

Cold Season Spotter Training for the Inland Northwest



Fall 2021
National Weather Service - Spokane



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Spokane, WA

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This is a Live Virtual Class

- Voice in Computer - no phone needed - headphones helpful
- All are in listen mode until the end

New to GoToWebinar? Here's the basics

the Menu bar

- Audio – tests your volume
- Attendees – all in attendance
- **Poll** – answer poll questions
- **Questions** – type in a question for the speaker to answer
- **Handouts** – download & print
- Chat – speaker's comments
- Click on the **Hand** to raise
- Click orange arrow to collapse window



Objectives

- Understand the roles & importance of the Weather Spotter
- Provide accurate and timely reports of hazardous weather
- Describe your community's cold season weather threats
- Learn how to prepare and be safe during hazardous weather
- Receive the Winter Outlook 2021-2022

Concentration on Cold Season weather spotting and the Checklist

Now let's look back at last year.....



October 23-24, 2020 - Early Snowfall

A few snow reports:

8.0" Malo

7.0" Colville

6.9" Spokane

5.0" Newport

5.0" Dover

3.0" Spirit Lake

2.0" Palouse



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November 7, 2020 - Blowing Dust

Visibilities reduced to 1-2 miles (even less) due to strong northerly winds in central Washington: Moses Lake, Ephrata, Warden, Soap Lake and George.

Hwy 17 @ Leahy Junction



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December 21-22, 2020 - Wind and Snow

Days before Christmas, a winter storm brought snow and wind.

A few snow reports:

8" Mazama

7" Twisp

3" Conconully

Strong winds led to downed trees and power outages in Pullman



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January 11-13 - Wind and Snow

Another winter storm brought more snow and wind to the region

A few snow reports:

13.9" Lucerne

7.5" Leavenworth

4.5" Boyds

Strong winds led to downed trees and power outages in Spokane, Rosalia, Airway Heights, Fernan Lake, and Coeur d'Alene.



Comstock Park in Spokane



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March 28-29, 2021 - Blowing Dust

Even during the dry spring, visibilities reduced to 1-2 miles (even less) due to strong west winds in many areas: Airway Heights, Moses Lake, Okanogan, Othello, and Warden.



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To our current Weather Spotters....



THANK
YOU!



Eyes and Ears of the
National Weather Service
with a count of over 1200
across the Inland NW!



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New to the program?

What is a Weather Spotter?

- Weather enthusiast who volunteers time to report severe or hazardous weather
 - As needed basis
 - No weather equipment is necessary
 - Simply call, email or send a report online
 - Become the eyes and ears of the National Weather Service



National Weather Service (NWS)

- Part of the Federal Government – Dept of Commerce
- Responsible for all weather/water Watches & Warnings
- 126 offices across the country
- Works with local agencies
- Observe & Forecast
- “Behind the Scenes”
- Decision Support
- Preparedness & Education

**Issue Weather and Water watches/warnings
for the protection of life and property.**



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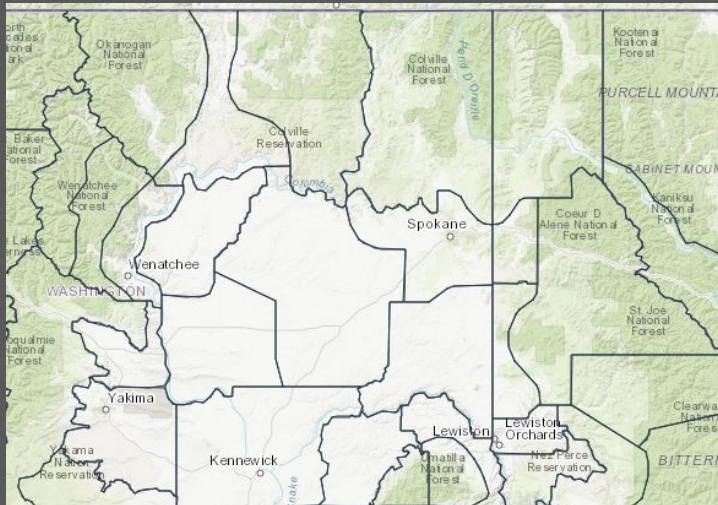
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[illegible]

- 13 counties in eastern WA
- 8 counties in north Idaho

- 9500+ ft in the north Cascades
- 170 ft along the mid Columbia River



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NWS Observations & Tools



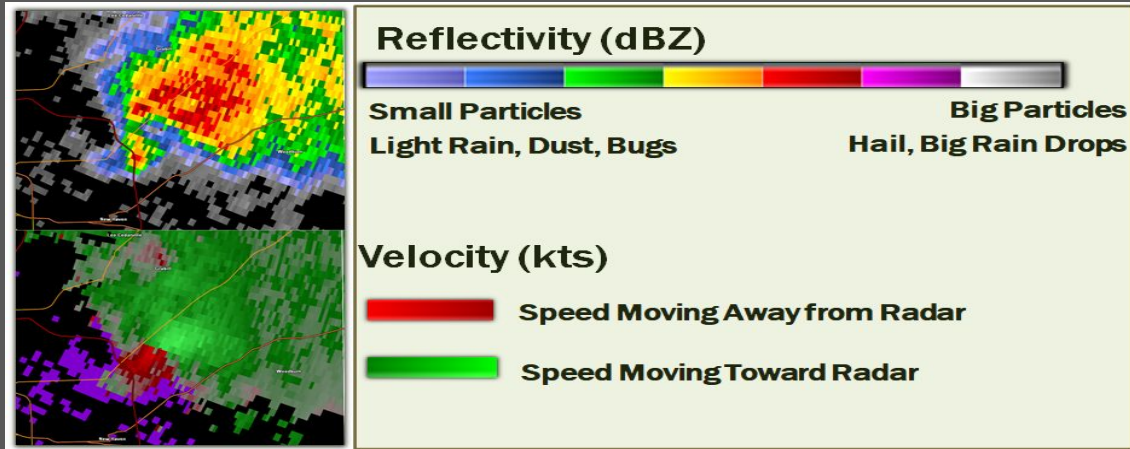
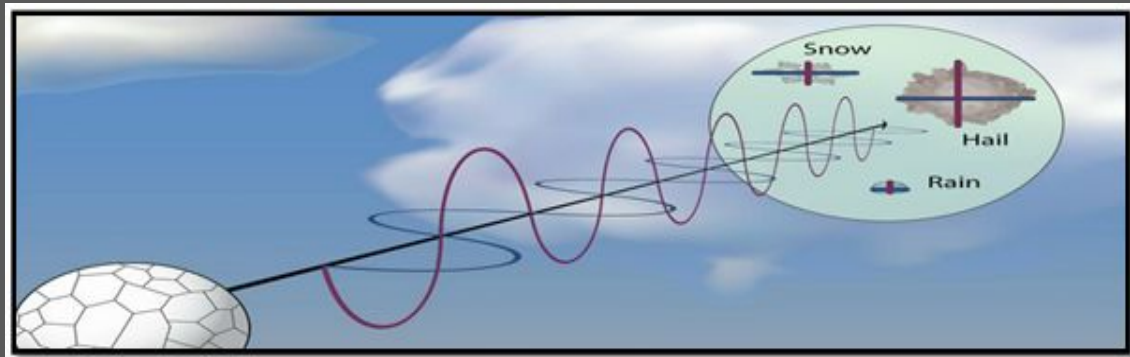
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Doppler Weather Radar



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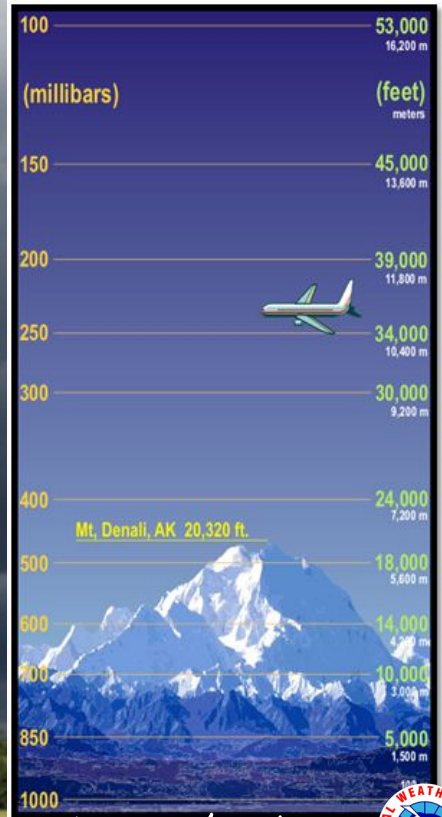
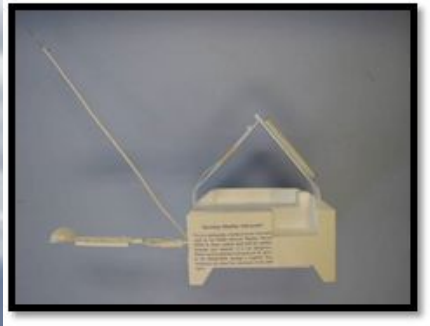
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Weather Balloon - Radiosonde

Twice a day - every day
92 Upper Air sites across the U.S.
Flight time ~ 1 hour 45 min



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Weather Satellites

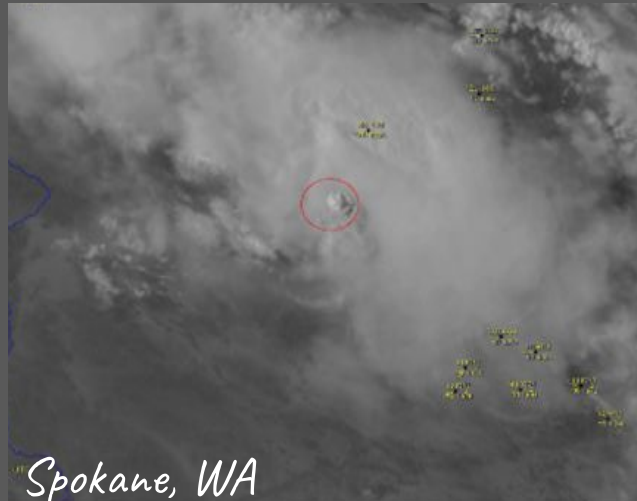
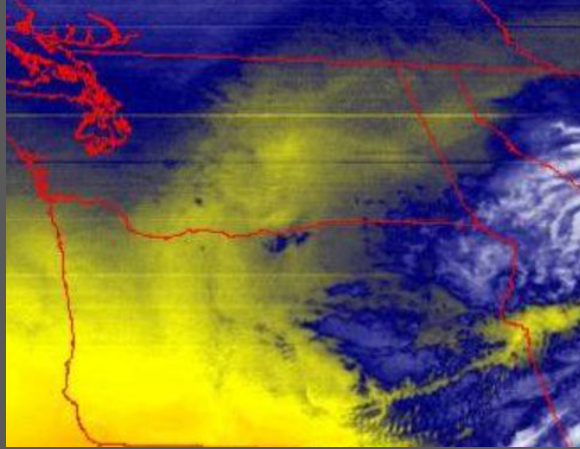
GOES 17 - 16 different channels

IR, Water Vapor & Visible

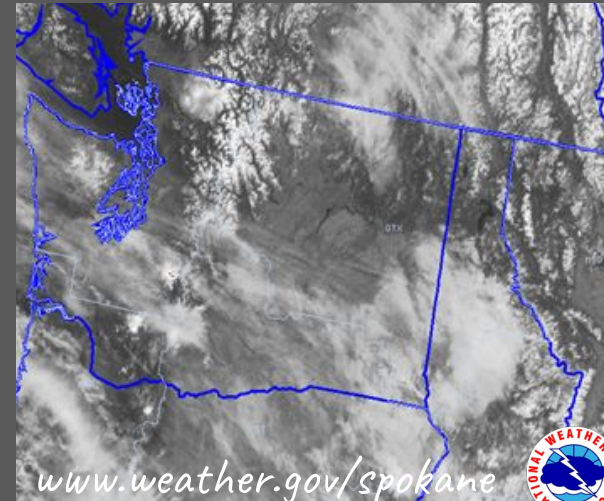
New images every 5 minutes

Aids in early detection

Thunderstorms & Wildfires



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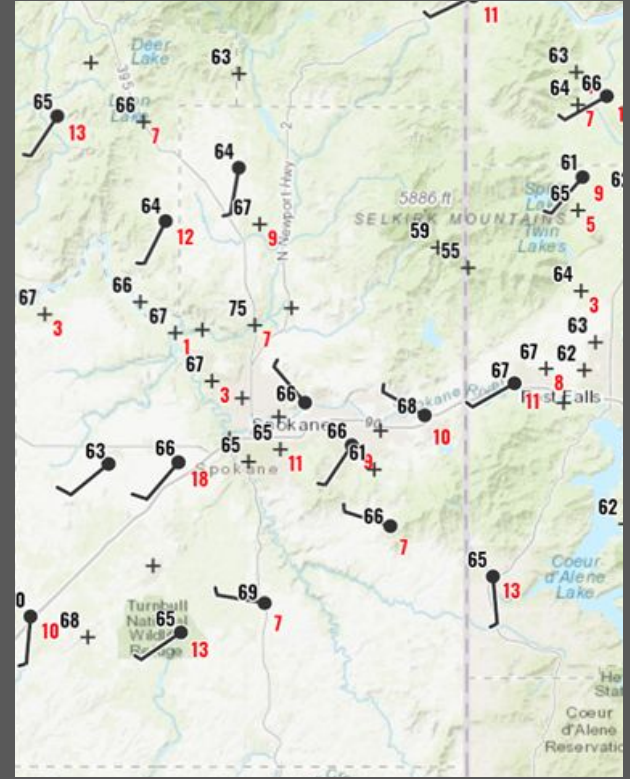


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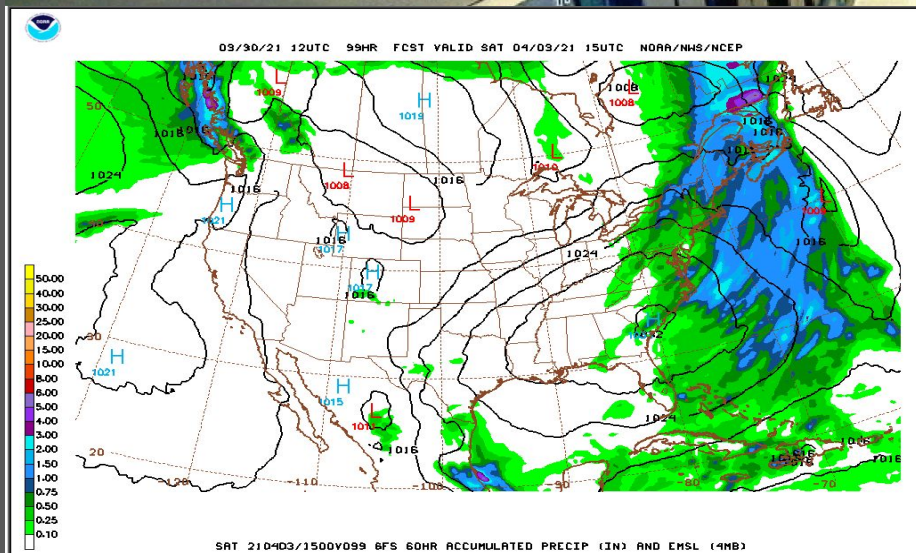


