Alaska Weather Spotter Training

Weather Forecast Office

Anchorage

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.

Why are Weather Spotters Needed?

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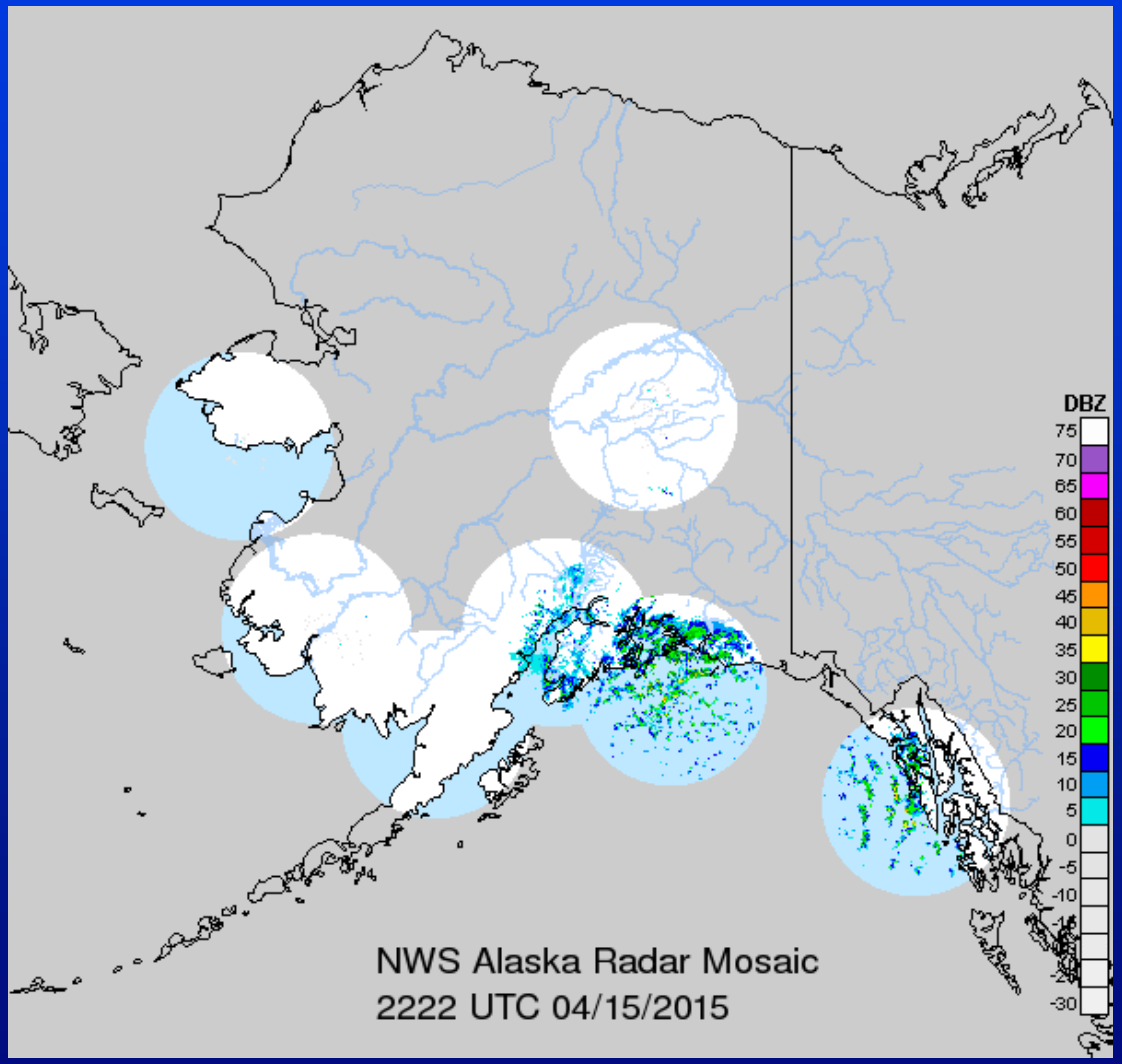
Automated weather observations can't detect everything!

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

Automated Weather Observing Station

Why are Weather Spotters Needed?



