

The Weather Watcher

of the Inland Northwest

www.wrh.noaa.gov/Spokane



Wind Whipped Days

During the early morning hours of November 18th, a warm front moved through the Inland Northwest. Behind this front winds of 35 to 50 mph descended from the mid levels of the atmosphere. These winds created scattered power outages as branches and occasional downed trees took out power lines throughout the Spokane and Coeur d'Alene area. Close inspection of weather balloon and computer model data indicated a low level jet stream about 1000 feet above the ground stretching from the Columbia River Gorge and hooking northeastward along the higher terrain of the Blue Mountains and the Palouse region. This unusual weather phenomenon sometimes makes an appearance over the Columbia Basin as strong mid level winds become channeled between mountain ranges. At night when the near surface "boundary layer" becomes stable, these strong winds skip along the top of the stable layer with light winds at the surface. During the day as solar heating causes rising and sinking air motions in the boundary layer, these strong winds are sometimes pulled down to the surface with descending air currents. The result is a random pattern of strong wind gusts kicking up dust and occasionally causing damage. The winds of November 18th were not unusually strong prompting the issuance of a Wind Advisory and the situation was monitored.

By 2 am Wednesday the 19th, it looked to be a different story. The Spokane Doppler radar, a versatile instrument for sensing both precipitation and winds, indicated wind speeds of 75 mph about 1500 feet off the ground which was 20 mph faster than the previous day. The weather balloon launch revealed winds of 69 mph a mere 900 feet above the surface, before the balloon pre-maturely burst. A second balloon was immediately launched and this time detected winds of 81 mph just off the surface. The technician on duty declared that he had never seen such strong winds so close to the surface in over 30 years of service at the Spokane weather office. A High Wind Warning was quickly issued for portions northeast Washington and north Idaho!

Between 6 and 7 am, the reports of damaging winds ranging from 60 to 70 mph began to pick up with local media calls of trees falling on houses and widespread power outages throughout Spokane. The Spokane airport measured a 63 mph gust, only 4 mph short of the all time record of 67 mph set in 1972. By 8 am, the focus of damaging winds moved into the Coeur d'Alene area. The highest gust at the Coeur d'Alene airport was 55 mph with widespread reports of fallen trees across the area.



Tree damage seen around south Spokane from Nov. 19th

By 9 am, the main event was tapering off as a strong cold front swept through the region. This front represented a sharp air mass boundary that dropped the temperature 15 degrees in half an hour as it passed the Coeur D'Alene airport. The front also swept eastward into the relatively unpopulated country of the Panhandle mountains. Remote weather stations in this region did not note any remarkable wind gusts. This suggested the colder and denser air mass behind the front slid in below the jet, forcing it high enough in the atmosphere to no longer effect the surface terrain.

The wind whipped days of November 18-19, 2003 was the weather event that ushered in winter to the valleys of the Inland Northwest. The very next day one of Spokane's heaviest early season snow storms dumped 6 to 10 inches of snow on the region. ☼ *Matt Fugazzi*

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Editor's Notes

With active winter weather underway and holiday travel increasing, winter safety is something you don't want to overlook. Even if you plan to travel short distances, make sure you know the weather forecast. Keep a winter survival kit in your vehicle, which includes extra warm clothing, food, water, matches, a flash light and batteries. A cell phone or CB radio can come in handy. Make sure someone is aware of your travel and let them know when you have arrived safely. If you do become stranded, stay in your vehicle, keep warm and wait assistance.

If there is something you would like to see in the next newsletter or if you have comments about a past issue of the Weather Watcher, please contact Robin Fox or Ken Holmes (509) 244-0110 extension 223.

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

All articles are written by the NWS staff and close contacts. A special thanks to Mary Moore, Ron Miller, Matt Fugazzi, Bob Bonner and John Livingston for their contributions. ☼





A New Suite of NWS Forecast Products

There have been many changes lately with how the National Weather Service (NWS) produces weather forecasts. In the past, the Zone Forecast Product (ZFP) was the main source of forecast information. This product was typed “by hand” and was based on weather across a zone, concentrating on cities in each zone. The way this product is produced has changed radically over the past year.