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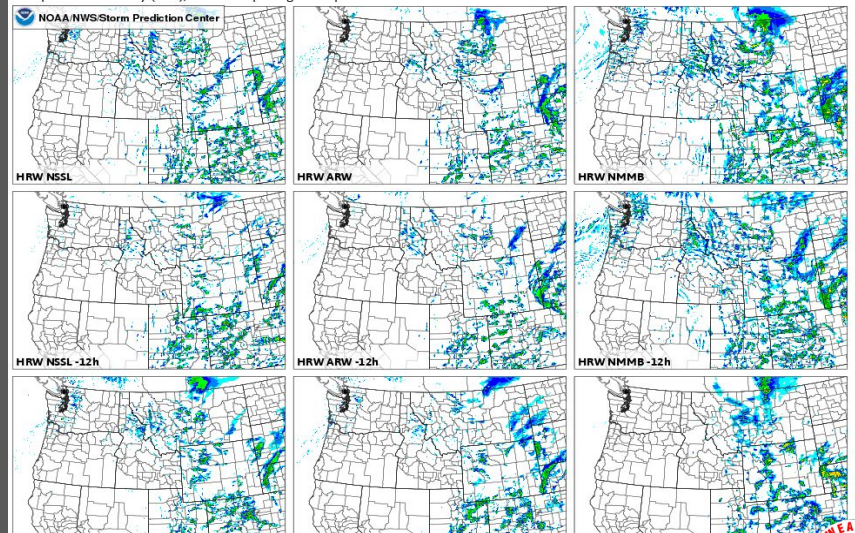




High Resolution Weather Models



Composite reflectivity (dBZ), ensemble postage stamp

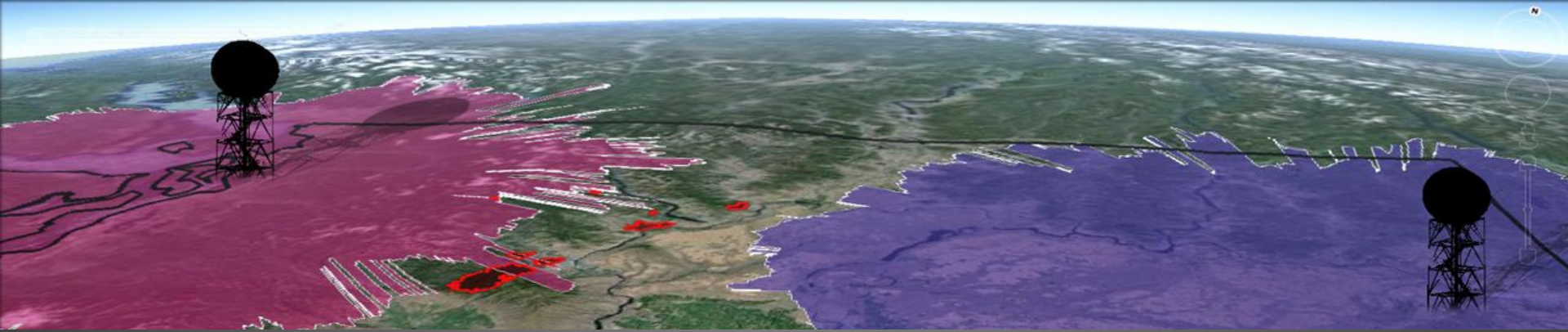


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We need weather spotters! Why?



- Limitations to radar, satellite, and surface observations
- Receive Ground Truth on events
- Fill in the “holes” not seen by observations
- Understand the many micro-climates in the region
- Maximize Warning effectiveness and Lead Times
- Add Credibility to NWS Warnings - Leads to Public Action!



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#1 Poll Question

Why do we need weather spotters?



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What's in a Spotter Report?



The checklist is titled "Inland Northwest Weather Spotter Checklist" and features the NOAA logo on the left and the SKYWARN logo on the right. It contains a series of colored boxes, each with a weather event and a reporting instruction:

- Tornado or Funnel Cloud:** ANY Kind
- Strong Winds:** +40 mph/Damage (58mph severe)
- Hail:** +3/4" in diameter (1" severe)
- Heavy Rain:** +1/2" in 1 hr or +1" in 12 hrs
- Flooding:** ANY Kind
- Mixed Precipitation:** freezing rain or sleet
- Snow:** +2" below 3K ft (valleys) or +6" abv 3K ft (mtns)
- Poor Visibility:** 1/2 mile or less
- Travel Problems:** due to weather
- Damage, Injury or Loss of life:** ANY
- Excessive Heat:** ANY
- Excessive Cold:** ANY

- **Specifics...Tell us the story!**

- **Who...What...and Where**

Spotter ID & Location

- **When the event began and/or ended**

- **Estimate of wind speed and/or hail size**

- **Damage and injury reports**

- **If unsure - report your uncertainty**

- **Include reports while traveling & any delayed or second hand reports**



How Spotters Report - Easiest Phone Call



How Spotters Report – Just as easy Online Reports

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Storm Reports

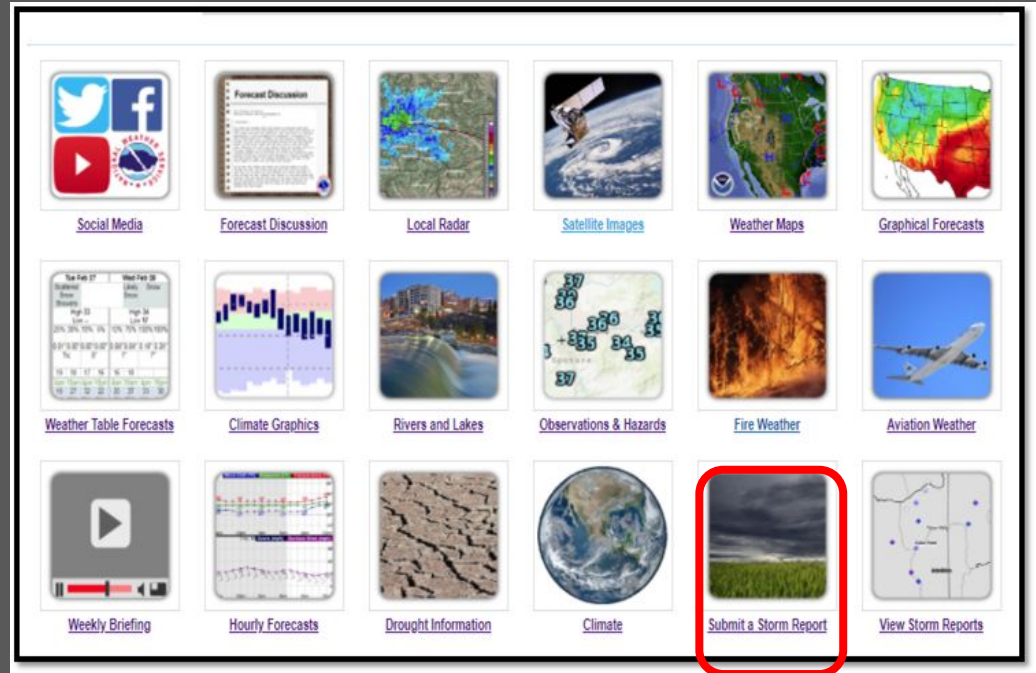
Alerting the NWS to local weather

Report Type -> Details -> Location -> Review and Send

Please select a report type ▼

Back Next

Privacy policy for weather reports



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Share weather data - Social Media

Twitter



- @NWSSpokane
- #wawx & #idwx
- Share reports & pictures
- Monitored 24/7



Facebook

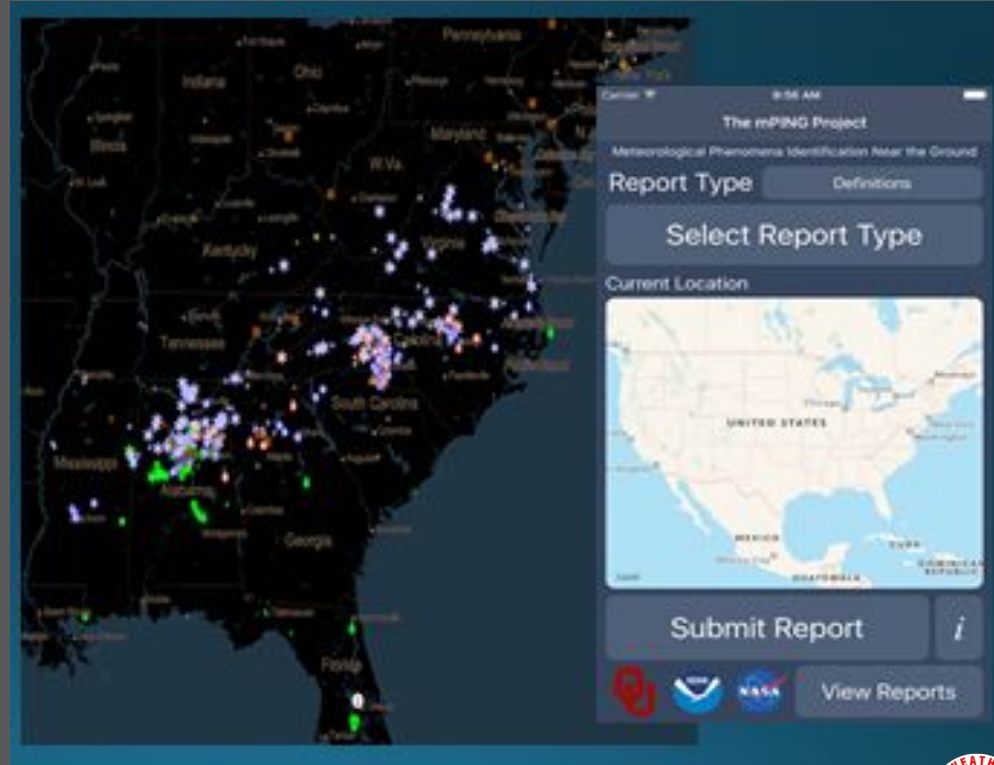


- NWS Spokane
- Send reports & pictures
- Monitored 24/7



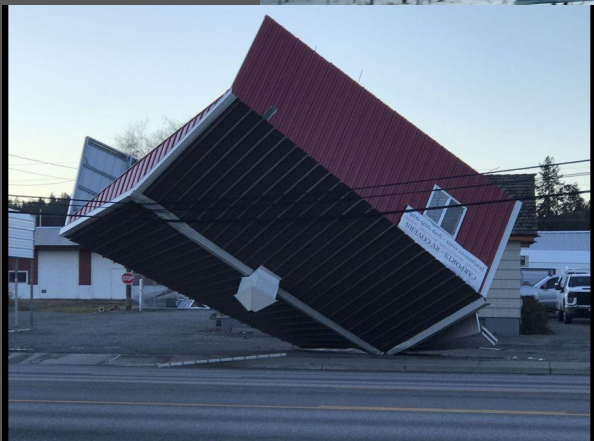
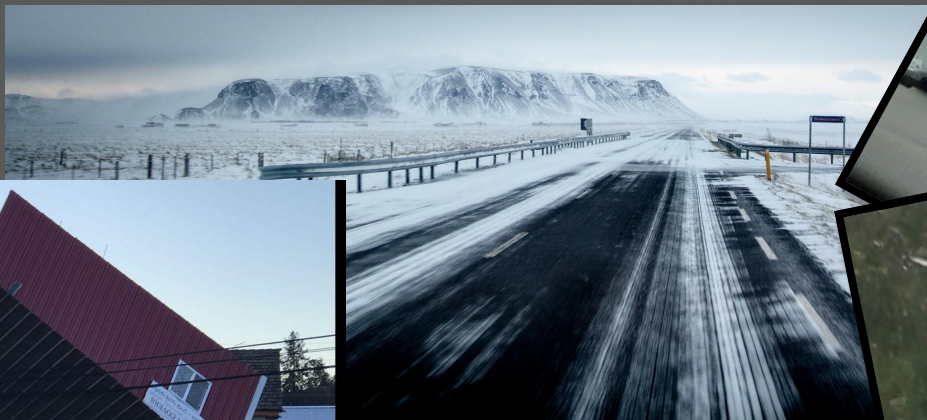
Share weather data - mPING

- Smartphone App
- Available on IOS and Android
- Reports sent to NWS
- Reports are anonymous
- Crowdsourcing
- Very easy to use
- Great for precipitation type!
- <https://mping.nssl.noaa.gov>



Share weather data - Email

nws.spokane@noaa.gov



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Examples of Spotter Reports

This is Max Ceesall, Spotter Stevens 12 calling from my home in Colville. Heavy snow is falling with about 3" on the ground. It began about an hour ago.

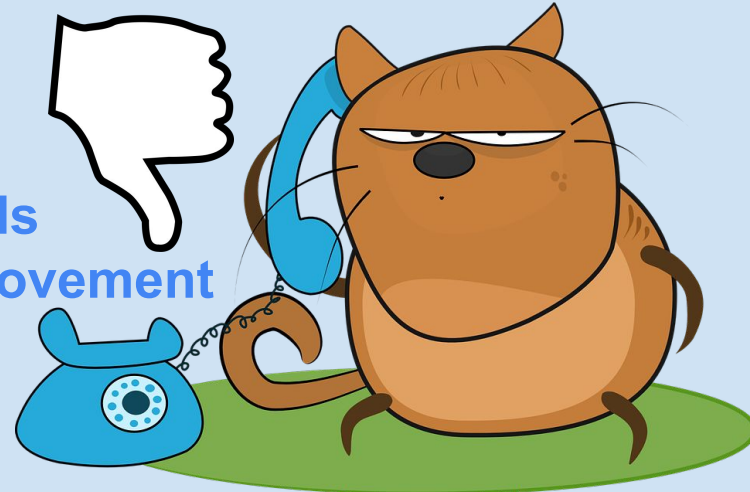


Good job!



