



SOUTHEAST ALASKA SKYWARN WEATHER SPOTTER TRAINING



Eagle River (North of Juneau)

**Weather Forecast Office
Juneau**

March 3, 2023



WEATHER-READY NATION SKYWARN TRAINING





What is meant by Weather-Ready Nation(WRN)?

- 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.



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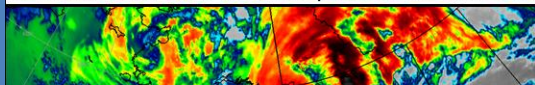


What is Impact-Based Decision Support Services (IDSS)?

- 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.

Atmospheric River Continues Precipitation

Current IR Sat View of Atmospheric River from May 5th 2018



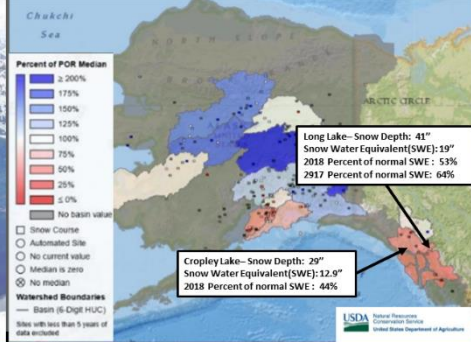
Today is the last day that this Atmospheric River will impact the Panhandle. Considerable precipitation remains ongoing through this

Below Normal Snowpack Continues For SE Alaska

- April storms brought near normal to slightly above normal precipitation to the southern Panhandle with below normal precipitation across the north
- April temperatures averaged within a degree or two of normal for most sea level sites in Southeast Alaska
- Low elevation sites melted out (not uncommon)
- Higher elevation snowpack remains well below normal
- Most locations have less than half the normal snowpack due to the precipitation deficit from the winter season

Alaska Statewide Snowpack Map

Based on May 1st, 2018 Snow Water Equivalent



Created: 5/8/2018 11:27 AM



weather.gov/juneau



facebook.com/NWSAlaska



@NWSJuneau #akwx



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.



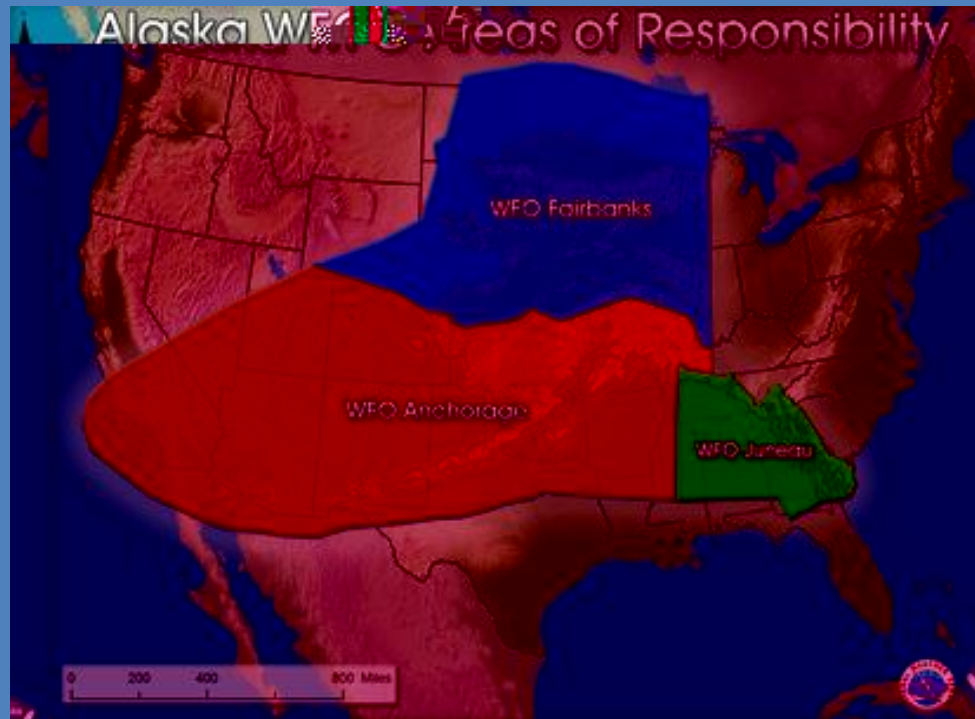
Mountain Wave Causing High Winds on Douglas Island
Photo: Jessica Voveris



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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.



