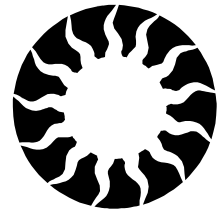


The Weather Watcher

of the Inland Northwest

www.wrh.noaa.gov/Spokane



Tornado or Dust Devil?

The old saying that goes, “We don’t get twisters around here”, blew away in the wind on May 11th. It was an unstable afternoon with a cool upper level trough over the Pacific Northwest. Convection was firing across the countryside, but became more organized ahead of a weak front moving in from northern Oregon. Winds were light creating weak surface winds and erratic storm motions of the high based scattered thunderstorms, especially over the Columbia Basin. There were several reports of small hail and heavy downpours from the storms, but nothing too menacing.

Then around 5:30 pm, two reports were received at the Spokane National Weather Service office of a funnel cloud near Moses Lake. One was a pilot report from about 10 miles south of Moses Lake. This is typical for late spring as cool convection funnels can develop beneath a broad, cold upper trough. More times than not, these funnels descend from the cloud base but do not reach the ground. A few minutes later, a report was received from the Grant County Sheriff Department that an experienced dispatcher actually sighted the funnel about 5 miles north of Warren, WA and that it was clearly reaching the ground with a debris cloud. It had blown out a wall of a storage shed and moved a water tank on a farm. The funnel was also spotted near Othello, leaning over sideways with its bottom off the ground, almost horizontal, before receding back into the clouds. The twister was captured on film by a Moses Lake area resident.

Looking at the image at the right, questions arise. Is it a dust devil or a tornado? With its large dust plume and non-threatening cumulus skies, it could be misleading. It’s obviously on the ground, so the issue is whether it was generated by the clouds aloft or just from surface heating. A tornado is defined as a violently rotating column of air, descending from a thunderstorm and in contact with the ground. A dust devil is a small vigorous whirlwind that develops under intense heating near the surface on a hot, sunny, dry afternoon. Most large dust devils tend to get more broad and diffuse at the top. Reports indicated that this twister was thin and well defined aloft, signaling it had some connection to the clouds above.



Courtesy of Bob Fakler of Moses Lake 5/11/03

What probably happened was a pre-existing dust devil or whirlwind developed under the updraft of a cumulus cloud. The updraft pulled and stretched the top of the dust devil and spun it up, similar to an ice skater that spins faster when she pulls her arms in. These phenomena develop frequently in the Front Range of the Rockies, near Denver, although not typically with this much dust. They have been referred to as a “land spout”, since they form similar to a waterspout except over land. The scientific term is a “non-descending” tornado. The bigger, nastier cousins found in the Great Plains evolve in the thunderstorm cloud and descend down to the ground; they are known as “descending” tornadoes. ☼ *Ron Miller & Robin Fox*

INSIDE THIS ISSUE:

One Hot & Dry Summer	2
Long Range Outlook	3
WXCODER	3
Staff News	3
Spotter Corner	4
Fire Wx Summary	4

Editor's Notes

September is NOAA Weather Radio month. The goal is to have weather radios become as common as smoke detectors in homes and businesses in the region. They are a convenient source of weather with the broadcasts originating from the National Weather Service. Besides weather warnings, they are also an “all-hazards” warning system, alerting immediate hazards on volcanic activity and secondary hazards from terrorism to earthquakes.

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. A special thanks to Ron Miller, Charles Ross, Robert Bonner, John Livingston, and Jeremy Harbeck. ☼

One Hot and Dry Summer

Another hot and dry summer is over. But just how does the summer of 2003 compare with other summers? There are several ways to measure how hot it was, but one that we like at the office is to count the number of days that the high temperature was 90°F or better. Here's a breakdown of where the summer of 2003 ranked:

	# days 90+	Norm	Records
Wenatchee	43	31	57 (1967), 54 (1961)
Lewiston	54	45	80 (1938), 75 (1940)
Spokane	33	18	39 (1958), 38 (1998)

In Spokane, this year ranked 6th for number of 90°F days. In Wenatchee and Lewiston, it was also hotter than normal, but not by a great amount. If you use the average high temperature as the rule, then this year was the 5th warmest in Spokane, with 1961 and 1998 at the top of the list. In Wenatchee it was the 4th warmest, and Lewiston had their 11th warmest summer this year.