Hi there, how are you doing? Who is this?
....Well hi Greg! I'm a spotter in Ferry County.
It's windy here. The news says it's much worse to the south. Are we going to get another storm?
How long is it supposed to last?

Needs Improvement



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Keep in Mind - We may contact you!



- As a registered weather spotter, you share your phone number with the NWS.
- If we see severe or hazardous weather near your location....
- We'll likely call and get information on what weather you are experiencing (ground truth) – especially SNOW REPORTS



Emails

It's important to keep emails current. You may receive notifications on:

- Upcoming WIDESPREAD Severe Weather or Winter Storm events.
- Quarterly newsletter and upcoming training opportunities.



#2 Poll Question

What is not the best way to provide a spotter report?



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Cold Season Hazards



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Heavy Snow



Heavy Snow!

4"+ in 12 hours

Please Report:

First Snow of the Season
Then at least 2" new snow



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What Criteria Must Be Met To Be Considered a BLIZZARD?

WIND

35 mph or greater

BLOWING SNOW

VISIBILITY

1/4 mile or less

TIME

At least 3 hours



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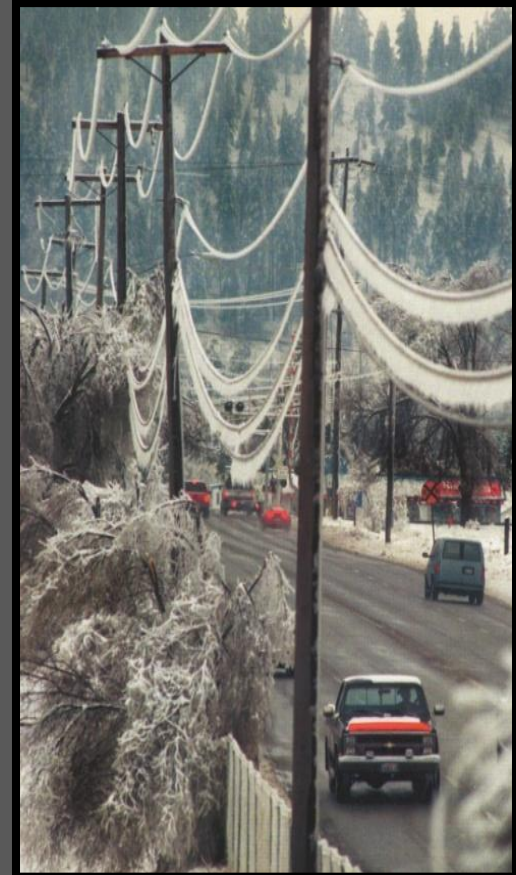
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Wintry Mixed Precipitation

- Freezing rain or Freezing drizzle
- Sleet
- Snow to Rain OR Rain to Snow
- Ice accumulation over $\frac{1}{4}$ inch = Ice Storm Warning!



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Strong or Damaging Winds

- Report any winds estimated to be over 40 mph
- Winds that produce any damage
- Severe/high winds ≥ 58 mph



Windstorm 2015



October 13, 2020



April 27, 2019



Don't have a weather station?

Not to worry...

Use the
Beaufort Wind
Chart to estimate
wind speeds

Beaufort Wind Chart – Estimating Winds Speeds

Beaufort Number	MPH		Terminology	Description
	Range	Average		
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	Severe gale	Light structure damage.
10	55-63	60	Storm	Trees uprooted. Considerable structural damage.
11	64-73	70	Violent storm	Widespread structural damage.



Heavy Rain

Report heavy downpours or long periods of steady rain

Give specific locations - streets and creeks

- 0.50"+ in 1 hour - convective
- 1.0" in 12 hours or 1.5"+ in 24 hours - stratiform



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Flooding and Ice Jams

Rising water on rivers, streams & low lying areas



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Mud and Debris Flows

Water-saturated rock, mud & debris moving down a slope, especially near recent burn scars



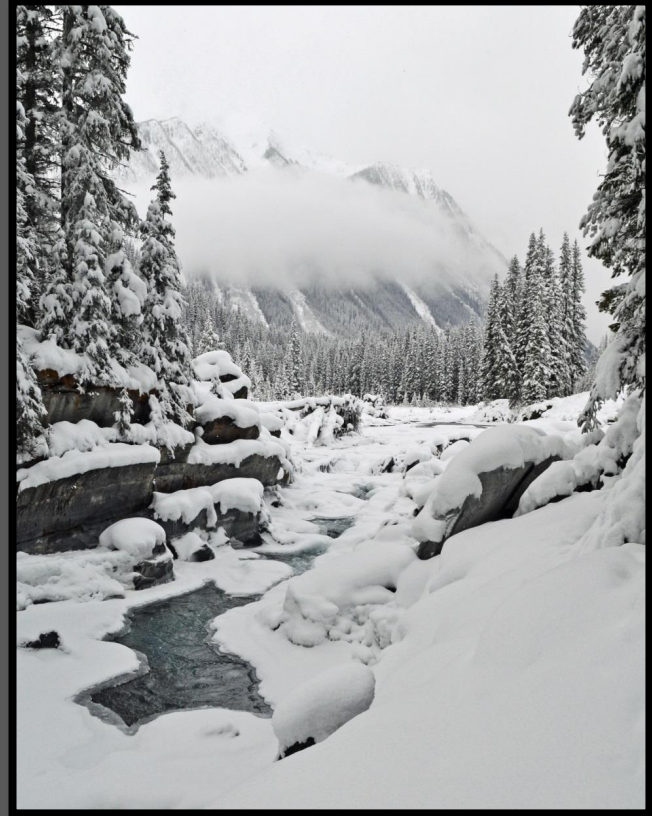
#3 Poll Question

What types of weather conditions could increase the threat of flooding?

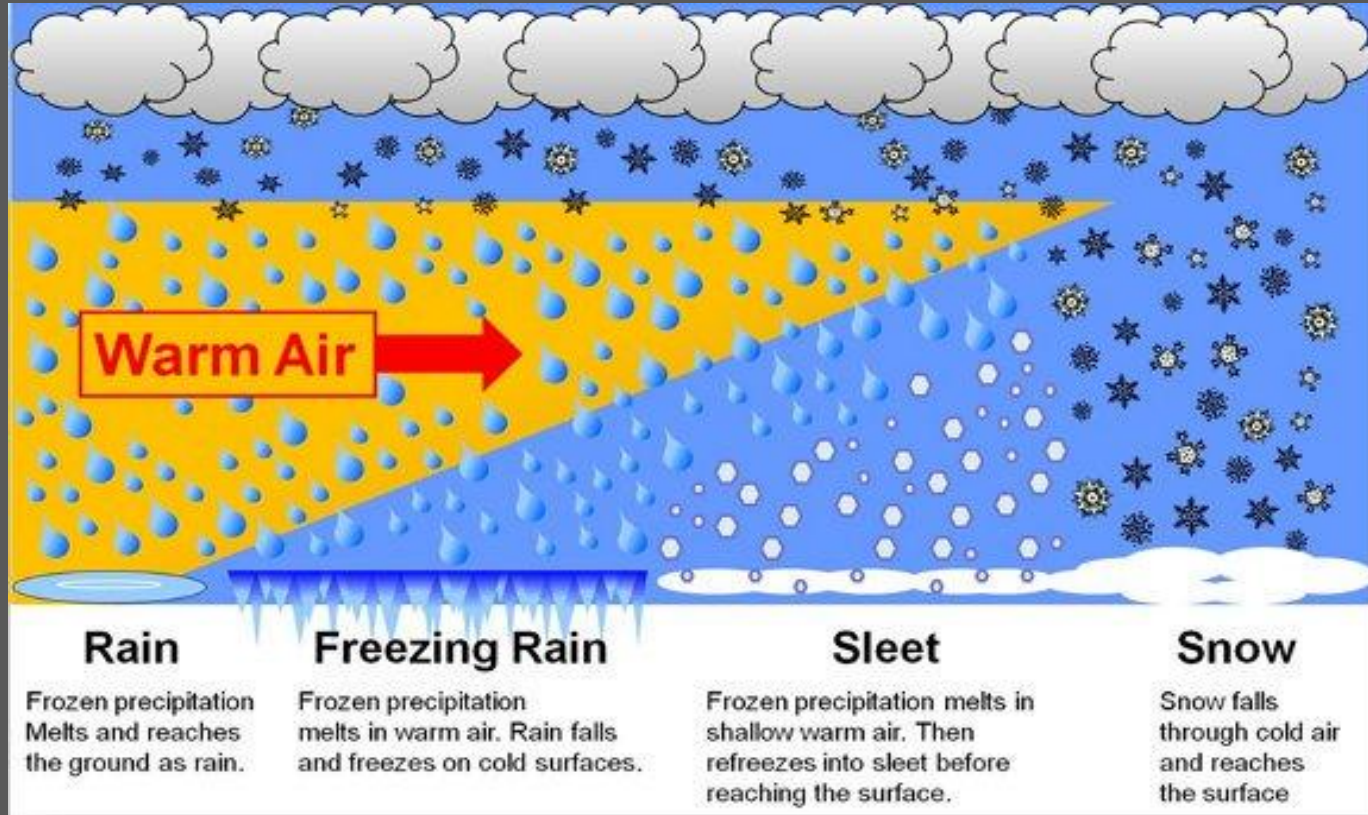


Typical Winter Storm Scenario

- Cold air in place over the Inland Northwest, especially in the valleys
- Warm Pacific Air rides over the cold air
- Precipitation begins as snow, occasionally changes to rain with possible freezing rain



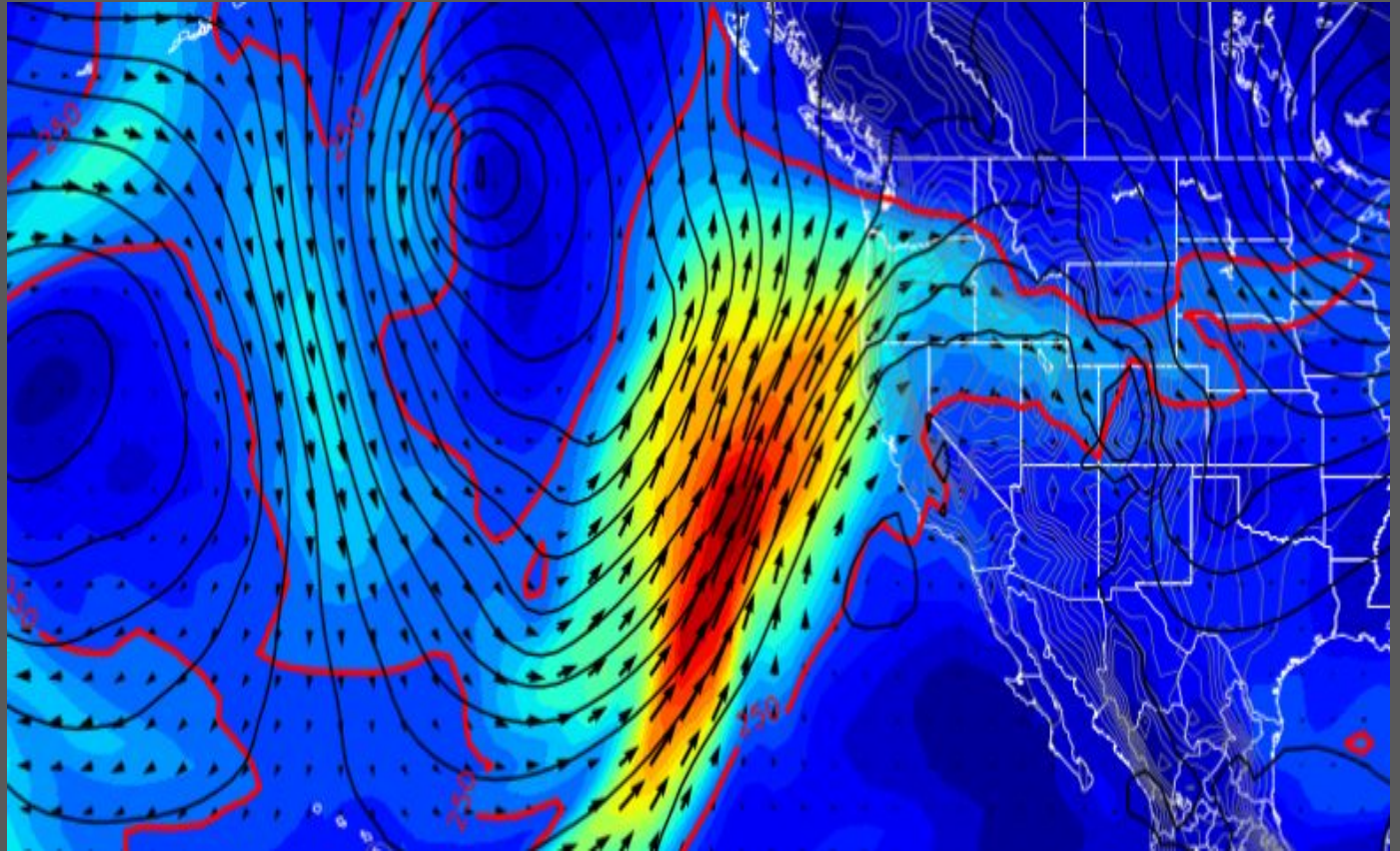
Vertical Temperature Profile is Critical!



