SOUTHEAST ALASKA SKYWARN
WEATHER SPOTTER TRAINING

Weather Forecast Office
Juneau

Online Training
• WRN initiative is about helping our nation become more resilient to increasing extreme weather, water, and climate events by integrating with and thus preparing the community for impacts associated with these events.
IDSS is forecast advice and interpretative services to assist core partners’ decision-making when weather, water, or climate has a direct impact on the protection of lives and property.
What is an NWS Spotter?

- A NWS Weather Spotter is a trained citizen who reports hazardous weather and any impacts it’s having on their community.

Photo: Jessica Voveris

Mountain Wave Causing High Winds on Douglas Island
Photo: Jessica Voveris
Why are Weather Spotters needed?

- There are only 122 weather forecast offices (WFOs) to cover the entirety of the U.S.
- Our WFO has a huge area of responsibility.
- It is impossible for us to track everything going on in SE Alaska without help.
Why are Weather Spotters needed?

• Automated weather observations can’t detect everything.
• Sparse observation network in SE Alaska
• Forecasters need to know important details such as wind damage, snowfall accumulation, flooding, thunderstorms, waterspouts, ice accumulation, landslides, and any other weather impacts on your community.
Why are Weather Spotters needed?

- 1 RADAR for all of SE Alaska
- Our RADAR does not cover the entire extent of our forecast area.
- Mountains (terrain) blocks the majority of the radar making it only regularly reliable over the Gulf and near Sitka.
Weather Spotter Safety

• Your own personal safety is the highest priority

• Always obey federal, state, and local laws and directives from public safety officials.

• Do not put yourself in harms way. This includes attempting to walk or drive over obstructions (i.e. flooded roads, downed power lines)
Exercise ACES

• ACES
  – Awareness
  – Communication
  – Escape Routes
  – Safe Zones
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• **Awareness** means you should constantly observe the situation around you. This is sometimes referred to as *situational awareness*.

• When you are aware of the imminent threats, and you are thinking ahead about possible outcomes, you can position yourself better to minimize these threats.
Exercise ACES

- ACES
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  - Communication
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- **Communicating** your whereabouts to others on a regular basis and having multiple lines of communication available can keep you and others safe from hazards.
• **ACES**
  – Awareness
  – Communication
  – Escape Routes
  – Safe Zones

• **Escape Routes** are important when you need to get away from danger.

• An escape route is a clear path that will allow you to reach your safe zone well before harm arrives.
Exercise ACES

• ACES
  – Awareness
  – Communication
  – Escape Routes
  – Safe Zones

• A safe zone or shelter is an area in which you are safe during a hazardous condition.

• Your safe zone can be either a location to shelter in place or an area completely away from the hazardous event.
  – Always clearly identify a safe zone in an area in which no harm will come to you.
YOU DO NOT WANT TO BECOME A PART OF THIS STATISTIC!
What do you report?

- Wind damage
- Flooding
- Thunderstorms
- Lightning
- Hail
- Dense fog - visibility less than ¼ mile

- Snowfall
- Time of changeover from snow to rain (or rain to snow)
- Freezing rain/drizzle
- Blowing snow with considerably reduced visibility (Blizzards)
Key Components of a Spotter Report

- 7 Key Components
  - Your Name & Spotter Number
  - Your Location
  - Location of hazardous weather
  - Type of hazardous weather
  - Time of hazardous weather
  - Duration of hazardous weather
  - Your contact information (even if we already have it)
Ideally snowfall should be measured on a snow board.

- A snow board is a clean (preferably white) board roughly 2-3 ft wide.
  - Place in the open away from trees, buildings, fences.
- If you cannot make a snow board a level table is best.
- Best to place it away from trees and buildings if possible.
How to Measure Snowfall

- Using your snow board or table, measure and record the snowfall since your last observation.
- Measure to nearest 1/10th of an inch.
- Note the time at the onset of snowfall and the end time.
- Measure storm total snowfall asap after the snowfall ends.
How to Measure Snowfall

• Clear off your snow board \textit{after} the event, not during.
• This ensures that data is not contaminated and you will be ready for the next event.

Meteorologist clearing snow table after a measurement
How to Measure Snowfall

• If you are not using a snow board then measure a few locations around your yard.
  – You will need to know the current snow depth before the event if using this method.

• If winds are causing drifting or blowing snow do not average the height of the drifts.
  – Try to find a place where the snow is uniform.

Snow drifts in Saint Paul, Alaska. Do not average in drifts like this. Take your measurements where the snow is uniform.
Snow can be light, moderate, or heavy.

Light Snow:
- 0.4” or less per hour
- Visibility ¾ miles or greater

Moderate Snow:
- 0.4” to 1.0” per hour
- Visibility between ¼ and ¾ miles.

Heavy Snow:
- 1.0” or greater per hour
- Visibility less than ¼ mile.
Snowfall Reports

Include:
• The amount of snowfall out of the entirety of the snow event
• Is the snow currently falling?
  – Let us know if it is light, moderate, or heavy
  • Is visibility being reduced?
  – If snowfall is heavy, we find it very helpful if you can update us throughout the event!
• Are there any impacts
  – i.e. schools or roads being closed? Events being cancelled?
• Is this a measurement or estimation?
  – Please try to avoid estimating snowfall totals whenever possible
• Email (juneau.weather@noaa.gov) or tweet (#akwx) us pictures
• Call us at the onset of snowfall and the ending of snowfall. (If you cannot call, please document the start and end-time) Measure storm total snowfall asap after the snowfall ends.
• We can always use snowfall reports, even if it is not heavy.
Freezing Rain & Drizzle: Liquid precipitation that falls and freezes upon contact with the surface (vehicles, buildings, trees, pavement, etc.).
Freezing Rain/Drizzle Reports

Include:

• Time of freezing rain/drizzle onset
  – Please call us at the onset and ending of freezing rain/drizzle

• Hazardous road conditions resulting from the frozen precipitation

• Any damage being caused
  – Downed trees, branches, power lines, etc.

