Welcome to Spotter Training!

National Weather Service Fairbanks, Alaska

Meteorologist Tyler Rodenbaugh

National Weather Service

Our Mission:

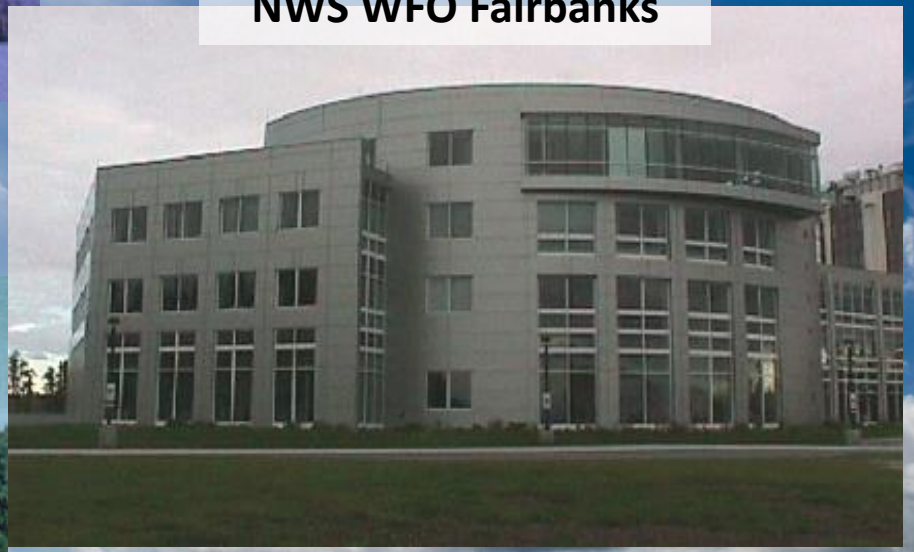
Provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas, for the protection of life and property and the enhancement of the national economy.

The NWS operates **24/7/365** to meet our mission.

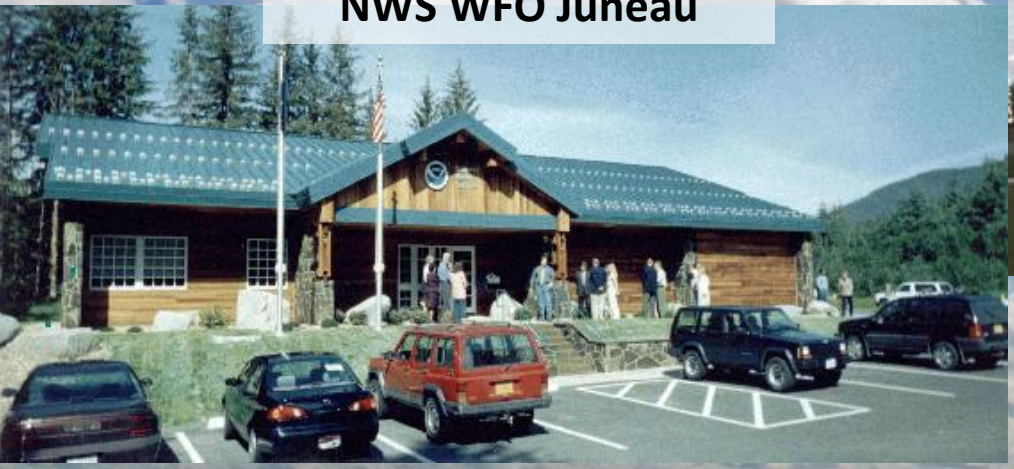
Alaska Weather Forecast Offices

NWS WFO Anchorage

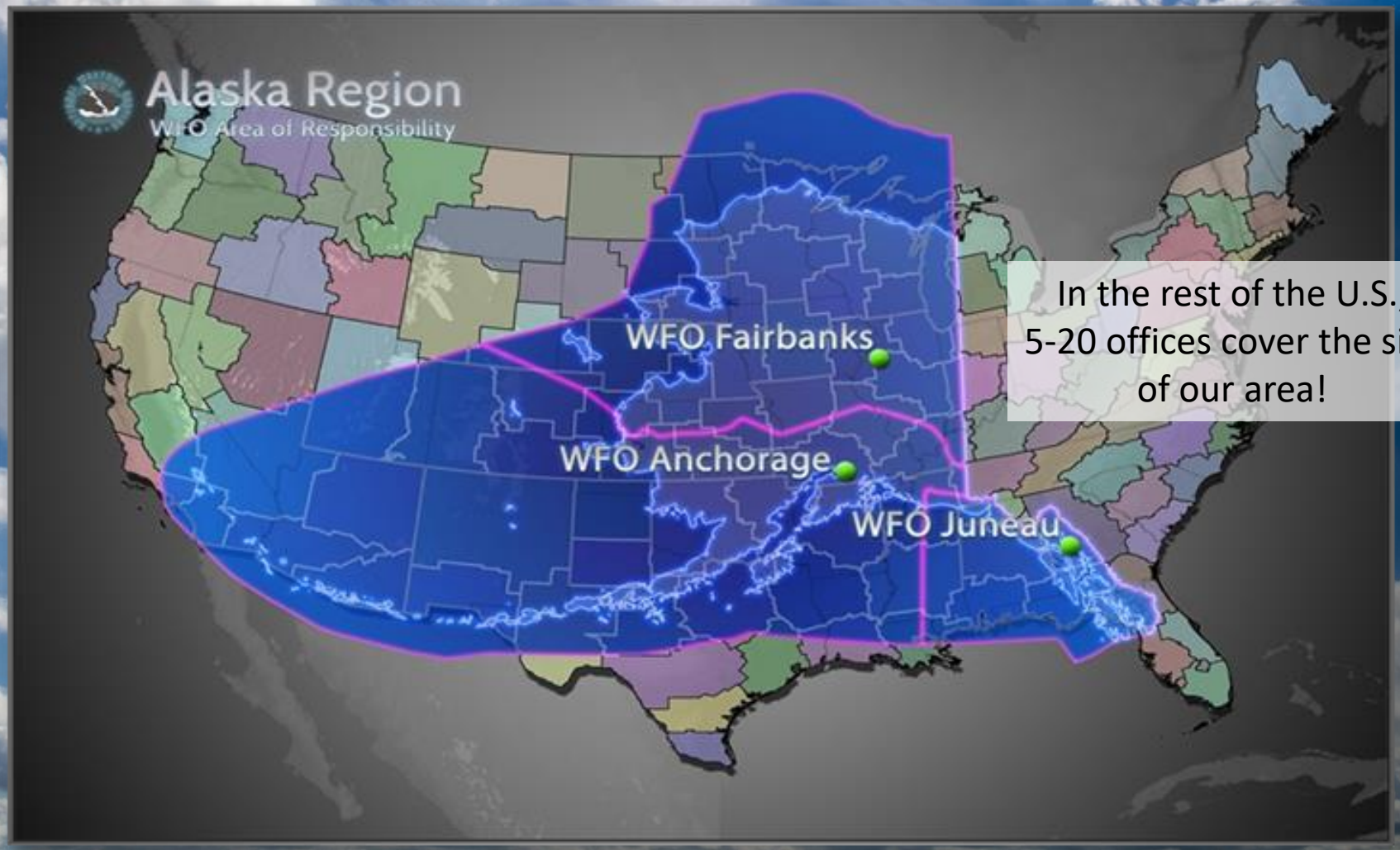
NWS WFO Fairbanks



NWS WFO Juneau



Area of Responsibility



In the rest of the U.S., 5-20 offices cover the size of our area!