With the high-tech world we live in today, the NWS has developed the ability to create weather forecasts on “gridded data” fields across a region. Computerized maps of weather parameters, like temperature, wind, cloud cover, weather, etc., for multiple time periods are routinely created and adjusted by the forecasters. When the forecasters are satisfied with these maps, they are generated into the full suite of NWS products. Regular updates are done by 3 pm and 4 am, with unscheduled updates during times of changing weather. Graphic images are produced and sent to the Internet. Computer programs and text formatters are used to convert the “gridded data” into words, phrases and numbers that you see in the ZFP, State Forecast Table (SFT), and other text products. One promise of the “gridded” forecasts is that instead of a forecast for just Spokane, one can get a forecast for Wilbur, Tum Tum and Post Falls just as easily. This has the potential to revolutionize the way forecasts are made and disseminated.

Issuing weather warnings for the protection of life and property has always been and will continue to be the NWS’s top priority. The watches, warnings and advisories are still created “by hand”; typing out the words you see in the products. In the realm of forecasting though, the “gridded” forecast has become the flagship product. This has led to the suite of new products.

There should be good agreement among all the various forecasts, but at times there may be some discrepancies. Temperature and POP forecasts in the Area Forecast Discussion (AFD) and SFT use points to define the values; while the ZFP uses descriptive

wording. The Fire Weather Forecast (FWF) is a text forecast where the formatters use fire weather boundaries, that differ from the public zone boundaries used in the ZFP. This can lead to some potential differences between the two products.

The NWS Spokane web page is a convenient source to view all of these forecast products, at <http://www.wrh.noaa.gov/Spokane>. If one is looking for a forecast for a city or zone, it’s probably best to go to the point and click map on the front of the page. On the left-hand side menu, additional forecast choices are available. Graphical forecasts are essentially the gridded data sets published to the internet. The digital forecasts are customized forecasts based on the gridded data for a specific location and time that you request. A Point Forecast Matrix (PFM) product is also available for a few locations, which gives specific weather data in table form. The State Forecast Product (SFP) is still produced for Washington state and contains a broad brush text forecast for each side of the Cascades.

The National Weather Service is going through a growing stage. The new forecast suite may take a little time to understand. But in the end, it should benefit the users by providing a more complete and versatile weather picture for all. ☼ *Robin Fox & John Livingston*

Reminders for Cooperative Observers

Precipitation is measured to nearest 0.01”, including rain and snow melted from rain gauge. i.e. 0.24”

Snowfall is measured to nearest 0.1” of an inch. i.e. 0.7”, 12.4”.

Snow depth is measured to nearest inch. i.e. 1” If snow depth is 1.5”, round up to 2”. If less, than 1”.

A List of NWS Forecast Products

| | | |
|------------|--------------------------|---|
| AFD | Area Forecast Discussion | Text of forecaster reasoning, point temperatures and POPs data for selected cities |
| ZFP | Zone Forecast Product | Text forecast of weather, sky, temperature and wind, out to 7 days for public use. |
| SFT | State Forecast Table | Table forecast of weather and POPs for daytime hours, high/low temperatures for selected cities |
| FWF | Fire Weather Forecast | Text forecast of weather, sky, temperature, winds, RH & mixing indices, out to 7 days for fire use. |
| PFM | Point Forecast Matrix | Table forecast of weather parameters at selected cities |
| SFP | State Forecast Product | Text forecast of weather and temperatures, out to 5 days |

Please call the NWS with spotter reports at (509) 244-0435



An Active Autumn

Answer: December 30, 1968 shattered temperature records across the region. The coldest was -48 degrees in both Winthrop and Mazama.

Fall is often one of the quietest seasons in the Inland Northwest. The weather is typically sunny and dry with an occasional Pacific storm system bringing light amounts of precipitation to the area. The Fall of 2003 did not adhere to the typical pattern.

September started on the hot side. Temperatures were in the 90s for most of the first week with Lewiston hitting the century mark twice in the first 6 days. A strong, windy cold front moved through the area on the 6th, bringing some rain and dropping temperatures significantly. The high in Lewiston on the 6th was 100°. Two days later Lewiston only reached 58°, a drop of 42 degrees in 2 days. The remainder of the month saw near normal temperatures, with one last warm spell at the end of the month. One of the more unique things about September was the thunderstorms. Although they didn't bring much rain, thunderstorms rumbled through various locations in the Inland Northwest on several days, in a month that rarely sees any thunderstorms at all.

