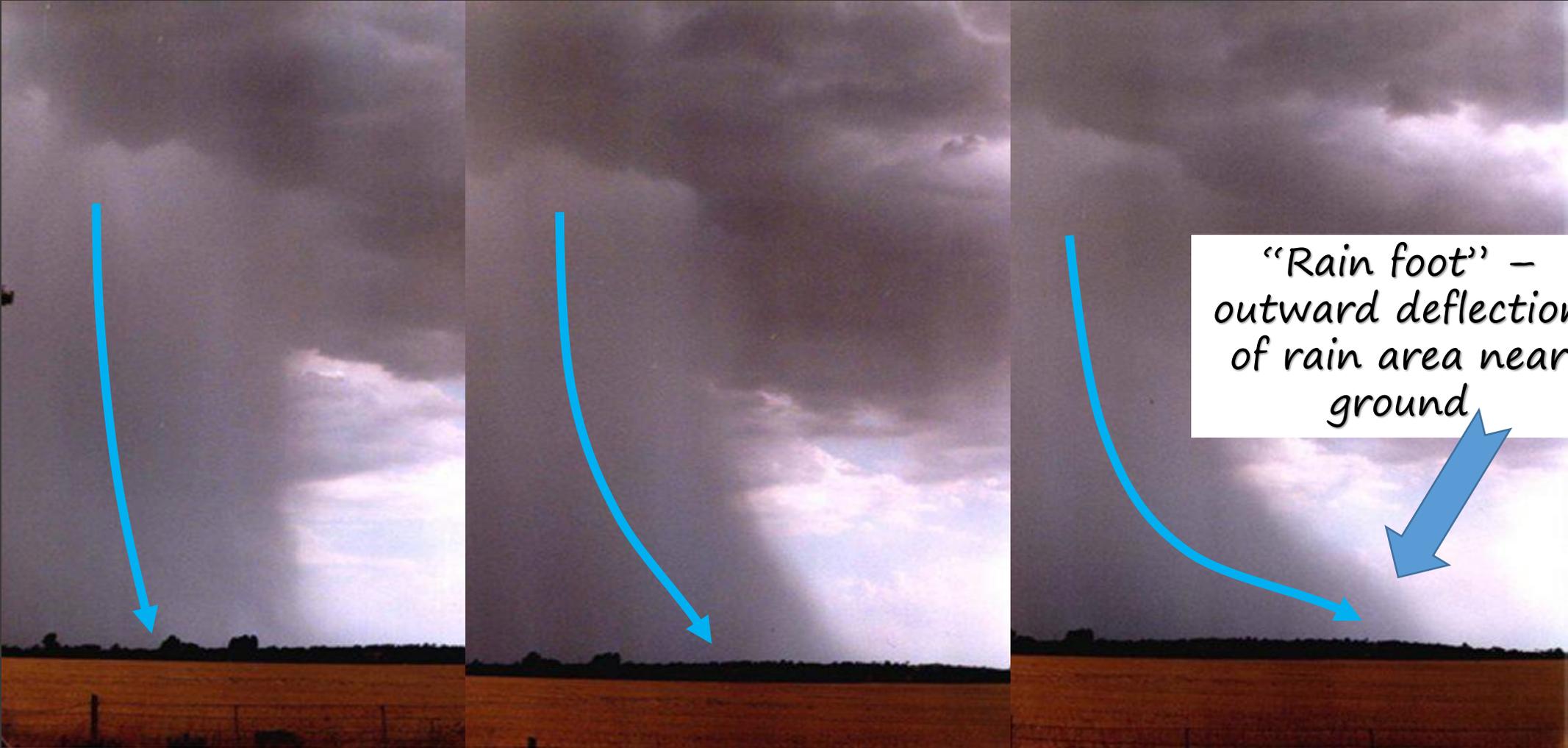
© Christian Cleary
www.azchasers.com
www.monsoonmadness.net

Wall Cloud or Shelf Cloud



- Shelf Clouds Point Away from Rain: **Downdraft & Straight-Line Winds**
- Wall Clouds can Point Towards Rain: **Updraft & Tornado Region**