What is an NWS Spotter?

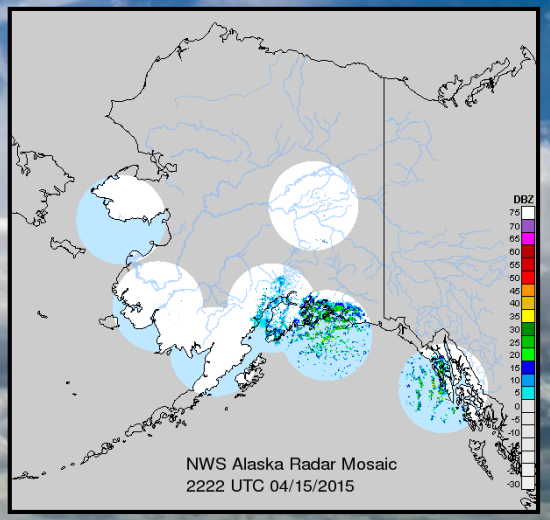
A weather spotter is a trained citizen who reports hazardous weather and any impacts it's having on their community.

Spotters help support our mission via their reports!

Why are Weather Spotters Needed?

Automated weather observations can't detect everything!

We need weather spotters to alert forecasters to important details such as lighting, hail, waterspouts, tornadoes, ice accumulation, snowfall accumulation, and any weather impacts on your community.



Why are Weather Spotters Important?

Your Report COULD…

- Be the first indication of significant weather
- Help us decide whether or not to warn
- Add warning and forecast credibility
- Help us issue **TIMELY** and **ACCURATE** warnings that *may save lives and minimize property damage*.

What is your commitment as a Spotter?

- Pro-active calls to the NWS when you observe significant weather
- Expect an occasional call from the NWS during reasonable hours


Spotter Reports

What Should I Report?

- When to report:
  - Wind is damaging structures or property
  - Snowfall is heavy (at least 3” in 12 hours or less)
  - Snow and blowing snow are causing a Blizzard
  - Freezing Rain
  - Thunderstorms
  - Large Hail
  - Heavy rainfall
  - Any flooding or flash floods
  - Smoke or fog has reduced visibility to 1 mile or less
  - Volcanic Ashfall

When you see weather that is, or potentially is, damaging or hazardous!

Weather Spotter Safety

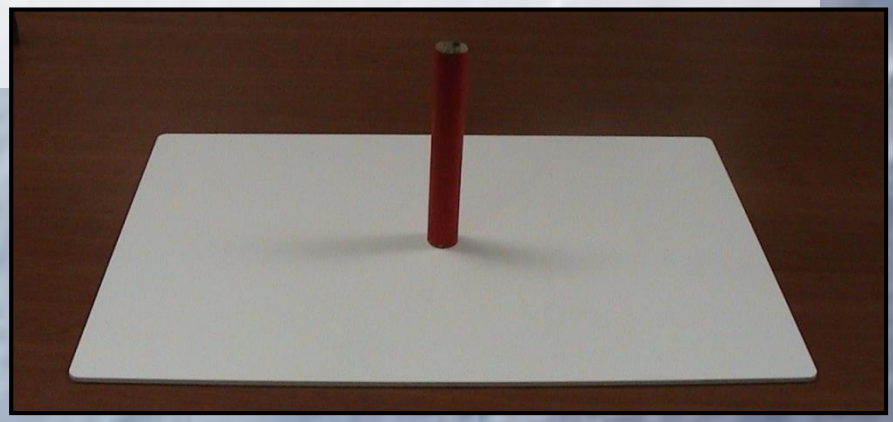
- The spotter's personal safety is the primary objective of every spotter
- The spotter should obey federal, state, and local laws and directives from public safety officials

- The spotter should never put his or herself in harm's way


Types of Weather To Report

Snowfall Measurements

- Measure snow on a “snow board” using a ruler
  - 16” X 16” piece of plywood painted white
  - Locate the snow board out in the open away from trees, buildings, fences, etc.
  - Make sure to mark where it is located with an orange stick or flag
  - If you do not have snow board, an outside table will also work
- Clear off your snow board after the snow ends
  - This will ensure you accurately start from scratch when the next storm hits!



