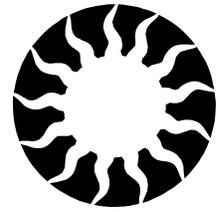


The Weather Watcher

of the Inland Northwest

www.weather.gov/Spokane



A Winter of Extremes

This past winter was actually three different winters all rolled into one. Winter #1 started off in fairly normal fashion with some valley snowfall just after Thanksgiving, which continued into the first few days of December. But then the storm door closed as high pressure built off the West Coast. This left the Inland Northwest dry and cold as the wind flow was from the north. Aside from a few weak weather systems, the area didn't see a drop or a flake for about three weeks. During this stretch, temperatures were 5 to 15 degrees below normal with some of the coldest temperatures of the season! Spokane remained below freezing from November 29th through December 20th. The snow stayed not only on the ground, but also in the trees through this period due to the lack of wind, which is a rare event for the lower elevations.

Winter #2 started just before the Christmas holiday, as the Pacific storm door opened to usher in warm and wet weather. Remarkably, despite going nearly three weeks without precipitation, the last 10 days of December made up for the deficit. In fact, just about every location wound up with precipitation totals around a half inch above normal. Temperatures in the teens and 20s were replaced by 40s and 50s. While Spokane couldn't break the freezing mark for the first part of the month, now it couldn't cool down to it, even overnight.

This mild, wet, and windy pattern continued throughout the month of January. Storm after storm from the Pacific brought rain and occasional snow to the lowlands, while the mountains continued to pile up the snow. The 30-day period from December 19th-January 17th was the wettest 30-day period ever in Spokane, for any time of the year! A record 6.58" of precipitation fell, surpassing the old mark of 6.56" set way back in November/December of 1897. This is an impressive amount of precipitation, especially when considering the fact that this is 40% of the annual average of 16.66". The month of January 2006 will go down as one of the warmest and wettest January's on record, not only for Spokane but for much of the country! In Spokane, it was the 5th wettest and 7th warmest out of 126 years of records. Lewiston had its 3rd warmest January in 126 years. In Ritzville, the 4.15" of precipitation was the wettest January in 108 years of records. In Coeur d'Alene, the average temperature of 36.7° made it the warmest January in 91 years of record keeping. Obviously with all of the warm temperatures, lowland snowfall was hard to come by. Most valley locations received less than half their normal snow in January. The exception to this were the valleys

of the eastern Cascades. Holden Village received an incredible 136" of snow for the month, while Mazama picked up 66.2" of snow.

This wet pattern came to a close in the first week of February as one last strong storm moved through the area. Winter #3 started just after Groundhog's Day. Once again, the storm door was shut, leaving our area under dry high pressure for most of the month. Overall though, temperatures were near normal. The exception to this was when a cold arctic air mass pushed into the area on the 16th. While temperatures weren't record breaking for this time of year, they sure felt rather bitter after the nearly two months of mild winter weather. As February drew to a close, the weather had become decidedly more spring-like. Aside from the Cascade valleys, most all of the other lowland locations had little if any snow on the ground. ☀

Ron Miller

Thanks to this active winter storm track; there is no sign of a drought and above average snow packs have returned to mountain locations across the Inland Northwest. The east slopes of the Washington Cascades have benefited from these storms with plenty of snow. This deep snow pack will lead



A View at Mount Spokane in early December 2005.

Renewed Mountain Snowpack

to large spring runoffs on area rivers and streams. Unlike the last two springs, flooding due to snow melt is a possibility over the next several months. Stay tuned! ☀ Charles Ross

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Editor's Notes

Spring is emerging ever so slowly in the Inland Northwest. It's difficult to think of spring with snow lingering on the ground. Remember, the first day of Spring or the vernal equinox is at 10:26 am on March 20th. Spring is also the time for snow-melt, high river flows and flooding. National flood safety awareness week is March 20-24. For more information, visit <http://www.nws.noaa.gov/floodsafety/>.