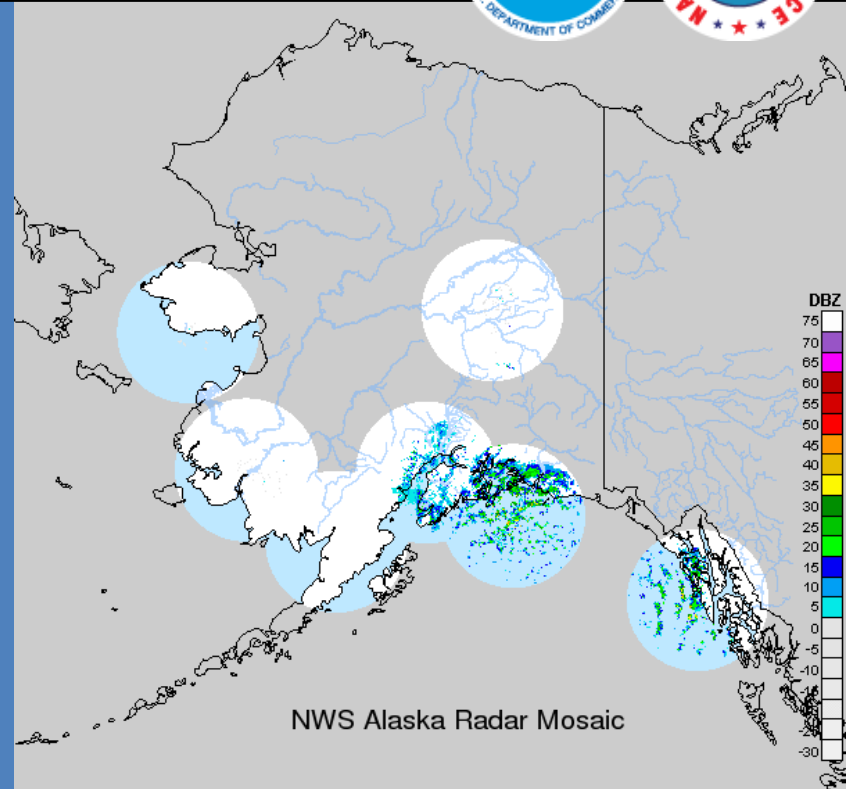
Automated Weather Observing Station (ASOS)





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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Exercise ACES



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



Exercise ACES



- 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



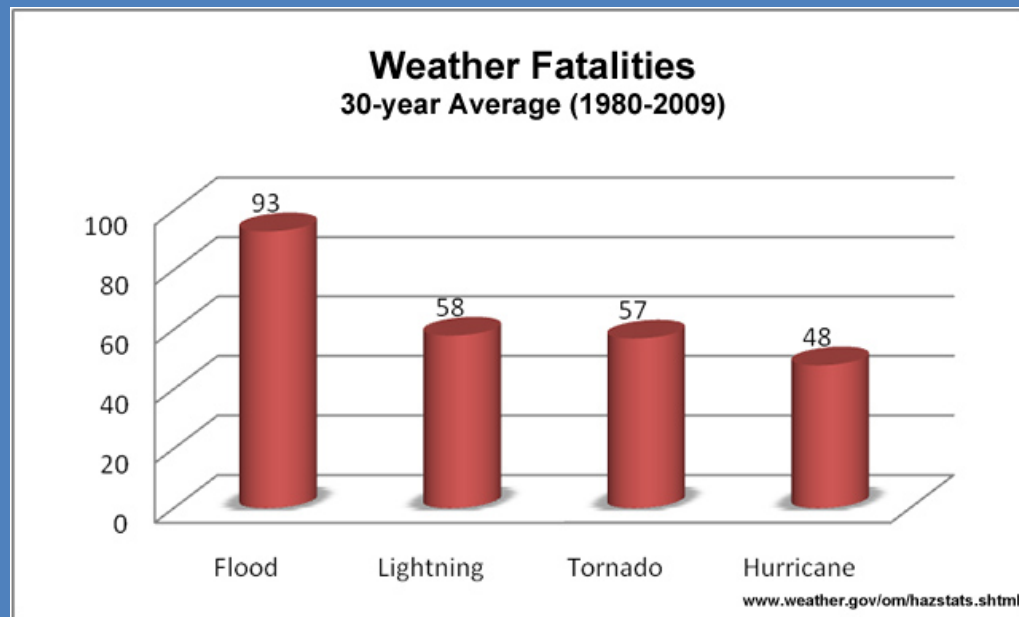
- ACES
 - Awareness
 - Communication
 - Escape Routes
 - Safe Zones
- A **safe zone** or **shelter** is an area in which you are safe during a hazardous condition.
- Your safe zone can be either a location to shelter in place or an area completely away from the hazardous event.
 - Always clearly identify a safe zone in an area in which no harm will come to you.