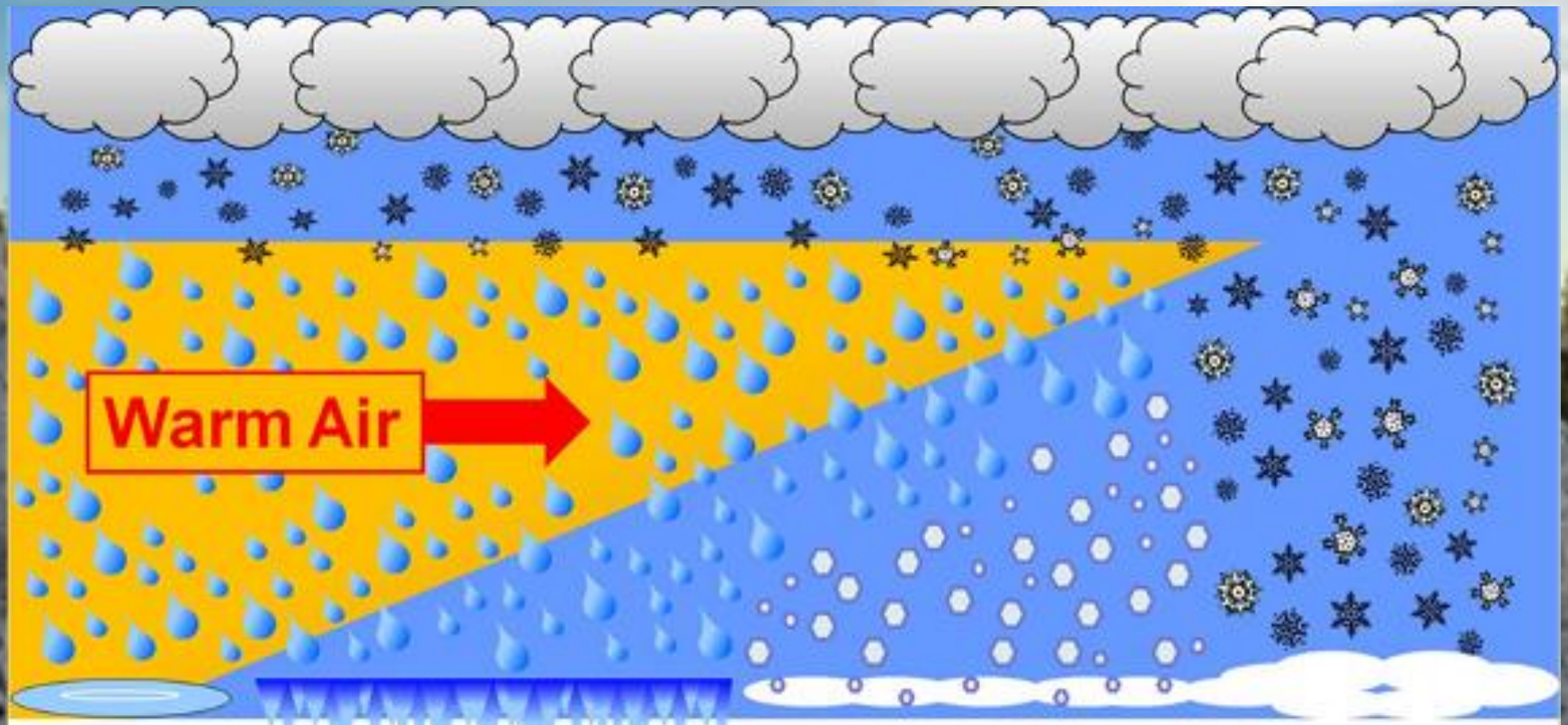
How to Measure Snow

- Measure and record the snowfall since the previous snowfall observation
- Measure snow to the **nearest tenth of an inch**
- If possible measurements should be taken every 12 hours, and then once the snow has stopped falling
  - Helpful to give a grand total for the storm with your final report
- If your observation is not based on measurement, it is extremely important to indicate the report is an estimate

How to Report Snow

- In your snow report, try to include:
  - The time the snow started
  - The amount of storm total snowfall measured
  - If the snow is still falling
    - If so, is it light, moderate, or heavy snowfall currently?
  - Is the snowfall impacting visibility?
    - Is the visibility less than a ½ mile?

Freezing Rain



Rain

Frozen precipitation Melts and reaches the ground as rain.

Freezing Rain

Frozen precipitation melts in warm air. Rain falls and freezes on cold surfaces.

Sleet

Frozen precipitation melts in shallow warm air. Then refreezes into sleet before reaching the surface.

Snow

Snow falls through cold air and reaches the surface

Why is Freezing Rain Dangerous?

- Hazardous for travelers.
  - Ice can create slick spots on roadways
  - Bridges, overpasses, and elevated roadways are especially susceptible to icing

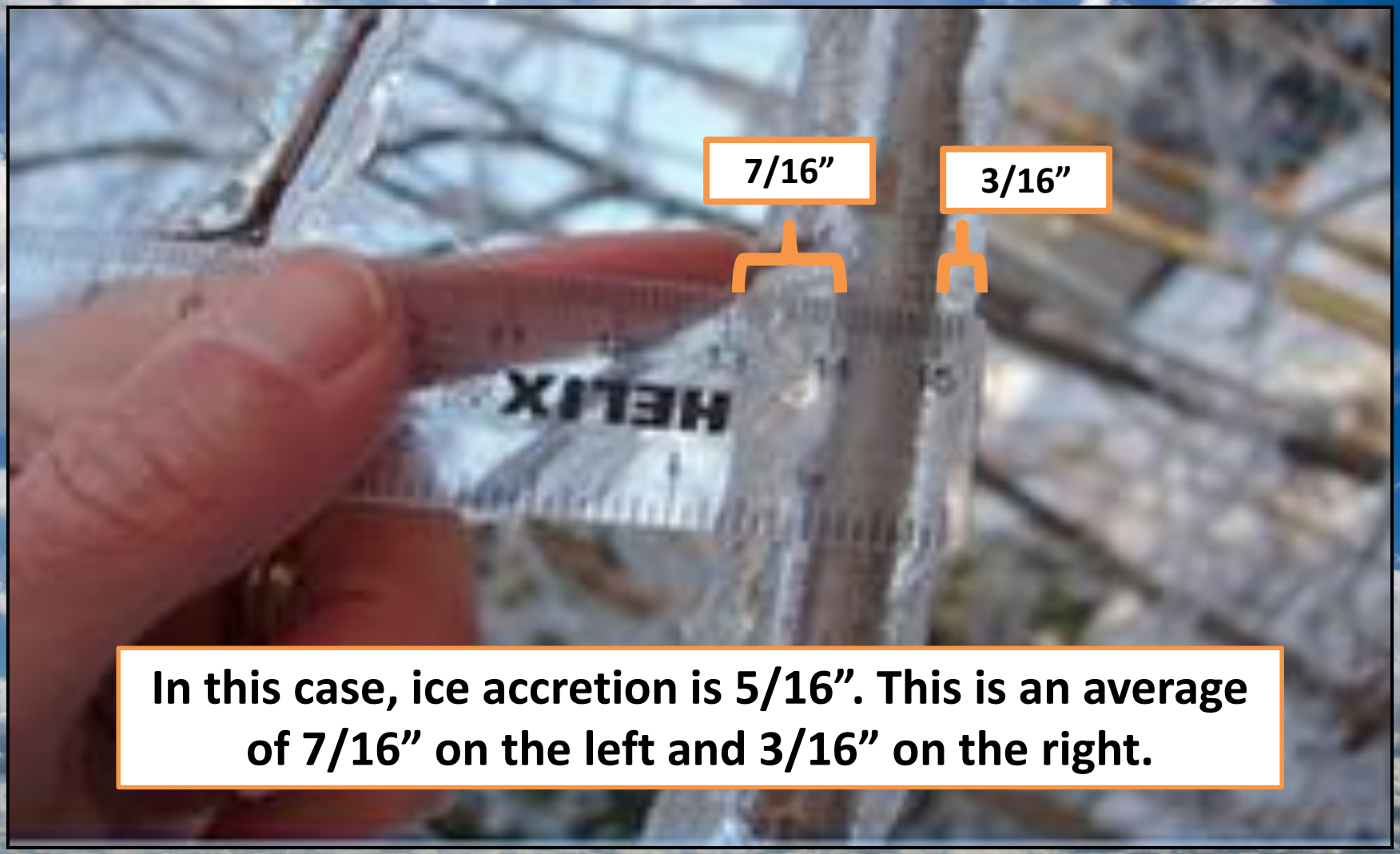
- Freezing rain can accumulate as ice on tree branches, powerlines or any surface that is cold.
  - Can cause power outages and create hazardous conditions

