

The Weather Watcher of the Inland Northwest

www.weather.gov/Spokane


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join COCORAHS DROUGHT

It's March Madness!

It's March, so that means it's time for the annual Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) recruitment contest! All 50 states compete to see who can recruit the most new volunteers. Last March in the Inland Northwest, there were 8 new volunteers in eastern Washington and 2 in northern Idaho. Let's beat that this year! CoCoRaHS is an organization made of volunteer weather observers who measure precipitation from their own backyards. Widespread coverage of CoCoRaHS observations helps tremendously due to the variability of precipitation across the Inland NW. The National Weather Service, plus many other organizations and individuals, use CoCoRaHS data on a daily basis.

If you would like to join CoCoRaHS, or recruit a friend or relative, check out cocorahs.org for more information. It doesn't have to be just in March. You can join anytime! Training is available online to set up and take observations. For easy access to information about the Inland Northwest daily precipitation, check out our local office page – www.weather.gov/otx/cocorahsOTX ☀️ Jenn Simmons

Last fall into the start of the winter, things were looking optimistic of ending the prolonged dryness. Abundant rains and mountain snow fell across the Inland NW. The mountain snowpack was well above normal by early January. Then as fast as it arrived, the tap shut off. Mid January into February was quiet, cold with lack of any significant moisture. The colder temperatures were able to hold on to the snowpack, at both the higher elevations and the valleys. It looked to be a surprising bust in terms of building the snowpack. What did this do to our current drought?

Drought conditions steadily improved through December, but remained mostly steady since then. The latest update from the [U.S. Drought Monitor](https://www.drought.gov/) shows moderate (D1) to severe (D2) drought across much of the eastern Washington into parts of north Idaho. Pockets of extreme (D3) drought still persist in the lower Columbia Basin. The [U.S. Seasonal Drought Outlook](https://www.drought.gov/) still suggests the potential for drought removal although drought will likely remain for most.

Editor's Notes

Spring has finally arrived with hopes of more precipitation. This is when we can expect rain, snow, graupel & hail, all in one afternoon. Thunderstorm season is right around the corner, where lightning becomes an increasing threat as we spend more time outdoors; [Lightning Awareness Week](#) is June 19-25, 2022. The mountain snowmelt leads to rises on streams and rivers; [Flood Awareness Week](#) is March 21-25, 2022.

The Spring Equinox will arrive Saturday, March 20th at 9:33 AM. This marks the equal time between day and night. After this date, expect longer daytime hours. The next full moons include: March 18 ~ the Worm Moon, April 16 ~ the Pink Moon & May 16 ~ the Flower Moon.

We're always looking for new ideas and stories for our publication. Please send to nws.spokane@noaa.gov.

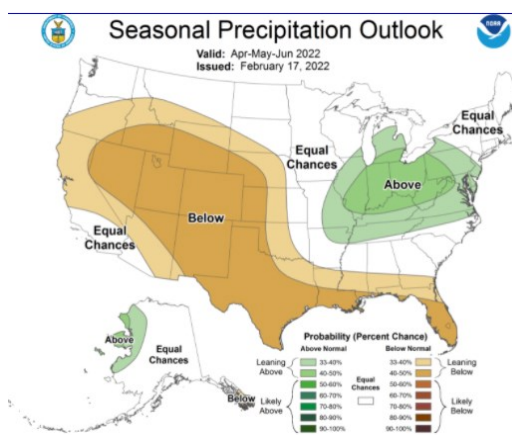
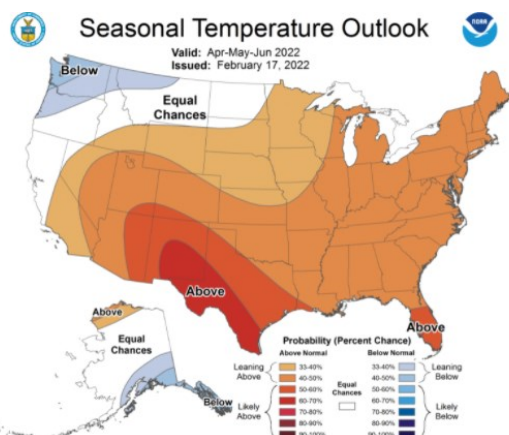
Newsletters are available on the NWS Spokane web page.

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 to Jeremy Wolf and Jenn Simmons for their contributions in this issue.