Why exercise ACES?



YOU DO NOT WANT TO
BECOME A PART OF THIS
STATISTIC!



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What do you report?



- Wind damage
- Flooding
- Thunderstorms
- Lightning
- Hail
- Dense fog - visibility less than $\frac{1}{4}$ mile
- Snowfall
- Time of changeover from snow to rain (or rain to snow)
- Freezing rain/drizzle
- Blowing snow with considerably reduced visibility (Blizzards)



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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)



How to Measure Snowfall



- 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



Meteorologist measuring snowfall



How to Measure Snowfall



- Using your snow board or table, measure and record the snowfall since your last observation.
- Measure to nearest $1/10^{\text{th}}$ 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 *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.



Photo: Kelly Harris

Snow drifts in Saint Paul, Alaska.
Do not average in drifts like this. Take your measurements where the snow is uniform.



How to Determine if Snowfall is Heavy



- Snow can be light, moderate, or heavy.
- Light Snow:
 - 0.4” or less per hour
 - Visibility $\frac{3}{4}$ miles or greater
- Moderate Snow:
 - 0.4” to 1.0” per hour
 - Visibility between $\frac{1}{4}$ and $\frac{3}{4}$ miles.
- Heavy Snow:
 - 1.0” or greater per hour
 - Visibility less than $\frac{1}{4}$ mile.



Plows clearing streets after heavy snow
Juneau, AK



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](https://twitter.com/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.



National Weather Service Juneau, AK



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Freezing Rain & Freezing Drizzle



Freezing Rain & Drizzle: Liquid precipitation that falls and freezes upon contact with the surface (vehicles, buildings, trees, pavement, etc.).



Freezing drizzle on a vehicle in Mendenhall Valley



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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?



Photo: Neil Stuart (NWS Albany, NY)



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Sleet & Sleet Reporting



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?



What is Flooding?



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.



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Flooding



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



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Glacier Dam Releases & Flooding



- A glacier dammed lake forms when water collects behind, under or within glaciers.
 - When the “lake” releases it can cause significant flooding.

July 2011:



Sept 2006:



Floods at Mendenhall Campground



Flash 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

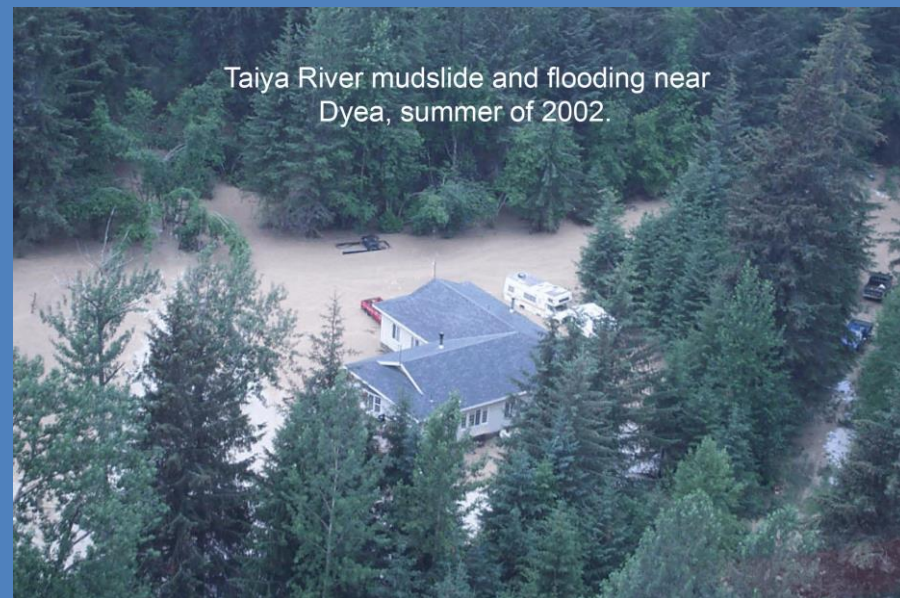


Flooding: What to Report



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, flood waters impacting homes and builds, bridge collapsed, landslide occurrence, etc.
 - Could be photo of high water on known object, geotagged photo of more general flooding.
- Depth of water
 - If it is safe/possible to measure
- Flood safety- [“Turn around don’t drown”](#)



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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





Wind Speed Estimation

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

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.