How to Report Freezing Rain

- In your freezing rain report, try to include:
  - Any hazardous road conditions that are resulting from freezing rain
  - Any damage caused by the icing, including downed tree branches or powerlines
  - Estimate of the ice thickness in fractions of an inch

**Use a ruler to measure and average the ice thickness on a branch or any other object **

Measuring Ice Accretion



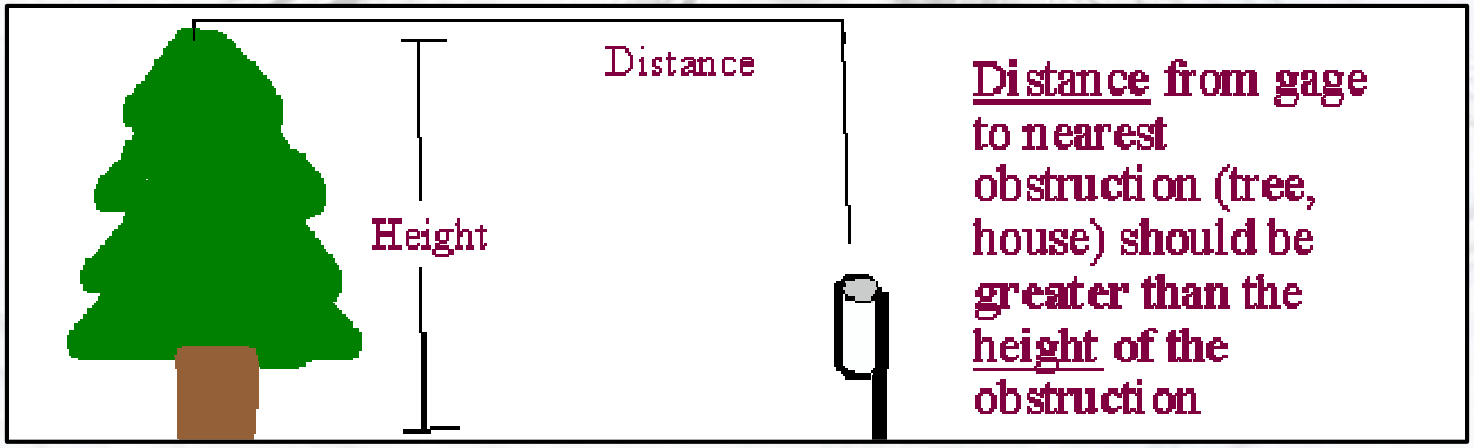
In this case, ice accretion is 5/16”. This is an average of 7/16” on the left and 3/16” on the right.

Reporting Heavy Rainfall

- Report heavy rainfall anytime, such as:
  - More than 0.50” or more in 1 hour
  - More than 0.75” or more in 3 hours
  - More than 1.00” or more in 6 hours
- Report on how long it has been raining (length of event)
- Use the plastic 4-inch diameter rain gauge to measure rainfall

Measuring Rainfall

- Use a 4-inch rain gauge
  - Install in a place that has no or few obstructions



  - How to read gauge: inside cylinder-
    - Main markings (with numerals) are TENTHS of an inch
    - Minor markings (horizontal ticks) are in HUNDREDTHS of an inch

Flooding

- River Floods:
  - Occurs when river levels rise and overflow their banks and inundate areas that are normally dry.
- Flash Floods:
  - Floods that happen rapidly within 6 hours of the immediate cause (heavy rainfall, levee or dam failure)
- Causes of flooding:
  - Snowmelt
  - Ice Jam

Flooding: What to report

- Report any flooding due to rain, snow-melt, or ice jams
- Roads impassable due to high water

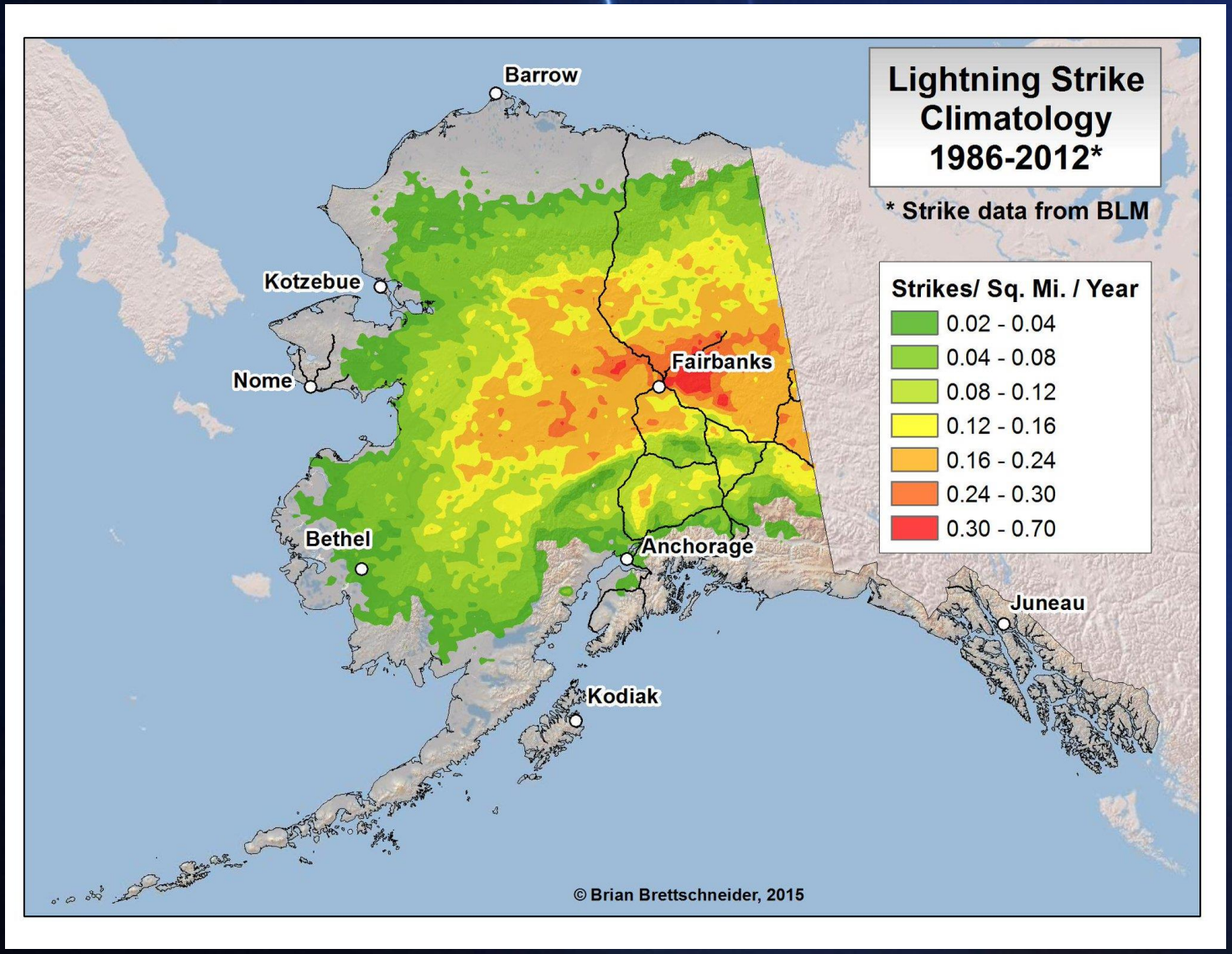
- Any occurring or potential property damage?
- Mudslide: Roads fully or partially blocked, property destroyed/damaged
- Spring Breakup: When ice on the river is breaking up and moving

