YOUR NATIONAL WEATHER SERVICE SPOKANE QUARTERLY REPORT

VOL XIX, ISSUE 3
SEPTEMBER 2014

The Weather Watcher

of the Inland Northwest

www.weather.gov/Spokane

Winter Time Concern—Air Stagnation

Days of high pressure usually mean dry and benign weather. But in the winter time, high pressure can bring more finicky weather with fog and low clouds, low level inversions and stagnant air.

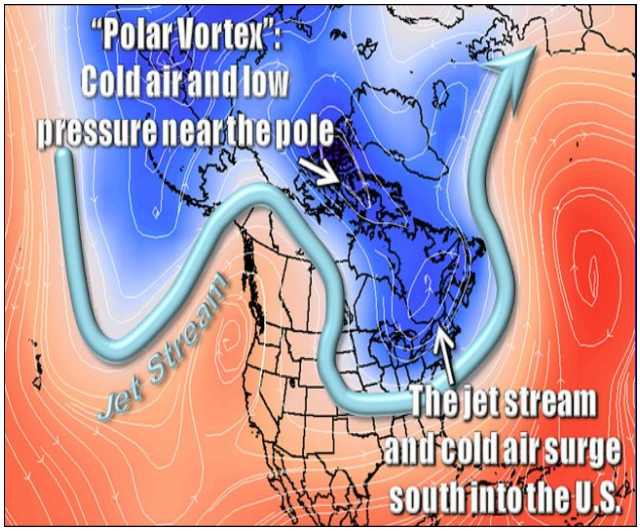
An inversion is a layer in the atmosphere where the air is stable with warm air on top of cold air. Under clear cold nights, raditional cooling can cause surface temperatures to drop faster than air a few hundred feet higher in the atmosphere. This leads to a low level inversion. Without any wind, this layer can last for days.

Air stagnation is a phenomenon which occurs when the same air mass remains over an area for an extended period of time. Typically it occurs on days of high pressure and strong low level inversions. This is because light winds and a lack of precipitation cannot "clean" the air of pollutants, either gaseous, like ozone, or particulate, like soot or dust. These conditions can lead to poor air quality and possible burn bans. The National Weather Service issues an Air Stagnation Advisory when these conditions are likely to occur and persist for days. ☼

What is a Polar Vortex?

Polar Vortex? It's not new. The term "polar vortex" has only recently been popularized, bringing attention to a weather feature that has always been present.

The polar vortex is a circulation that develops in the upper portions of the atmosphere near the poles; however it is associated with a large pocket of very cold air, typically the coldest air in the Northern Hemisphere during the winter. This frigid air can find its way into the United States when a piece of the polar vortex breaks off and is pushed southward. Typically it moves in behind a strong cold front and brings a "cold snap" to a region. The polar vortex is not dangerous, but is capable of delivering frigid temperatures to a region for several days at a time, even across the Inland Northwest. ☼



INSIDE THIS ISSUE:

Editor's Notes.

Winter officially begins on December 21st at 3:03 pm PST or 23:03 UTC. This winter solstice marks the shortest day of the year.

Being from the Inland Northwest, most are accustomed to winter driving. Remember, it's always good to check the latest weather forecasts before you make your plans. And check the road and mountain pass conditions before you hit the road.

We are always looking for new ideas, pictures and stories for our publication. If you have any to share, please contact us by phone at (509) 244-0110 or email nws.spokane@ noaa.gov.

This newsletter and past issues are available online on weather.gov/Spokane.

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

All articles are written by the NWS staff. Special thanks to Ron Miller, Jon Fox and John Livingston, for their help.

Answer: January 19, 1902

What are those Weather Forecasters Thinking?

Ever interested to know more of what the forecaster is thinking? Why do the forecasts say what they say? Well there are a couple ways to understand the weather forecasters' ideas.

One is the **Area Forecast Discussion**. It's a detailed and sometimes lengthy discussion written by the forecasters for each forecast update. You can expect to see a new one at least 4 times a day, but additional ones are available during changing weather. You can find these discussions on the NWS web on the left hand column at *weather.gov/Spokane*.

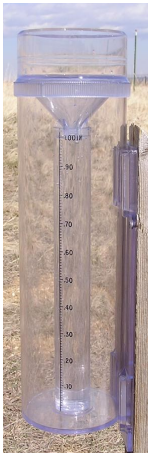
Another way is the **Inland Northwest Blog**. It's a write-up or blog to provide additional insight into the forecast challenges. It's a discussion of weather and climate of the Inland Northwest that is updated 2-4 times a month. You can find this blog at *inlandnorthwestweather.blogspot.com*

Observers & Snow

Hello snow observers! Winter is here! Hope you have your gauges winterized and ready for snow. Remember, it's important to remove the inner tube and funnel from your rain gauge and store them indoors. Also have your snow board or snow measuring area set up and your ruler ready!

