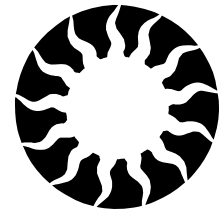
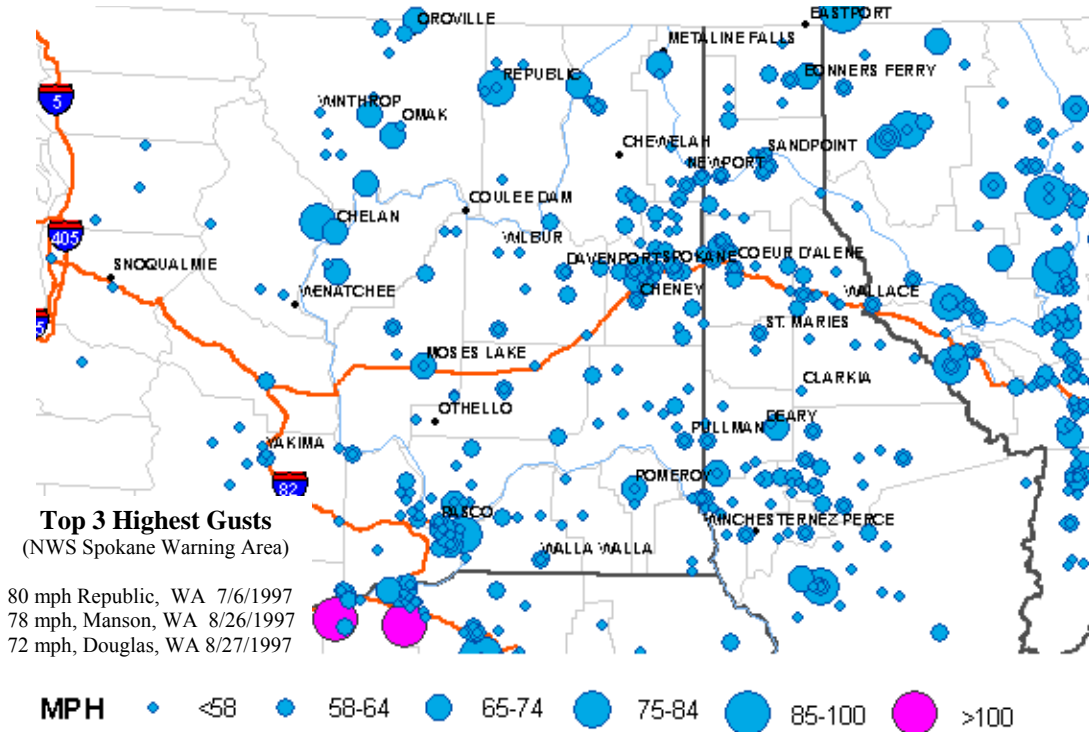


The Weather Watcher of the Inland Northwest

www.weather.gov/Spokane

Damaging Thunderstorm Wind Reports, 1970-2008

Since 1970, nearly 750 reports of damaging thunderstorm winds have been documented across the Inland Northwest. The graphic below includes both measured and estimated wind gusts from official sources, including weather spotters. Your reports make a difference!



INSIDE THIS ISSUE:

Winter Review	2-3
Spring Outlook	3
Coop Corner	4
Staff News	4
Your Data Matters	4

Editor's Notes

Thunderstorm season is here! Remember to play it safe; when the skies rumble and lightning strikes.

Mark your calendars

- **All Hazards Awareness Month** is April.
- **Severe Weather and Wildfire Awareness Week** is May 3-9
- **National Lightning Awareness Week** is May 21-27.

We have made a change to the newsletter distribution. Since each newsletter issue is available online, we have limited mailing out paper copies. If you still would like a paper copy, please contact us and we will keep you on the mailing list.

For any questions or comments on the newsletter, please contact Robin or Kerry at (509) 244-0110 extension 223 or email nws.spokane@noaa.gov.

The main purpose of this publication is to keep our readers informed about our services and programs, and recognize those who help us with our mission, including weather spotters, observers, media, and emergency management.

All articles are written by the NWS staff. A special thanks to Ron Miller, Kerry Jones, John Livingston, Royce Fontenot, and Robert Bonner for their help on the included articles.

Want to report precipitation? Check out CoCoRaHS at <http://www.cocorahs.org>

Spring Flood Outlook

Despite our heavy snow early this winter, it's been fairly dry during the last two months and the Inland Northwest is actually looking at a low runoff season! Since these snowstorms, there have been very few storms to help build up the mountain snowpack.