• Is the ice measurable?
  – How thick is it?
Sleet:
• Sleet is precipitation that falls through a warm layer (above the surface) and then passes through a thick below freezing surface layer.
  – Do not confuse with hail
  • We will talk about hail later.

What to include in a sleet report:
• Time of sleet onset/end
• Hazardous road conditions resulting from sleet.
• Is the sleet accumulating?
  – What is the depth?
Flood: An overflow of water onto normally dry land. The inundation of a normally dry area is caused by rising water in an existing waterway, such as a river, stream, or drainage ditch.

Flooding in Galena, Alaska
Common causes of flooding in SE AK

• Heavy Rainfall
• Glacier Dammed Lake Releases
• Snow/Ice-melt
• Rain on snow
• A combination of any of these

Mendenhall River flood in 2012.
Photo: Heather Bryant/KTOO
Snowmelt/Icemelt Flooding

- Occurs from the melting of snow.
  - Can be enhanced during the spring season if the ground is still frozen

Snowmelt flood in Fairbanks in April, 2009
A glacier dammed lake forms when water collects behind, under or within glaciers.

- When the “lake” releases it can cause significant flooding.
Flash Flood:
- A flood caused by heavy or excessive rainfall in a short period of time.
- Characterized by raging torrents that rip through river beds, urban streets, or canyons.
- Can occur without rainfall (i.e. dam failures, debris becoming dislodged)
- **Uncommon in SE AK**

Flash flooding in Anchorage due to heavy rainfall in 2015
Photo: ADN
When reporting flooding we would like to know:

- **Cause/Type of the Flood**
- **Current Weather Conditions**
- **Impacts:**
  - I.E. Water on roadway, trail inundated with water, bridge collapsed, mudslide occurred, etc.
- **Depth of water**
  - If it is safe/possible to measure
Wind

Report high winds if they are damaging trees, property, structures, power-lines, etc.

– Estimating wind speed is difficult so it helps if you can report damage.

Hurricane Force Wind Damage Metlakatla, AK Apr. 11th 2018 Photos: Martin Redditt
Estimating wind speed is difficult.

- We prefer reports to be coupled with tangible evidence of high winds.
  - Could be as simple as you see garbage cans blowing down the street.
While rare in Alaska, especially Southeast Alaska, severe thunderstorms can occur.

- Hail, Strong Wind Gusts, Lightning, Funnel Clouds, and Tornadoes are all possible.
Severe Thunderstorm Criteria

- A thunderstorm is severe if it produces any of these criteria:
  - Hail 1” or bigger in diameter
  - Wind gusts of 58 mph
  - A tornado
- Lightning is not part of severe criteria.
  - However, if you see lightning or hear thunder, please let us know about it.

Thunderstorm near Kwethluk, Alaska.
Photo by Tyler Konig
If hail falls out of a shower or thunderstorm please call us or submit a report.

- Even if the hail is not severe criteria (>1”) we would like to know about it.
- Measure hail by comparing it to a common object
  - Pea size, dime size, nickel size, etc.
Funnel Cloud:

- A rotating, funnel-shaped cloud extending downward from a thunderstorm base.
  - Does not reach the ground
  - Not common in SE Alaska

A funnel cloud over the Kenai Peninsula in July of 2005
Photo: Julia Ruthford
This funnel cloud eventually turned into a waterspout
**Tornadoes**

**Tornado:**

- Violently rotating column of air extending from the base of a cloud all the way to the ground.
  - Uncommon in SE Alaska
  - Do not expect to see a tornado like the one pictured in the bottom right.

A weak tornado in Sand Point, Alaska

A strong tornado in Kansas

Photo: Jake Byrd
Do not confuse a rain shaft with a tornado. They can deceive you especially at further distances.
Gustnado:

- Small, short-lived vortices that do not extend directly down from a cloud like a tornado does.
  - May or may not look like they connect to a cloud
  - Please **do not** report a gustnado to us

Gustnado at Mendenhall Glacier
Photo: Jake Byrd
Waterspout: Column of cloud-filled wind rotating over a body of water.

- May or may not be tornadic
  - Fair weather waterspouts can occur in SE Alaska especially over the gulf and during cold air outbreaks.
  - Tornadic waterspouts are much rarer.
- Please report a waterspout to us if you see one as they are very dangerous to mariners.

Waterspout over Lake Ontario in Oswego, NY. Spray ring indicates it is connected to the surface.
7 Key Components

- Your Name & Spotter Number
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Our office is staffed with forecasters 24/7 365 days per year.

Call us at 1-877-807-8943
Submitting a Spotter Report Online

- **weather.gov/ajk/StormReports**
- Click “Submit a Weather Report”
  - Zoom in on the map and click where your submitting the report for
  - Fill out the appropriate information
  - Type up some additional details for us
    - i.e. onset of snow/ending of snowfall (storm total snow)
  - Please fill out the contact info, it **does not** get included in the public report, but we need to know which spotter submitted it.
  - Click green Submit Report button at bottom of screen
- During major events, we may call you after you submit the online report, if we need more information.
We Need Your Contact Information

- We will need your contact information as well so that we can call you during events for new weather info.
- We may call or email you beforehand to give you a heads up that we will need your help.
- Let us know hours we may contact you (i.e. 10 AM – 9 PM).

Low Clouds in Haines, AK
Questions? Email us!
Juneau.Weather@noaa.gov