Atmospheric Rivers

Plumes of
atmospheric
moisture

Mild & Wet
Weather



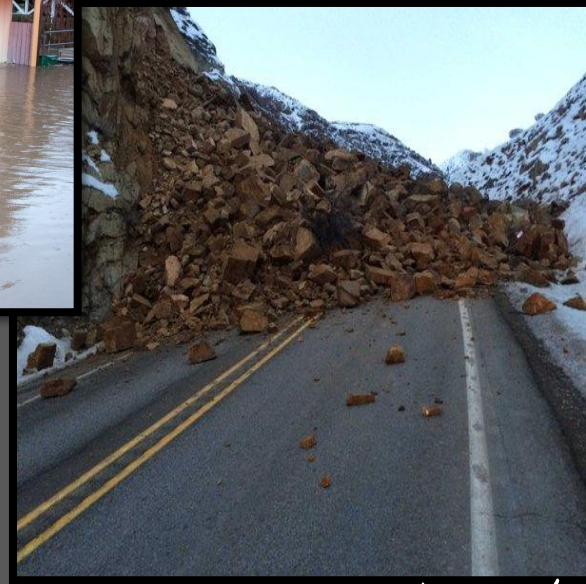
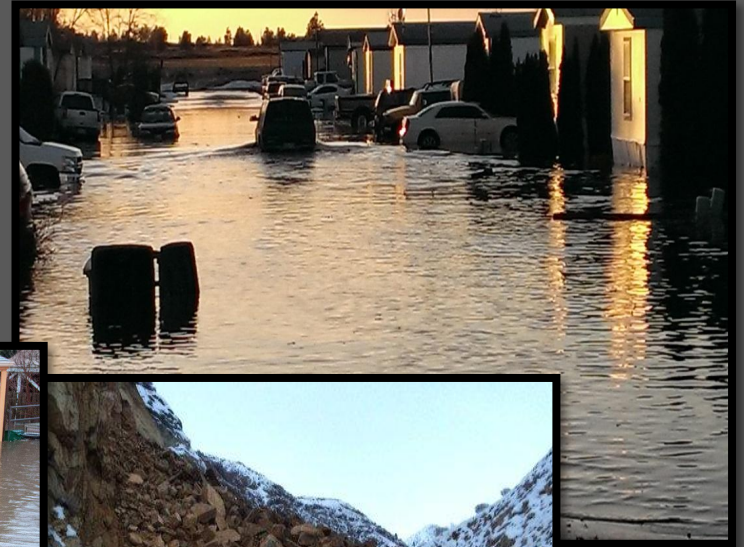
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Atmospheric River Events



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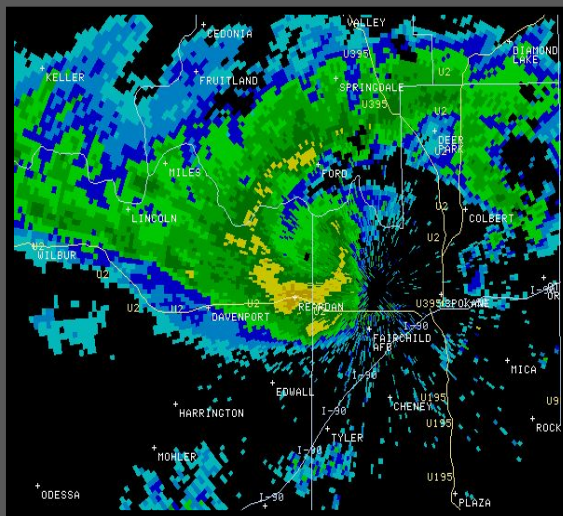
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Small Scale Unstable Lows

- Develop Behind Strong Cold Fronts
- May not be well forecast by models
- Potential for ~1 ft of snow in a short time
- Spotter play a BIG role with reports



Winter Precipitation



Sleet



Graupel



Hail



#4 Poll Question

Identify the type of precipitation.



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Thunderstorm Hazards

Occur in Every Season



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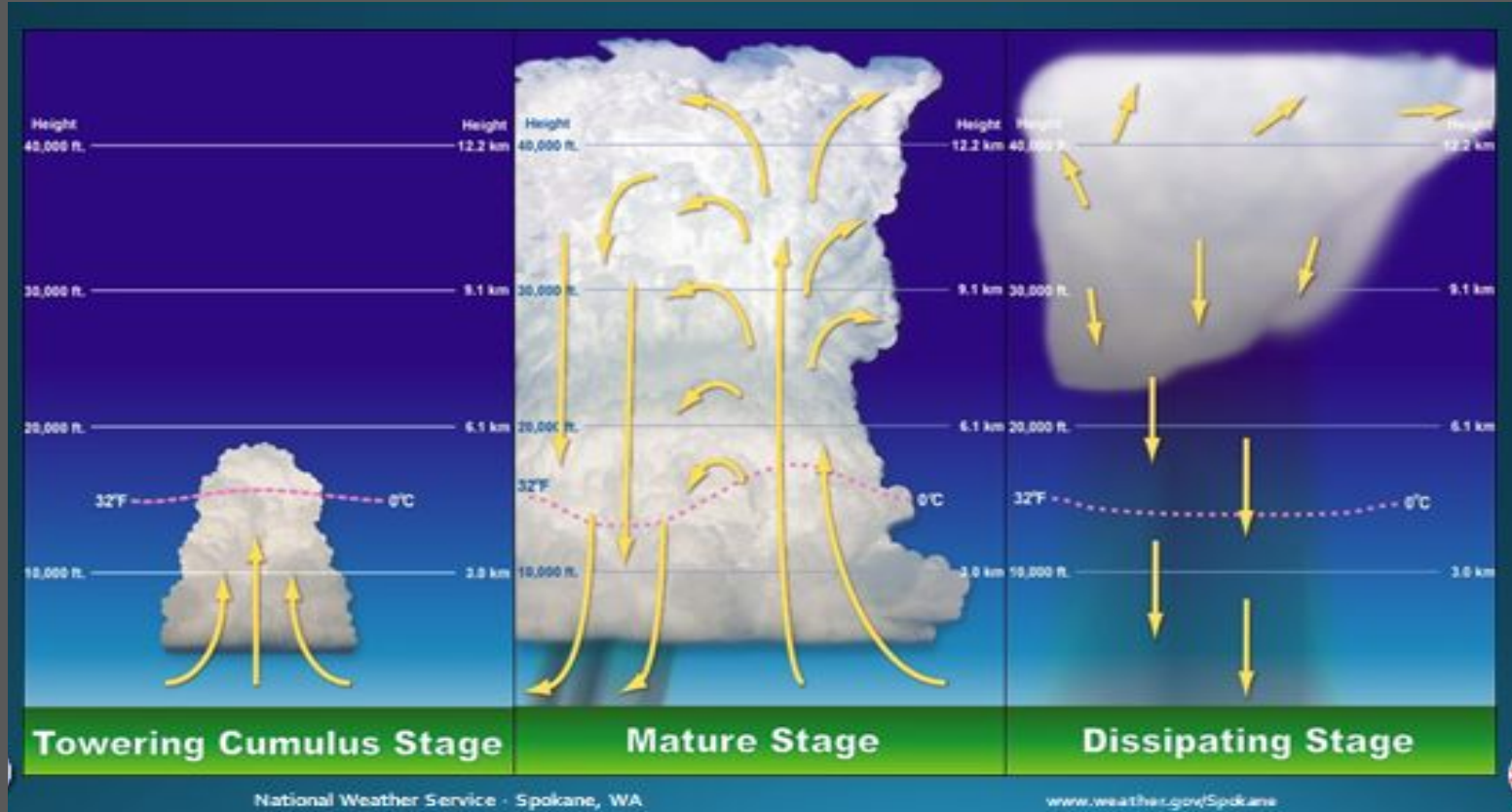
Thunderstorms Ingredients



- **Moisture** – most notably in the lower levels of the atmosphere
- **Instability** – ability of air to accelerate up when pushed
- **Lift Mechanism** – the “Push” that triggers the lift



Stages of a Thunderstorm



What is a Severe Thunderstorm?

Winds \geq 58 mph or Wind Damage



Hail $>$ 1" in diameter



Tornado



- Less than 10% of all thunderstorms are Severe
- Though Lightning is ALWAYS extremely dangerous, the amount of lightning does not make a storm SEVERE.





How to Report Hail Size



Don't Compare Hail to Marbles!
Why? Not all Marbles are Alike in Size!



Measure Hail With Common Objects



Good Examples of Comparison



Object	Size
Dime/Penny	0.75 inches
Nickel	0.88 inches
Quarter	1.00 inches
Half Dollar	1.25 inches
Ping Pong Ball	1.50 inches
Golf Ball	1.75 inches

Object	Size
Hen Egg	2.00 inches
Tennis Ball	2.50 inches
Baseball	2.75 inches
Tea Cup	3.00 inches
Grapefruit	4.00 inches
Softball	4.50 inches

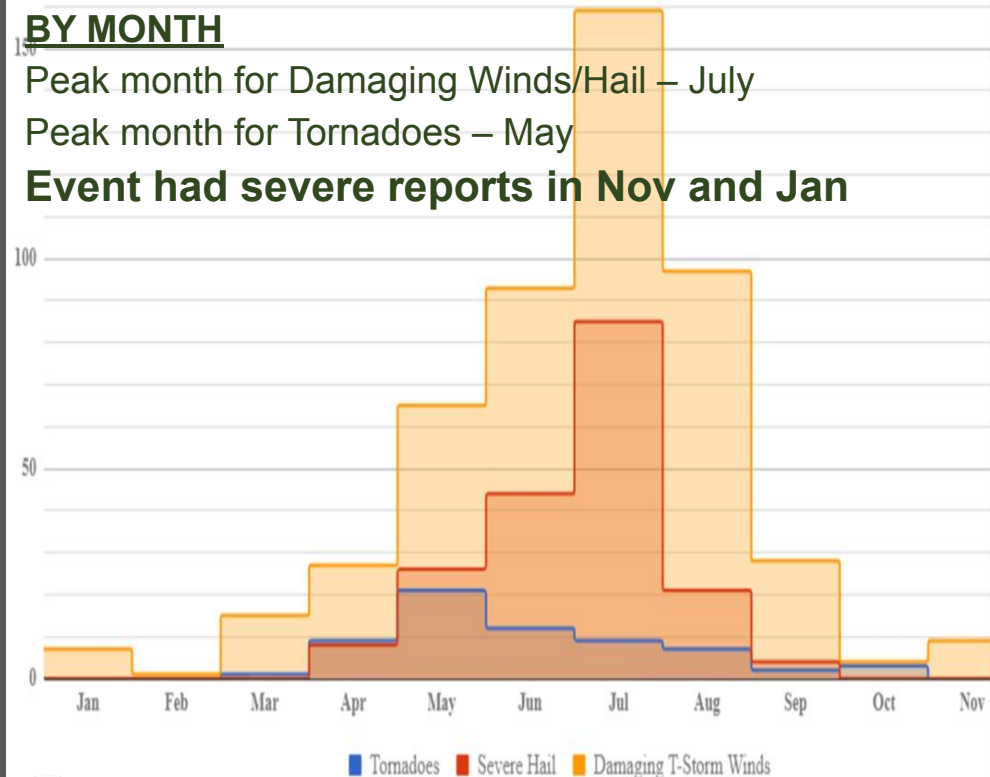
Local Severe Weather Climatology

BY MONTH

Peak month for Damaging Winds/Hail – July

Peak month for Tornadoes – May

Event had severe reports in Nov and Jan

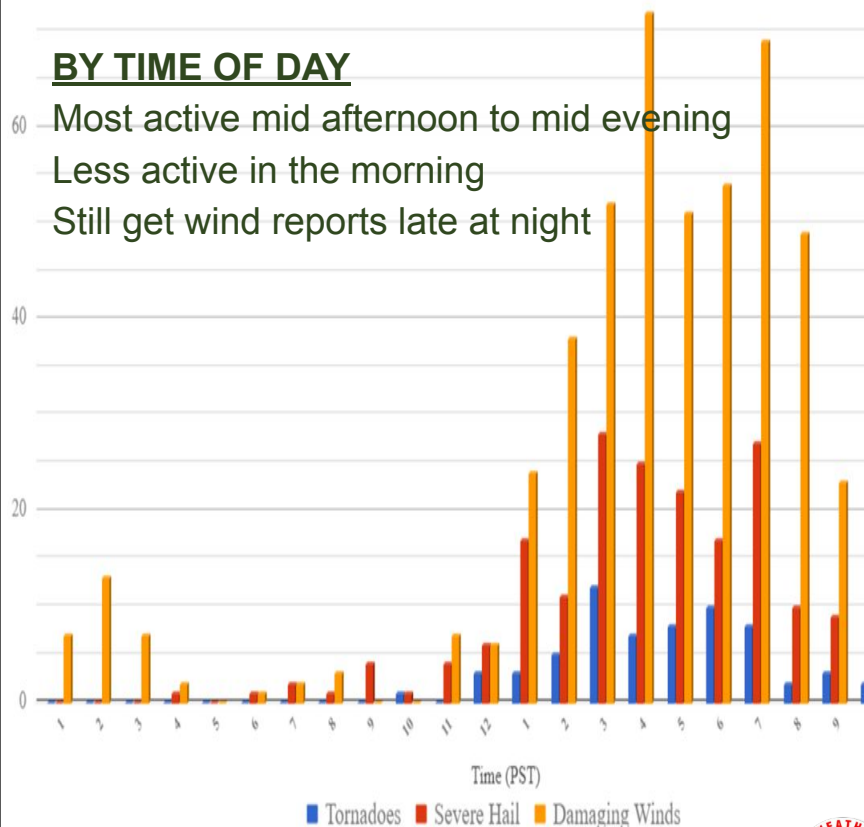


BY TIME OF DAY

Most active mid afternoon to mid evening

Less active in the morning

Still get wind reports late at night



Cloud Types

Scud clouds - ragged



Cumulus



Towering Cumulus



Stratus – stable clouds, hugs mountains



Wall cloud – lowering cloud base/ rotation



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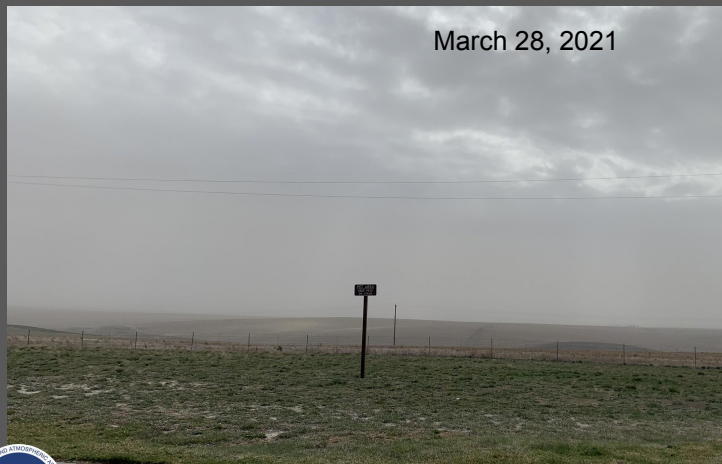
What about Funnel Clouds & Dust Devils?

- Funnel clouds stay aloft attached to storm cloud
- Dust devils start at the ground and extend upward
- Tornadoes extend from storm cloud to the ground
- In doubt, check for cloud cover and debris on ground
- Take a picture and share!



Dust Storm Safety

- Prolonged dry spell + strong winds + plowed fields
- Sudden reduction in visibility
- Also called Haboobs
- If widespread, can lead to air quality issues
- If driving, best to pull over to the side of the road and wait.



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Flood Safety

- Be alert for rising water, especially in canyons or low lying areas.
- Avoid walking or driving (at any speeds) through flood waters. A depth of 2 feet of moving water can carry away most automobiles.
- Be extra careful at night when it's hard to see.