Here are a few reminders on snow measuring and recording at *www.cocorahs.org*:

- Melt the captured snow in your gauge. Record this as your first entry of precipitation. (hundredths of an inch)
- Measure the new snowfall from your snow board. Clean your board off. (tenths of an inch)
- Measure the new and old snow as snow depth from your yard. (half of an inch)



Thank you for snow reports. We appreciate the work it takes to record the snow properly. Spotter snow reports of over 2 inches are valuable in real time. NWS forecasters rely on these reports for storm verification and forecast updates. ☼ *Robin Fox*

Winter Outlook

The NWS Climate Prediction Center forecasts that the Inland Northwest will see a mild winter with a better chance of above normal temperatures. As for precipitation, conditions may start off on the wet side in December, but there is better chance for below normal precipitation by early 2015. These forecasts are based on the development of a weak El Niño that is anticipated to form this winter. El Niño is part of a large scale ocean-atmosphere climate phenomenon linked to warming of the ocean temperatures near the equator in the Pacific. The last time the Inland Northwest experienced an El Niño winter was 5 years ago, during the winter of 2009-10. It was a mild winter with only 14.4" of snow in Spokane. Typically, El Niño winters bring above normal temperatures and below normal snowfall to the Inland Northwest. For more information on El Niño and seasonal outlooks, see *www.cpc.ncep.noaa.gov/* ☼ *Robin Fox*

Autumn Weather Statistics

Wenatchee Water Plant	Sep	Oct	Nov	Total
Avg High Temp	79.5	66.1	47.0	64.2
Departure from Norm	+1.2	+2.6	+0.5	+1.4
Avg Low Temp	53.1	47.1	31.3	43.8
Departure from Norm	+1.4	+5.9	-0.9	+2.1
Total Precip	0.18	1.28	0.89	2.35
Departure from Norm	-0.12	+0.76	-0.50	+0.14
Total Snowfall	0.0	0.0	2.3	2.3
Departure from Norm	0.0	0.0	+0.4	+0.4
Lewiston Airport	**Sep**	**Oct**	**Nov**	**Total**
Avg High Temp	81.9	69.0	47.7	64.2
Departure from Norm	+3.7	+6.4	-0.5	+1.5
Avg Low Temp	53.5	46.8	32.8	41.3
Departure from Norm	+2.5	+5.7	-1.3	+2.3
Total Precip	0.25	0.99	1.36	2.60
Departure from Norm	-0.42	+0.03	+0.18	-0.21
Total Snowfall	0.0	0.0	T	T
Departure from Norm	0.0	0.0	-1.8	-1.8
Spokane Airport	**Sep**	**Oct**	**Nov**	**Total**
Avg High Temp	75.7	62.9	41.6	60.1
Departure from Norm	+2.8	+4.9	0.0	+2.6
Avg Low Temp	50.4	43.7	27.6	40.6
Departure from Norm	+3.0	+6.5	-2.2	+2.4
Total Precip	0.26	1.42	1.34	3.02
Departure from Norm	-0.40	+0.24	-0.96	-1.12
Total snowfall	0.0	0.0	0.5	0.5
Departure from Norm	0.0	-0.1	-6.9	-7.0

NWS Spokane

Meteorologist In Charge
John Livingston

Administrative Assistant
Rose Tibbitts

Science Operations Officer
Ron Miller

Warning Coordination Meteorologist
Andy Brown

Service Hydrologist
Katherine Rowden

Information Technology Officer
Todd Carter

Observation Program Leader
Mark Turner

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

General Forecasters
Robin Fox
Rocco Pelatti
Laurie Nisbet
Jeremy Wolf
Jeffrey Coté
Ellie Kelch
Steve Bodnar
Steven Van Horn

Meteorologist Interns
Joey Clevenger
Ty Judd
Ryan Fliehman

Electronic Systems Analyst
Dwight Williams

Electronic Technicians
Paul Kozsan
Mike Henry

Facilities Technician
Mike Belarde

Autumn in Review

For some folks, autumn is the best season of the year. And the 2014 version didn't disappoint. Overall, it was mild with normal precipitation.

September started off the season on a cool note. Temperatures on the first few days of the month were below normal with light rain showers. Little did we know at that point that the majority of the rainfall for the month fell in those first few days. Omak received 0.37" of rain on the 2nd, a record for the day. Temperatures remained in the 60s on the 3rd. But the warm weather wasn't over. Four days later temperatures had warmed back into the mid-80s and lower 90s. The temperature rollercoaster continued for the rest of the month as the Inland Northwest swung between the 60s and the 80s. The morning of the 11th saw the first frost of the season for a few locations, including Nez Perce, Idaho which dropped to 28F and Omak which fell to 33°F.

