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National Weather Service Aberdeen

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2016 Fall Edition

NATIONAL WEATHER SERVICE ABERDEEN, SD

Severe Season Recap

by Kelly Serr

Our summer season was very active. We issued an above average number of severe thunderstorms warnings, 291 to be exact. The tornado warnings issued were right around what we would expect in any given year, with the season total ending at 16 tornado warnings.

We kicked off May with a rather impressive landspout north of Herreid, SD. However, June 14th was really the busiest day in terms of tornado warnings. A total of 6 tornadoes were confirmed over parts of Day, Roberts & Grant County in SD as well as Big Stone & Traverse in MN. Most of the tornadoes were brief, weak & touched down in open fields. However, one tornado did form right over Bitter Lake in Day County & the tornado with the longest track began near the Grant/Roberts County line & remained on the ground for just over 5 miles. This tornado did result in minor crop damage as well as damage to trees & fence posts.

The 4th of July brought more than fireworks to northern Brown County. Straight-line winds toppled several campers at Elm Lake.

Several rounds of storms impacted different areas on July 16th. When all was said & done many had reported large hail, damaging straight-line winds & even a tornado. The tornado touchdown south of Clark was brief.

Straight-line winds did significant damage to a machine shed near Bath & another storm rolled several campers at Lake Poinsett. There were minor injuries.

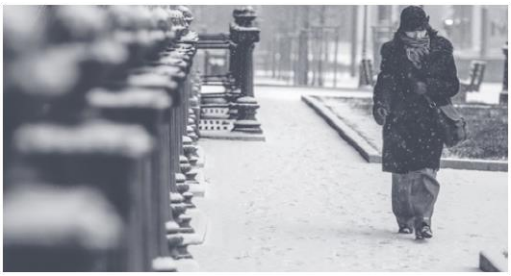
Severe thunderstorms produced large hail & winds of 80-90 mph (higher in some areas!) across parts of Brown & Day counties late on August 1st. The Andover & Bristol areas took the brunt of it. Wind-driven hail resulted in crop & siding damage. There was also significant structural damage to several farmstead buildings in the area.

Another round of severe storms occurred August 9th & 10th. While 60+ mph winds were reported in numerous locations across northern SD, the strongest winds were experienced in Marshall & Edmunds Counties.

To top it all off, Watertown went from drought to flooding in a matter of minutes on August 11th. A total of 3.90" of rain was recorded at the Watertown airport & 1.29" of THAT amount fell within a 12 minute period from 11:10-11:22 pm.

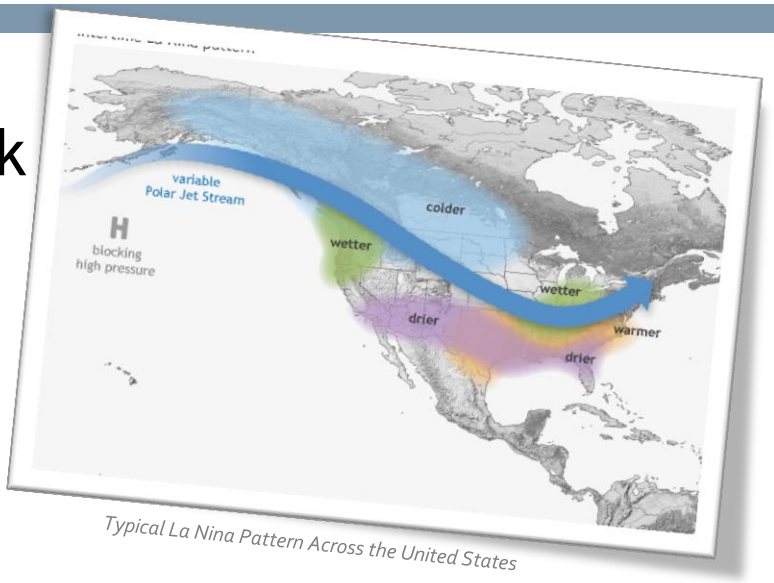
THANK YOU to everyone who sent in reports & photos this summer. Now, dust off the snow boots & snow sticks, we'll need your help this winter as well!