Spring Seasonal Outlook—April through June

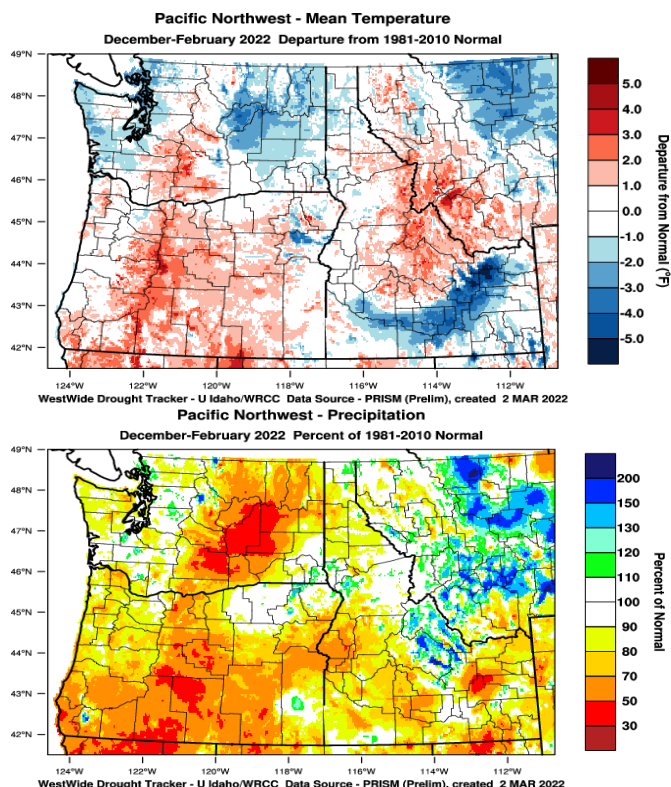
The [Climate Prediction Center's](https://www.cgd.noaa.gov/) seasonal outlook for April to June across the Inland NW indicates a better chance for cooler than normal temperatures and equal chances for at, below or near normal precipitation.



Share your precipitation reports! Check out CoCoRaHS at www.cocorahs.org

Winter 2020-2021 in Review

This winter brought drier than normal conditions for most of the region, along with near to below normal temperatures. Most of this was due to a prolonged dry stretch from mid-January through most of February. The maps below summarize how the winter fared in terms of temperature and precipitation anomalies.



DECEMBER Winter started off on a rather balmy note, with several monthly temperature records broken this month. Temperatures on the 1st were more common of late September than the start of meteorological winter! The warmest readings were recorded in Central Washington including 74°F in Omak, with Winthrop and Quincy reaching 70°F. Strong downslope flow off the Cascades contributed to the warmth, with Tumwater Mountain near Leavenworth gusting to 74 MPH. Other regional monthly records set include Entiat, Chelan, and Ephrata at 69°F, Mazama 64°F, Pullman 62°F, Moscow and Kellogg 61°F, Coeur d'Alene and Chewelah 60°F, Bonners Ferry 59°F, and Davenport 57°F. More typical winter arrived thereafter, with the Cascades especially snowy for much of the month. In addition to the snow, windy conditions occurred on the 11th with gusts including 58 MPH in Pomeroy and 54 MPH at the Spokane Airport. By month's end, Mazama had recorded its 9th snowiest December with 55.1". Towards the second half of the month, many of the lower elevations joined in with the snow. On the 18th and 19th, heavy snow fell in the Bonners Ferry area with 8". On Christmas Eve into Christmas Day, more snow fell across eastern Washington and north Idaho with some of the higher totals including 10" in Elk, and 8" in Newport. Then came an arctic freeze. The Okanogan Valley took the brunt of the frigid weather. On the morning of the 27th, tempera-

tures dropped below 0°F, with bitterly cold wind chills of -27°F measured in Omak with winds gusting to between 40-55 MPH. In some wind sheltered valleys surrounding the Okanogan Valley, temperatures dropped to near -10°F. Finally, to close out the month, a weather system on the 30th brought heavy snow to the Lewiston area, with 7.2" of snow making it the snowiest day since January 12th, 2012. The warm start winter was a distant memory.