Winter Storm Safety

- Make sure your vehicle is winterized before the big winter storm arrives. Have a winter survival kit packed with blankets, flashlight, shovel, ice scraper, food and water.
- Dress for the weather. Remember to dress in layers. Limit time outside to avoid hypothermia in extreme cold.
- If caught in a winter storm, stay indoors or find shelter. Stay warm and dry.



Lightning Safety

Close Enough to Hear Thunder,-
Close Enough to be Struck!

- Lightning can strike as far as 10 miles from the thunderstorm.
- More than 50% of lightning deaths occur AFTER the storm has passed

When Thunder Roars, Go Indoors

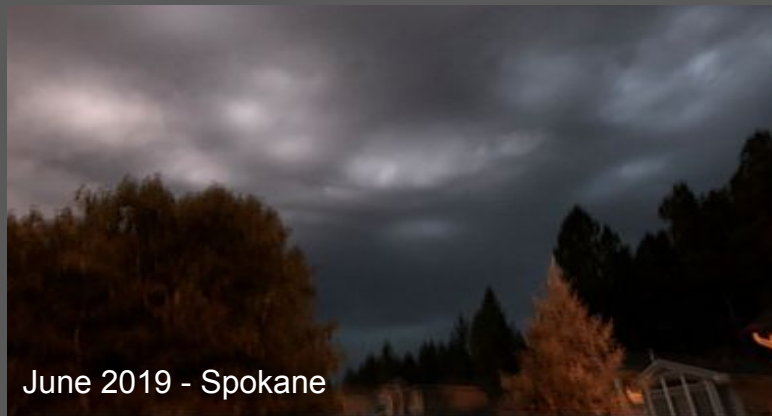
Seek Safe Shelter indoors - or vehicle if needed
Stay away from windows & doors
Don't use a corded phone or take a bath/shower



Spokane, WA April 2017



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June 2019 - Spokane

Spokane, WA



Ritzville - May 2020

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Spotter Safety

- Personal Safety is the Primary Objective of every spotter
- Protect You and Your Family First
- Do NOT put yourself in harm's way
 - Don't walk or drive over obstructions as flooded roads or downed power lines
 - Don't put yourself under objects that have the potential to fall or be blown over
- **ACES - Awareness, Communication, Escape Route and Safe Zones**



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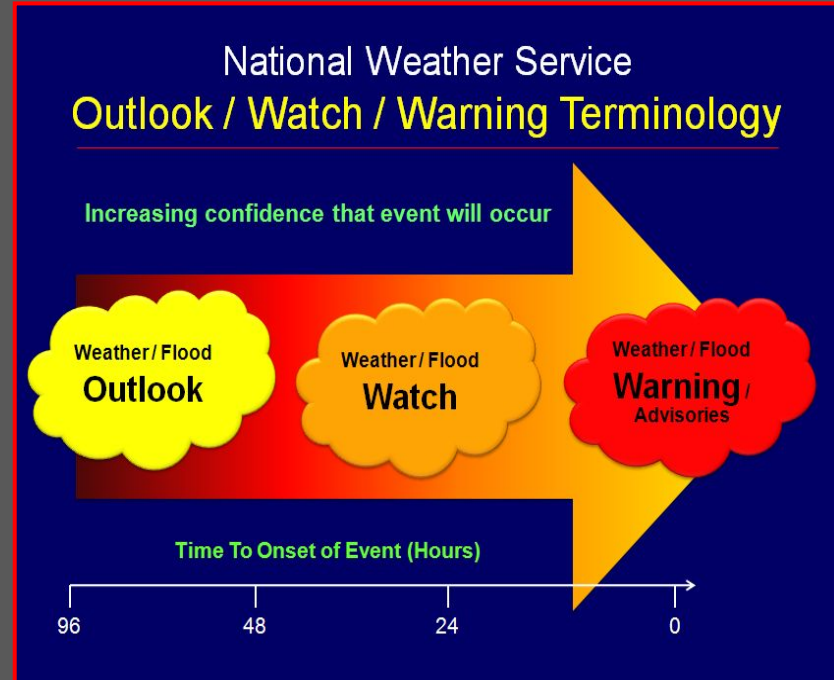
#5 Poll question

You encounter a flooded roadway.
What's the safest thing to do?



Stay Informed - NWS Terminology

- **Watch:** Severe weather is favorable, but not imminent. **GET READY!**
- **Warning:** Severe weather is here or coming soon. **ACT NOW!**
- **Advisory:** Minor nuisance or inconvenient weather is here or coming soon



NWS Weather Warnings

- Tornadoes
- Severe Thunderstorms
- Flooding
- Snow, Ice, & Cold
- Wind
- Fire
- Freeze



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Stay Informed

NOAA Weather Radio

Continuous operation.

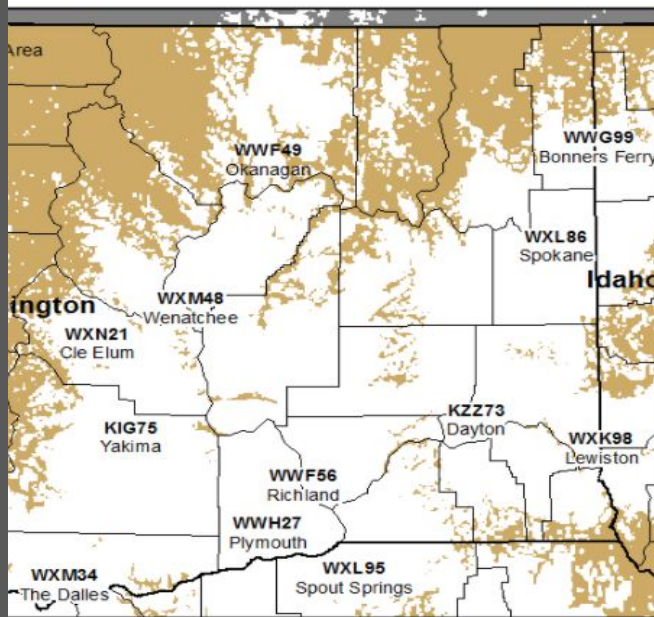
Battery backup capable.

Handheld device great for outdoor activities.

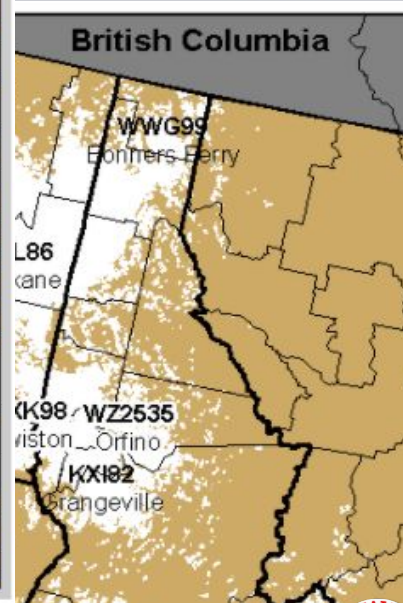
Can drive across the country and get info anywhere along path.



Washington



Idaho



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Spokane, WA


www.weather.gov/spokane



Stay Informed

NWS Spokane Web Page

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HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by City, ZIP or ZIP code
Enter location
[Location Help](#)


News Headlines


- [Spring 2021 Virtual Weather Spotter Training - Register Here!](#)
- [NOAA Weather Radio Technical Issues - Degraded service at Mt Spokane transmitter](#)
- [Weather Watcher Quarterly Newsletter - Spring 2021](#)

MY FORECAST
Spokane WA



Clear
46°F
8°C [Get Detailed info](#)

Today

Sunny
High: 59°F


Tonight

Mostly Clear
Low: 33°F [change location](#)

NWS Forecast Office Spokane, WA
[Weather.gov](#) > Spokane, WA






Spokane, WA
Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Weather this week

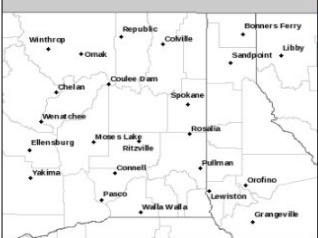


Seasonal & Settled Before Mid-Week Change ©2021 NWS - Spokane, WA

MON	TUE	WED	THU	FRI
				
50°s - low 60°s	High 50°s - 60°s	60°s	50°s - low 60°s	High 40°s - 50°s

[Show Caption](#)

Click a location below for detailed forecast.



Watches, Warnings & Advisories

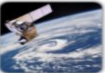




There are no watches, warnings, or advisories at this time.

Zoom In Zoom Out

Last Map Update: Mon, Apr. 5, 2021 at 10:44:15 am PDT

Text Product Selector (Selected product opens in current window)

Latest Text Products Issued by OTX

 Social Media	 Forecast Discussion	 Local Radar	 Satellite Images	 Weather Maps	 Graphical Forecasts
 Weather Table Forecasts	 Climate Graphics	 Rivers and Lakes	 Observations & Hazards	 Fire Weather	 Aviation Weather
 Weekly Briefing	 Hourly Forecasts	 Drought Information	 Climate	 Submit a Storm Report	 View Storm Reports



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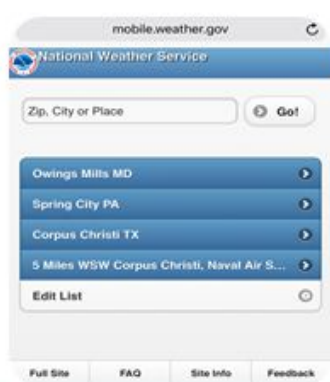
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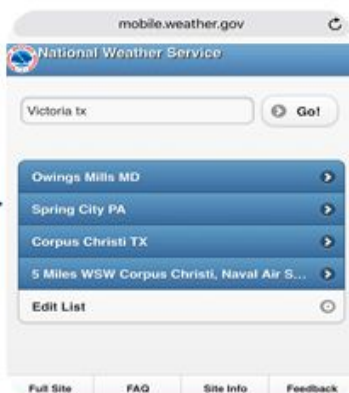


Stay Informed On your Smartphone

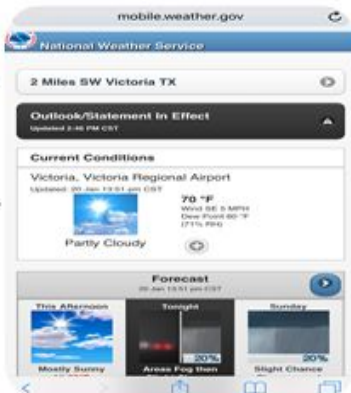
mobile.weather.gov



Mobile.Weather.gov
Smart Phone Enabled



Type in desired location
Hit 'Go'



Up pops current
conditions, hazards, and
forecast



Can add this website to
your 'Home' screen for
quick access



Home Screen



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Staying Informed On Your Phone!



Weather Warnings

Tornado Warnings

Flash Flooding Warnings

Extreme Wind Warnings

Dust Storm Warnings

Snow Squall Warnings

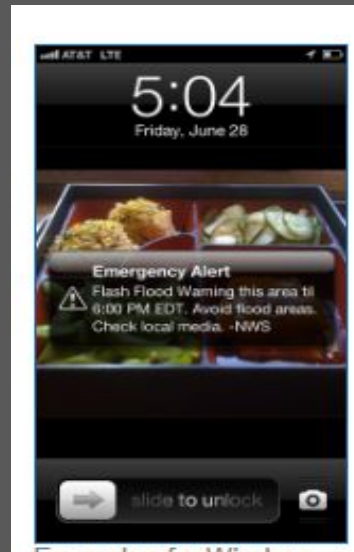
Alert Categories

Extreme Weather & Water Warnings

Local emergencies & Evacuations

AMBER Alerts

Presidential Alerts – National emergency



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Stay Informed

Be Prepared - Disaster Kits and Disaster Plans

- **Water**, one gallon of water per person per day for at least three days
- **Food & medicine/prescriptions**, at least a three-day supply
- **Radio**, battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries for both
- **Flashlight and extra batteries**
- **First aid kit**
- **Whistle** to signal for help
- **Dust mask** to help filter contaminated air and plastic sheeting and duct tape to shelter-in-place
- **Moist towelettes, garbage bags and plastic ties** for personal sanitation
- **Wrench or pliers** to turn off utilities
- **Manual can opener** for food
- **Local maps**
- **Cell phone with chargers, inverter or solar charger**



<http://www.ready.gov/kit>



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Other Ways to Get Involved

- ☒ Weather Spotter
- ☐ Join the Community Collaborative Rain, Hail, and Snow Network
- ☐ Join the Citizens Weather Observers Program



Community Collaborative Rain, Hail and Snow Network - CoCoRaHS

Help Observe Precipitation in your Community

www.cocorahs.org

Volunteer take readings once a day - transmit on mobile device

The screenshot shows the CoCoRaHS website homepage. At the top, the logo and title "COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK" are displayed, along with the tagline "Because every drop counts". Navigation links for Home, Countries, States, View Data, Maps, My Data, My Account, Admin, and Logout are provided. A "Select Language" dropdown is also visible. Below the header, a welcome message states: "Welcome to CoCoRaHS! 'Volunteers working together to measure precipitation across the nations.'" A "Main Menu" sidebar on the left lists links for Home, About Us, Join CoCoRaHS, Contact Us, and Donate, as well as a "Resources" section with links to FAQ/Help, Education, Training Slide Shows, Videos, Condition Monitoring, Evapotranspiration, Soil Moisture, Volunteer Coordinators, Mail Pad, Distribution/Drop-off, Help Needed, Printable Forms, The Catch, Message of the Day, Publications, CoCoRaHS Blog, Web Groups, State Newsletters, Master Gardener Guide, State Climate Series, March Madness, and WXTalk Webinars. The main content area features a section titled "Who uses CoCoRaHS Observations?" with a table of reports received today (4/22/2020 as of 6:26 PM EDT). The table shows: Daily (10,433), Multi-day (63), SigWx (5), Hail (7), Condition (9), and ET (51). Below the table is a map of the United States with color-coded precipitation data. A legend for "Daily Precipitation (inches x.xx) USA 4/22/2020" shows color ranges from Trace to 2.17 - 2.39. A "JOIN CoCoRaHS" button is located on the right. Below it are links for "TRAINING SLIDE SHOW" and "Training Animations". A "Things to know about..." section lists "Rain", "Hail", and "Snow" with corresponding icons. At the bottom, there are links to "Download on the App Store" and "ANDROID APP ON Google Play".