For any questions or comments on the newsletter, please contact Robin at (509)244-0110 extension 221 or email w-otx.webmaster@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 and Charles Ross for their contributions.



Spring Outlook

The NOAA Climatic Prediction Center announced the return of La Niña in February. Oceanic sea surface temperatures have met the operational definition of La Niña for the November through January period. La Niña is defined by the periodic cooling of ocean waters in the east-central equatorial Pacific, which can impact the typical alignment of weather patterns around the globe. Forecasters predict this La Niña event will likely remain into late spring, and possibly into summer. This pattern will favor continued drought in parts of the South and Southwest from Arizona to Arkansas and Louisiana, and above normal precipitation in the Northwest and the Tennessee Valley area. La Niña events recur approximately every three to five years. The last La Niña occurred in 2000-2001 and was a relatively weak event compared to the 1998-2000 event. Typically a cooler and somewhat wetter pattern develops for eastern Washington and north Idaho as the northern jet stream strengthens and brings storms into the region. The long range outlook for this Spring calls of a better chance for below normal temperatures and near normal precipitation. For more information, see <http://www.cpc.noaa.gov> ☀

Spotter Corner

It's time to brush up on convective storm spotting criteria. Several spotter training sessions have been conducted. One was held in East Wenatchee on February 3rd with over 15 spotters in attendance and several new recruits. Other spotter meetings were held in Mead, Washington on March 16th and in Medical Lake, Washington on March 20th; both had terrific turnouts.

With the departure of Ken Holmes, scheduling and conducting additional spotter meetings will be tight in the coming months until a new Warning Coordination Meteorologist arrives. If you have interest in a spotter talk, please contact the National Weather Service via the phone or our web page, and we will do our best to plan an event. In the meantime, feel free to brush up on the spotter criteria via the online spotter training or review the Weather Spotter's Guide.

The response to the Espotter program has been strong. So far, there are 56 users signed up to send reports to the NWS office in Spokane! If you have an internet connection and haven't signed up, please consider it. It's safe, fast and easy, and the reports are received instantly at the weather office. Simply go to the central web site to register at <http://espotter.weather.gov>. After permission is granted, you will be able to send reports. Just a reminder, there are two forms that can be used for reports; one is a winter form for snow and ice and the other is geared more toward thunderstorms in the spring and summer.

Continue the outstanding work, Spotters; and keep those reports coming in! The Spokane Weather Office appreciates each and every report. Remember you are the eyes and ears of the National Weather Service! ☀ *Robin Fox*

NWS Spokane

Meteorologist In Charge
John Livingston

Administrative Assistant
Meg Layh

Warning Coordination Meteorologist
Ken Holmes

Science Operations Officer
Ron Miller

Data Acquisition Program Manager
Robert Bonner

Service Hydrologist
Charles Ross

Information Technology Officer
Todd Carter

Lead Forecasters
Jon Fox Claudia Cox
Robin Fox
Matt Fugazzi
Bob Tobin

General Forecasters
Tracy Cox
Rocco Pelatti
Paul Bos
Todd Lericos
Laurie Koch
Jeremy Wolf

Hydro-Meteorological Technicians & Intern
Stan Savoy Milt Maas
Verne Ballard
Jeffrey Coté