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. This includes attempting to walk or drive over obstructions (e.g., flooded roadways and downed power lines) and positioning themselves under objects that have a potential to fall or be blown over due to severe weather.

What Should I Report?

When to Report:

- Wind is damaging structures or property
- Snowfall is heavy
- Snow and blowing snow are causing a Blizzard
- Freezing rain
- Large hail
- Any flooding or flash floods
- Fog has reduced visibility to ½ mile or less

Types of Weather To Report

Snowfall Measurements

- Ideally, you want to measure snow on a “snow board”. A snow board is a clean, preferably white board roughly 2 by 3 feet. Locate the snow board out in the open away from trees, buildings, fences, etc.
- If you cannot make a snowboard, an outside table will also work.

Meteorologist measuring snowfall on our snowboard at the NWS Anchorage Office

How to Measure Snow

- Using your snowboard or outdoor table, measure and record the snowfall since the previous snowfall observation. Measure snow to the tenth of an inch.
- If possible measurements should be taken every 12 hours, and then once the snow has stopped falling. It is helpful to give a grand total for the storm with your final report.
- If your observation is not based on a measurement, it is important to indicate the report is an estimate.

How to Measure Snow

Meteorologist clearing snow table after a measurement

Remember to clear off your snow board after your measurement. This will ensure you accurately start from scratch for the next measurement!

How to Measure Snow

If you are not using a snow board, sample several locations in your yard and average. If winds are causing drifting snow, do not average in the drifts.

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

Photo courtesy of Kelly Harris

How to Report Snow

In your snow report, try to include:

- the time the snow started
- The amount of storm total snowfall measured since the beginning of the storm
- If the snow is still falling. If so, is it light, moderate, or heavy snowfall currently?
- Is the snowfall impacting visibility?
- If the report is a direct measurement or an estimate
- Pictures of the snow measurement if it is a very heavy storm

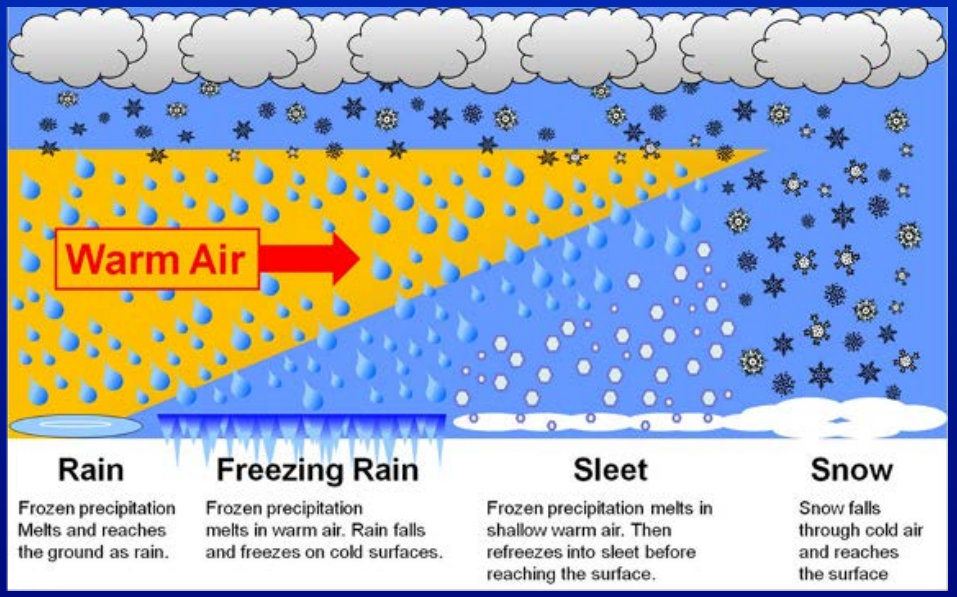
When to Report Snow

- If heavy snow is falling, it's very helpful to give us reports throughout the duration of the storm rather than wait until the storm is over to send in your first report.
- We can always use snowfall reports, even if the snow is not particularly heavy. If it's impacting your community or roads, we'd like to know about it.