Daily	Multi-day	SigWx	Hail	Condition	ET
10,433	63	5	7	9	51



The screenshot shows the CoCoRaHS app interface on a smartphone. The top bar displays "Logout", "Precip Report", and "Details". The main content area shows a "CO-LR-610" report for "Fort Collins 3.5 SW". The "Precipitation Report" form includes fields for "Observation Date" (2015-05-13), "Observation Time" (07:00), and "Rain/Melted Snow" (0.00). There are toggle switches for "Trace Precip" and "Metric Units (mm/cm)". A "Submit" button is at the bottom. The CoCoRaHS logo is visible in the top left corner of the app screen.



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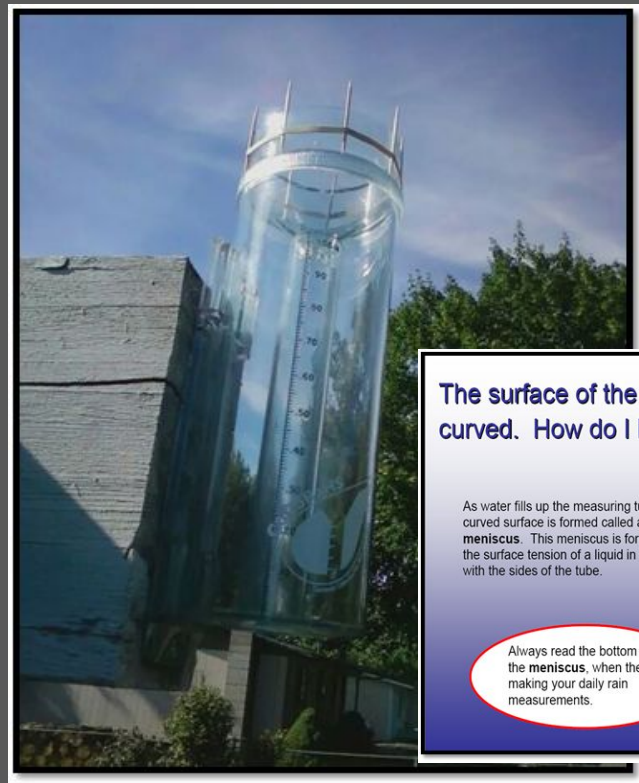
www.weather.gov/spokane



Community Collaborative Rain, Hail and Snow Network - CoCoRaHS

Five easy steps

1. Sign-up at on the CoCoRaHS web site www.cocorahs.org
2. Obtain a 4" plastic rain gauge
3. View the online "training slide show"
4. Set up the gauge in a "good" location in your yard - away from trees
5. Start observing precipitation and report online daily



The surface of the water in the gauge looks curved. How do I know where to read?

As water fills up the measuring tube, a curved surface is formed called a **meniscus**. This meniscus is formed by the surface tension of a liquid in contact with the sides of the tube.



Always read the bottom of the **meniscus**, when the making your daily rain measurements.



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Citizen Weather Observers Program

CWOP

www.wxqa.com



- Have a weather station and want to share data online
- Has a PC and Internet access
- Register Online & Receive a weather station ID
- Transmits data every 15 mins



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Citizen Weather Observers Program

Citizen Weather Observer Program

Site Contents:

[News](#)
[Main Page](#)
[Data Quality](#)
[Member Lists](#)
[Map/Data Displays](#)
[Ham Wx Station Info](#)
[CW Packet Checking](#)
[Weather Station Resources](#)
[Computer Security and Archive](#)



Join [CWOP](#) or [CWOP-snow](#)
[Search CWOP](#) or [shortform](#)

Related Links:

[CWOP info](#)
[APRS-IS info](#)
[findu.com info](#)
[FAQs, Forums](#)
[Solar Radiation](#)
[MADIS Program](#)
[APRSWXNET info](#)
[APRS Servers to Use](#)
[NOAA mesonet display](#)

What's going on here?

The Citizen Weather Observer Program (CWOP) is a public-private partnership with three goals: 1) to collect weather data contributed by citizens; 2) to make these data available for weather services and homeland security; and 3) to provide feedback to the data contributors so they have the tools to check and improve their data quality. In fact, the web address, wxqa.com, stands for weather quality assurance.

The [number of North American CWOP stations](#) sending data over the past several days is normally more than 7000 stations sending 50,000 to 75,000 observations every hour. The number of [world-wide citizen weather stations](#) sending data to CWOP is shown increasing over the past decade.

CWOP members send their weather data by internet alone or internet-wireless combination to the findU server and then every five minutes, the data are sent from the findU server to the NOAA MADIS server. The data undergo [quality checking](#) and then are distributed to users. There are over 800 different organizations using CWOP mesonet data. Here is a partial list:



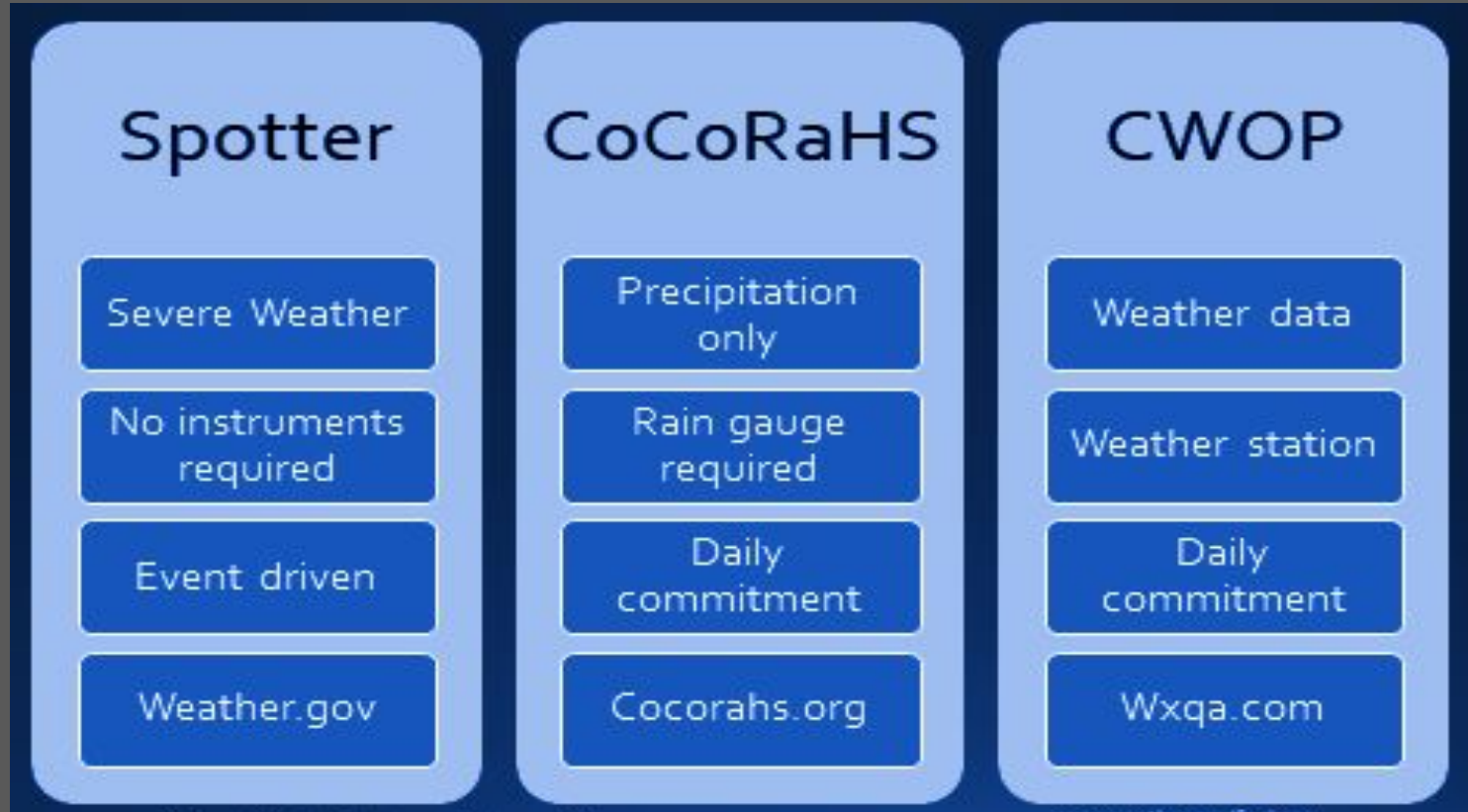
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Different programs - All useful to the NWS



Weather Spotter Resources Online

www.weather.gov/spokane

- Latest radar & satellite images
- Current watches, warnings & forecasts
- Latest NWS Storm Reports
- Maps of NOAA Weather Radio frequencies
- Current & Past Newsletters
- Spotter Guide
- Additional training resources -

MetEd



Spotter Resource Page

[Send Spotter Reports](#)

*This website is an easy method to send spotter reports online through your computer!
You have to be a registered weather spotter for the Inland Northwest to gain access to the system.*

[Online Weather Spotter Sign Up Form](#) - New

[Weather Spotter Sign up Form](#)

[Virtual Training - Nov 2020](#) [Notes](#)

[Weather Spotter Checklist](#)

[Virtual Training - April 2020](#) [Notes](#)

[Ways to be a Weather Volunteer](#)

[Virtual Training - Dec 2019](#) [pdf](#)

[Latest NWS Storm Reports](#)

[Training Schedule](#) - NEW Spring '21

[Weather Watcher Newsletter](#)

Additional ONLINE Training

<u>Spotter Training through COMET MetEd</u>	<u>CoCoRaHS</u>
<u>SKYWARN Spotter Training - Basic</u>	<u>CoCoRaHS slide shows</u>
<u>Role of the SKYWARN Spotter - Applications</u>	<u>CoCoRaHS videos</u>
<u>SKYWARN Spotter Convective Basics - Intermediate</u>	<u>Wx Talks Webinars</u>



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#6 Poll question

What is a good way to stay informed about hazardous weather?



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Winter Outlook 2021-2022



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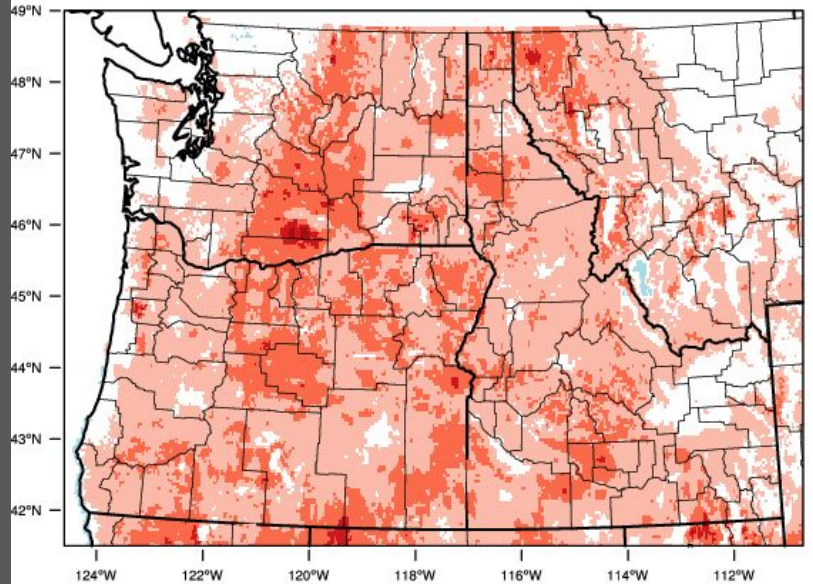
So far this fall...

wrcc.dri.edu/

After a Record HOT & DRY Summer, temperatures continue to be above normal and precipitation below normal.

Pacific Northwest - Mean Temperature

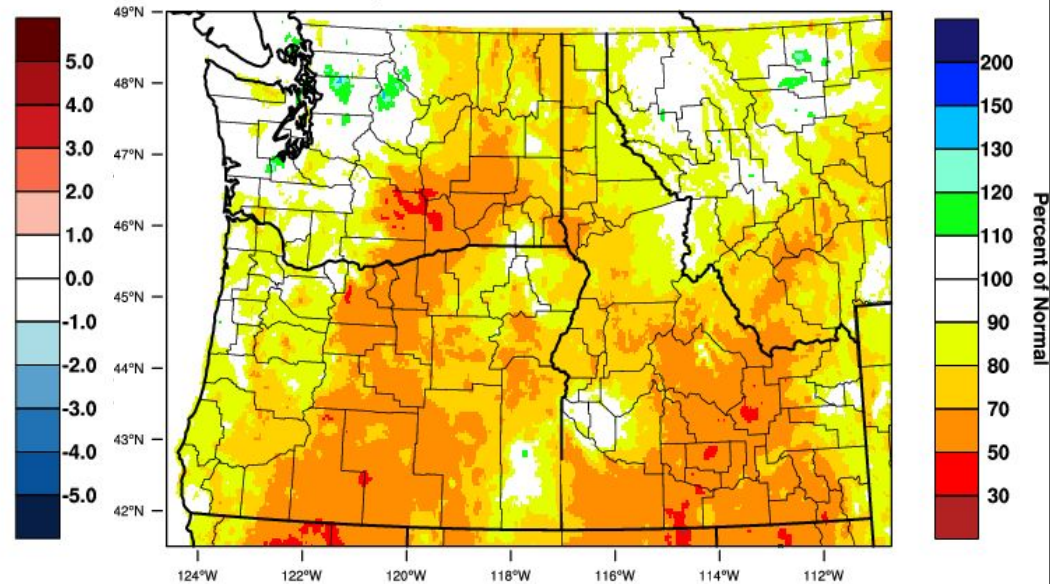
October-September 2021 Departure from 1981-2010 Normal



WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 2 OCT 2021

Pacific Northwest - Precipitation

October-September 2021 Percent of 1981-2010 Normal



WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 2 OCT 2021



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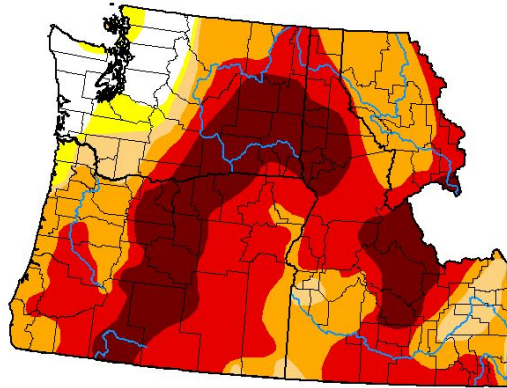


Drought Update

US Drought Monitor & Seasonal Outlook

www.cpc.noaa.gov

U.S. Drought Monitor Pacific Northwest DEWS



October 19, 2021

(Released Thursday, Oct. 21, 2021)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.22	93.78	90.80	84.57	57.32	22.41
Last Week 10-12-2021	6.19	93.81	90.80	84.73	56.67	22.85
3 Months Ago 07-20-2021	0.00	100.00	92.49	75.92	44.39	16.24
Start of Calendar Year 12-29-2020	38.14	61.86	40.77	27.90	10.74	0.00
Start of Water Year 09-28-2021	0.00	100.00	93.35	84.83	57.49	24.06
One Year Ago 10-20-2020	19.88	80.12	44.76	29.66	15.29	0.00