IN THIS ISSUE



2016-2017 Winter Outlook

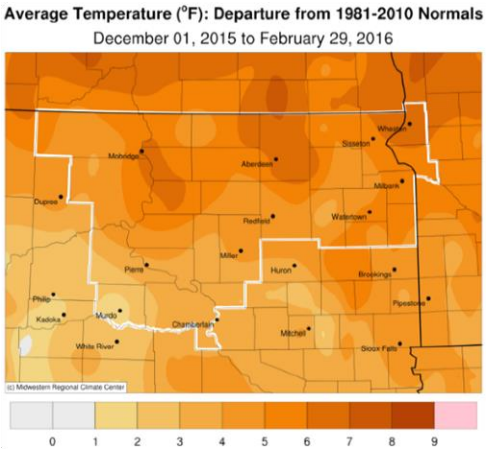
by Scott Doering



Typical La Nina Pattern Across the United States

What Happened Last Winter?

Winter outlooks with a climate signal like a strong El Nino/La Nina often leads to higher forecast confidence. Last winter, 2015-2016, was one of those high confidence events. We had a very strong El Nino which is a great signal for above normal temperatures in the Dakotas.



Last year's winter temperature departure from normal. The entire area was above normal.

Winter Outlook for 2016-2017

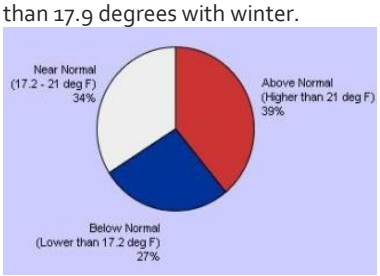
A weak and potentially short-lived La Nina is the most likely outcome for this winter with about a 70-75% chance of development through the fall-winter. However, with a weak La-Nina, the forecast confidence is lower than compared to last winter.

The Dakotas usually experience below normal temperatures during the winter months of December – February. While these are typical impacts from a La Nina, not all of these are associated with every La Nina event. Since 1950, there have been 11 weak La Nina winters. Of the 11, eight brought below normal temperatures to Aberdeen's forecast area. Only one weak La Nina brought above normal temperatures, and that occurred during our very warm winter of 2011-2012. Of the 11 weak La Nina, about a third to a half brought above normal snowfall to central and eastern South Dakota. Slightly more than half produced above normal snowfall in north central South Dakota.

Please note, other factors play a crucial role during the winter include the Arctic Oscillation, which influences the number of arctic air masses that penetrate into the South and create nor'easters on the East Coast, the Madden-Julian Oscillation, which can affect the number of heavy rain events in the Pacific Northwest.

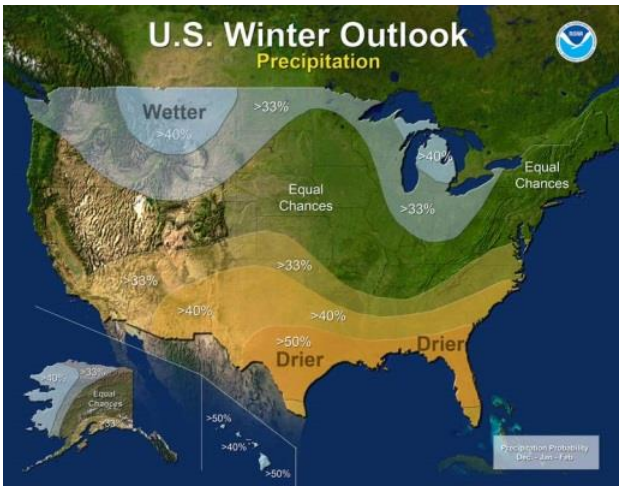
The Climate Prediction Center is favoring slightly below normal temperatures for most of South Dakota and all of North Dakota and Minnesota. What does the >33% for below normal look like? Well, we can downscale the outlook to individual locations.

Using Aberdeen in the example below, you can see there is only a 37% chance for below normal temperatures. Or another way of saying it is that there is a 37% chance for the average temperature in Aberdeen from December through February of being colder than 13.1 degrees. There is a 34% chance the winter for Aberdeen will be between 13.1 and 17.9 degrees or near normal. Lastly, there is a 29% chance the average temperature will be warmer than 17.9 degrees with winter.



The Climate Prediction Center is showing equal chances for precipitation for most of South Dakota and Minnesota. Equal chances mean there is no clear signal for above or below average precipitation.