Weather.gov/Juneau

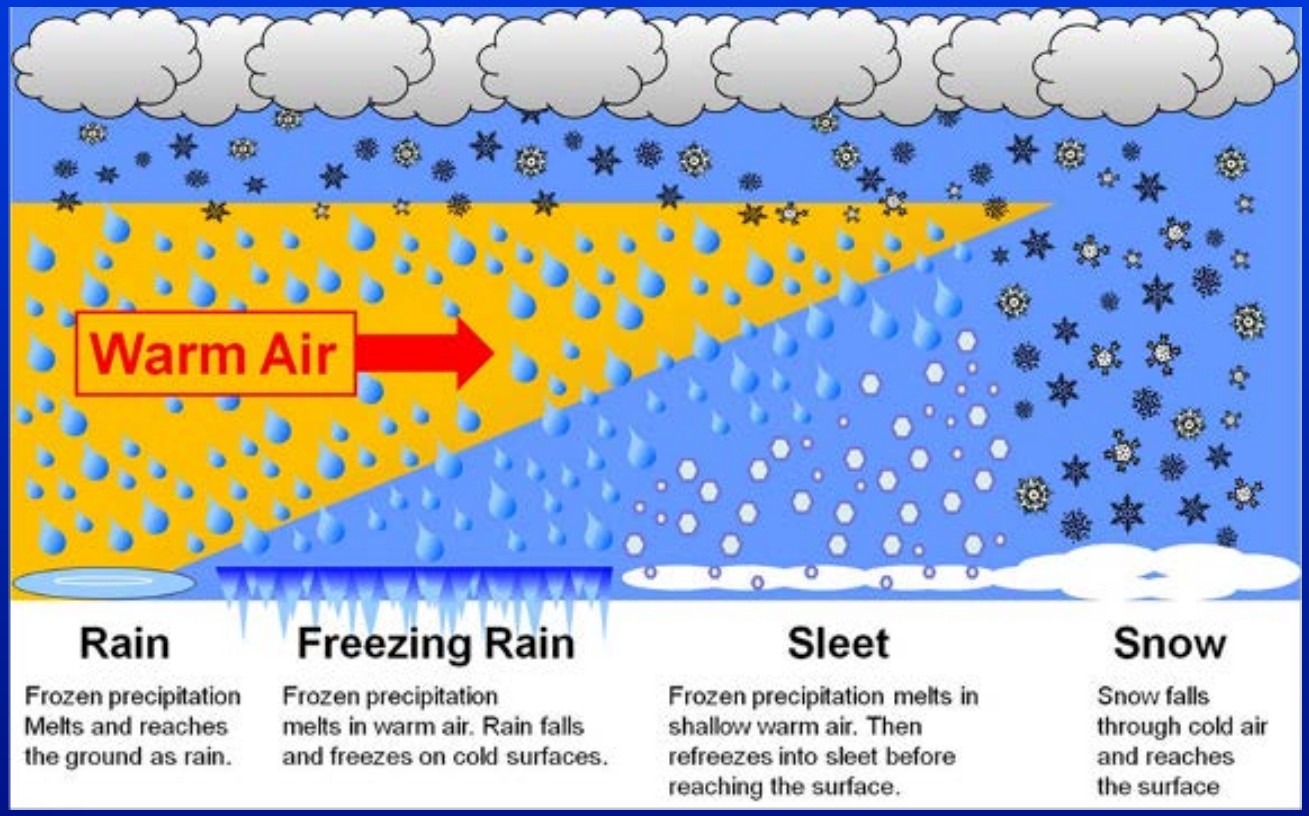
Freezing Rain and Sleet

- Both freezing rain and sleet occur by the same general process: liquid raindrops in a layer of warm air well above the surface fall into a layer of freezing air near the surface. The difference between these two wintry precipitation types depends on the thickness of the layer of freezing air.



Weather.gov/rnk

Freezing Rain and Sleet



How to Report Freezing Rain

In your freezing rain report, try to include:

- The time the freezing rain started
- Any hazardous road conditions resulting from the frozen precipitation
- Any damage caused by the icing, including downed tree branches or power lines
- If possible, an estimate of the ice thickness. You can use a ruler for this and average the ice thickness on a branch

Photos courtesy of Neil Stuart – NWS Albany, NY

Flooding

Flooding

Common causes of flooding in Alaska:

- River Floods
- Ice Jam Flooding
- Snowmelt Flooding
- Heavy Rainfall
- Glacier Dammed Lakes

Mendenhall River flood in 2012. Photo by Heather Bryant/KTOO

Flooding Definition

- **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

Ice Jam Flooding

- Floods can happen any time of year in Alaska
- However, river ice breakup season, which occurs in spring, sees an increase in flooding.