Intensity



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Brad Pugh
CPC/NOAA

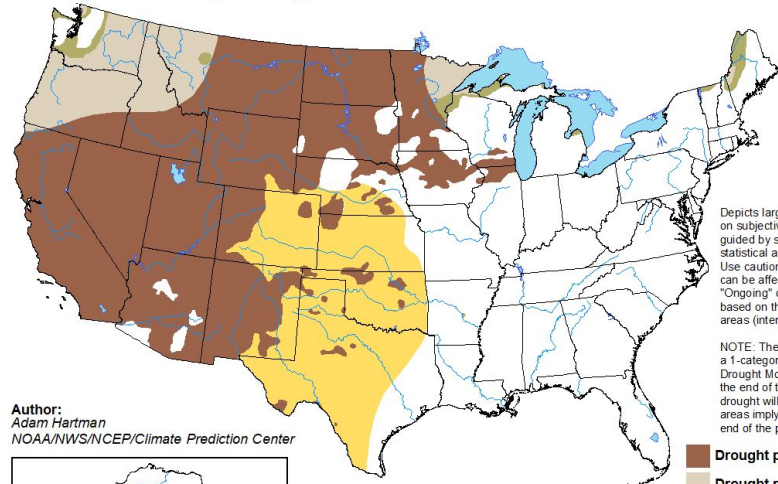


droughtmonitor.unl.edu

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for September 16 - December 31, 2021

Released September 16



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

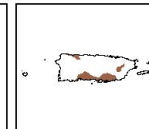
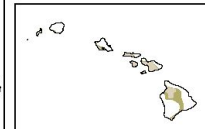
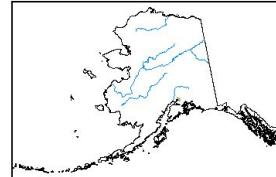
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely



<http://go.usa.gov/3eZ73>

Author:
Adam Hartman
NOAA/NWS/NCEP/Climate Prediction Center



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La Nina Status

ENSO Alert System Status: La Niña Advisory

- Equatorial sea surface temperatures (SSTs) are near-to-below average across most of the Pacific Ocean.
- La Niña conditions have developed and are expected to persist especially from December 2021 to February 2022 in the Northern Hemisphere.

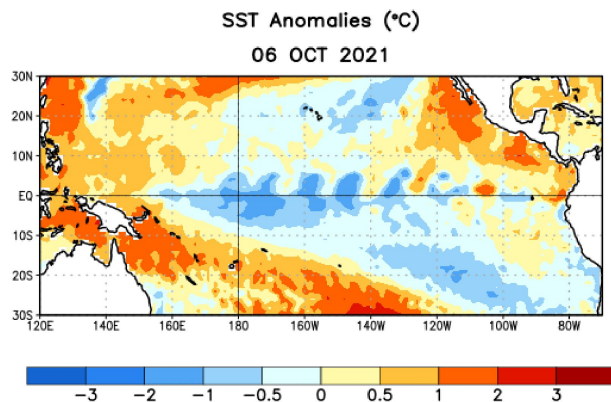
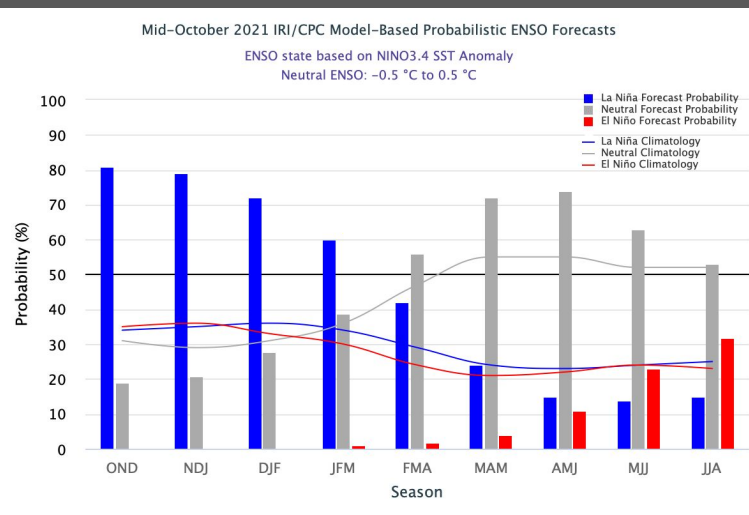
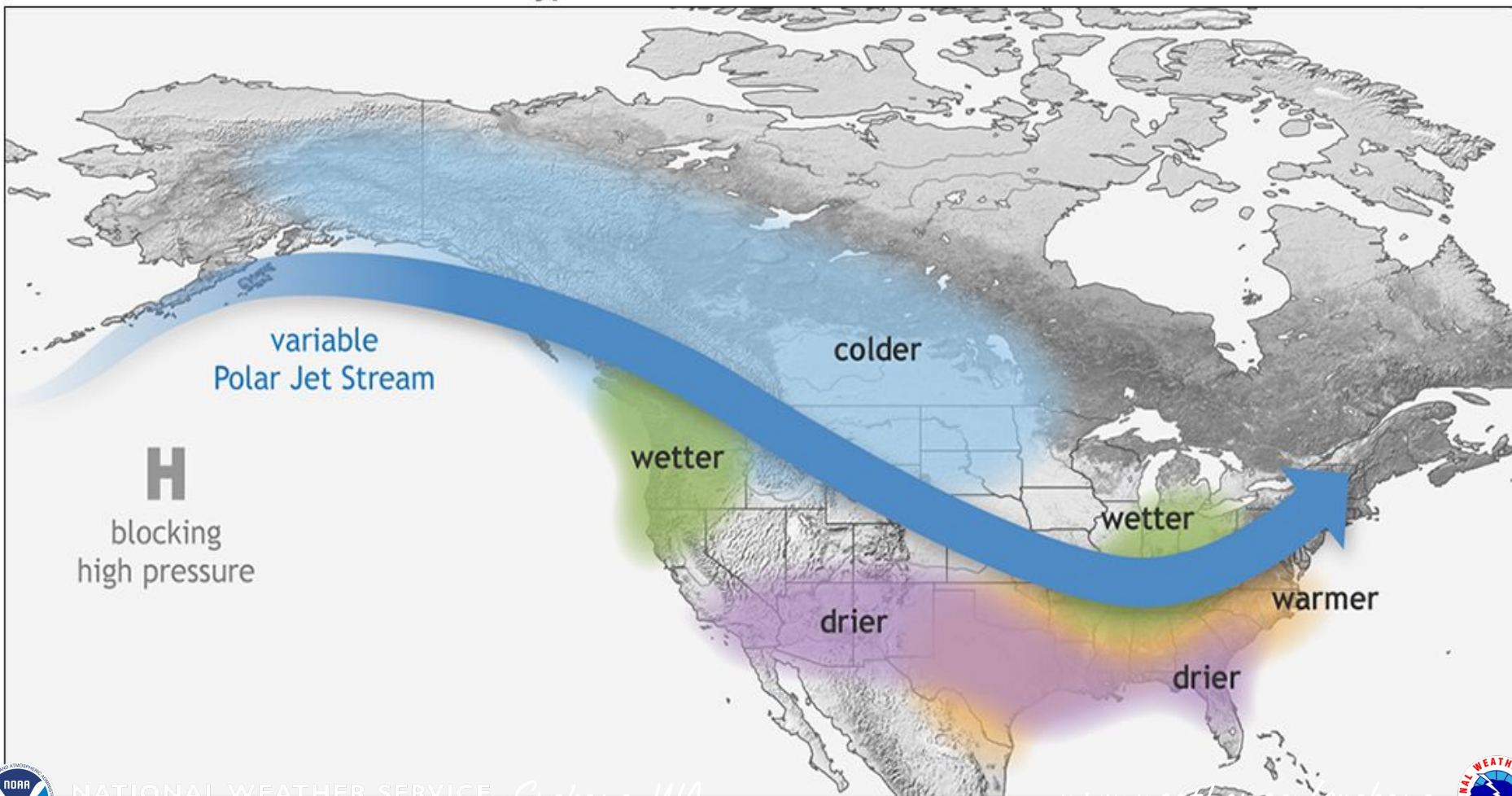


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 6 October 2021. Anomalies are computed with respect to the 1991-2020 base period weekly means.



Typical Wintertime La Nina Pattern

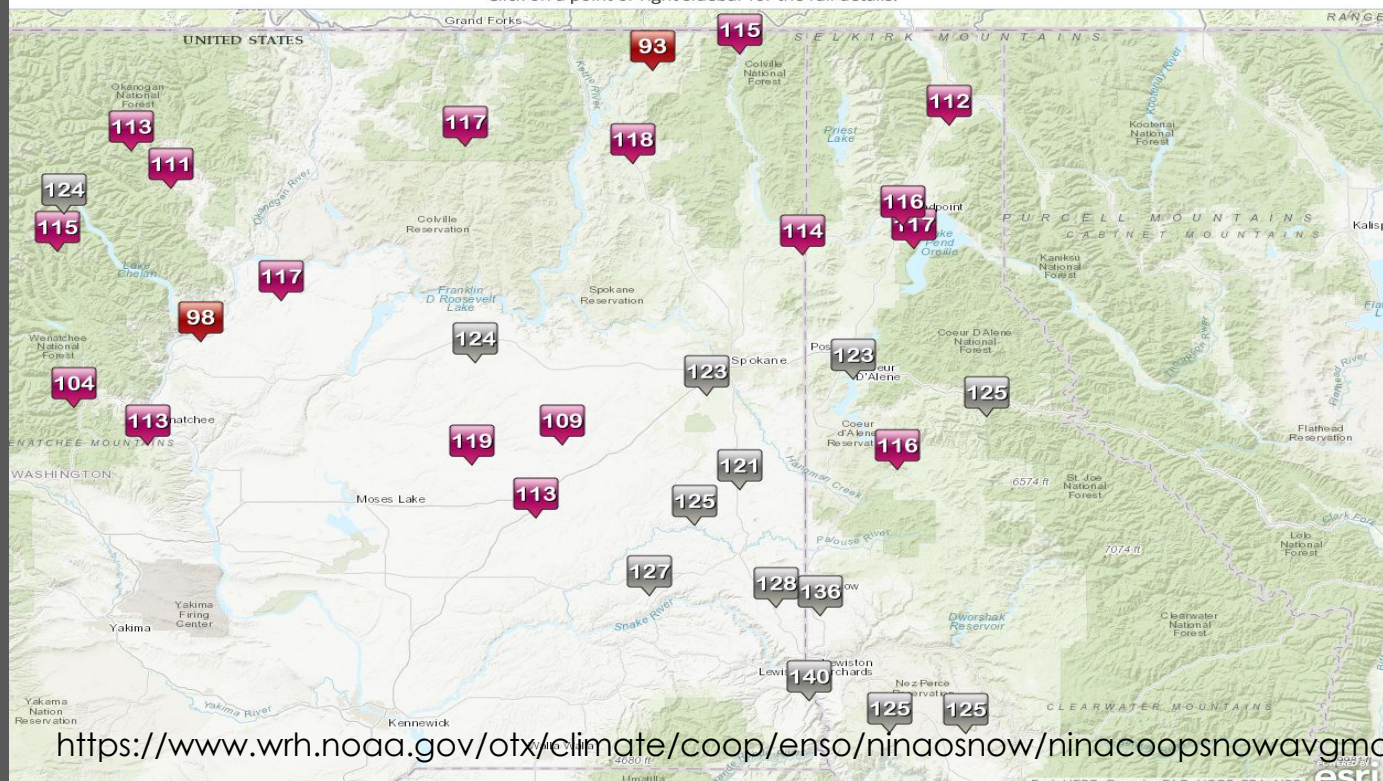


Interactive La Nina Snow Climatology

NWS Spokane Coop Observed, La Nina Snow Climatology

Percent of Normal Snowfall

Click on a point or right sidebar for the full details.



Bonniers Ferry - Avg. 71 in., Pct. Norm. 112%
Boundary Dam - Avg. 67 in., Pct. Norm. 115%
Chief Joseph Dam - Avg. 33 in., Pct. Norm. 117%
Chelan - Avg. 31 in., Pct. Norm. 98%
Coeur d'Alene - Avg. 63 in., Pct. Norm. 123%
Colville - Avg. 56 in., Pct. Norm. 118%
Harrington - Avg. 30 in., Pct. Norm. 109%
Holden Village - Avg. 316 in., Pct. Norm. 115%
Kellogg - Avg. 67 in., Pct. Norm. 125%
La Crosse - Avg. 22 in., Pct. Norm. 127%
Leavenworth - Avg. 94 in., Pct. Norm. 104%
Lewiston - Avg. 22 in., Pct. Norm. 140%
Moscow - Avg. 67 in., Pct. Norm. 136%
Mazama - Avg. 134 in., Pct. Norm. 113%
Newport - Avg. 72 in., Pct. Norm. 114%
Nez Perce - Avg. 52 in., Pct. Norm. 125%
Northport - Avg. 59 in., Pct. Norm. 93%
Odessa - Avg. 18 in., Pct. Norm. 119%
Priest River - Avg. 92 in., Pct. Norm. 117%
Pullman - Avg. 46 in., Pct. Norm. 128%
Republic - Avg. 60 in., Pct. Norm. 117%
Rosalia - Avg. 31 in., Pct. Norm. 121%
Ritzville - Avg. 22 in., Pct. Norm. 113%
Sandpoint - Avg. 81 in., Pct. Norm. 116%
Spokane - Avg. 59 in., Pct. Norm. 123%
St. John - Avg. 25 in., Pct. Norm. 125%
St. Maries - Avg. 65 in., Pct. Norm. 116%
Stebekin - Avg. 161 in., Pct. Norm. 124%
Wenatchee - Avg. 29 in., Pct. Norm. 113%
Wilbur - Avg. 31 in., Pct. Norm. 124%
Winchester - Avg. 113 in., Pct. Norm. 125%
Winthrop - Avg. 77 in., Pct. Norm. 111%



