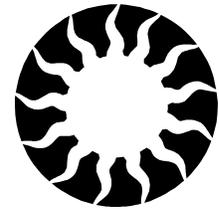


The Weather Watcher

of the Inland Northwest

www.weather.gov/Spokane



Enhanced Fujita Scale

On February 1st, the National Weather Service implemented the Enhanced Fujita (EF) Scale to rate tornadoes. The new EF-Scale replaces the original Fujita Scale (F-Scale), which was first introduced by the late Dr. T. Theodore Fujita in 1971. So why the change? Over the years, several weaknesses with the F-Scale become readily apparent: (1) It is very subjective and based solely on the damage caused by a tornado. (2) There is no recognition of the different types, styles and quality of construction, all of which have become more advanced since the 1970s. (3) The F-Scale is difficult to apply without the aid of so-called damage indicators. In other words, if a ½-mile wide tornado does not hit any structures, what F-scale should be assigned? (4) It is based on the worst damage regardless of how extensive the damage is. (5) The F-scale is subject to bias.



The F1 tornado in Airway Heights 5/21/04.

the forecast area has experienced a tornado in the last 50 or more years. Although most tornadoes are weak F0s, there have been reports of stronger F1s to F3s causing significant damage.

The new EF scale will base damage assignment on more than one structure, if available, and result in a far more consistent assessment by utilizing more indicators and degrees of damage. It simply refines and improves the original F-scale. The original F-scale historical database will not change. An F5 tornado rated years ago is still an F5, but the wind speed associated with the tornado may have been somewhat less than previously estimated. A correlation between the original Fujita scale and the EF scale has been developed. This makes it possible to express ratings in terms of one scale to the other, preserving the historical database.

How does this impact the Inland Northwest? On average, eastern Washington and north Idaho see about 1 tornado a year, and almost every county in

The EF-scale was developed by the Texas Tech University Wind Science and Engineering Research Center, along with a forum of wind engineers, universities, private companies, government organizations, private sector meteorologists and NOAA meteorologists. For more information, please visit <http://www.spc.noaa.gov/efscale/>

☼ Kerry Jones

Polygon Warnings: Tomorrow's Technology Today

The concept of polygon or storm-based severe weather warnings has been around quite awhile. It has only been within the past few years, with the advent of new technologies that support graphical/web-based products, that the NWS has begun to aggressively expand the capabilities that polygon warnings provide. Forecasters at NWS Spokane issue severe thunderstorm, flash flood, and tornado warnings based on individual storms.

In the past, the NWS would issue Tornado or Severe Thunderstorm warnings for an entire county. The use of polygons allows the forecaster to be more specific by warning only those parts of the county that are affected by the storm. This is especially important in the western U.S. where the counties are typically much larger. With polygons, the forecaster can warn the residents of one or two towns rather than the entire county.

Each point or vertex of a warning polygon has a unique latitude and longitude (lat/lon) pair. Many private sector companies use this information, which is found at the end of each warning, to graphically plot the warning polygons for customers. TV meteorologists and Weather Radio manufacturers are also taking advantage of this lat/lon information. Using a polygon outline, Emergency Managers can better determine what areas may need special notification. By evolving from "county-centric" to "specific threat" areas we will improve the accuracy of warnings and minimize the impact on residents outside the polygon area.

☼ Kerry Jones

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Editor's Notes

Spring can bring some of our more violent weather. Strong thunderstorms can produce to heavy rain, hail, strong winds, flooding and even tornadoes.

Although there have been changes with how the NWS warns on these storms and how they are classified, it is important to remember that all thunderstorms are dangerous and should not be taken lightly. Lightning is an under-rated killer. When lightning strikes, seek safe shelter.

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 to recognize those who help us with 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, Kerry Jones, Royce Fontenot, and Bob Bonner for their contributions.