Strong Downdraft Visual Clues



Beginning

1 Minutes Later

2 Minutes Later

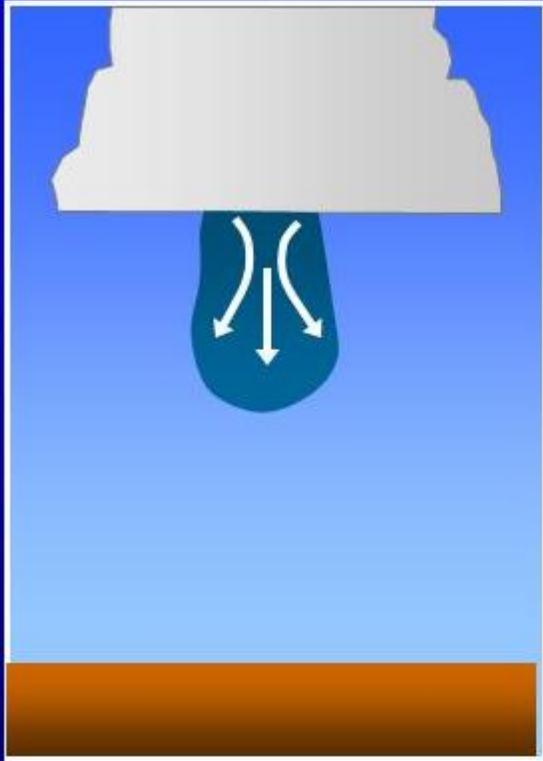
Downbursts



A concentrated severe downdraft that induces an outward burst of damaging winds at the surface

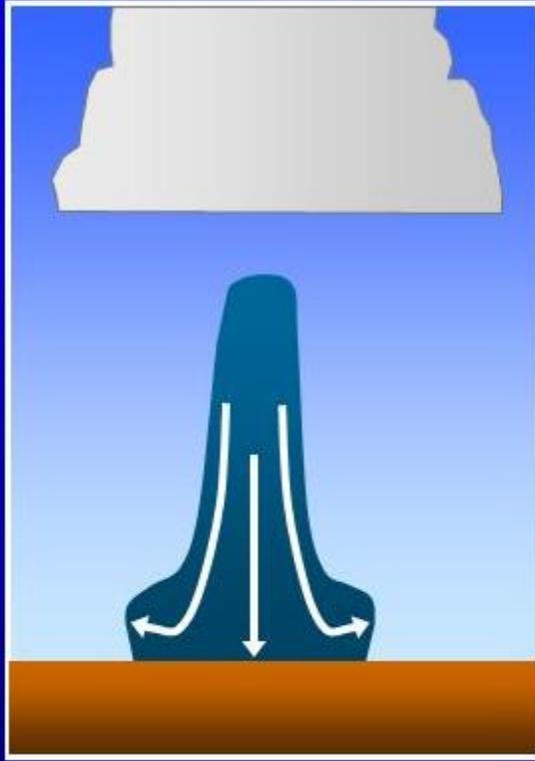
A microburst is a downburst over a very concentrated area (2.5 mi diameter).