Non-Thunderstorm Winds

- Report high winds, especially if they are damaging trees or property.
- Try to include the location and type of wind damage in the report.

<1 mph	= Calm, smoke rises vertically.
1-3 mph	= Direction of wind shown by smoke drift not by wind vanes.
4-7 mph	= Wind felt on face; leaves rustle, vanes moved by wind.
8-12 mph	= Leaves and small twigs in constant motion; wind extends light flag.
13-18 mph	= Raises dust and loose paper, small branches moved.
19-24 mph	= Small trees with leaves begin to sway.
25-31 mph	= Large branches in motion; whistling heard in overhead wires; umbrellas used with difficulty
32-38 mph	= Whole trees in motion; inconvenience felt walking against wind.
39-46 mph	= Twigs break; wind impedes walking; light objects (lawn furniture) tossed.
47-54 mph	= Branches snap; loose shingles removed; minor damage to sheds/barns.
55-63 mph	= Small trees uprooted, structural damage can occur.
64-72 mph	= Large trees uprooted; widespread damage to structures.
>72 mph	= Hurricane Force: Trees snapped, extensive destruction.

Thunderstorms in Alaska



Severe Thunderstorms

- In Alaska, severe thunderstorms are rare, but do occur.
- Types of severe weather possible in Alaska:
  - Excessive lightning
  - Weak Tornadoes
  - Hail
  - Gusty winds
  - Microbursts

Severe Thunderstorm Criteria

- By definition a severe thunderstorm produces at least one of the following:
  - Hail at least 1” in diameter
  - Wind gusts of at least 58 mph
  - A tornado

Hail

Common in Alaska:

Pea-size: ¼ inch

Dime-size: ½ inch

Penny-size: ¾ inch

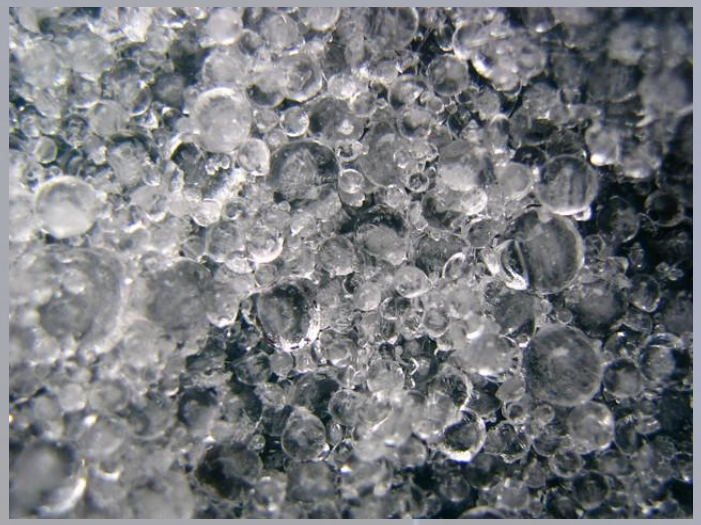
Quarter-size: 1 inch (severe thunderstorm)

DO NOT reference marbles!

Ice Pellets (Sleet) vs Hail

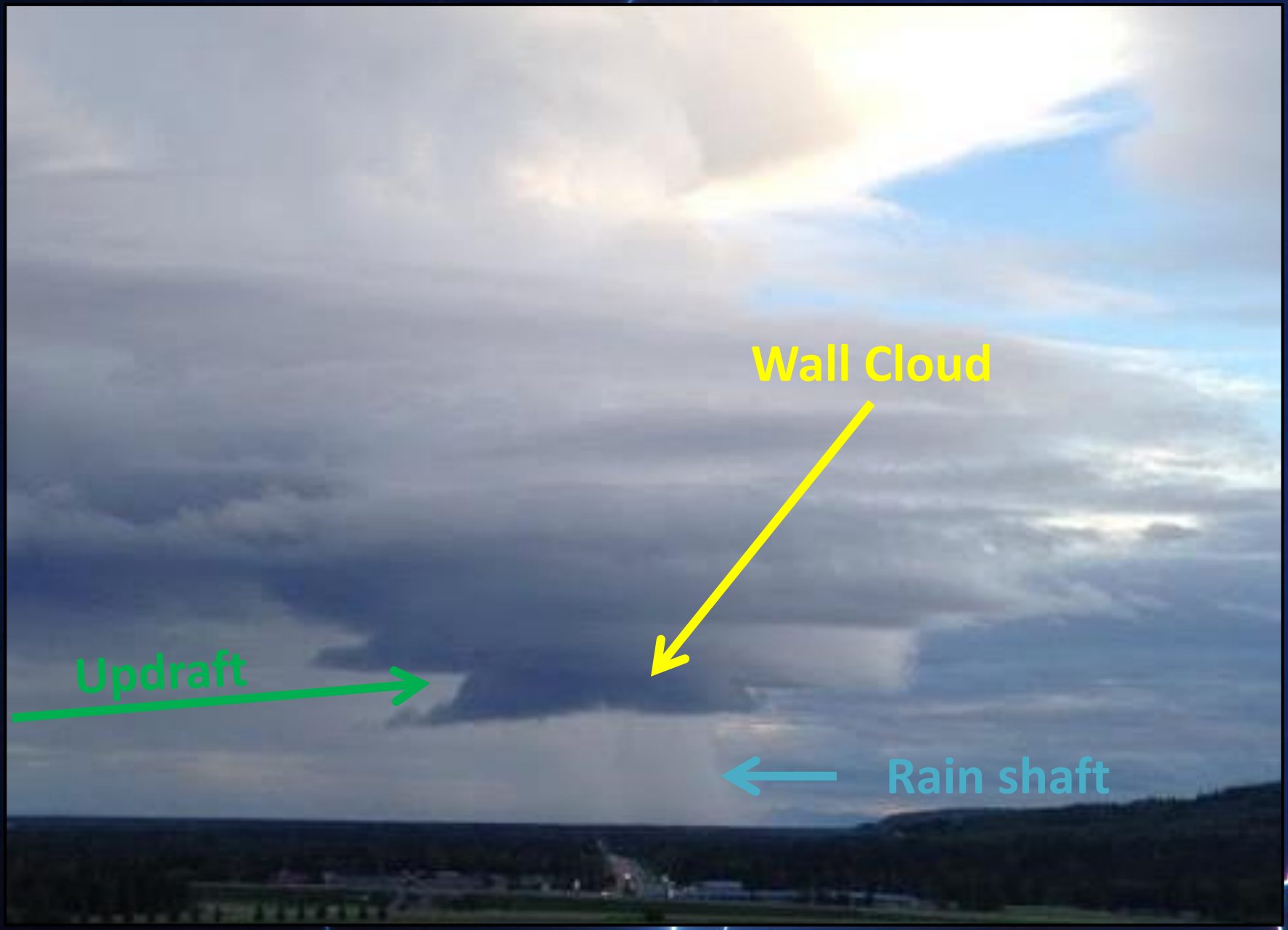
Ice Pellets or Hail?