JANUARY The month started off with some of the coldest temperatures of the winter in many areas. Arctic air, clearing skies, and light winds allowed temperatures to plummet in some places including -19°F in Chewelah and Davenport, -16°F Wilbur, and -10°F in Northport. Lewiston dropped below 0°F for the first time since Nov 24th, 2010 with a low of -1°F. A rapid switch from cold arctic air to an influx of moisture off the Pacific Ocean started on the 2nd brought some of the most active weather of the winter, breaking records in the Cascades. On the 5th into the 6th, Wenatchee received its highest 24 hour snowfall on record with 23". Meanwhile snow continued to fall for areas closer to the Cascade crest. Snow totals over a 2 day period include 46" in Plain, Holden Village 37", and Mazama 25". The heavy snow closed ALL west-east passes across the Cascades in Washington for multiple days. If this wasn't enough, strong winds developed on the 7th on the Waterville Plateau and locally around the Methow Valley with significant drifting snow. Meanwhile on the Palouse, the strong winds blew over a semi truck on Highway 195 near Colton. Some wind gusts include: 64 MPH at Shirrod Hill, 63 MPH at Beverly, 58 MPH at Pullman, 55 MPH at Winthrop, and 49 MPH at the Wenatchee Airport. Elsewhere snow changed to freezing rain and then rain during the storm. The Idaho Panhandle received heavy snow with 18" in Bonners Ferry and 14" in Sandpoint. The remainder of the month was quiet, except for widespread rain falling over NE Washington into the ID Panhandle on the 20th with 0.50-1.00" of rain.

FEBRUARY It started where January left off with a prolonged stretch of quiet weather, but this changed on the 19th. Heavy snow fell at Stevens Pass through the 20th with 29". Then an arctic front dropped in on the 21st. These typically don't bring a lot of snow, but the front stalled just south of Spokane and Coeur d'Alene and interacted with a small weather disturbance producing heavy snow. Snow totals ranged from 5-8" with the highest amounts in Rockford. The arctic front dropped high temperatures into the upper teens and 20s. Very cold wind chills were observed during the morning of the 22nd over portions of Eastern Washington and the Idaho Panhandle including -17°F in Athol, -15°F Coeur d'Alene, and -11°F in Wallace. A wet storm closed out the month with more heavy snow in the Cascades on the 27th and 28th. Snow totals include 32" in Stehekin, 28" at Stevens Pass, 20" in Mazama, and 18" near Plain. A few places in the Idaho Panhandle received heavy snow as well with 13" on the west side of Priest Lake and 7" in Eastport. Otherwise snow quickly changed to rain making for a sloppy mess. ☀️ *Jeremy Wolf*

ANSWER: True! And it only takes 12 inches of fast moving water to carry away a small car; 24 inches for a van or truck.



Coeur d'Alene at Cataldo river gage site on March 2, 2022

Winter Weather Statistics

Wenatchee Water Plant	Dec	Jan	Feb	Total
Avg High Temp	36.7	32.5	43.7	37.6
Departure from Norm	+0.5	-3.3	-0.2	-1.0
Avg Low Temp	25.1	22.9	25.7	24.6
Departure from Norm	-1.3	-2.7	-1.9	-2.0
Total Precip	0.93	1.86	0.54	3.33
Departure from Norm	-0.66	+0.54	-0.38	-0.50
Total Snowfall	7.6	27.7	1.6	36.9
Departure from Norm	+1.6	+22.1	-1.4	+22.3
Lewiston Airport	Dec	Jan	Feb	Total
Avg High Temp	40.3	40.6	46.6	42.5
Departure from Norm	-0.5	-1.5	-0.4	-0.8
Avg Low Temp	29.5	28.3	28.5	28.8
Departure from Norm	0.0	-2.0	-3.2	-1.7
Total Precip	1.77	1.30	0.32	3.39
Departure from Norm	+0.64	+0.17	-0.72	+0.09
Total Snowfall	11.5	3.8	2.3	17.6
Departure from Norm	+7.4	+1.1	-1.5	+7.0
Spokane Airport	Dec	Jan	Feb	Total
Avg High Temp	32.5	34.4	39.4	35.4
Departure from Norm	-1.3	-0.1	-0.1	-0.5
Avg Low Temp	22.5	24.3	23.7	23.5
Departure from Norm	-1.8	-0.4	-2.6	-1.6
Total Precip	1.35	2.13	1.18	4.66
Departure from Norm	-0.99	+0.16	-0.26	-1.09
Total snowfall	17.7	11.0	6.0	34.7
Departure from Norm	+3.9	-1.3	-1.8	+0.8

Spring Flood Outlook

High flows have occurred on several river basins already this year. Elevated flows have been reported on the Palouse, Paradise Creek and Hangman/Latah Creek in January and again in March. River rises were observed on the Coeur d'Alene Basin in March as well with the forecast point at Cataldo, ID reaching minor flood stage.