Downburst Lifecycle



FORMATION

Evaporation and precipitation drag forms downdraft



IMPACT

Downdraft quickly accelerates and strikes the ground



DISSIPATION

Downdraft moves away from point of impact

Dry Microburst



Occurs when most or all of the rain evaporates from the downdraft

Can cause damaging wind without any rain falling

Strong Storm Components - Review

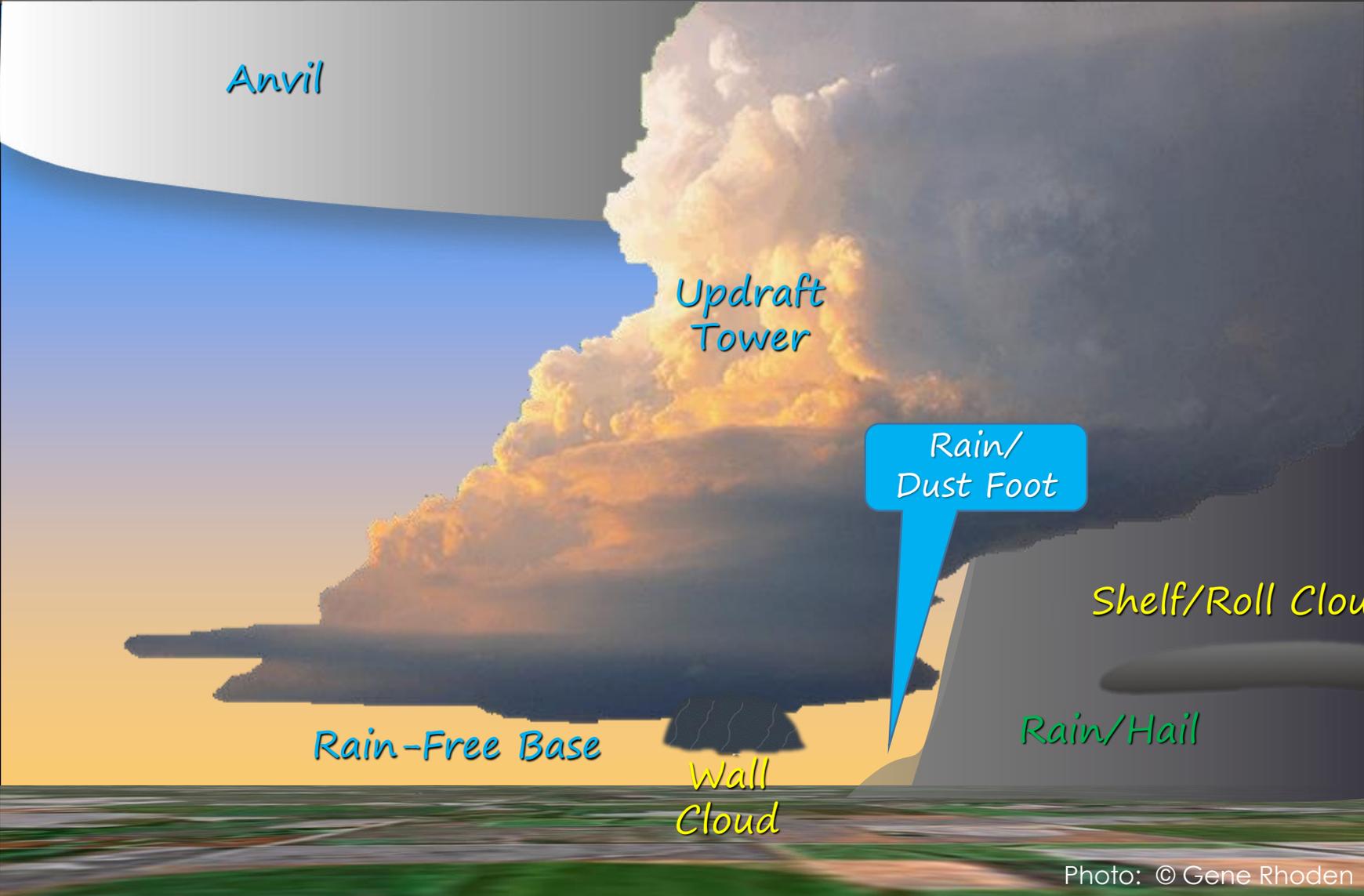


Photo: © Gene Rhoden

Tornadoes



- Violently rotating column of air in contact with the ground
- Winds from 65 mph to greater than 200 mph!

Funnel Clouds



- Funnel shaped cloud extending from the base of a thunderstorm cloud
- Rotation
- Circulation **NOT** on the ground
- More typical in winter and spring months across the deserts.

Tornado or Funnel Cloud?



If condensation (cloud material) does not extend all the way to the ground, look for dust/debris near the ground

Funnel Cloud or Tornado?



What would you report?

Tornado or Funnel Cloud?

Neither!

