Northern Alaska
Weather Spotter Training
National Weather Service Fairbanks, Alaska
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.
Area of Responsibility

In the rest of the U.S., 5-20 offices cover the size of our area!
Alaska Weather Offices
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
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
  – Locate the snow board out in the open away from trees, buildings, fences, etc.
  – 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?
  – If the report is a direct measurement or an estimate
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**
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 the 4-inch rain gauge
  - Install in a place that has no or few obstructions

  ![Diagram of a rain gauge and a tree with annotations for distance and height.]

  - 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
  – Heavy rainfall
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
Wind

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

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

- In Alaska, severe thunderstorms are rare, but do occur.
- Types of severe weather possible in Alaska:
  - Cold air funnels
  - Excessive lightning
  - Weak Tornadoes
  - Small Hail
  - Gusty winds
  - Microbursts
Severe Thunderstorm Criteria

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

[Image of thunderstorm safety sign]
Hail

Pea-size: ¼ inch
Dime-size: ½ inch
Penny-size: ¾ inch
Quarter-size: 1 inch (severe thunderstorm)

DO NOT reference marbles!
Ice Pellets or Hail?

- Ice pellets are clear and smooth, mostly seen in winter or early spring.
- Hail has a white stone-like appearance, always from thunderstorms or showers.
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
Funnel Clouds

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

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

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

- North and west of the Alaska Range, volcanic ash that reaches the ground is normally a very minimal amount
- Measuring Volcanic Ashfall:
  - Use a snow board
  - After measuring the depth on the snow board, remove ash by a gentle water washing (don’t brush dry)
Spotter Registration and Procedures
Spotter Registration

- 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)
What Should I Report?

• **When to report:**
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*When you see weather that is, or potentially is, damaging or hazardous!*
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)

**Volcanic Ash**

Place snowboard outside when expecting volcanic ashfall.

**Strong Winds (35 mph or stronger)**

How to Estimate Wind Speed:

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

**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!

<table>
<thead>
<tr>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25</td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>0.88</td>
</tr>
<tr>
<td>0.75</td>
</tr>
</tbody>
</table>

**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.
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](mailto: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

Rain

“In the last hour I received 0.63 inches of rain. Water is running onto the road from overflowing ditches.”
Reporting Procedures: Examples

What – How Much – How Long – Impacts

Rain

“In the last hour I received 0.63 inches of rain. Water is running onto the road from overflowing ditches.”
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.”
Reporting Procedures: Examples

What – How Much – How Long – Impacts

Flooding

“The Wilderness River is flooding the Dalton Highway. One of the two lanes has become impassable in the last 15 minutes.”
mPING

The mPING Project
Meteorological Phenomena Identification Near the Ground

Select Report Type

Current Location

Submit Report

View Reports
mPING

• **Meteorological Phenomena Identification Near the Ground**
• 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
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
We are on Instagram too!

NWS Fairbanks is now on Instagram!

Follow us at...

nwsfairbanks

This is currently a prototype effort to determine utility of Instagram for the NWS and its customers.
Our website: www.weather.gov/afg
Visit Our Mobile Friendly Forecast Page!
http://innovation.srh.noaa.gov/NWSwidget

Fully **Adaptive** forecast page for computers, tablets & smartphones

Save as a widget on your phone!
Spotter Program Page
www.weather.gov/afg/spotter

NWS Fairbanks Spotter Program

Spotter Training

The NWS Fairbanks is looking for volunteer weather spotters in Interior Alaska, the North Slope, and Western Alaska from Scammon Bay to Point Hope.

Volunteer weather spotters are able to help their community and surrounding communities by reporting to the NWS thunderstorms, hail, heavy rainfall, strong winds, heavy snow, freezing rain, river and coastal flooding, etc. Most of the time a weather spotter will provide a report to us by phone, internet, or ham radio. There may be times where we will call you in the event we feel that something unexpected is happening in your area or to ask further questions on a report that you already gave to us.

To become an official NWS spotter, you receive free certified training conducted by the NWS. The spotter training covers how to make and send a spotter report, and provides all spotters with a common “weather language” to identify and describe weather events and ice and snow conditions. It is important that each spotter describes the same weather in the same way. This allows the NWS to incorporate your reports directly into their forecasting and warning system. The training is about a one hour presentation, with additional time for questions. If you are unable to travel to a training session, we can make other arrangements including online training. The training is good for two years.

If you are interested in becoming a spotter, click on this link and fill out the form. For additional information about our spotter program contact Lindsay Tardif-Huber by email or by phone at (907)458-3708.

What happens after I fill out the spotter signup form? We will contact you to arrange storm spotter training. Once you have had storm spotter training, we will issue a certificate with your spotter location ID and number. Remember, training is good for two years.
Storm Report Page

Questions?

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

Ed Plumb
Service Hydrologist &
Acting Warning Coordination Meteorologist
[link to email]

OR

Lindsay Tardif-Huber
NWS Fairbanks Storm Spotter Program Lead
[link to email]
Phone: (907) 458-3708