Severe Weather/Thunderstorms



While rare in Alaska, especially Southeast Alaska, severe thunderstorms can occur.

- Hail, Strong Wind Gusts, Lightning, Funnel Clouds, and Tornadoes are all possible



Supercell Thunderstorm Over New Mexico
Photo: Jake Byrd



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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



Hail



- 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.



Pea Size Hail at NWS Juneau



Funnel Clouds



Funnel Cloud:

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



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Tornadoes

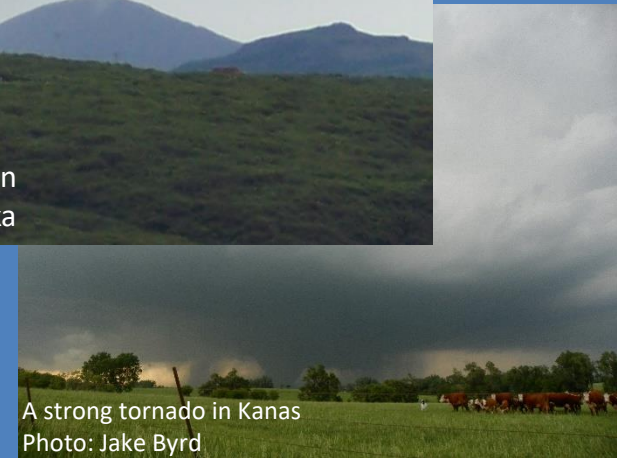


Tornado:

- 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



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Rain Shafts



Do not confuse a rain shaft with a tornado. They can deceive you especially at further distances.



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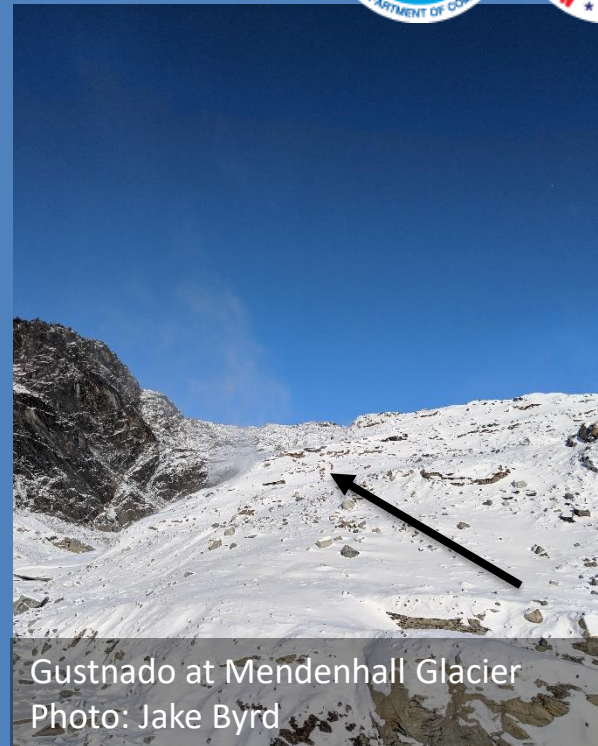


Gustnadoes



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



Waterspouts

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.
 - Tornadic waterspouts are much rarer.
- Please report a waterspout to us if you see one.



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

Photograph by Lance Glover

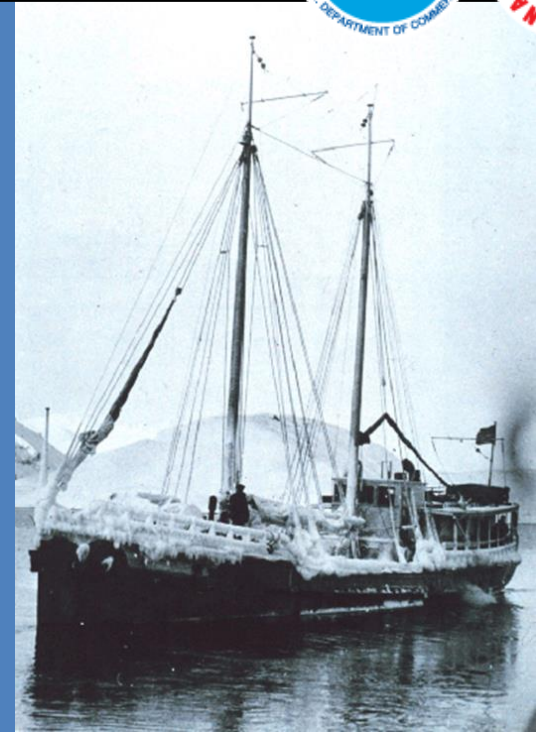


Marine Weather Spotting



What should you report?