No Rotation

Tornado & Funnel Cloud “Imposters”



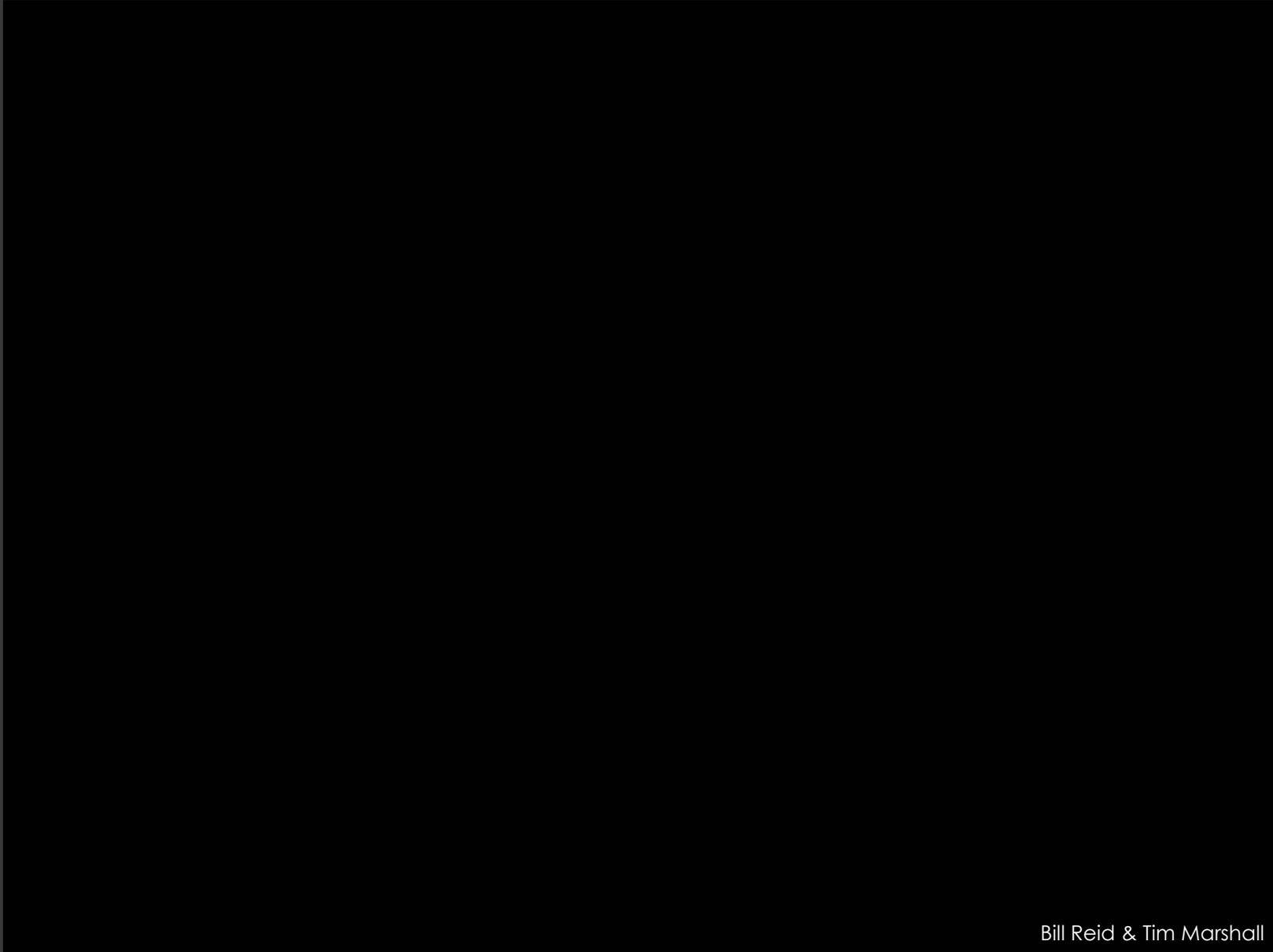
- Scud Clouds
 - Ragged Low-Level Clouds
- Rain Shafts, Virga
- Steam Plumes
- Smoke Columns
- Gustnadoes

- Look For Rotation
 - no rotation: imposter
- Watch for Persistence of the feature
 - what initially looks like a funnel, may turn out to be scud