Winter in Review

The active storm pattern that was evident in November continued into **December**. The month started dry and cold. Nighttime temperatures dropped into the single digits with some below-zero readings, while daytime readings stayed in the teens and 20s. Gradually the cold air gave way to milder temperatures. Many of the sites that had a few inches of snow on the ground to start the month lost that snow pack as rain and warmer temperatures arrived. The cold air remained in place along the Cascade east slopes where additional snow continued to fall.

A major storm impacted the Pacific Northwest in the middle of the month. A strong Pacific storm developed off the coast and tracked across southern British Columbia. Initially, the effects of the storm were felt along the Cascades. Light rain on the morning of the 14th quickly changed to heavy snow. Snowfall rates of 2-4 inches per hour were reported causing numerous traffic problems on both the main thoroughfares and county roads. One to 2 feet of snow fell over the Waterville Plateau and Okanogan Valley, as well as the Cascade valleys. Holden Village received 27.5" of snow in 24 hours while other spotters in the Entiat and Methow valleys picked up 16" of snow! WOW

As the storm moved onshore, the threat changed from snow to wind. High winds were felt from the Columbia Basin and Palouse

into the northern mountains and the Idaho Panhandle. Some of the strongest wind gusts included an 81 mph report southwest of Moses Lake and an 88 mph reading south of Moscow. Numerous power outages and downed trees occurred throughout the Inland Northwest.

Following this event, the storm track remained fairly constant, with storms moving into the area from the southwest. While this meant rain for some locations, cold-air damming along the Cascades and northern mountains kept the precipitation in the form of snow, providing for a white Christmas for many folks. A spotter near Cashmere picked up 8.5" of snow on the 23rd while a spotter near Manson received 15" of snow on the 26th.

The active weather pattern continued into the first part of **January**. Temperatures were generally near or above average for the middle of winter as strong winds affected the region. On the 6th, the wind gusted to 69 mph in the Spokane Valley and 58 mph in Uniontown near Pullman. The next day featured a mountain wave windstorm in the Wenatchee area. While high winds are not rare in the Pacific Northwest, Wenatchee (due to its location) often is spared the strongest winds. In this situation, a strong mountain wave developed which allowed the strong winds to blow in the city of Wenatchee. The peak gust at Pangborn Field was 72 mph, while at Manson the wind reached 74 mph. This wind storm caused considerable damage to the Wenatchee area, as seen in the image to the right.



By the middle of the month the weather had changed markedly. Cold Canadian air had moved into the region for our chilliest week of the winter. Highs were generally in the teens with sub-zero overnight lows. The cold spell was short-lived and temperatures rebounded back to their more normal values. As is often the case, the transition from cold to warm resulted in significant snowfall. The Coeur d'Alene area picked up 5-10" of snow on the night of the 19th. A large ridge of high pressure developed over the western U.S. This pattern continued into early February. Since the high was slightly offshore, occasional bursts of snow and cold seeped into the area from the north.

By the second week of **February** the west coast ridge had moved onshore. Warming temperatures and melting snow were the result, and the first signs of spring were in the air. Temperatures on the 17th warmed into the 50s with Lewiston and Pomeroy reaching 64°. As is often the case, winter still had one more gasp. A cold unstable trough moved over the Pacific NW during the last week of the month. Showers of fluffy snow were quite common, with 2-4 inches accumulating in just 1-2 hours. ☼ Ron Miller