October was one of the warmest ever across the Inland Northwest. Abundant sunshine and warm afternoons was the rule. Nighttime temperatures were also mild so backyard gardeners were harvesting throughout the month. The 4th through the 13th saw very mild temperatures for early October. Highs on the 7th reached 80°F in Spokane and 87°F in Lewiston, while Wenatchee warmed to 90°F on the 6th, setting records for the day. The weather did cool down a little on the 11th as a dry cold front moved through the area, bringing blowing dust to the Moses Lake area. A wetter front on the 14th and 15th brought welcome rain to the area. But the warm weather wasn't over. La Crosse reached 81°F on the 19th while Pullman topped out at 75°F, both of which were records for the day. Eventually, the Pacific fronts became stronger and wetter. A rather wet system brought heavy rain to parts of the area, including Omak which received 0.86" and Odessa which picked up 0.50" on the 22nd, both daily records. Temperatures cooled to more normal readings for late October as another front brought strong winds on the 26th. The wind gusted to 56 mph at Cocolalla and Wenatchee and 53 mph at Lewiston and Deer Park. For the month, Wenatchee had its 2nd warmest October ever, while Lewiston and Spokane had their 3rd and 5th warmest Octobers respectively.

November initially looked like another mild month. Although it was rainy, the temperatures were much above normal, and nighttime lows remained well above freezing. The 32°F at the Spokane airport on the 2nd tied for the latest ever first freezing temperature. Lewiston reached 73°F on the 6th, a record for the day. But then the remnants of Typhoon Nuri in the western Pacific created a large storm in the Bering Sea. This changed the jet stream pattern and brought an unseasonably cold Canadian air mass into much of the country. Our mild weather was replaced with highs around freezing and lows in the teens. Veterans Day was a rather raw day with a cold northeast wind blowing all day. Priest Lake and Naples dropped to 1°F on the morning of the 14th while Odessa reached 2°F. These temperatures persisted for over week. As milder Pacific air pushed out the cold air, snow resulted. Many valley locations picked up a light dusting on the 20th. But the temperatures continued to warm, and subsequent snow was confined to the mountains, where one to three feet fell over a few days. The exception was the Cascade valleys, which picked up 4-8" of snow on the 22nd. The Methow Valley received up to 18" of snow on the 24th, guaranteeing a white Thanksgiving. But for the rest of the area, Thanksgiving was very mild, reaching the 50s and lower 60s with a breezy west wind. A strong cold front dropped the temperatures to sub-freezing for the last day of the month. ☼ *Ron Miller*

Heavy snow in the Upper Methow valley 11/26/14

Staff News

Meteorologist Ty Judd will be departing the NWS Spokane at the end of December. He moved here from Norman, OK where he had gained experience in severe weather and outreach. He has had an active role at NWS Spokane in social media and is known for his creative Weather Stories and engaging weather posts on Facebook and Twitter. Good luck to Ty and his family! ☼ *Robin Fox*

Remember your Winter Spotter Checklist

Snow:
2"+ valleys & 4"+ mountains

Strong Winds:
30mph+ or damage

Hail: pea size or larger

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

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

Any Flooding

Any **Mixed Precipitation**!

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

NWS Open house Recap

WFO Spokane hosted an Open House on September 20th. Around 300 guests toured the office and learned about NOAA Weather Radio, Climate, Forecasting and Fire Weather. The kid's activities table and the flood plain demonstration were very busy and the guests took in presentations on Volunteer Observers, Our Products and Services and the Winter Outlook. Social Media played a big part in promoting the event in advance and it was used to keep people informed as the day went by. MIC John Livingston was honored to present the Thomas Jefferson Award to Nancy Taylor of Lacrosse, Washington. This was the only Jefferson award given in the Western Region in 2014. The perfect weather day wrapped up with the 00Z balloon launch. ☼ *John Livingston*

Skywarn Appreciation Day

On December 5-6th, the Spokane ARES/RACES amateur radio group setup their radios at the NWS Spokane for the 16th Annual Skywarn Recognition Day. During this 24 hour period, local "hams" monitored the airways, contacted other stations to share in the transfer of information. There were 94 NWS offices that took part in this event. It was a day to recognize the commitment made by amateur radio operators, and allowed them to practice emergency operations so they can be ready for the next disaster.

During this event, these dedicated radio operators were able to make contacts not only from local stations in the Inland Northwest, but from all over the country, from Fairbanks, AK to Nashville, TN, and from Portland, Maine to Raleigh, NC. And there was an international contact to South Korea! A big thanks to the Spokane ARES/RACES group for their enthusiasm and efforts! ☼ *Jon Fox*

Winter Storm Watch	Heavy Snow Warning
CAUTION—Watch the Sky!	DANGER—Storms coming
PREPARE	ACT NOW!

The Weather Watcher
Of the Inland Northwest

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

Think Snow!

Trivia: When was the latest date in the season when Spokane saw a 1" snowfall?