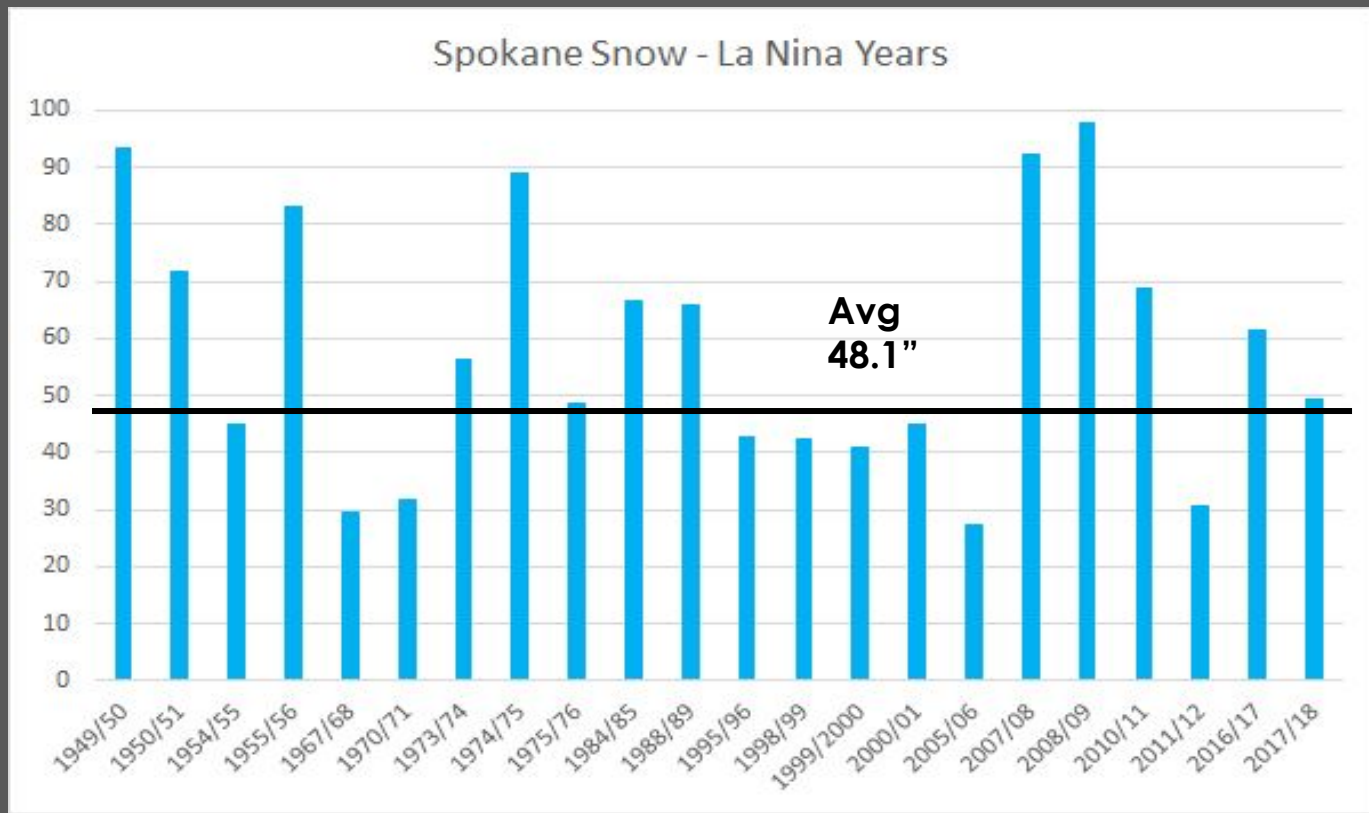
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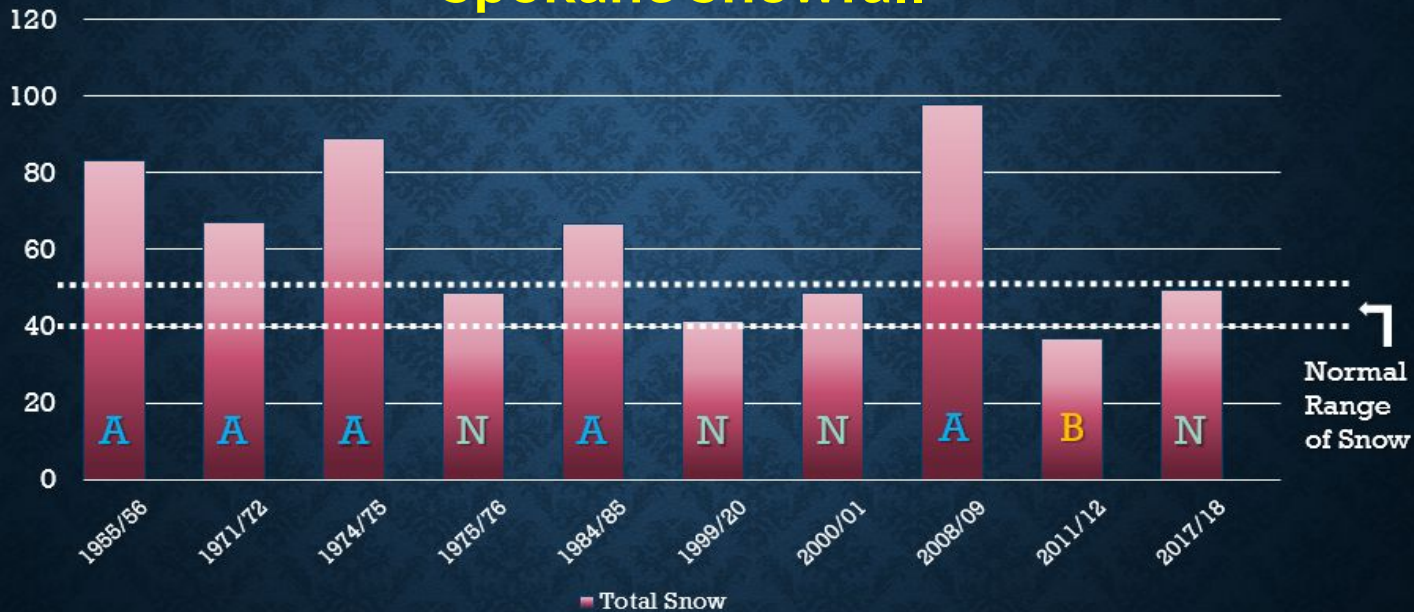
Spokane La Nina Snowfall





CONSECUTIVE LA NINA WINTERS

Spokane Snowfall



Above Normal (A) = 5

Normal (N) = 4

Below Normal (B) = 1



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One Month Outlook

November

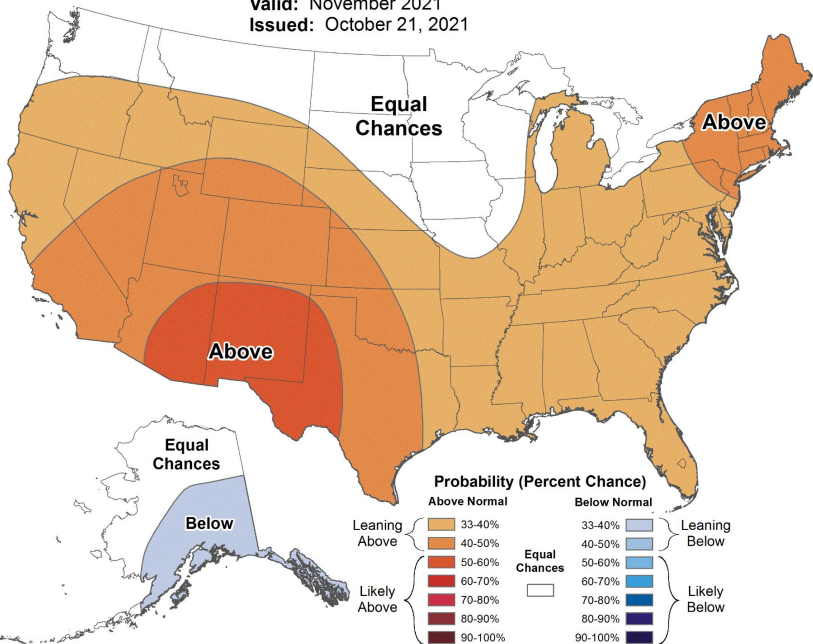
www.cpc.noaa.gov



Monthly Temperature Outlook



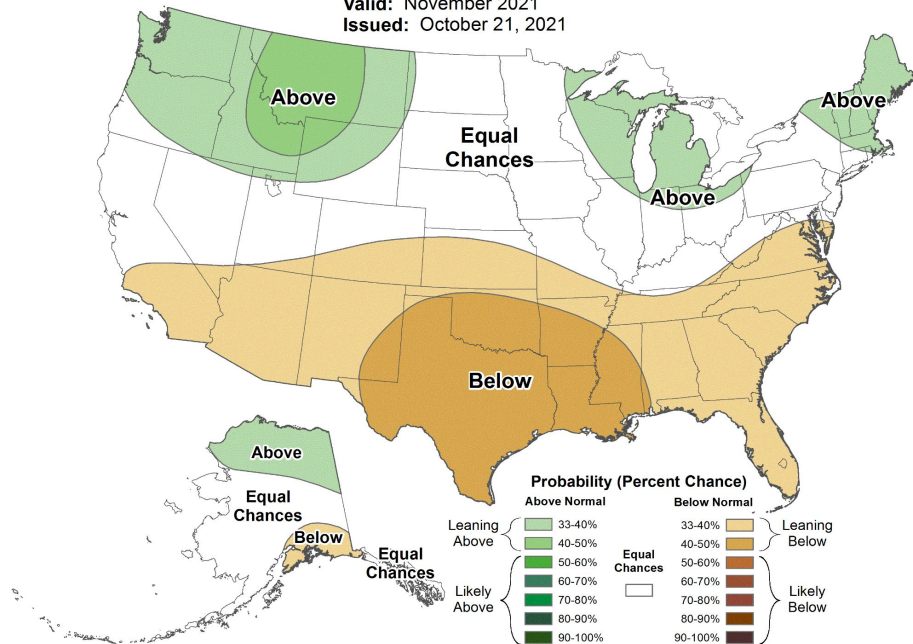
Valid: November 2021
Issued: October 21, 2021



Monthly Precipitation Outlook



Valid: November 2021
Issued: October 21, 2021



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Three Month Outlook

November through January

www.cpc.noaa.gov

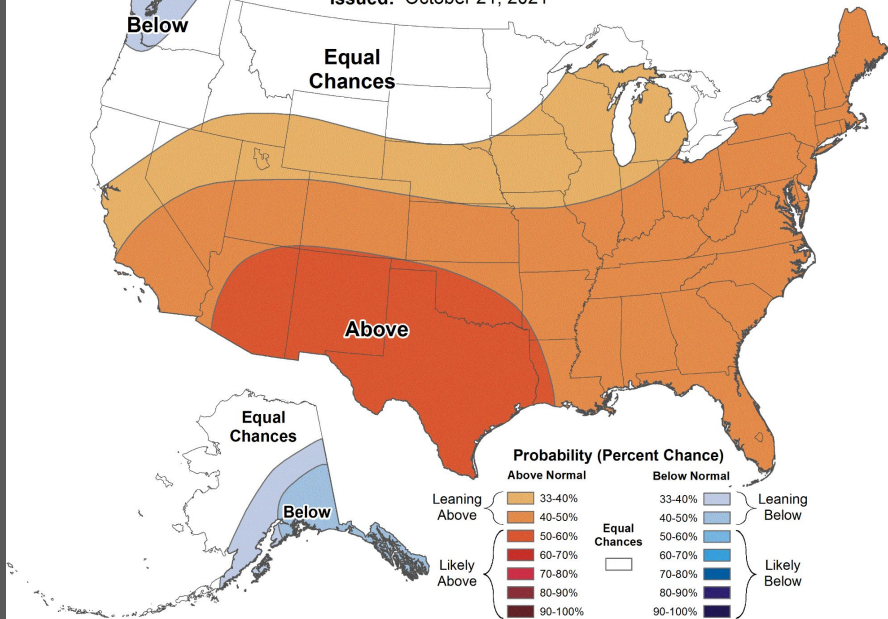


Seasonal Temperature Outlook



Valid: Nov-Dec-Jan 2021-22

Issued: October 21, 2021

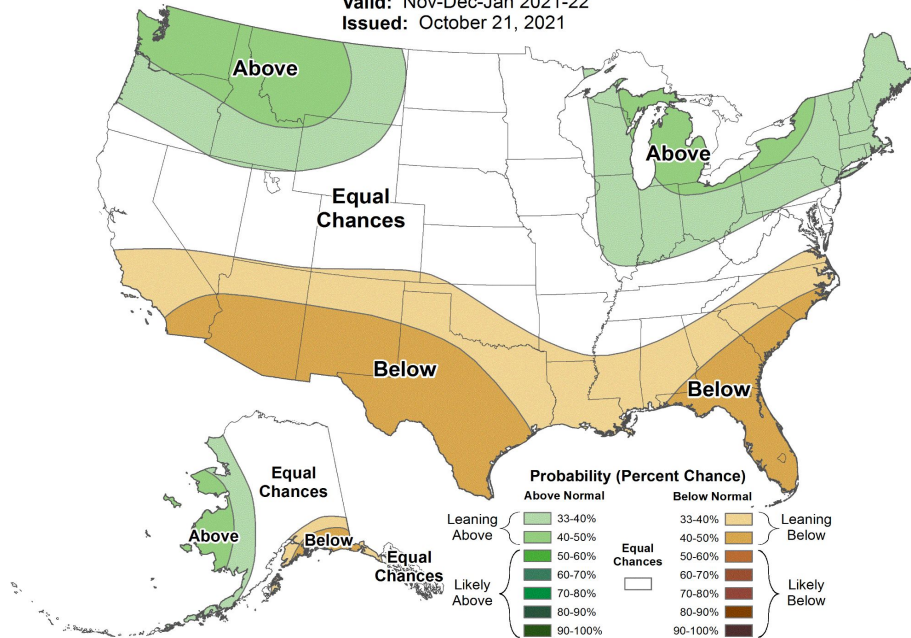


Seasonal Precipitation Outlook



Valid: Nov-Dec-Jan 2021-22

Issued: October 21, 2021



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Key Points – Winter Outlook

- Drought continues, but may see a slow improvement after a record hot and dry summer
- La Nina favored for the upcoming winter
 - Winter outlook - Slightly elevated odds of cooler and wetter than normal
- Winter is coming...Anticipate storms with snow, ice, rain and wind



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www.weather.gov/spokane



NWS + Weather Spotters = Saved Lives

nws.spokane@noaa.gov

THANK YOU!

What's Next?

You will receive a follow-up email

- register as a weather spotter
- Spotter ID
- Spotter training certificate

Any Questions?

Unmute yourself to talk



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