YOUR NATIONAL WEATHER SERVICE SPOKANE QUARTERLY REPORT

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The Weather Watcher

of the Inland Northwest

www.weather.gov/Spokane

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Windstorms—A Look Back

It's not unusual for the Inland Northwest to experience several windy storms every winter. It comes with the territory of living at this latitude, as well as being a frequent "gateway" for storms entering the U.S. from the Pacific. But many of these windy storms aren't considered "extreme". These strong winter-time winds are usually due to a deep low pressure system that tracks across the region along with a strong jet stream aloft. A typical wind storm in our area will result in gusts somewhere in the 50-60 mph. A wind gust 60+ mph becomes very rare event.

Before this year, the highest non-thunderstorm wind at Spokane was 67 mph from **January 9, 1972**. Here were damage reports from that storm, courtesy of the Spokesman Review:

- *Communities of Beverly, Shawana and Mattawa (along the Columbia River south of Wenatchee) sustained extensive damage. Six trailer houses were over-turned and destroyed. Other low-income homes were leveled. All three towns were without power and phones.*
- *Rattlesnake Mountain near Richland measured a wind gust of 150 mph, the top speed of the instrument.*
- *Gusts of 60-65 mph and higher were prevalent.*
- *The wind blew away the upper mechanical room of the University of Idaho Physical Science Building in Moscow.*
- *Wind toppled chimneys in Colfax.*

Another strong wind storm occurred on **November 19, 2003**. The wind gusted to 63 mph at Spokane. Here are some reports:

- *In the north Idaho, a dozen large pine trees fell on summer homes along Lake Pend Oreille.*
- *In the Coeur d'Alene area, numerous trees fell on houses and power lines.*
- *65 mph gust measured in Pomeroy, WA.*

A familiar sight in Spokane, 11/17/15—downed trees and power lines on city streets

- *Over the Palouse, a wind gust blew the roof off of a barn near Colfax*
- *Near Newport, a tree was blown onto a house.*
- *The heaviest damage occurred in the Spokane area where numerous trees were toppled onto houses and power lines. Up to 16,000 people were without power in Spokane's South Hill neighborhoods.*

Now a new windstorm can be added to the list, **November 17, 2015**. The wind gusted to 71 mph at Spokane—a new non-thunderstorm record. Here is a brief list of reports:

- *3 Deaths across the region*
- *396,000 Avista customers in North Idaho and eastern Washington lost power with 30,000 without power after a week.*
- *817 trees downed by the storm & counted in the city of Spokane street right-of-way, according to the Spokesman Review*
- *North Idaho peak gusts of 60+ mph in Huetter, Worley, Viola, and Cocolalla*
- *Eastern Washington peak gusts of 60+ mph in Lind, Moses Lake, Pullman with Mission Ridge Ski area clocking in at 137 mph.*

Windstorms can and will mostly likely return to the Inland Northwest in the years to come. The hope is that we can be better prepared for the event ☼ *Ron Miller & Robin Fox*

Editor's Notes

As they say...Winter is coming. It has been wet, warm and windy—but the snow?! Most would like to see more—especially in the mountains.

Make sure you are prepared for winter weather—when it does strike. Have your vehicle winterized and packed with an ice scraper, chains, & a charged phone.

The Winter Solstice or the first day of Winter is December 21st at 8:48 pm. This marks the longest night of the year for the northern Hemisphere.

We are always looking for new ideas, pictures and stories for our publication. If you would like to share, please call (509) 244-0110 or email nws.spokane@noaa.gov.

This newsletter and past issues are available online on our NWS Spokane web page.

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. A special thanks goes to Ron Miller, Jon Fox, Bob Tobin and Andy Brown for their help.

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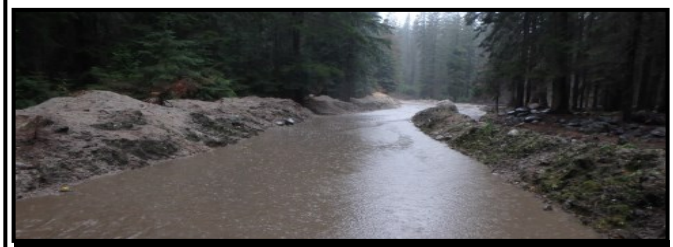
2015 Fire Season Stats

There were about 58 wildfires that burned almost a million acres across the Inland NW in 2015. This number is above average for both total number of fires and acreage burned. The drought and hot summer weather aided in drying the fuels across the region.