- Ice pellets (aka sleet) are clear and smooth, mostly seen in winter or early spring
- Hail has a white stone-like appearance, always from thunderstorms or showers



Wall Cloud

- Cloud lowering beneath rain-free base
- Marks the updraft at thunderstorm base


Wall Cloud
Updraft
Rain shaft

Funnel Clouds

- A rotating, finger-like appendage extending from the cloud base
- Does not make contact with the ground

Tornadoes

- Violently rotating column of air extending from cloud base to ground
  - The rotating, tornadic condensation cloud edges will be fairly “smooth”
- Rare in Alaska, but can happen and have been reported
- There are a lot of tornado look-a-likes that have a ragged looking appearance

Scud Clouds

Scud clouds may look like funnel clouds, but are not. Scud clouds are raggedy in appearance and do not rotate.

Microburst/Downburst

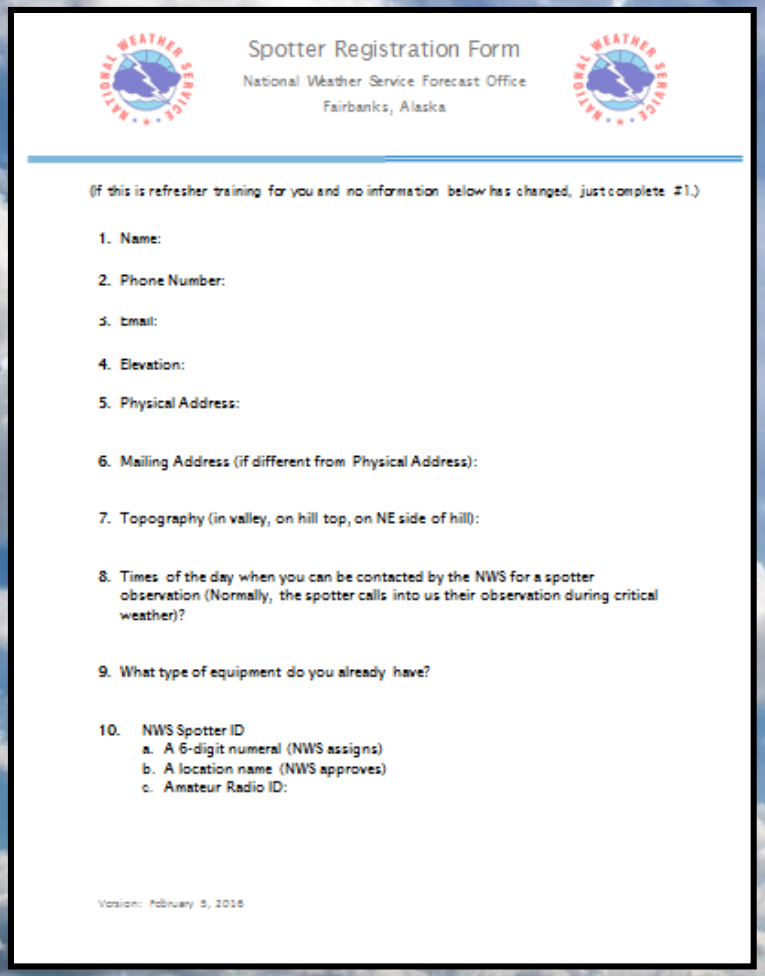
- Dry air aloft mixes with falling rain to product cooling through evaporation
  - Cool air sinks… the cooler the air, the stronger the winds
  - Any melting hail will add cooling and strengthen winds
  - Difficult to warn for due to their small size and short lifetime

Dust Devils

- Most likely in the late Spring and early Summer
- Very short-lived
- Form at the ground, unlike funnel clouds
- Can damage outbuildings and weakly constructed structures


Spotter Registration and Procedures

Spotter Registration



Spotter Registration Form

National Weather Service Forecast Office

Fairbanks, Alaska

(If this is refresher training for you and no information below has changed, just complete #1.)

1. Name:
2. Phone Number:
3. Email:
4. Elevation:
5. Physical Address:
6. Mailing Address (if different from Physical Address):
7. Topography (in valley, on hill top, on NE side of hill):
8. Times of the day when you can be contacted by the NWS for a spotter observation (Normally, the spotter calls into us their observation during critical weather)?
9. What type of equipment do you already have?
10. NWS Spotter ID
    a. A 6-digit numeral (NWS assigns)
    b. A location name (NWS approves)
    c. Amateur Radio ID:

Version: February 5, 2016

- Please fill out the Spotter registration form
- Having received your registration info, we'll email you:

A certificate which includes:

- The name of your site
- Spotter number (XXX-ZZZ)

Northern Alaska Weather Spotter Guide

Provided by: National Weather Service, Fairbanks
www.weather.gov/fairbanks

To Report Observations:
Call: (907) 458-3708 or Email: fairbanks.weather@noaa.gov

My Spotter ID:
My Spotter #:

When Spotter Observations are needed:

Damaging Dust Devils

Funnel Clouds or Tornadoes

Is it rotating?