Another factor that favors a low runoff year is the air temperature was very cold during these big snow storms and this produced 'dry' snow with little moisture. The amount of moisture in the snow, also known as snow water equivalent (SWE), is one of the key factors that hydrologists look at in determining how much water will be available for runoff. As of March 1st most river basins in the Inland Northwest and British Columbia are less than 80% of their normal SWE values!

Even though the SWE values are low, there is a risk of spring flooding. This will largely depend on the weather conditions at the time the snow begins to melt. So stay tuned to current forecast and remember: Turn Around...Don't Drown! ☀ Royce Fontenot

Spokane's Snow Record

If you remember in 2008, the Spokane airport fell short by less than an inch in breaking the all-time snow record. Well, this snow season we are back in the race again.

Since March 1st, the Spokane Airport picked up another 4.7" of snow. This places the winter of 08-09 tied for 3rd on the list of snowiest winter seasons. But remember, we may not be done with the snow yet. Here are the top 5 snowiest seasons. ☀ Robin Fox

1. 1949-50	93.5"
2. 2007-08	92.6"
3. 2008-09/1974-75	89.0"
4. 1992-93	87.3"
5. 1955-56	83.2"

The Wild and Snowy Winter of 2008/09

The winter of 2008/09 will long be remembered by many residents of the Inland Northwest. But remember, one spot's stormy winter is another spot's drought. So while snow was abundant for folks in Spokane and surrounding areas, others in Wenatchee and the east slopes of the Cascades actually had below normal snowfall.

In **December**, the first 11 days were rather mild and snow-free. In fact, some were beginning to wonder if we would see a winter at all after a mild November. High temperatures were consistently above freezing, reaching 44° in Spokane on the 10th. Then the weather pattern changed dramatically on the 11th as very cold arctic air moved into the western US. The arctic front brought up to a foot of new snow and frigid temperatures north and east of Spokane.

On the 17th and 18th, the first in the series of big and long remembered snowstorms began. Snow began midday on the 17th and by 4pm there was already 4-8" on the ground. Snow continued overnight and through much of the day on the 18th. The 24-hour snowfall record at Spokane was 13.0" set back in January of 1950. That record was shattered with 19.4" of snow at Spokane Airport. The 2-day storm total was more than 23", an incredible amount for the Spokane metro area. Some outlying areas in north Idaho picked up 3 feet of snow. The heavy snow was actually confined to a rather small area, with double-digit snowfall reported at locations between Chewelah south to Colfax.

A short two day break allowed low temperatures on the morning of the 20th to drop below zero in many locations. Spokane Airport reached -18°F while other valley locations in North Central Washington reached temperatures as cold as -25°F. Heavy snow moved in on the morning of Sunday the 21st and continued until midday Monday. Spokane officially measured 8.9" from this storm. Then a strong storm moved in on Christmas Eve. Heavy snow started in Spokane in the afternoon and ended during the night. Another 6.1" of snow fell in Spokane. To the west, Davenport picked up 8" and up north, Sandpoint recorded nearly 9" of snow.

Even after Christmas, light snow continued to fall. One to 3 inches of snow fell each of the next 3 days before the snow actually changed to light rain in some locations on the 28th. In some of the Cascade valleys, up to 12" of snow fell on the 27th. Snow crews worked nearly continuously to clear the snow. In downtown Spokane, there just wasn't enough places to put the snow. Multi-laned streets lost a lane due to snow berms, leading to traffic jams.

When December was all said and done, numerous snowfall records were broken. In addition to the all-time 24-hour snowfall record, December 2008 is now the snowiest month ever in Spokane! Other cities in the U.S. also had their snowiest December ever, including Boise ID, Madison WI, and Bismarck ND.

The snowy weather pattern continued into early **January**. A couple of storms quickly hit the region on the 1st and 2nd, with 12" of snowfall at Spirit Lake, ID. Skies briefly cleared allowing temperatures to drop below 0° on the 3rd. The mercury dropped to -15°F at Priest Lake and Coeur d'Alene, -11°F at George, and -20°F at Deer Park. The last of the snowstorms arrived on the evening of the 4th. Another 5 to 12" of snow fell on an already snow-weary region. While Spokane Airport officially measured 8.9", more than a foot of snow fell in the area around Wenatchee as well as near Moscow.