NOAA U.S. 2016-2017 Winter Outlook for Temperatures



NOAA U.S. 2016-2017 Winter Outlook for Precipitation

MORE INFORMATION

Would you like the three category temperature outlook downscaled for you location? Head on over to this webpage: https://goo.gl/Evpmzu

SPOTLIGHT: HISTORIC '66 BLIZZARD

Jamestown, ND, NOAA's National Weather Service (NWS) Collection, Photographer Mr. Bill Koch

March 2-5, 1966 Blizzard

50 years ago, a large winter storm system slowly tracked across South Dakota, starting the 2nd and ending on the 5th.The largest snow depth measured was 39 inches at Bowdle. Strong winds of 40-55 mph, with gusts over 70 mph, caused blowing snow which reduced visibility to zero in some areas. Snow drifts of 30 ft were reported in sheltered areas, while open fields lay nearly bare.

Livestock losses were heavy, including 50,000 cattle, 46,000 sheep, and 1,800 hogs. The largest livestock losses took place in the central and north-central part of the state.

The blizzard was rated as one of the most severe the state of South Dakota had ever seen. Amongst the anguish, and despite all the heartbreak and devastation, the true character and hardiness of the prairie people still shone brightly. The accounts of neighbors helping neighbors, families opening their homes to stranded strangers, and first responders and communities working together to rescue their residents were vast and widespread.

WEATHER FACTS

-58 F

Coldest Temperature ever recorded in SD, 6 miles SE of McIntosh, February 17, 1936

52 in

Greatest 24-hour snowfall ever recorded in SD, Lead, SD, March 14, 1973

FOR MORE INFORMATION

For important forecasts this winter visit:
www.weather.gov/abr
www.facebook.com/NWSAberdeen
www.twitter.com/NWSAberdeen

Winter Weather Preparedness

There is no better time than now to run through your winter preparedness checklists!

At Home and Work

Your primary concerns at home or work during a winter storm are loss of heat, power and telephone service and a shortage of supplies if storm conditions continue for more than a day. In either place, you should have available:

- Flashlight and extra batteries
- Battery-powered NOAA Weather Radio and portable radio to receive emergency information
- Extra food and water such as dried fruit, nuts and granola bars, and other food requiring no cooking or refrigeration.
- Extra prescription medicine
- Baby items such as diapers and formula
- First-aid supplies
- Heating fuel: refuel before you are empty; fuel carriers may not reach you for days after a winter storm
- Emergency heat source: fireplace, wood stove or space heater, properly ventilated to prevent a fire
- Fire extinguisher, smoke alarm; test smoke alarms once a month to ensure they work properly
- Extra pet food and warm shelter for pets
- Review generator safety. You should never run a generator in an enclosed space
- Make sure your carbon dioxide detector is working detector and that the outside vent is clear of leaves and debris. During or after the storm, make sure it is cleared of snow.
- Home fires are common each winter when trying to stay warm. Review ways to keep your home and loved ones safe.

In Vehicles

Each year, on average, more than 6,000 people are killed and more than 480,000 are injured due to weather-related vehicle crashes. If you need to drive in snow or cold conditions, TAKE IT SLOW! Black ice can be difficult to see. If the temperature is near freezing, drive like you're on ice--you may be!

Before you leave the house, especially before a longer trip in winter, make sure all fluid levels are full and ensure that the lights, heater, and windshield wipers in proper condition. Keep your gas tank near full to avoid ice in the tank and fuel lines. Avoid traveling alone. Let someone know your timetable and primary and alternate routes. Then call 511 for the latest traffic and road incidents, including construction and weather conditions and restrictions. Call before you leave, it might change your plans! Fully check and winterize your vehicle before the winter season begins. Carry a Winter Storm Survival Kit that includes the following:

- Mobile phone, charger, batteries
- Blankets/sleeping bags
- Flashlight with extra batteries
- First aid kit
- Knife

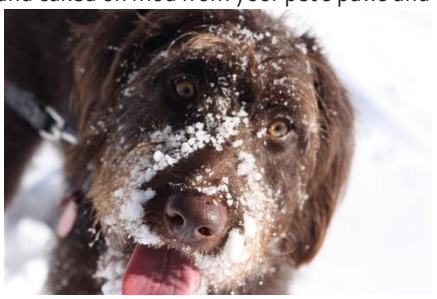
Winter Preparedness Continued…

- ☐ High-calorie, non-perishable food
- ☐ Extra clothing to keep dry
- ☐ Large empty can to use as emergency toilet, tissues and paper towels for sanitary purposes
- ☐ Small can and waterproof matches to melt snow for drinking water
- ☐ Sack of sand or cat litter for traction
- ☐ Shovel
- ☐ Windshield scraper and brush
- ☐ Tool kit
- ☐ Tow rope
- ☐ Battery booster cables
- ☐ Water container
- ☐ Candle and matches to provide light and in an emergency, lifesaving heat.
- ☐ Compass and road maps, don't depend on mobile devices with limited battery life

Don't Forget About the Pets!