Heavy Rainfall

more than...

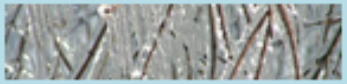
0.50" in 1 hour
0.75" in 3 hours
1.00" in 6 hours

Heavy Snowfall

(anytime)
3" in 12 hours or less

Freezing Rain or Freezing Drizzle

Estimate the amount of ice accumulation on the road or surface (fraction of an inch)



Strong Winds (35 mph or stronger)

How to Estimate Wind Speed:

Speed	Effect
30-40 mph	Large trees in motion; whistling in overhead utility lines
40-50 mph	Whole trees in motion; garbage cans/similar items blown over
50-65 mph	Twigs/Small branches break off tree; Damage to fences/shingles
65-80 mph	Large branches break off of trees; shallow rooted trees uprooted
80-100 mph	Extensive tree/roof damage; trailer homes overturned

Volcanic Ash

Place snowboard outside when expecting volcanic ashfall.

Flooding

(swollen rivers due to rain, snow-melt or ice jam blockage)

Roads impassable due to high water

Streams or rivers overflowing their banks, any occurring or potential property damage?

Mudslides: Roads fully or partially blocked, property destroyed/damaged

Breakup: The FIRST occurrence when ice on the river is breaking up and moving.

Low Visibilities

1 mile or less
(please try to estimate)

Blowing Snow, Fog, or Smoke

Hail

(any size, any time!)

Reference hail by coin size and not by marbles!

Reporting Procedures

- **By Phone:**
  - Call 24/7 **NWS Fairbanks: 458-3708**
  - State: “This is spotter (your spotter ID or spotter #)”
  - Then give us the information…
- **By Email:**
  - Address: fairbanks.weather@noaa.gov
  - Subject Line: Spotter ID or Spotter #
  - Then type in your report…

Reporting Procedures

- **What** weather element
- **How much**
- **How long/when**
- **Impacts** (obstruction, damage, injury, death observed or known)
- **WHERE**
  - If your observation was NOT made at your home, be sure to give your location!!

Reporting Procedures: **Examples**

What – How Much – How Long – Impacts

Snow Event

"Five inches of snow has fallen since 4 AM. I've heard that 3-4 vehicles have slide off the road."

Reporting Procedures: **Examples**

What – How Much – How Long – Impacts

Wind Event

"I observed (or estimated) wind gusts to 45 mph in the last 15 minutes. Several trees were toppled and now our power is out."

Reporting Procedures: **Examples**

What – How Much – How Long – Impacts

Funnel Cloud

"I am looking at a funnel cloud now just south of Murphy Dome. It's showing rotation and in the last 5 minutes it has been extending down toward land."

Reporting Procedures: **Examples**

What – How Much – How Long – Impacts

Tornado

"A tornado is touching down about a quarter mile to the east and I see some shingles being ripped off an old shed."

Reporting Procedures: **Examples**

What – How Much – How Long – Impacts

Large Hail

"Hailstones the size of a nickel fell about 10 minutes ago. They just stopped. The stones covered my car with small dents."

Reporting Procedures: **Examples**

What – How Much – How Long – Impacts

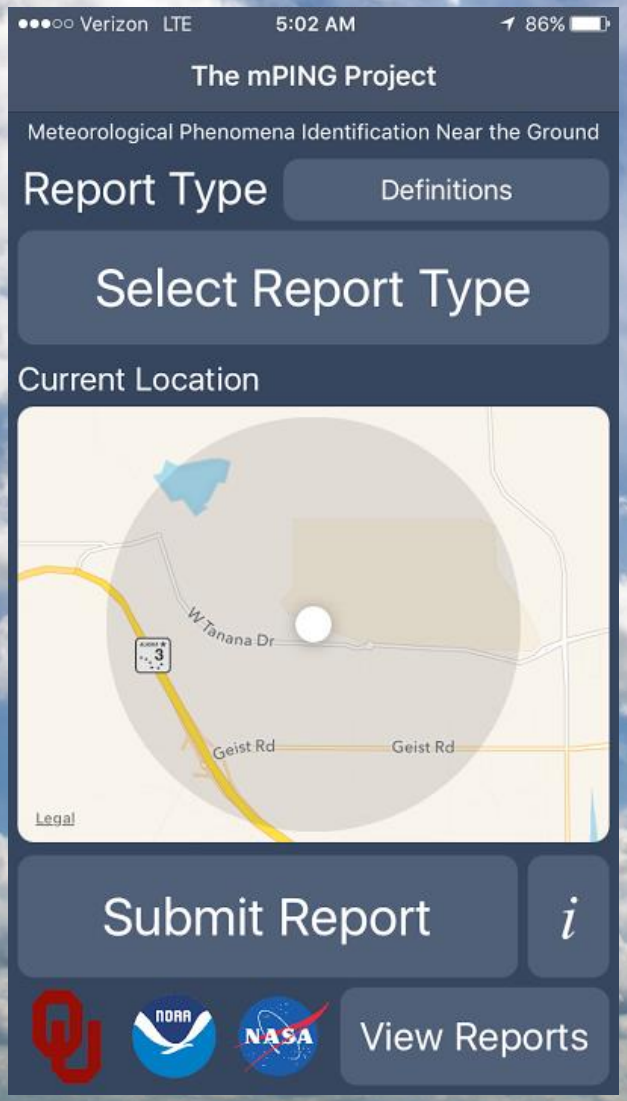
Freezing Rain

"Freezing rain has been falling the last 30 minutes. I estimated there's one-sixteenth of an inch of glaze on the road and sidewalk. The motorists I see are all moving at slow speeds and some are sliding."