Winter Weather Statistics				
Wenatchee Water Plant	Dec	Jan	Feb	Total
Avg High Temp	29.8	33.5	40.9	34.7
Departure from Norm	-5.9	-1.6	-1.9	-3.1
Avg Low Temp	18.5	22.8	28.0	23.1
Departure from Norm	-6.7	-0.4	+0.6	-2.2
Total Precip	1.22	1.14	0.42	2.78
Departure from Norm	-0.30	-0.21	-0.52	-1.03
Total Snowfall	17.9	8.2	1.1	27.2
Departure from Norm	+7.3	-1.1	-3.1	+3.1
Lewiston Airport	Dec	Jan	Feb	Total
Avg High Temp	36.5	39.3	47.8	41.2
Departure from Norm	-2.7	-0.1	+2.2	-0.2
Avg Low Temp	24.3	28.5	31.4	28.1
Departure from Norm	-4.2	+0.6	+0.2	-1.1
Total Precip	1.60	1.45	0.53	3.58
Departure from Norm	+0.55	+0.31	-0.42	+0.44
Total Snowfall	12.6	3.0	T	15.6
Departure from Norm	+7.8	-2.7	-2.2	+2.9
Spokane Airport	Dec	Jan	Feb	Total
Avg High Temp	27.8	31.2	36.3	31.8
Departure from Norm	-5.0	-1.6	-3.0	-3.2
Avg Low Temp	16.0	20.6	24.8	20.5
Departure from Norm	-5.6	-1.1	-0.9	-2.5
Total Precip	3.94	1.19	1.21	6.34
Departure from Norm	+1.69	-0.63	-0.30	+0.76
Total snowfall	61.5	17.6	4.1	82.2
Departure from Norm	+46.4	+3.4	-2.6	+47.2

Answer: It's another name for snow pellets, formed when super-cooled water droplets condense on a snowflake and make a rime ball.

**NWS
Spokane**

Meteorologist In Charge
John Livingston

Administrative Assistant
Rose Tibbitts

Warning Coordination Meteorologist
Kerry Jones

Science Operations Officer
Ron Miller

Data Acquisition Program Manager
Robert Bonner

Service Hydrologist
Royce Fontenot

Information Technology Officer
Todd Carter

Lead Forecasters
Jon Fox
Matt Fugazzi
Bob Tobin
Greg Koch
Paul Bos

General Forecasters
Robin Fox
Rocco Pelatti
Laurie Nisbet
Jeremy Wolf
Jeffrey Coté
Mike Fries
Ellie Kelch
Steve Bodnar

Hydro-Meteorological Technicians & Interns
Stan Savoy
Colby Neuman
Steven Van Horn

Electronic Systems Analyst
Dwight Williams

Electronic Technicians
Paul Kozsan
Mike Henry

Facilities Technician
Mike Belarde

An Icy and Foggy Winter of 2008/09

The weather pattern finally changed on the 6th of January, which led to new weather problems. On the night of the 6th, a strong wind-storm hit the east slopes of the Cascades from Wenatchee to Yakima. Half of a roof was torn off of a house in Wenatchee Heights while some businesses in Wenatchee suffered damage to their windows. Power was out for most of the evening in town as power lines went down. Wind gusts as high at 75 mph were recorded in the area, with the sensor at the top of Mission Ridge measuring a gust to 121 mph.

Warm and moist air from the southwest changed the snow to rain. This coupled with strong winds dramatically reduced the snowpack, leading to flooding in some areas. Plain, Washington (between Wenatchee and Stevens Pass) measured 4.14" of rain in 24 hours, and flooding in the area washed out part of the road near the Highway 2 and 97 junction.

Little did we realize it at the time, but the weather would be markedly different for the remainder of the winter season. High pressure dominated the area from mid-January through mid-February, steering all of the storms away from our region. The 45 day period from January 7th to February 21st was driest ever in Spokane. The inactive weather pattern allowed dense freezing fog to form. This resulted in a slow ice-storm of sorts along the Highway 2 corridor between Spokane and Almira. Ice and frost built up on power lines causing numerous power outages.

While most folks in the valleys didn't miss the snow, the absence of snowfall in the mountains was beginning to be noticeable. The

mountain snowpack dipped to around 70-85% of normal by late February. Then a moist Pacific storm on the 25th brought around 2 feet of snow to the Idaho Panhandle ski resorts, which helped the snowpack a little. By the end of February, Holden Village (in the Cascades) was 5th on the list of least snowy winters dating back to 1930.