What about precipitation? While summers in the Inland Northwest are typically dry, this summer was drier than most. Here's how it stacked up:

	3 month Total & Rank	Norm	Records
Wenatchee	0.29" (6th)	1.20"	0.11" (1973) 0.12" (1971)
Lewiston	0.93" (11th)	2.31"	0.01" (1883) 0.25" (1919)
Spokane	0.66" (2nd)	2.42"	0.48" (1949)

JUNE

Typically June is still a showery month in this area, as spring grudgingly gives way to summer. Our saying in the office is that summer doesn't start until after the 4th of July. But this year that saying didn't quite hold true. There were the usual warm spells in the 80s and lower 90s, but as usual they didn't last. However, we didn't get much rain during the cool periods. By the end of the month, Lewiston was hitting the century mark with Wenatchee and Spokane in the lower 90s. Overall the month was warmer than normal. June also saw a strong thunderstorm outbreak on the 10th. Thunderstorms in northeast Washington and the northern Panhandle produced large hail. Two-inch hail was observed in Newport, WA with 1.25" hail in the Spokane Valley.

JULY

The 4th of July holiday weekend had beautiful weather with sunny skies and temperatures in the 80s. Daytime readings warmed into the 90s and lower 100s soon afterward, and summer arrived to stay. The southwest U.S. 4-corners high was very strong this summer and the western U.S. baked during the second half of July. In our region, the string of hot days was notable. Wenatchee had 15 consecutive days of 90°F or better, ranking it the 5th on the all-time list (1971 was tops with 31 days). If Spokane had not dropped to 89°F on July 25th, it too would have had 15 consecutive 90°F or better days, which would have been a record. For the month as a whole, Wenatchee and Spokane had their 7th warmest average high temperature ever, and Lewiston had it's 10th. Clear skies through much of the month allowed the overnight temperatures to cool down to normal values which helped folks cope with the heat.

AUGUST

The heat broke with a wet Pacific system that rained all day in the Idaho Panhandle on the 3rd of August. The rest of the month continued to see hot spells, but these would only last for a few days before temperatures would cool off. The month still finished out warmer than normal. ☀ *Ron Miller*

Summer Weather Statistics

Wenatchee Airport	June	July	August	Total
Avg High Temp	82.8	91.2	87.6	87.2
Departure from Norm	+4.1	+4.5	+1.5	+3.4
Avg Low Temp	57.3	63.2	61.3	60.6
Departure from Norm	+3.3	+3.4	+1.6	+2.8
Total Precip	0.19	0	0.10	0.29
Departure from Norm	-0.45	-0.30	-0.25	-1.00
Lewiston Airport	June	July	August	Total
Avg High Temp	82.9	95.4	90.4	89.6
Departure from Norm	+4.9	+7.8	+2.8	+5.2
Avg Low Temp	53.6	62.3	60.9	59.4
Departure from Norm	0	+3.4	+1.6	+1.7
Total Precip	0.23	0.31	0.39	0.93
Departure from Norm	-0.93	-0.41	-0.36	-1.70
Spokane Airport	June	July	August	Total
Avg High Temp	77.5	89.0	84.8	83.8
Departure from Norm	+3.6	+6.5	+2.2	+4.1
Avg Low Temp	49.7	57.0	55.7	54.1
Departure from Norm	+0.5	+2.4	+1.2	+1.4
Total Precip	0.22	0	0.44	0.66
Departure from Norm	-0.96	-0.76	-0.24	-1.76

Answer: According to the Storm Data reports dating back to 1955, there have been 32 tornadoes reported in the Inland NW or roughly 1 every year and a half.

The Long Range Outlook

After a long summer of hot and dry weather, there is finally a feeling of fall in the air! With the lack of precipitation this summer, many rivers, streams and lakes are at very low levels. In fact, many rivers across the region were at or near record low flows as of early September. With the lack of rain and snow over the last several years, the region is in need of a snowy winter in order to improve both surface and ground water levels. It would also bring much needed soil moisture to the mountains to help reduce the high fire dangers that we have had over the last several summers.