Stickpin Fire on 8/13/15—courtesy Peter Holter Mehren

A low pressure system that arrived during the middle of August sparked a number of thunderstorms and subsequent wildfires. The most active period for wildfire starts was mid August, 8/10-8/15, when at least 24 fires began. These fires included the Rutter Canyon, Kettle Complex, Okanogan Complex, Carpenter Road, Ruby Point Stickpin Fire and Kanisku Complex, to name a few. ☼ *Bob Tobin*



Flooding on Pope Creek on 10/31/15—courtesy USFS

Spotters & Observers Corner

NWS Spokane is just finishing up the latest round of winter weather spotter training. We have at least 25 new weather spotters from the Coeur d'Alene, Spokane and Lewiston areas; and more than doubled that amount in additional training meetings over the last month. Thank you for your interest and enthusiasm in reporting the weather. We look forward to your reports!

Current spotters and observers, a BIG THANK YOU for all of your reports! We appreciate all of the data and pictures, especially during this active period of weather. ☼ *Andy Brown*

SPOTTER REPORTS: (509) 244-0435

Winter Outlook

Wait—I thought this was to be an El Nino winter. What's up with all of this rain??

Yes December has been off to a WET start! See the table below on precipitation amounts for the first ten days of December. It's quite impressive for the Cascades. Some locations on the west slopes have received amounts in excess of 10 inches. It's also been wet in the Idaho Panhandle with Mullan Pass coming in with 6.70" and Pritchard at 5.38".

WET START TO DECEMBER 2015

SITE	Dec 1-10th precipitation	Dec 1-10th Normal	Departure from Normal	Percent of normal
Stehekin	8.47"	2.24"	+6.23"	378%
Mazama	4.80"	1.31"	+3.49"	366%
Saint Maries	3.92"	1.45"	+2.47"	270%
Bonners Ferry	3.34"	1.06"	+2.28"	315%
Pullman	2.80"	0.59"	+2.21"	475%
Republic	2.40"	0.71"	+1.69"	338%
Spokane Airport	2.25"	0.82"	+1.43"	274%
Wenatchee Airport	1.65"	0.46"	+1.19"	358%
Lewiston	0.97"	0.32"	+0.65"	303%

So the reason for this very wet period was a very active jetstream that stretched across the Pacific Ocean, and directed at the Pacific Northwest. There is good indication that this jet will remain and continue wetter than normal weather for the Inland Northwest—possibly until Christmas. Overall it looks like December is going to finish out wetter than normal, and warmer than normal too.

As we look into the new year, strong El Nino conditions will prevail, which is expected to focus the active Pacific jet stream and wetter weather south from California into Texas. The long range forecast from the Climate Prediction Center says that there will be a better chance of drier weather for the Inland Northwest during the later half of the winter. Also anticipate warmer than normal temperatures to persist. ☼ *Ron Miller & Robin Fox*

Flooding on Black Canyon Rd in Okanogan County—
courtesy Omak Chronicle—11/17/15

Autumn in Review

September continued to give welcome relief to the unrelenting heat from earlier in the summer. Temperatures were generally cooler than normal across the entire region, although most location continued to see relatively dry weather. Temperatures at the beginning of the month were slightly cooler than normal, however by the 5th and 6th a fairly strong cold front delivered widespread light to moderate rains and more importantly much cooler temperatures. The front also produced some gusty winds near Wenatchee with a gust to 42 mph reported on the 5th. A significant warm-up developed by the 10th and persisted for a few days with highs in the 80s to lower 90s. Another strong cold front tracked through the region on the 13th which plummeted high temperatures nearly 30 degrees from their peak. The front was not a big rain producer. A slow warming ensued between the 15th and 20th after which another cold front moved through producing a few reports of 40 mph winds. The remainder of the month saw roller coaster temperatures however little if any rain fell. Generally speaking the cooler temperatures and shorter days were sufficient to put a slow end to the area wildfires despite the lack of appreciable rain.

While September was generally characterized by cool conditions, the tables completely flipped in **October.** Every day of the month featured warmer than normal temperatures. The sum of all these warm days resulted in the warmest October on record in Wenatchee and the second warmest in Spokane! Not only was it warm, it was also dry. The first 17 days of the month featured dry and warm weather, with the only noteworthy feature consisting of a cold front on the 10th. This front produced wind gusts around 45 mph in both Spokane and Wenatchee. It also produced some light rain near the Cascades and the northern mountains. The last seven days of the month finally delivered some much needed precipitation to the region. Near the Cascades rainfall amounts ranged from 3 to 7 inches with 1 to 2 inches falling over much of the Idaho Panhandle. The strongest event of the month was a cold front that moved through between the 30th and 31st. Wind gusts of 40-55 mph were reported with some blowing dust over the Columbia Basin.