Winter Weather Statistics

| Wenatchee Airport | Dec | Jan | Feb | Total |
|---------------------|-------|-------|-------|-------|
| Avg High Temp | 31.8 | 32.5 | 41.2 | 35.2 |
| Departure from Norm | -1.7 | -1.4 | -0.4 | -1.2 |
| Avg Low Temp | 22.7 | 20.2 | 30.3 | 24.4 |
| Departure from Norm | +0.2 | -1.6 | +3.6 | +0.7 |
| Total Precip | 2.52 | 0.18 | 1.20 | 3.90 |
| Departure from Norm | +1.09 | -0.96 | +0.34 | +0.47 |
| Lewiston Airport | Dec | Jan | Feb | Total |
| Avg High Temp | 41.8 | 37.6 | 46.6 | 42.0 |
| Departure from Norm | +2.6 | -1.8 | +1.0 | +0.6 |
| Avg Low Temp | 29.3 | 24.6 | 32.8 | 28.9 |
| Departure from Norm | +0.8 | -3.4 | +1.6 | -0.3 |
| Total Precip | 0.96 | 0.11 | 1.11 | 2.18 |
| Departure from Norm | -0.09 | -1.03 | +0.16 | -0.96 |
| Spokane Airport | Dec | Jan | Feb | Total |
| Avg High Temp | 33.9 | 31.2 | 39.1 | 34.7 |
| Departure from Norm | +1.9 | -1.6 | -0.2 | 0.0 |
| Avg Low Temp | 23.3 | 18.2 | 28.8 | 23.4 |
| Departure from Norm | +1.7 | -3.5 | +3.1 | +0.4 |
| Total Precip | 2.37 | 0.67 | 1.81 | 4.85 |
| Departure from Norm | +0.12 | -1.15 | +0.3 | -0.73 |
| Total Snowfall | 5.3 | 11.8 | 9.6 | 26.7 |
| Departure from Norm | -9.8 | -0.7 | +1.6 | -8.9 |

Coop Corner

One of our long time cooperative observers in Plain, Washington passed away on the 19th of February.

Mr. Troy Moore and his wife Jean took over the cooperative weather site at Plain thirty nine years ago on April 1, 1968. Jean will continue on taking observations at Plain.

The National Weather Service extends sincere condolences to Jean and family on the loss of Troy. ☼
Robert Bonner

EnviroKids Club

EnviroKids Club is a new club which enables children to explore more aspects of the environment, including air, water, weather, plants and animals, garbage and recycling. EnviroKids Club is FREE for grades K-6 that live within Spokane County. Visit <http://www.scapca.org> to sign up.

There are many goals of the EnviroKids Club. (1) Increase youth environmental awareness. (2) Encourage "good environment" behaviors before any bad habits develop. (3) Educate children about problems, solutions, and Spokane's unique environment. (4) Empower children to make a difference in their world. The EnviroKids Club is an extracurricular club, sponsored by American Lung Association of Washington, Gonzaga Environmental Outreach, National Weather Service, SCAPCA, Spokane County Water Resources, Spokane Regional Solid Waste System, Washington State Department of Ecology, and West Valley Outdoor Learning Center. ☼ *Robin Fox*

Answer: An F3 tornado was reported near Creston in Lincoln county on April 5, 1972.

About Royce

My name is Royce Fontenot and I'm the new Service Hydrologist here in Spokane. Just to give some background on myself, I grew up along the Louisiana Gulf Coast and have my B.S. and Masters degrees from Louisiana State University, as well as a year as a Vandal at the University of Idaho! Before coming to the Spokane office, I worked at three NWS offices in Alaska as well as almost eight years at the Southern Regional Climate Center at LSU. I've been married to my wife Michelle for almost three years and while we don't have any children yet, we've got two cats that seem to be almost as demanding! ☼ *Royce Fontenot*

Spring Water Supply Outlook

The overall water supply outlook for the Inland Northwest is looking pretty good for the remainder of the season. The lack of precipitation in January had an impact on the snow pack in the region, particularly in the northern Idaho panhandle where the snow pack was slightly below normal by February 1st. A series of weather systems in February brought widespread snow to the mountain areas bringing the snow pack in Idaho up to near normal. Along the east slopes of the Cascades and the Washington-British Columbia border, the snow pack is currently running above normal as well as the snow pack totals in British Columbia.