Tornado & Funnel Cloud “Imposters”



“Gustnadoes”

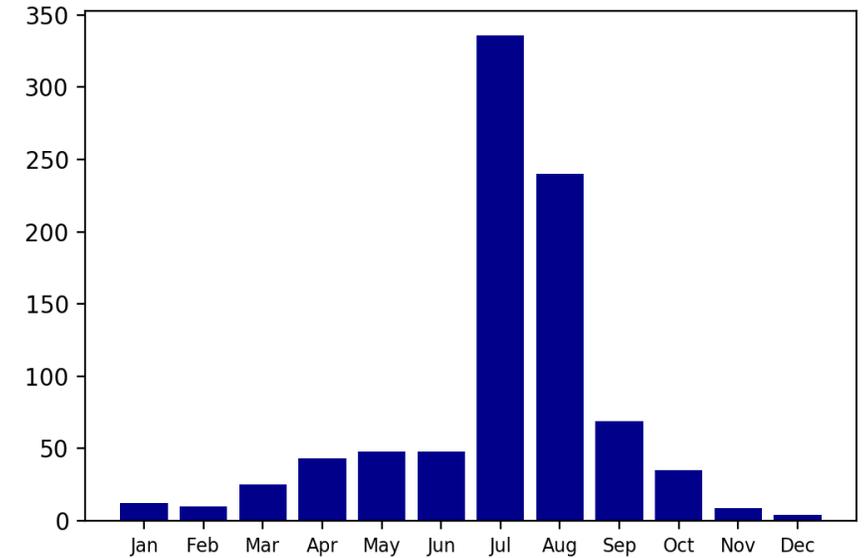


Dust Storms



Mike Olbinski

Dust Storm LSRs Per Month - Arizona



- Dust storms peak in July and August across Arizona
- Typically travel at 15-30 mph.
- **Dust Storm Warning** – $\frac{1}{4}$ of a mile or less visibility
- If you encounter one on the road – Pull Aside and Stay Alive!

Weather Hazards to Report

Tornadoes & Funnel Clouds

- *must have rotation!*
- *persistence*
- *beware of imposters!*



Weather Hazards To Report

Flooding



NOAA News



Liz Skeens



Mike Dinder

- *Running washes*
- *Impeded traffic flow*
- *Water up to the sidewalk*















Weather Hazards To Report

Low Visibility



Kelly Presnell – AZ Daily Star



Dann Niegocki

Dust Storms

- Report when visibility below 1 mile

Weather Hazards to Report



A.D.E.Q.

02/1/2015 11:50 AM

Becky Huppert

Fog

- Report when visibility is below 1 mile

Weather Hazards To Report



Wind Damage

- From any natural cause – thunderstorms, cold fronts, etc.
- Examples: tree limbs snapped, whole trees down, roof materials damaged, patio furniture blown from yard.
- *Always report wind related damage!*