The Spring Flood Outlook looks near normal for most of the Inland NW. More rounds of elevated flows are likely especially during times of mild temperatures and heavy precipitation with snowmelt and increased runoff. An abundant snowpack remains in the northern Cascades, Blue Mountains, Panhandle mountains and across the border in B.C. The [long range Flood Risk](#) highlights an increased chance of main stem river flooding on the Stehekin, Okanogan, Grand Ronde, Palouse, and Coeur d'Alene rivers between the months of March through May. In addition to elevated stream flows and flood potential, other risks include rapid rises on small streams, field flooding, mud slides, rock slides and ponding of water, especially in areas of poor drainage or frozen ground. The risks of the spring flooding should subside by Memorial Day in the northern river basins. Those residing near rivers should keep current on [river observations and forecasts](#) ☀ Robin Fox



Funnel cloud on March 4, 2022 near Lewiston Hill.

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Remember your Spring Spotter Checklist

Tornado or Funnel Cloud

Hail: pea size or larger

Strong Winds:
30mph+ or damage

Any Flooding

Reduced Visibility:
under a mile due to fog, snow...

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

Snow:
2" + valleys & 4" + mountains

Any Mixed Precipitation

Travel Problems or Damage:
due to severe/hazardous weather

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Myth or Fact? Six inches of moving water can knock a person off their feet.

New Radiosonde

Weather balloons are an important tool to gather upper air weather data. This provides valuable input to the computer programs that model the atmosphere and predict the weather. Twice a day, everyday, across the country and the world, weather stations launch weather balloons, attached to a radiosonde, to gather the weather data. NWS Spokane is one of these upper air weather sites and have just switched over to a new manual radiosonde observing system (MROS). The main difference with this new system is that the size of the radiosonde has been reduced by more than half, weighing only 63 grams. It still detects temperature, moisture and geopotential height. It uses GPS to detect wind speed and direction and calculates the air pressure. The flight time still remains about the same, around one and a half to two hours to complete. The balloon and radiosonde rises over 30,000 m or about 18 miles high! ☀

MROS Radiosonde March 12, 2022



SNOWMELT PROCESSES

During certain times of the year, water from snowmelt can be responsible for almost all of the streamflow in a river. It's important for hydrologists to understand these processes in order to accurately forecast river floods.

FLOOD SCIENCE Snowmelt Processes

Snow Distribution

The path that weather systems take is the most important factor in determining snowpack, but terrain and vegetation also influence how snow accumulates on the ground.

Snowpack Characteristics

The temperature and the amount of water (snow water equivalent) in the snowpack are important to the melting process. Before rapid melting can occur, the snowpack as a whole needs to be warmed to 32°F.

Snow Energy Exchanges

Incoming solar radiation, emitted longwave radiation, turbulent transfer of heat, ground conduction, and heat transferred during rainfall are all important factors in heating or cooling the snowpack.

Weather Factors

Strong winds and high dew point temperatures aid in melting by limiting the effects of evaporative cooling and allow the layer directly above the snowpack to remain warm due to turbulent mixing. Rain falling on a snowpack can accelerate the melt process, as

Where the Water Goes

Once rapid melting begins, the water will either infiltrate into the soil, run off into streams and other bodies of water, pool in place and potentially refreeze as ice, or a combination. Ice jam flooding can occur if the river channel has excessive ice cover.

WEATHER.GOV/FLOOD



Staff News

We have a few more staff changes to announce at NWS Spokane. Rebekah Cheatham departed the agency in January. She plans to pursue additional education and a new direction in her career. Derek Haupt accepted the offer as a new Electronics Technician. He should arrive in April. Science Operations Officer, Chad Shafer, finally relocated to Spokane in February and is working in the office! We wish both Rebekah and Derek good luck and safe travels. Welcome aboard Chad!

Our office still has limited access. We hope to see a gradual change in the months to come, including attending more in person meetings and visits with our partners. ☀



GOES-T Launch

On March 1, 2022, the latest geostationary weather satellite, GOES-T, was launched into space and put into orbit around the Earth. Once the satellite completes its test process, it will be placed in the "GOES West" position over the Pacific Ocean to monitor weather systems and hazards over the western U.S. It will be renamed GOES-18. The current GOES West (GOES-17) will become an on-orbit spare. ☀