October is typically known for its drastic cooling. The average temperature drop from the first day to the last day of the month is more than any other month of the year. But of course, October 2003 was an exception. The warm weather at the end of September continued into October, with temperatures running 10-15 degrees above normal in the first week. Another warm spell occurred in the middle of the month. Lewiston hit 83° on the 21st and 80° of the 22nd. Spokane hit 77° on the 21st. These were not only records for the day, but was also the warmest it had ever been so late in the fall, with records going back to 1881. The month ended with a dramatic high wind event on the 28th. A cold front from the northern Gulf of Alaska moved through the area bringing wind gusts of 50-60 mph with a 94 mph gust recorded at a fire weather sensor near Oroville, WA. Other wind reports included 61 mph at Douglas, WA, 60 mph at Kettle Falls, 54 mph at Pullman, and 52 mph at Wenatchee. This front also spawned some thunderstorms, which is even rarer in October. The lack of rainfall contributed to a significant blowing dust event from this front as well. But the entire Inland Northwest wasn't dry. An extremely wet event occurred on the 20th along the east slopes of the Cascades. While Seattle was shattering its 24-hour rainfall record, a near-record flood occurred on the Stehekin River as a result of this event. Stehekin picked up 4.51" of rain over a 2 day period. October 2003 was on track for record warmth, but just like the previous year, a cold Canadian air mass moved into the area dropping temperatures to well below normal.

November continued to see more active weather. The month started off very cold, with high temperatures in Spokane staying below 35° for the first 6 days. By the middle of the month the weather was back to normal, but then a sequence of storms changed all that. First, a cold front stalled just off the coast. Copious amounts of moisture invaded the area from the southwest with another extremely heavy rain event in the Cascades. Stehekin received 5.20" in 2 days, but due to the snow on the ground there was no repeat of the October flood. Other reports included 4.50" at Lake Wenatchee, but only 0.01" at Wenatchee airport, which demonstrated the strong rain shadow. During this 48 hour period from 18-19 November, very strong winds blew across the remainder of eastern Washington and north Idaho. Wind gusts to 68 mph were measured at Fairchild Air Force Base on the 19th before the cold front finally moved through. In its wake was a very cold and unstable atmosphere. A small-scale low pressure system moved into eastern Washington on the 20th and stalled over the Spokane metro area. Snowfall amounts of 8" were common with up to 13"

report- ed. The snowfall was very localized with nearby locations receiving only a few inches. The 8.5" of snow measured at Spokane Airport was the second greatest 24-hour snowfall in November!

The one unmentioned fact in all this active weather was the continued drought. While some of the storms were rather spectacular, the day-to-day weather was on the dry side. As a result our precipitation deficit was about 1.25" for the 3 months. The exception is in the Cascades where the heavy rain events have them well ahead of normal. ☼ *Ron Miller*

The NWS Climatic Prediction Center suggests that the Inland Northwest will see at or above normal temperatures and above normal precipitation through the winter season. For more information, please visit <http://www.cpc.ncep.noaa.gov/>.