As with most of the seasonal articles that look back and summarize a winter season, we again are faced with classifying this winter in a historical sense. Trying to come up with a single measure for a winter is often difficult. For instance, how do you compare a cold but dry winter with a mild winter that had a few heavy snowfalls? One measure that was derived is called snow-depth days (SDD). This number is simply calculated by adding up the daily snow depth each day of the winter. The theory is that this measures the winter as a whole. It takes into account heavy snowfall events, but also tends to downplay winters where that snow did not last very long. The coldness of the winter is measured by the fact that even a few inches of snow on the ground will last day after day in sub-freezing air.

On the table below, you can see the recent two winters on the bottom. While snowier than normal, they pale somewhat in comparison to some of the historically harsh winters. What made the Winter 08/09 so remarkable was the short amount of time over which so much snow fell - roughly about 3 weeks. Yet there was more than a winter's-worth of snow the top of many buildings by early January, causing many roof collapses in the Spokane area. ☼ *Ron Miller*

Season	SDD	Remarks and descriptions
1968-69	1529	Deepest snow depth ever of 42". Jan 11°below normal
1951-52	1186	Snowy Dec & Jan, snow on the ground til mid-March
1992-93	1059	Above normal snowfall each month Nov-Feb
1984-85	1019	Dec-March much colder than normal
1948-49	993	Coldest Jan. ever; 22 nights Dec-Feb were sub-zero
1978-79	917	10" or more snow depth for 45 straight days
1949-50	821	Snowiest winter ever.
1985-86	808	Nearly 2 feet of snow in November with 8 sub-zero nights
2000-01	729	An anomaly. Drought winter with a few inches of snow depth
2007-08	432	Only 10 days with snow depth 10" or more
2008-09	510	Snowiest month ever, but almost no snow after Jan 5th

Spring Outlook

The NWS Climate Predication Center released its Spring Outlook They indicate that the La Niña in the Pacific Ocean will weaken to more neutral conditions. This will translate to a better chance of below normal temperatures and more seasonal precipitation for the Inland Northwest for the rest of March, April and May. ☼

Remember your Spring Spotter Checklist

Tornado or Funnel Cloud

Snow:
2"+ valleys and 4"+ mountains

Strong Winds:
30 mph+ or damage

Reduced Visibility:
under a mile due to rain, dust, fog, snow, etc.

Any Flooding

Hail: pea size or larger

Heavy Rain:
Showery: 1/2" + in 1 hr
Steady Rain: 1"+ in 12 hrs
or 1.5"+ in 24 hrs

Any mixed precipitation

Travel Problems or Any Damage: due to severe or hazardous weather.

Staff News

The NWS Spokane office has welcomed two new employees with the recent retirements of HMTs Verne Ballard and Milt Mass.

Meteorologist Intern Steven Van Horn moved to Spokane from Southern California. After receiving his undergraduate from UC Davis, he received his Masters in Atmospheric Science from UCLA. Steven also worked at the NWS Oxnard office while finishing up his degree.

Meteorologist Intern Colby Neuman moved to Spokane from Salt Lake City. He received his undergraduate degree at Cornell and recently received his Masters degree in Meteorology from University of Utah. Colby also worked at the NWS Salt Lake City office while finishing up his degree. He enjoys skiing and is happy to be in Spokane.

Welcome to the Inland Northwest Steven and Colby! ☀
Robin Fox

Your Data Matters

Do you ever wonder how important your co-op, spotter, CoCoRaHS and amateur radio reports and observations really are? They have always been important to the NWS, climatologists and others, but recent events have raised the bar! The President recently declared a Major Disaster in Washington State for Severe Winter Storm and Record and Near Record Snow. This made assistance available to local governments and the public and the type of disaster and assistance varied from county to county based on what occurred. And how did FEMA and Washington State determine what occurred? They used your co-op, spotter, CoCoRaHS and amateur radio reports and observations!

Bottom Line: Be as thorough and consistent as possible. Stay up to date on how to properly measure rain, snow and hail. Submit your reports as soon as possible. We appreciate your dedication and hard work! Keep those observations and reports flowing! ☀ *John Livingston*

Coop Corner

Just a reminder for cooperative observers, please label your fisher porter rain gauge tapes. Remember to put your station name, date and time at the start of the tape and at the end of the tape. Without the labeling, we are not able to use the information. Thanks! ☀ *Bob Bonner*

The Weather Watcher

Of the Inland Northwest



National
Weather Service
2601 N Rambo Rd
Spokane, WA 99224
(509)-244-0110

Trivia: What is graupel?