Weather Hazards to Report



Report any sized hail

- *Biggest stone?*
- *Piling up? How deep?*



10/5/2010

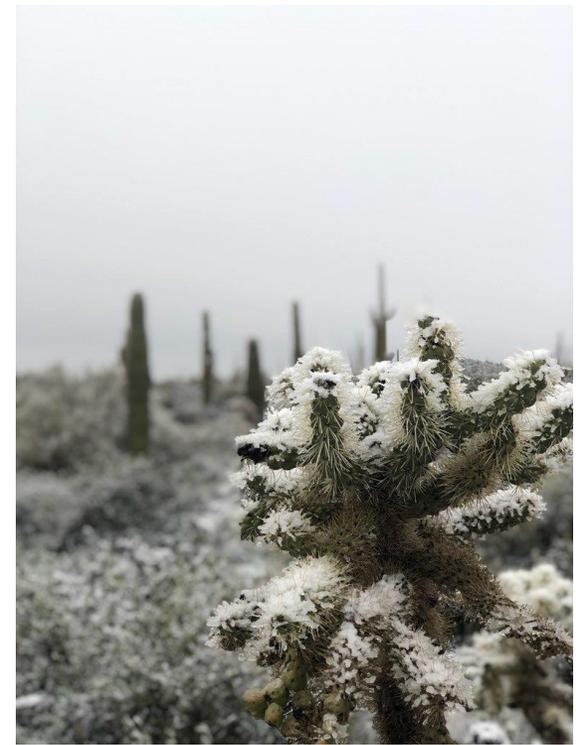
Tom Hormann



10/5/2010

Tracy Randall

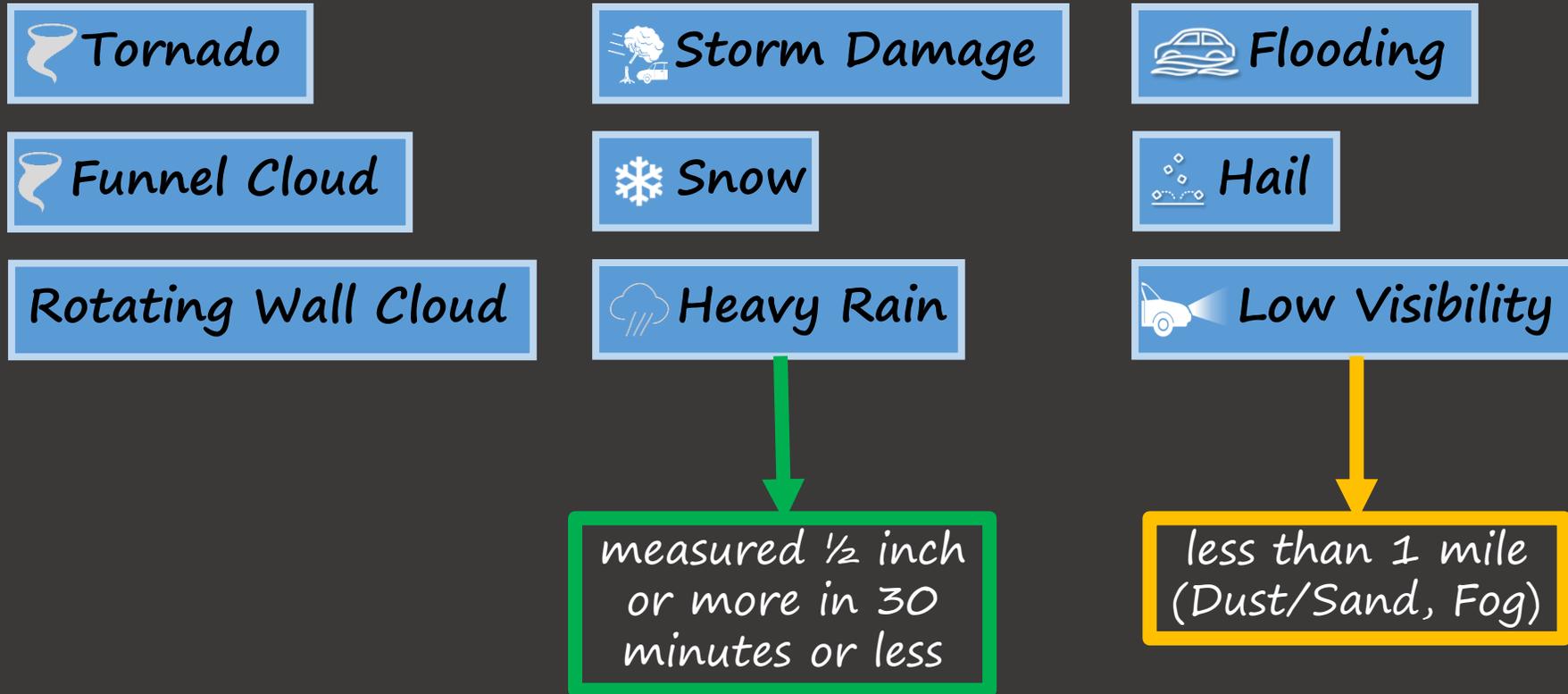
Weather Hazards to Report



- even if it is not accumulating
- take multiple samples of snow depth if possible
- let us know about road conditions

Reporting Procedures

Criteria



Only report conditions meeting criteria

Reporting Procedures

Content Essentials

Who?

spotter id

What?