| Autumn Weather Statistics | | | | |
|---------------------------|-------|-------|-------|-------|
| Wenatchee Airport | Sept. | Oct. | Nov. | Total |
| Avg High Temp | 79.5 | 64.3 | 41.1 | 61.6 |
| Departure from Norm | +3.0 | +2.6 | -2.8 | +0.9 |
| Avg Low Temp | 53.6 | 43.6 | 25.7 | 41.0 |
| Departure from Norm | +2.6 | +3.5 | -4.7 | +0.4 |
| Total Precip | T | 0.38 | 0.35 | 0.73 |
| Departure from Norm | -0.43 | -0.07 | -0.80 | -1.30 |
| Lewiston Airport | Sept. | Oct. | Nov. | Total |
| Avg High Temp | 80.2 | 67.1 | 46.8 | 64.7 |
| Departure from Norm | +3.5 | +5.1 | 0 | +2.8 |
| Avg Low Temp | 52.8 | 43.9 | 30.5 | 42.4 |
| Departure from Norm | +1.9 | +2.7 | -3.6 | +0.3 |
| Total Precip | 1.06 | 0.29 | 0.49 | 1.84 |
| Departure from Norm | +0.26 | -0.67 | -0.72 | -1.13 |
| Spokane Airport | Sept. | Oct. | Nov. | Total |
| Avg High Temp | 75.4 | 62.7 | 37.5 | 58.6 |
| Departure from Norm | +2.9 | +4.2 | -3.6 | +1.2 |
| Avg Low Temp | 48.4 | 40.1 | 21.5 | 36.7 |
| Departure from Norm | +2.5 | +4.4 | -7.2 | -0.1 |
| Total Precip | 0.58 | 0.51 | 1.57 | 2.66 |
| Departure from Norm | -0.18 | -0.55 | -0.67 | -1.40 |
| Total Snow | 0 | 0 | 15.4 | 15.4 |
| Departure from Norm | 0 | -0.3 | +8.0 | +7.7 |

Remember your Winter Spotter Checklist

Snow

2"+ valleys
6"+ mountains

Mixed Precipitation

rain, snow, sleet,
any freezing rain

Poor Visibility

1/2 mile or less in fog

Heavy Rain

Showery- 1/2" an hour
Steady Rain- 1" in 12
hours or 1.5"+ in 24 hrs.

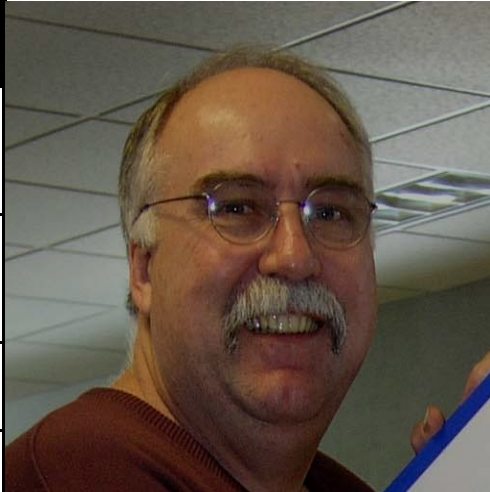
Flooding

Strong Winds

30 mph+ or damage

**Travel Problems or
Any damage due to
weather!**

Staff News



Larry Sossaman will be calling it quits from the weather business on January 1, 2004. He will retiring after over 38 years of federal service. His career began in the Navy before transferring to the NWS. He was stationed in Alaska, Portland, OR; El Monte, CA; Glasgow, MT; Santa Maria, CA; Astoria, OR and finally to Spokane for the last 8 years. He has been active with the Automated Surface Observation System (ASOS), NOAA Weather Radio and quality control. We wish Larry the best of luck in his retirement! ☀

Skywarn Day

The 5th Annual Skywarn Recognition Day was held during the 24 hour period starting promptly at 4 pm PST on December 6th. It was co-sponsored by the Amateur Radio Relay League (ARRL) and the National Weather Service (NWS). The goal was for the ham radio operators to make as many contacts as possible between the NWS offices and other ham operators around the world during this time. This exercise was used to refine radio skills needed during a potential weather disaster.

This year, the contacts fell short of those in years past due to noisy radio bands. The set up was during a hard rain, so all got soaked right off the bat. Despite these problems, fun was had by all. There were 14 operators participating at the NWS Spokane office. They made 118 contacts including at least 23 other NWS offices. They were able to reach other hams from Toronto to Eastern Kiribati!

Amateur radio operators are a key component to the NWS's severe weather operations, working along side forecasters to collect and relaying storm reports. At times, ham operators may provide the only communications link to areas stricken by a weather disaster. ☀
Mary Moore & Robin Fox

The NWS will be staffing a booth in the 2004 Ag Expo at the Spokane Arena from January 13-15. If you are in the area, please stop by for a visit.

The Weather Watcher Of the Inland Northwest



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**Trivia: What was the
coldest temperature
recorded in the Inland
Northwest?**

**Warm Holiday Wishes
from NWS Spokane!**