Eagle, Alaska. May 17, 2013
Courtesy Ed Christensen

Snowmelt Flooding

Snowmelt flood in Fairbanks in April, 2009

Glacier Dammed Lakes

Flooded Mendenhall Campground

July 2011:

September 2006:

Weather.gov/Juneau

Water.weather.gov

Flash Flooding Definition

Flash flood:

- A flood usually caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours.
- Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons.
- They can occur within minutes or a few hours of excessive rainfall.
- They can also occur even if no rain has fallen, for instance after a dam has failed, or after a sudden release of water by a debris or ice jam.

Flash Flooding

Flash flooding in Anchorage as a result of heavy rainfall in 2015.
Courtesy ADN

Wind

Wind

- Report high winds, especially if they are damaging trees or property.
- In the report, try to include the location and type of wind damage. This helps us to estimate the wind speeds.

Tree downed in Ketchikan

Estimating Wind Speeds

>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.

Severe Weather

Lightning strikes the hills northwest of the Yukon River.
Photo by Ned Rozell

Severe Thunderstorms

- Although rare, severe thunderstorms do occur in Alaska.
- Cold air funnels, excessive lightning, tornadoes, hail, and gusty winds are all possible.

Thunderstorm near Kwethluk, Alaska. Photo by Tyler Konig

NWS Severe Thunderstorm Criteria

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

* Note that lightning is not a criterion for a severe thunderstorm. While lightning can be deadly and safety precautions should be taken when lightning is in the area, lightning does not need to be reported to the NWS.

Thunderstorms in Alaska

- Can happen anywhere, but interior and southwest Alaska are particularly susceptible.
- The boundaries of mountains, cold/warm air at the edge of the tundra, and the interaction with sea breezes all contribute to thunderstorms in Alaska.

Thunderstorm in Bethel, Alaska. Photo by Kayla Rousey

Hail

HAIL

Report the largest size stone you see

Compare to common objects

Dime/Penny	0.75 inches
Nickel	0.88 inches
Quarter	1.00 inches
Half Dollar	1.25 inches
Ping Pong Ball	1.50 inches
Golf Ball	1.75 inches
Hen Egg	2.00 inches
Tennis Ball	2.50 inches
Baseball	2.75 inches
Tea Cup	3.00 inches
Grapefruit	4.00 inches
Softball	4.50 inches

Tornadoes

- Defined as a violently rotating column of air extending from cloud base to ground

- Exhibit rapid rotation

Weak tornado lifting in Sand Point, Alaska

Funnel Clouds

- A rotating, funnel-shaped cloud extending downward from a thunderstorm base.
- Exhibit rapid rotation
- Does not reach the ground

Funnel cloud on the Kenai Peninsula in July, 2005

Photo courtesy of Julia Ruthford, NWS Anchorage

Funnel Clouds

Scud Clouds

Scud clouds are small, ragged, low cloud fragments that are unattached to a larger cloud base.

A scud cloud is the lower hanging cloud, located just below the yellow text. It could easily be mistaken for a tornado. Study the cloud feature to make sure it is what you think it is. Photo courtesy of NSSL Photo library.

Rain Shafts

A Rain Shaft is a streak of precipitation falling from a cloud and reaching the ground.

Rain shafts can be very deceiving and can sometimes look like tornadoes. Rain shafts will usually change opaqueness as the precipitation increases or decreases.

Rain Shaft

Rain Shaft over Anchorage
2014

Smoke

A smokestack or fire can produce a plume of smoke that sometimes resembles a tornado, especially from a distance. Unlike a tornado, the smoke will not be rotating.