- Damage: trunk/limb diameter? roof material type?
- Flooding: streets? washes? depth? ponding vs. flowing?
- Low vis: how low (distance)? how widespread?

Where?

at home? elsewhere?
city, major cross-
streets

When?

time reportable
criteria first began

Only report information you can confirm

Reporting Procedures

In a Nutshell...

When you encounter something that meets criteria... Report it!

For HAMs, don't wait for radio Net to be activated.

Reporting Procedures

Content Essentials

Social Media

 **Twitter**
[@NWSPhoenix](#)
#azwx #cawx

 **Facebook**
facebook.com/NWSPhoenix

 **Instagram**
[@nwsphoenix](#)



Spotters ONLY

Website (mobile friendly)

Email

Phone

Amateur Radio

Working Together to Protect Lives and Property

Ways to stay informed

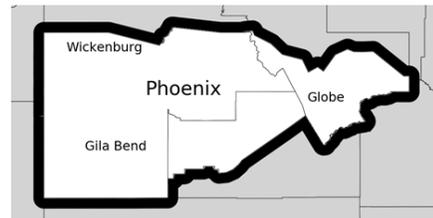
[Weather.gov/phoenix](https://www.weather.gov/phoenix)

Weather Threat Matrix

Created at 09:07 AM on Wednesday, April 15



Threat	WED 04/15	THU 04/16	FRI 04/17	SAT 04/18	SUN 04/19	MON 04/20	TUE 04/21
Extreme Temps							
Blowing Dust							
Lightning							
Flooding							
Winds							
Hail							
Snow							
Fog/Haze/Smoke							



South Central Arizona

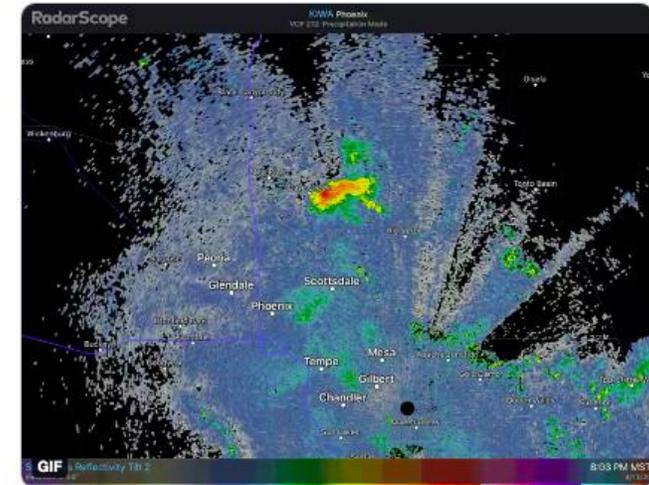
Interact With Us NWSPhoenix Weather.Gov/PSR @NWSPhoenix NWSPhoenix

Threat Matrix updated 10 AM daily

Social Media



A few additional showers and thunderstorms popping up over northern parts of the Valley right now. Locally heavy rain, lightning, small hail, and some gusty winds will be possible with these storms. #azwx



Facebook: NWSPhoenix
 Twitter: @NWSPhoenix
 Instagram: @nwsphoenix



Spotter Essentials

- *Stay Informed*
- *Stay Safe!*
- *Understand Weather Basics*
 - *Identify Weather Hazards*
 - *Report Hazardous Weather*

Attendance/Program Confirmation

❖ *Online Quiz*

- *Necessary to confirm attendance.*
 - *Especially for those brand new to our program.*
- *All answers covered in the presentation. Electronic handout quite handy as well.*
- *Link for quiz sent in a follow up email.*

Contact Details

Austin Jamison

Spotter Focal Point
(notify of contact info changes)



austin.jamison@noaa.gov

Marvin A. Percha Jr.

Ham Radio Contact – KI7BLU



marvin.percha@noaa.gov



weather.gov/phoenix



www.facebook.com/nwsphoenix



www.twitter.com/nwsphoenix



www.instagram.com/nwsphoenix



602-275-7418 (public line)

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