Winter can be a particularly difficult time for pets. Give your pet a safer, healthier weather season by following these tips:

- ☐ A temperature of 10°F or below is too cold for any pet to tolerate.
- ☐ Provide outdoor dogs or cats with a dry, insulated pet house or shelter out of the wind. Staying warm demands extra calories, so increase your pet's food intake, particularly protein.
- ☐ Remove ice, salt, and caked on mud from your pet's paws and coat right away. Contact your veterinarian immediately if you suspect your pet has frostbite. Frostbitten skin may turn reddish, white, or gray, and it may be scaly or sloughing.



- ☐ Pets like the smell and taste of antifreeze, but even a small amount can kill them. Thoroughly clean up spills at once. Tightly close containers and store them where pets cannot get to them
- ☐ Always have fresh, clean water available, but don't use metal dishes outside, your pet's tongue could stick to the frozen metal

FOR MORE INFORMATION

Visit the National Weather Service Winter Preparedness Page at http://www.nws.noaa.gov/os/winter/

"Range of Possibilities" - Snow Forecasting Webpage

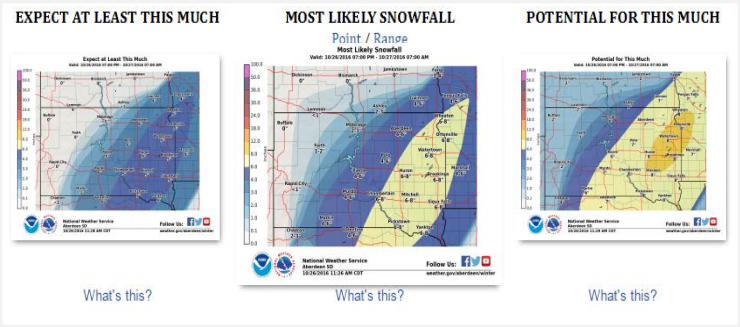
What is it?

- An improved way to forecast snow
- Range of possibilities, not just the current expectation
- Combines NWS forecaster skill & 70 U.S. & international weather models
- Gives *range of possibilities* point-by-point across the region

3 Different Ways to View the Forecast

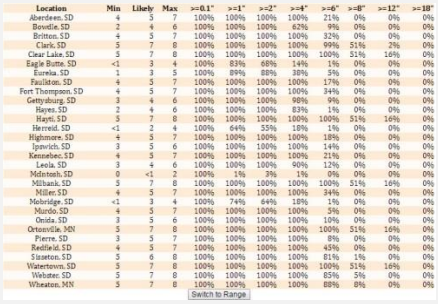
1) Minimum/Most Likely/Maximum

These areal maps show not only our current expectation (most-likely), but also the range of possibilities from the least amount, to maximum amounts for the storm.



2) Localized City Listing

This forecast shows the range of possibilities for individual towns and cities near you