For the spring into summer, normal stream flows are expected over the Inland Northwest. There is a higher probability of increased stream flows due to high snow pack in the Okanogan basin and other areas along the US/Canadian Border. Remember to check the Rivers and Lakes reports from the NWS at <http://ahps2.wrh.noaa.gov/ahps2/index.php?wfo=otx> ☼ *Royce Fontenot*

Spring Weather Outlook

The weather outlook for the Spring months, from March through May, across the Inland Northwest is expected to be close to climatology. Near normal conditions in both temperature and precipitation are anticipated. For more information, please visit <http://www.cpc.ncep.noaa.gov/> ☼ *Robin Fox*

More Staff News

Forecaster Paul Bos received a promotion to a Lead Forecaster at the beginning of the year. Paul has worked in the Spokane weather office for the past 7 years. A new General Forecaster will be arriving in April. She is Ellie Kelch and has worked at NWS Albany, NY for the last several years, in addition to the Boise weather office.

'Tis the season for wedding bells. Forecaster Laurie Koch got married in February. Her husband is from the Spokane area, and she has changed her name to Laurie Nisbet. Meanwhile, Steve Bodnar got married in March, and his wife will finally be able to join him in Spokane.

A big congratulations to those members of our NWS Spokane staff and best of luck with their new endeavors! ☼ *Robin Fox*

Remember your Spring Spotter Checklist

- Funnel Cloud or Tornado**
- Hail**— pea size or larger
- Reduced Visibility** — under a mile due to snow, fog or rain, etc.
- Flooding**—of any kind
- Strong Winds**— 30 mph+ or damage
- Snow**—2” in valleys
6” in mountains
- Heavy Rain**— Showery— 1/2+” an hour
Steady Rain- 1” in 12 hrs
or 1.5”+ in 24 hrs
- Travel Problems or Any Damage** due to hazardous weather.

Spring Calendar

- March 19-23rd**
Flood Safety Awareness Week
- April 17th**—Spotter Training
Whitman County
Pullman, WA, 6-8 pm
- April 19th**—Spotter Training
Lewis County
Nezperce, ID, 6-8 pm
- April 21st**—Earth Day Celebration
Riverfront Park Spokane
- May 3rd**—Spotter Training
Asotin County
Clarkston, WA, 6-8 pm
- May 6-12th**
Severe Weather Awareness Week
- May 17th**—Spotter Training
Douglas County
Grand Coulee, WA, 6-8 pm
- May 31st**—Spotter Training
Chelan County
Leavenworth, WA, 6-8 pm
- June 24-30th**
National Lightning Safety Week

For an updated list of spotter training, see <http://www.wrh.noaa.gov/otx/spotter/train.php> for details.

New on the Web

The National Weather Service has been working hard on enhancing our service to the public, specifically with our web page. We have been successful on weather spotter recruitment by advertising where we need additional reports. More explanations, reports, and images on past snow, rain, and wind events are also available to share with our users.

Another new development is what the public views in the NWS forecast on the web page. When you clicked on the map located on the NWS homepage, you would be directed to a new page showing a picture icon “Forecast at a Glance” followed by a worded “Detailed 7-day Forecast”. In the past, these two forecasts sometimes did not agree and may have caused some confusion. This was because the “Forecast at a Glance” was derived by the NWS forecast grids or images, while the “Detailed 7-day Forecast” was the NWS Zone Forecast Product (ZFP). In February, a change was made to link up the NWS forecast grids to both forecasts. The result has been a more detailed forecast, especially in temperature and wind speed, which can change depending on what location you choose. If you are still in need of viewing the ZFP, it can be found near the bottom of the web page with other forecast formats under “Additional Forecasts and Information.” If you have any comments or questions regarding our web page, please share them with the webmaster at

w-otx.webmaster@noaa.gov. ☀ Robin Fox

The Weather Watcher

Of the Inland Northwest



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Trivia:What was the strongest tornado to hit the Inland Northwest?