- **Wind (Speed & Direction)**
- **Wave Conditions**
 - Wave Height and Swell
- **Freezing Spray & Accumulations**
- **Dense Fog**
- **Any of the previously mentioned conditions from this presentation**



Freezing Spray Accumulation



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How do I report winds and waves without fancy equipment?

The Beaufort Scale (Note: it is best over open water...within the inner channels a good rule of thumb is 1ft. of wave = 5kts of wind i.e. 5 ft .sea is 25 kts of wind)

Beaufort #	Description	Wind Speed (kts)	Wave Height (ft.)	Sea Conditions
0	Calm	< 1	0	Sea like a mirror
1	Light Air	1-3	0-1	Ripple with appearance of scales are formed without foam crests.
2	Light Breeze	4-6	1-2	Small wavelets still short but more pronounced; crests have a glassy appearance but do not break.
3	Gentle Breeze	7-10	2-3.5	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.
4	Moderate Breeze	11-16	3..5-6	Small waves becoming longer; fairly frequent white horses.
5	Fresh Breeze	17-21	6-9	Moderate waves taking a more pronounced long form; many white horses are formed; chance of some spray.
6	Strong Breeze	22-27	9-13	Large waves begin to form; the white foam crests are more extensive everywhere; probably some spray.
7	Near Gale	28-33	13-19	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins to be seen.
8	Gale	34-40	18-25	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind.
9	Strong Gale	41-47	25-29	High waves; dense streaks of foam along the direction of the wind; sea begins to roll; spray affects visibility.
10	Storm	48-55	30-36	Very high waves with long overhanging crests; resulting foam in great patches is blown in dense white streaks along the direction of the wind; on the whole the surface of the sea takes on a white appearance; rolling of the sea becomes heavy; visibility affected.
11	Violent Storm	56-63	36-46	Exceptionally high waves; small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edges of the wave crests are blown into foam; visibility affected.
12	Hurricane Force	> 64	> 46	The air is filled with foam and spray; sea is completely white with driving spray; visibility very seriously affected.



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)



Submitting a Spotter Report via Phone



- Our office is staffed with forecasters 24/7 365 days per year.
- Call us at 1-877-807-8943

1-877-807-8943



Lead Forecaster Nicole Ferrin briefs WFO Juneau Staff during active weather

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Submitting a Spotter Report Online



- weather.gov/ajk/StormReports
- Click “Submit a Weather Report”
 - Select hazard to report from dropdown menu Zoom in on the map and click where your submitting the report for
 - Enter in time/date of observed weather and fill out the appropriate information for the hazard (i.e. how much snow and the onset of snow/ending of snowfall (storm total snow)
 - Zoom in on the map and click where your submitting the report for or put in you address.
 - Review report to be sent, provide spotter ID or contact info if you want. (The contact info **does not** get included in the public report, but we need to know which spotter submitted it.)
 - Select “Send Report”
- During major events, we may call you after you submit the online report, if we need more information.

Storm Reports
Alerting the NWS to local weather

Report Type -> Details -> Location -> Review and Send

Please select a report type

Back Next

Privacy policy for weather reports

Report Type -> Details -> Location -> Review and Send

Time at which you observed this weather
1135 AM AKST

Date on which you observed this weather
03/03/2023

Please provide details (if any) of wind damage (trees down, branches down, etc.):

Only if directly measured, the wind speed (MPH):

These winds happened with a thunderstorm
 These winds did NOT occur with a thunderstorm

Back Next

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Report Type -> Details -> Location -> Review and Send

Here is the information you'll be sending:

Report time: 11:35 AM 03/03/2023
Latitude: 58.1243
Longitude: -134.8242

You are reporting: 46 mph winds (measured).

If you wish to provide a name, spotter ID, or contact info, you can do so here.

If your NWS office has set up custom reporting groups, you can select one here.

Pursuant to 18 U.S.C. § 1001, knowingly and willfully make any materially false, fictitious, or fraudulent statement or entry on this form is a crime punishable by fine and imprisonment.

Back Send Report!

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Report Type -> Details -> Location -> Review and Send

We need the location of your report, but we don't store it permanently, only as a latitude and longitude for the report.

Automatically use your device's location:
Use my device's current location

Search for your address:
Find Address

Or you can click your location on the map:

Back Next

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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



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SOUTHEAST ALASKA SKYWARN TRAINING



Petersburg, AK
Photo: David Levin

Questions?



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