Location	Min	Likely	Max	>=0.1"	>=1"	>=2"	>=4"	>=6"	>=8"	>=12"	>=18"
Aberdeen, SD	4	5	7	100%	100%	100%	100%	21%	0%	0%	0%
Bowdle, SD	2	4	6	100%	100%	100%	62%	9%	0%	0%	0%
Britton, SD	4	5	7	100%	100%	100%	32%	0%	0%	0%	0%
Clark, SD	5	7	8	100%	100%	100%	100%	99%	51%	2%	0%
Clear Lake, SD	5	7	8	100%	100%	100%	100%	100%	51%	16%	0%
Eagle Butte, SD	<1	3	4	100%	83%	68%	14%	1%	0%	0%	0%
Eureka, SD	1	3	5	100%	89%	88%	38%	5%	0%	0%	0%
Faulkton, SD	4	5	7	100%	100%	100%	100%	17%	0%	0%	0%
Fort Thompson, SD	4	5	7	100%	100%	100%	100%	34%	0%	0%	0%
Gettysburg, SD	3	4	6	100%	100%	100%	98%	9%	0%	0%	0%
Hayes, SD	2	4	6	100%	100%	100%	83%	1%	0%	0%	0%
Hayti, SD	5	7	8	100%	100%	100%	100%	51%	16%	0%	0%
Herreid, SD	<1	2	4	100%	64%	55%	18%	1%	0%	0%	0%
Highmore, SD	4	5	7	100%	100%	100%	100%	18%	0%	0%	0%
Ipswich, SD	3	5	6	100%	100%	100%	100%	14%	0%	0%	0%
Kennebec, SD	4	5	7	100%	100%	100%	100%	21%	0%	0%	0%
Leola, SD	3	4	6	100%	100%	100%	90%	12%	0%	0%	0%
Milnotah, SD	0	<1	2	100%	1%	3%	1%	0%	0%	0%	0%
Milbank, SD	5	7	8	100%	100%	100%	100%	100%	51%	16%	0%
Miller, SD	4	5	7	100%	100%	100%	100%	34%	0%	0%	0%
Mobridge, SD	<1	3	4	100%	74%	64%	18%	1%	0%	0%	0%
Murdo, SD	4	5	7	100%	100%	100%	100%	5%	0%	0%	0%
Onida, SD	3	5	6	100%	100%	100%	100%	10%	0%	0%	0%
Ortonville, MN	5	7	8	100%	100%	100%	100%	100%	51%	16%	0%
Pierre, SD	3	5	7	100%	100%	100%	100%	8%	0%	0%	0%
Redfield, SD	4	5	7	100%	100%	100%	100%	45%	0%	0%	0%
Sisseton, SD	5	6	8	100%	100%	100%	100%	81%	1%	0%	0%
Watertown, SD	5	7	8	100%	100%	100%	100%	100%	51%	16%	0%
Webster, SD	5	7	8	100%	100%	100%	100%	85%	5%	0%	0%
Wheaton, MN	5	7	8	100%	100%	100%	100%	88%	8%	0%	0%

Switch to Range

3) Chance of Exceeding

These maps show the percentage chance of exceeding a specific snowfall amount. Options are: 0.1", 1", 2", 4", 6", 8", 12", 18".

Where Can I Find This Forecast?

- www.weather.gov/abr/winter

NEW AROUND TOWN

New NWS Aberdeen Employees

Three new employees have joined the NWS Aberdeen team in 2016. Steve arrived in late January and took over the science and operations officer duties. His job is to make sure that office staff is properly trained to issue the best forecasts and warnings possible. He also works on research projects both locally and with meteorologists from other offices or even researchers from other fields.

Kari arrived in late March and is our newest forecaster. She'll be rotating through the shifts, producing forecasts and issuing warnings. Kari is also a trained IMET (incident meteorologist). That means that Kari will occasionally be deployed to large fires across the United States. You can read more about this unique aspect of the job in her bio below.

James has only been with us since late July, but has hit the ground running. James will be headed to Norman, OK soon to go through an intense radar operations course. All National Weather Service forecasters attend this training to learn how to interpret radar data and issue meteorologically sound warnings. In the meantime James is becoming an expert in launching weather balloons. Read on for more information about our newest employees!

Steve Fleegel

Steve grew up in Willmar, MN and became interested in the weather after a tornado touched down three blocks from his house the day after his 6th birthday. He attended the University of North Dakota and received a degree in Atmospheric Science. After college, Steve worked a variety of weather related jobs, including weather modification in North Dakota, meteorology instructor at West Virginia State University, and the Associate State Climatologist for West Virginia. Steve began his career in the National Weather Service in Green Bay, WI before spending 8 years, and experiencing 1555" of snow, in Marquette, MI. He is excited to be back in Vikings/Twins territory and looking forward to a significant decrease in snowfall this winter.

Kari Fleegel

Kari joined the Aberdeen team at the end of March, moving from Marquette, Michigan, where she had worked over the last 10 years. She has been in the National Weather Service for over 15 years, with previous posts of Charleston, West Virginia and Great Falls, Montana. An Incident Meteorologist for nearly 15 years, Kari has supported emergency personnel all across the country with site specific weather forecasts. This includes assisting fire crews at several wildland fires, Emergency Managers, and those working on oil spill recovery efforts in the Gulf of Mexico and Lower Michigan, the 2004 Republican Convention in New York, Bridge Day in West Virginia, and even the Australia Bureau of Meteorology in Tasmania, Australia.