Gustnadoes

Photo Courtesy of Curtis Walker

Waterspouts

Waterspout over the Turnagain Arm, July 20, 2014

How to Report

How to Report

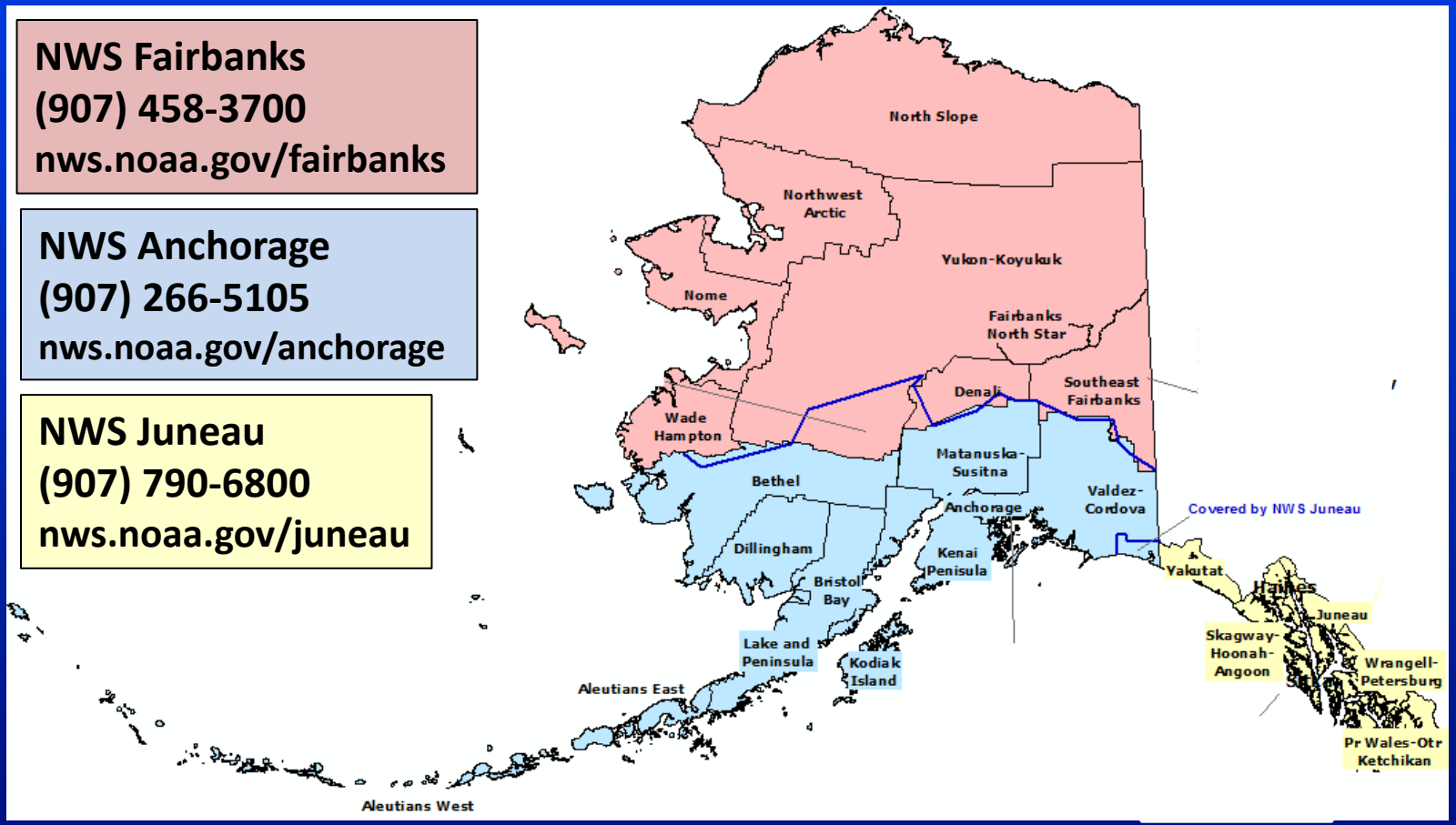
- When reporting to the NWS, there are seven components:
  - your name
  - approximate location of hazardous weather
  - type of hazardous weather
  - time hazardous weather started
  - duration of hazardous weather