November saw warmer than normal conditions as the first three weeks of the month saw relatively persistent and mild westerly flow. This pattern supported 3 windy days due to the passage of strong cold fronts. The initial front moved through on the 1st with gusts to 45 mph with similar speeds encountered from the 2nd front on the 13th. The final front of the month was the most memorable. This front roared through the area on the 17th and produced some of the strongest wind reports the Inland Northwest has ever seen from a non-thunderstorm event. Wind gusts in excess of 60 mph were reported at Moses Lake and Pullman with a 71 mph gust in Spokane. This resulted in widespread blowing dust and numerous downed trees and power lines over northeast Washington and north Idaho. From a precipitation standpoint, the westerly flow kept light rainfall over much of eastern Washington and north Idaho. Meanwhile heavy precipitation was kept near the Cascades and over the northern mountains. The last week of the month saw cold and dry conditions in the wake of a dry polar front cold front. ☼ *Jon Fox & Ron Miller*

ANSWER: 77mph on June 21, 2005 due to a thunderstorm gust front

Autumn Weather Statistics

Wenatchee Water Plant	Sep	Oct	Nov	Total
Avg High Temp	75.6	68.2	48.2	64.0
Departure from Norm	-2.7	+4.7	+1.7	+1.2
Avg Low Temp	50.8	45.5	31.4	42.6
Departure from Norm	-0.9	+4.3	-0.8	+0.9
Total Precip	0.51	0.48	1.33	2.32
Departure from Norm	+0.21	-0.04	-0.05	+0.12
Total Snowfall	0.0	0.0	1.0	1.0
Departure from Norm	0.0	0.0	-0.9	-0.9
Lewiston Airport	**Sep**	**Oct**	**Nov**	**Total**
Avg High Temp	77.2	70.4	46.8	64.8
Departure from Norm	-1.0	+7.8	-1.4	+1.7
Avg Low Temp	50.6	48.3	33.1	44.0
Departure from Norm	-0.4	+7.2	-1.0	+1.9
Total Precip	0.65	0.75	0.95	2.35
Departure from Norm	-0.02	-0.21	-0.23	-0.46
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	70.7	64.5	42.1	59.1
Departure from Norm	-2.2	+6.5	+0.5	+1.6
Avg Low Temp	47.1	44.2	27.7	39.7
Departure from Norm	-0.3	+7.0	-2.1	+1.5
Total Precip	0.52	1.14	0.77	2.43
Departure from Norm	-0.15	-0.04	-1.53	-1.72
Total snowfall	0.0	0.0	1.5	1.5
Departure from Norm	0.0	-0.1	-5.9	-6.0

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 smoke, dust...

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

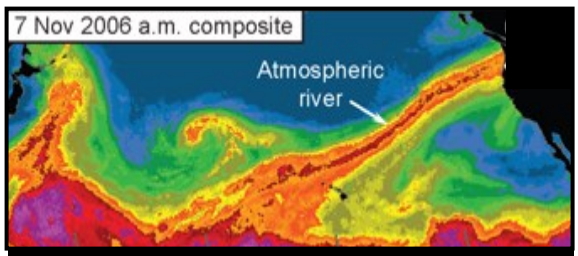
Any Flooding

Any **Mixed Precipitation**

Travel Problems or Damage:
due to severe/hazardous weather

Atmospheric Rivers

The Inland Northwest has had several rounds of wet and windy weather over the last couple of months. You may have heard the term *"Atmospheric River"* mentioned with this type of weather pattern, but what does that really mean? Rivers in the sky?



AR seen on satellite over the Pacific Ocean

Atmospheric Rivers (AR) are relatively narrow regions in the atmosphere that are responsible for most of the horizontal transport of water vapor outside of the tropics. They can come in all shapes and sizes, but those that contain the largest amounts of water vapor, the strongest winds, and stall over a particular area can lead to extreme rainfall and flooding. The term was first coined in 1998 and has been studied in depth since then. Here are a few quick facts:

- On average, about 30-50% of annual precipitation in the West Coast states occurs in just a few AR events, thus contributing to water supply.
- A well-known type of a strong AR that can hit the western U.S. is the "Pineapple Express," where moisture from the tropics near Hawaii reaches the West Coast.
- ARs move with the weather and are present somewhere on the earth at any given time.

NWS forecasters are quite familiar with the AR concepts and can identify them in numerical forecast models, several days in advance—giving us plenty of notice on the potential for heavy rain, snow, wind and even possible flooding. Want to learn more? Please see http://www.esrl.noaa.gov/psd/atmrivers/ ☼

Robin Fox

Watch : Conditions are favorable for severe or hazardous weather around the watch area.
CAUTION—Watch the Sky!

Warning : Severe or hazardous weather is likely or is occurring in the warned area.
DANGER—ACT NOW!

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Trivia: What is the all time high wind gust in Spokane?