So we now turn our attention to the upcoming winter. The biggest factor in forecasting winter weather is the presence or absence of an El Niño. Last winter we saw moderate to strong El Niño conditions, which are often associated with warmer temperatures. That was sure the case last winter, as temperatures were so warm that even the mountains had a tough time building a substantial snow pack. So far this fall, it appears that this winter will feature neither an El Niño nor a La Niña. This is known as a 'neutral year'. Neutral years are very tough to forecast, as under these conditions, many different types of winters can be experienced.

One thing that we have noticed in neutral winters is an increase in the variability of the weather. In neutral winters, we've had periods of intense cold and snow, followed by mild and wet days, often occurring within a short time. This is in stark contrast to last winter's weather, in which above normal temperatures remained virtually all winter long. So the bottom line is, expect a more typical winter across the Inland Northwest. This means that we may all need to wear our heavy coats and use the snow blowers a little more often than last winter!

The NWS Climate Prediction Center indicates that the Inland Northwest can expect a seasonal autumn and that this trend should persist into the winter season. ☀

Charles Ross

Staff News

Lead forecaster, Bob Tobin, and his family, will be making their home in Spokane this month as they transfer from the NWS Pendleton office. Bob has been active in the fire weather program in eastern Oregon over the past several years. He is eager to take on the role as Fire Weather Program Leader at NWS Spokane. Welcome Bob! ☀

WXCODER

The National Weather Service has instituted an additional method for Cooperative Observers to transmit their observations in real time. The only requirement is that the observer have internet access. The new method is known as Wxcoder, Web Xmitted Cooperative Observer Data Encoded Report.

WxCoder is not a replacement for ROSA. However, sending in your observation via WxCoder is simply easier and faster. In addition, in the near future those who elect to use WxCoder will not have to send in their B-91 or B-92 (Weather Forms) at the end of the month. The program will automatically generate the form and send it to us here at the NWS. At present, this option is not quite available but will be within a few months.

If you are a Cooperative Observer with internet access and would like to try WxCoder, let Bob Bonner know via email or telephone. If you email, don't forget the dot between the first and last name. If you respond via the telephone, please leave a voice mail message. Thanks ☀

Email: Robert.Bonner@noaa.gov
Phone: 244-0110 x 225



A peek of things to come. Are you ready?

Please call the NWS to make a spotter report. **(509) 244-0435**

Remember your Autumn Spotter Checklist

Strong Winds

30 mph+ or any damage

Poor Visibility

1/2 mile or less in dust or fog

Heavy Rain

Showery- 1/2" an hr
Rain- 1" in 12 hrs
1.5"+ in 24 hrs.

Snow

ANY- first of the yr, then 2"+ valleys & 6"+ mountains

Spotter Corner

Spotters, have you received your call from Jeremy in the past several weeks? Jeremy Harbeck is a meteorology student in his third year at UW who spent this summer working at the Spokane weather office. One of his many projects was to painstakingly update our spotter database by calling each and every spotter. This kind of major update has not been done for many years. He was able to call everyone on the list and actually reached a good portion of you. But for some of you, he was only able to leave a message. We will try to complete this update in the near future. In the meantime, if you have recently moved or changed phone numbers, please contact us to let us know. You can call on the spotter line or send an email to w-otx.webmaster@noaa.gov. A good quick check would be to see if your mailing address, spotter ID or Coop ID are correct below. Thanks for your participation and patience in this process.

Fire Weather Summary

Concerns for a busy 2003 fire season in the Inland Northwest were justified with below normal mountain snow pack and a warm and dry late spring. With the season now winding down, hindsight shows a number of serious fires did occur, but the number of acres burned did not approach the large numbers recorded in 1994 and 2001. The weather played a critical role in limiting lightning related starts with a strong ridge in place for much of the summer. Any thunderstorms that did cause fires seemed confined to the US-Canada border areas from the North Cascades to the Okanogan and North Idaho. The Inland Northwest did experience one or two smoke episodes, primarily from fires in northwest Montana and southern British Columbia. ☼ *John Livingston*



The side of South Hill in Spokane on 6/27/03

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

Trivia: How many tornadoes have been reported in the Inland Northwest since 1955?