Find Your Local Office

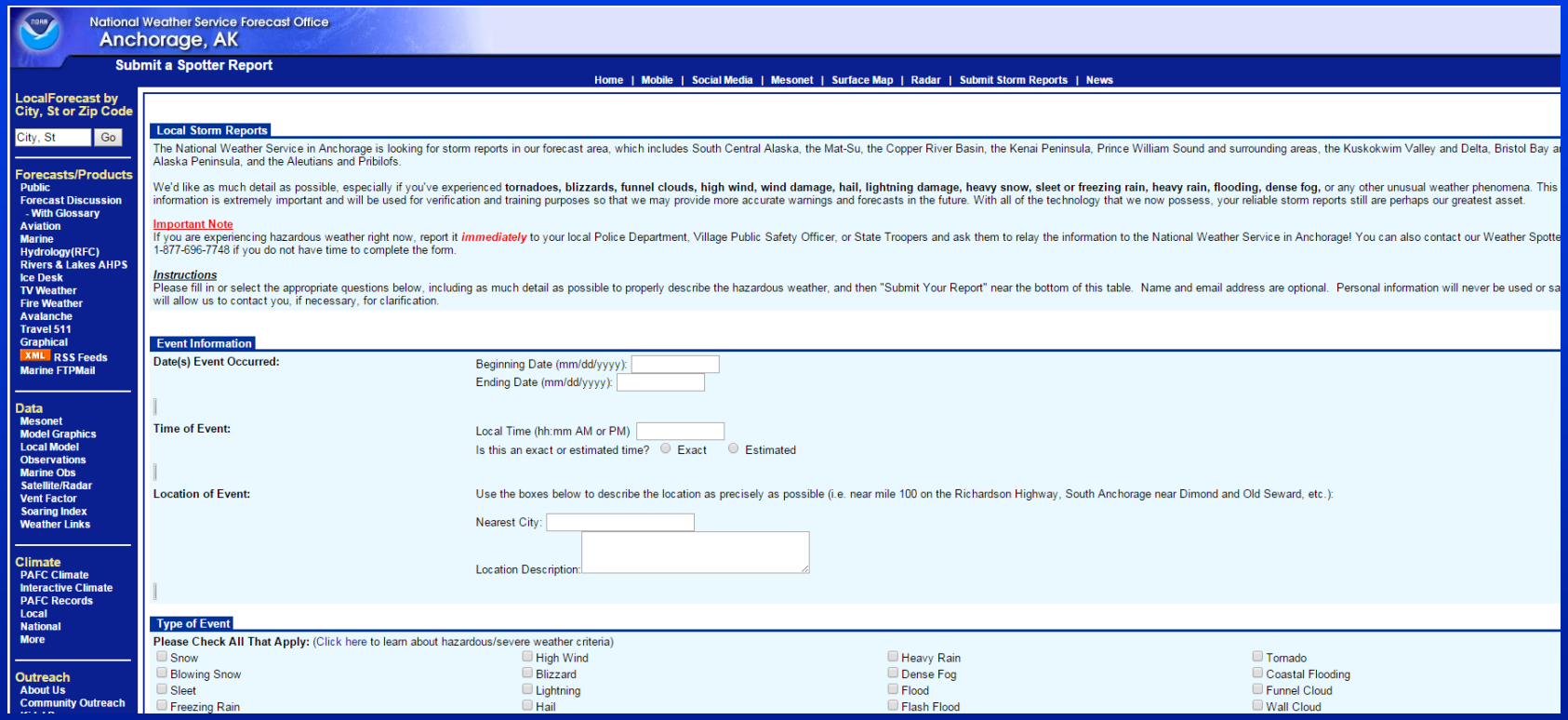
NWS Fairbanks
(907) 458-3700
nws.noaa.gov/fairbanks

NWS Anchorage
(907) 266-5105
nws.noaa.gov/anchorage

NWS Juneau
(907) 790-6800
nws.noaa.gov/juneau



Submitting a Report Online



NWS Fairbanks: http://pafg.arh.noaa.gov/spotter/spotterReport.php

NWS Anchorage: http://pafc.arh.noaa.gov/spotter/report.php

NWS Juneau: http://pajk.arh.noaa.gov/spotter/spotterReport.php

Thank you!!

Photo Courtesy of NASA/Warren Gammel