Electronic System Analyst
Dwight Williams

Electronic Technicians
Robert Sumpter
Paul Kozan

Facilities Technician
Mike Belarde

Winter Weather Statistics

Wenatchee Airport	Dec.	Jan.	Feb.	Total
Avg High Temp	29.5	39.4	43.5	37.5
Departure from Norm	-4.0	+7.8	+1.9	+1.9
Avg Low Temp	21.8	29.6	26.5	26.0
Departure from Norm	-1.1	+5.5	-0.2	+1.4
Total Precip	1.93	1.98	0.94	4.85
Departure from Norm	+0.50	+0.84	+0.08	+1.42
Lewiston Airport	Dec.	Jan.	Feb.	Total
Avg High Temp	37.4	48.4	46.5	44.1
Departure from Norm	-1.8	+9.0	+0.9	+2.7
Avg Low Temp	26.3	36.0	28.4	30.2
Departure from Norm	-2.2	+8.1	-2.8	+1.0
Total Precip	1.63	1.11	0.25	2.99
Departure from Norm	+0.59	-0.03	-0.69	-0.13
Spokane Airport	Dec.	Jan.	Feb.	Total
Avg High Temp	30.4	40.1	38.9	36.5
Departure from Norm	-2.4	+7.3	-0.4	+1.5
Avg Low Temp	17.8	30.9	23.0	23.9
Departure from Norm	-3.8	+9.3	-2.7	+0.9
Total Precip	2.96	4.48	1.16	8.60
Departure from Norm	+0.71	+2.66	-0.35	+3.02
Total Snowfall	4.4	9.4	3.8	17.6
Departure from Norm	-10.7	-4.8	-4.3	-19.8

Please call the NWS with spotter reports at (509) 244-0435 or 1-800-483-4532

Hail vs. Graupel

As we embark on the convective season, we will be witnessing more building cumulus clouds and instability showers. Remember atmospheric stability decreases with warmer temperatures on the ground and colder air in the upper atmosphere. Precipitation falling from instability showers comes in a myriad of types during the early spring, ranging from rain, snow, hail, or even graupel.



Graupel or snow pellets are a precipitation type that is frequently reported by spotters and can be confused with hail. Graupel are essentially snow balls falling from the sky and can reach the ground despite surface temperatures being well

above freezing. Graupel is soft and white, and will either bounce or break apart easily when it lands on a surface. Despite sizes reaching up to an inch in diameter, graupel typically causes little if any damage.



Hail is a product of thunderstorms or intense showers. It is generally a white or translucent ball of ice. It forms in the updraft of a thunderstorm; where the rising, warm moist air feeds into a building

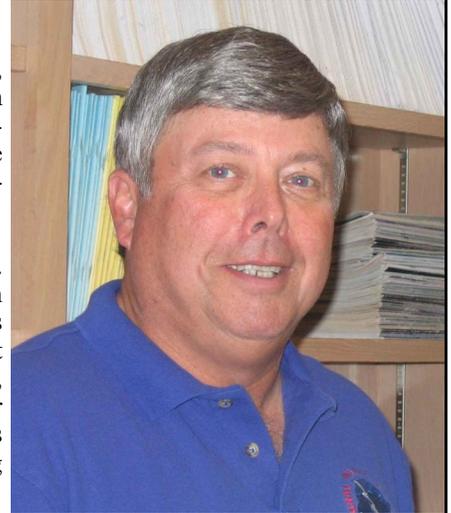
cloud. The process of transporting the ice fragments back and forth between freezing and nonfreezing layers of air results in the onion-like layers of ice accumulating on the hail piece. When these pieces become heavy enough to overcome the force of the vertical air current, they fall to the ground as hailstones. Hailstones can range from pea size to golf ball size or bigger. When the hail reaches 3/4" or larger, the thunderstorm is considered severe and a Severe Thunderstorm Warning is issued due the damage these ice balls can cause. Large hail can do plenty of damage to automobiles, windows, roofs, crops and animals, as one hailstone can fall at speeds up to 120 mph. On June 22, 2003, a record setting hailstone recovered in Aurora, NE, was 7" in diameter! ☀

Robin Fox

Staff News

After over 40 years of federal service, Ken Holmes, Warning Coordination Meteorologist of the Spokane weather office, has decided the time has come. He will retire from the National Weather Service. His last day will be on April 3rd.

Ken has had a rich and diverse career. After college, he joined the Air Force in the mid 1960s where he spent many hours in a cockpit flying over the southern Great Plains of Texas and Oklahoma. Soon after, he became a student pilot instructor for many of the incoming recruits. One of his most memorable experiences was flipping a Cessna over in a cotton field!