… and later on:

"Freezing rain ended 15 minutes ago. I measure one-eighth of an inch."

mPING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The mPING Project
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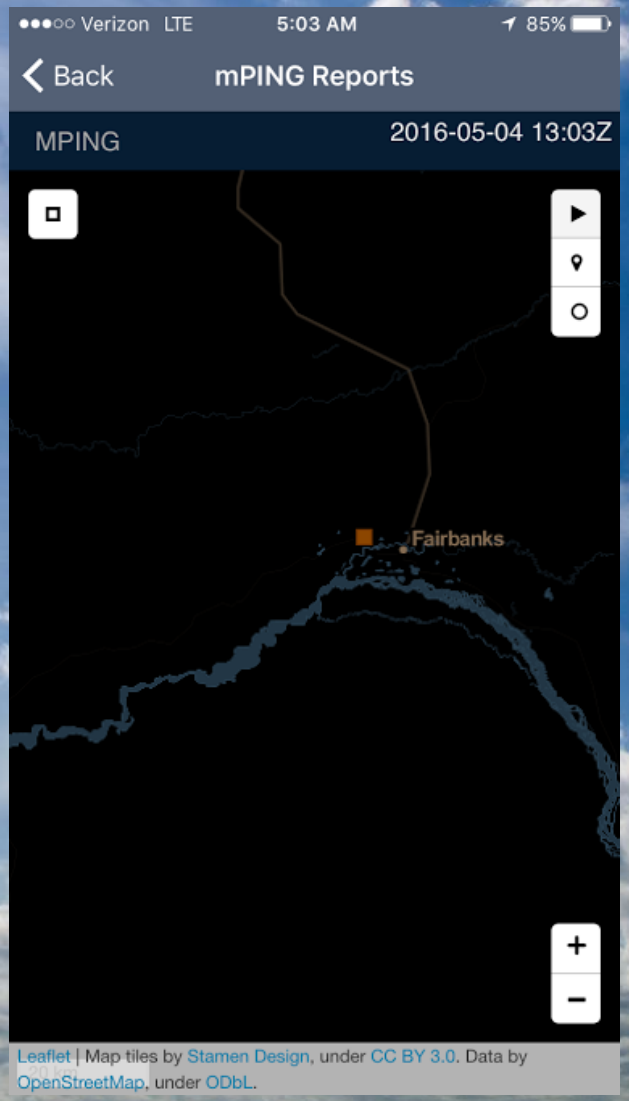
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mPING Reports
MPING
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Fairbanks
Leaflet | Map tiles by Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

mPING

- **M**eteorological **P**henomena **I**dentification **N**ear the **G**round
- Available as an app for Android and Apple phones
- Reports are geocoded
- Types of reports:
  - Precipitation type (Snow, Rain, Freezing Rain)
  - Hail
  - Wind damage
  - Tornado
  - Flood
  - Mudslide
  - Reduced Visibility

CoCoRaHS

- Another way to become involved in reporting weather!
- Community Collaborative Rain, Hail and Snow Network (CoCoRaHS).
- To join CoCoRaHS: https://www.cocorahs.org/Content.aspx?page=application

We are on Facebook and Twitter!

NWS Fairbanks on Social Media

Follow us on Twitter

@NWSFairbanks

Like us on Facebook

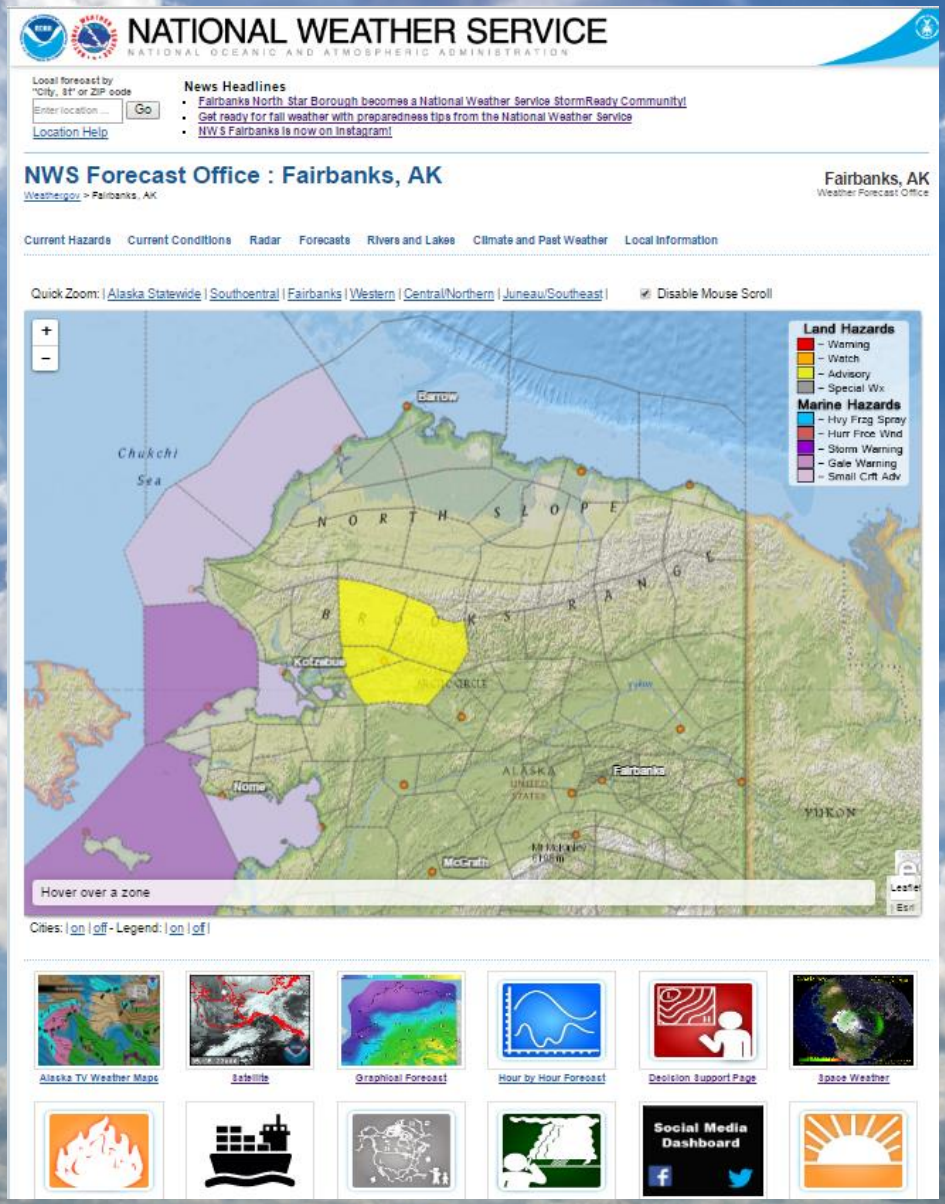
facebook.com/NWSAlaska

Scan to follow us on Twitter

Scan to like us on Facebook

Visit our webpage for the latest forecast:
weather.gov/fairbanks

Our website: www.weather.gov/afg



Spotter Program Page

www.weather.gov/afg/spotter

Questions?

Thanks for joining our team!
If you have questions later, please don't hesitate to contact:

Ed Plumb
Warning Coordination Meteorologist
edward.plumb@noaa.gov

OR

Tyler Rodenbaugh
NWS Fairbanks Storm Spotter Program Lead
tyler.heckstall-rodenbaugh@noaa.gov
Phone: (907) 458-3708