Kari is originally from the Red River Valley region, and received her Bachelor's degree in Atmospheric Sciences from the University of North Dakota in 2001. While she's excited to be closer to home, she's less enthused about the colder winters.

James Telken

James Telken is originally from Jamestown, North Dakota and graduated from Jamestown High School in 2003. In February of 2006 he left for the Marine Corps where he served four years of active duty as a Heavy Equipment Operator. The equipment he operated included tractor forklifts, road graders, bulldozers, cranes, and ISO container movers. After the end of active service in January of 2010, James immediately began attending the University of North Dakota. During his senior year of 2014 he was a student volunteer at the National Weather Service in Grand Forks. In May of 2014 he graduated from UND with Cum Laude honors in the field of Atmospheric Sciences and minors in History and Mathematics. The following summer, James took part in the North Dakota Cloud Modification Project (NDCMP) 2015 as a radar meteorologist in Stanley, ND. Post project, they sent him to Bowman, North Dakota to assist in moving a WSR-74C radar from their old airport to their new airport. James completed half of the NDCMP 2016 before moving to Aberdeen, South Dakota as an Intern Meteorologist for the National Weather Service.

Steve Fleegel
Science and Operations Officer

Kari Fleegel
Meterologist

James Telken
Intern Meteorologist

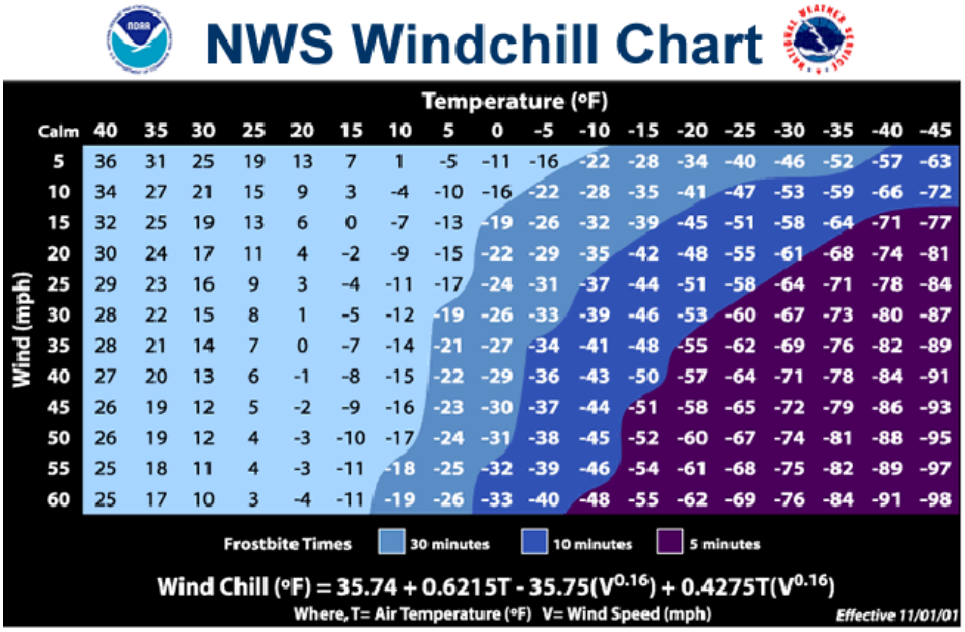
Wind Chill

What is Wind Chill?

The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. Therefore, the wind makes it FEEL much colder. If the temperature is 0°F and the wind is blowing at 15 mph, the wind chill is -19°F. At this wind chill temperature, exposed skin can freeze in 30 minutes.

What is Frost Bite?

You have frostbite when your body tissue freezes. The most susceptible parts of the body are fingers, toes, ear lobes, or the tip of the nose. Symptoms include a loss of feeling in the extremity and a white or pale appearance. Get medical attention immediately for frostbite. The area should be SLOWLY rewarmed using warm, not hot water.



Skyscanner National Weather Service Aberdeen

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> Winter is the time for comfort, for good food and warmth, for the touch of a friendly hand and for a talk beside the fire: it is the time for home.
>
> ~Edith Sitwell

[Addressee]
[Street Address]
[City, ST ZIP Code]