After his four year tour of military duty, Ken sought out civilian work and joined the National Weather Service. He started as a forecaster in Minneapolis, MN where he received his indoctrination by some well experienced forecasters. After a couple of years, he transferred to a brand new office in Indianapolis, IN. While there, he experienced the record tornado outbreak of April 3-4, 1974, where 33 tornado warnings were issued from his office alone for this event. Ken had enough of severe weather and began heading west. He transferred to Salt Lake City where he was Meteorologist In Charge of a weather unit in an air route traffic control center. He also received management training and development at both the regional and the national level.

In 1979, Ken made his next and final move to Spokane where he stepped in as a Meteorologist In Charge. The weather office, located at the Spokane International Airport, was shedding its agriculture forecasting duties, and was concentrating on surface and upper air observations. At that time, the weather was monitored by an air traffic control radar perched on Mica Peak, and the upper air observations used equipment dating back to the WWII era.

Over the next 27 years, Ken has become a National Weather Service fixture for the Inland Northwest. As a terrific story teller and a real people person, he has been able to connect with many of the users and customers in the region. He has witnessed many changes and been through several diverse weather events. He says his best experience was doing the ground work and outreach for the modernized new weather office. He says the most memorable weather event included the tornado event in eastern Washington on May 31, 1997, right after the new radar was installed. The Ice Storm of 1996 was also an event that will be difficult to forget!

Ken doesn't plan to stay idle; he will be busy with his many hobbies. He will continue boating on Lake Coeur d'Alene and remain active in the Western Pattern Horse Racing. He plans on staying in the Spokane area and spending time with his family. We wish Ken the best of luck! ☀ *Robin Fox*

A Retirement Dinner for Ken Holmes is scheduled for the evening of **April 1st** starting at 6 pm at the **Northern Lights Brewery** in Spokane.

For more details or to RSVP for dinner, please call Meg at the NWS office at 509-244-0110 ext 221.

Answer: Sorry, this is an old myth. If an egg can stand upright, it would do it at any time, and not just at the equinox. It takes a lot of tricks and patience.

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.
- Any Flooding**
- Strong Winds**— 30 mph+ or damage
- Snow**—2" + in valleys and 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.

Preparedness at Grand Coulee Dam

The Grand Coulee Dam, located on the Columbia river in central Washington, is the largest concrete structure in the United States. It forms the centerpiece of the Columbia Basin Project, a multi-purpose endeavor managed by the U.S. Bureau of Reclamation. In addition to producing up to 6.5 million kilowatts of power, the dam irrigates over half a million acres of the Columbia river basin farm land and provides abundant wildlife and recreation areas. By strictly regulating the Columbia's highly variable flow rate, the dam provides much needed flood control to the river basin.



A view of the Grand Coulee Dam

The Grand Coulee Dam is one of the true modern engineering wonders of the world, and a fixture of the Inland Northwest. Despite the solid construction of this feature, plans need to be in place for the unfortunate circumstance of a dam failure.

On March 9, 2006, Spokane staff members Ken Holmes, Robin Fox, and Charles Ross participated in a tabletop dam break exercise at Grand Coulee Dam. Charles had the opportunity to participate on the design team for this exercise and served as a controller during the event, while Ken and Robin represented the National Weather Service during the exercise. The scenario was quite complex, in which a significant threat to Grand Coulee Dam was exercised. Due to the large number of agencies and jurisdictions affected by this project, there was

a turnout of over 40 participants from different state, local and federal offices. It was a terrific opportunity to meet and work with the many various agencies and witness the diversity of concerns and decisions by each group. By the end of the day, everyone realized just how much additional preparation is needed to truly be prepared for an emergency at this project, and most importantly how critical good communications are between the different agencies should a dam break event ever occur. ☀ *Charles Ross*

The Weather Watcher

Of the Inland Northwest



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

Trivia: Can you balance an egg upright on the day of the vernal equinox?

