Basic Weather Spotting for the Inland Northwest



Spring 2025
National Weather Service
Spokane



Tree Damage in Oroville, WA - Sept 25, 2024

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

o.

- 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 severe weather
- Describe your community's severe weather threats
- Properly define a severe thunderstorm and basic thunderstorm structure
- Learn how to prepare and be safe during severe weather

Concentration on Basic weather spotting and the Checklist

Now let's look back to the last couple of years.....



Flooding - Feb 23-24, 2025

Palouse, WA





Dust Storms - September 25, 2024



Pullman, WA







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!

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 necessary
 - Simply call, email or send a report online
 - Become the eyes and ears of the National Weather Service



National Weather Service (NWS)

- Agency of the Federal Government
 - Dept of Commerce
 - O NOAA
- One of 122 offices nationwide
- Forecasts, watches, warnings, and advisories 24/7/365 operations
- ~ 25 staff members
- 2-3 people per shift

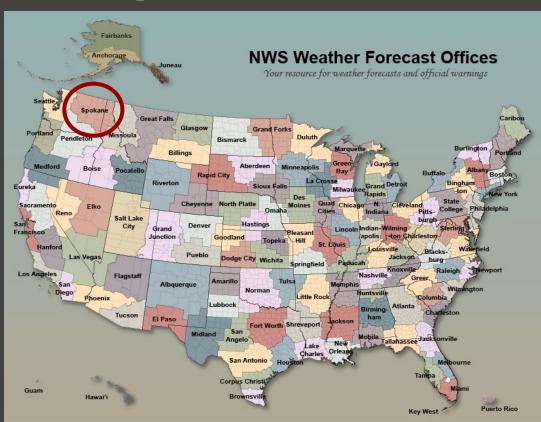
MISSION

Provide weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy.





NWS Spokane Forecast & Warning Area



Includes 2 states

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

Elevations range

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

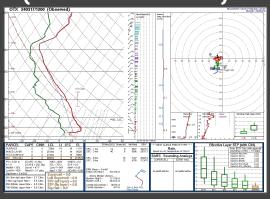


How the NWS "Sees" Weather

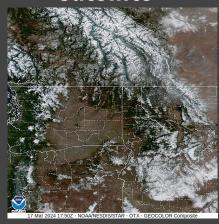
Doppler Weather Radar



Radiosonde (Weather Balloon)



Satellite



Webcams

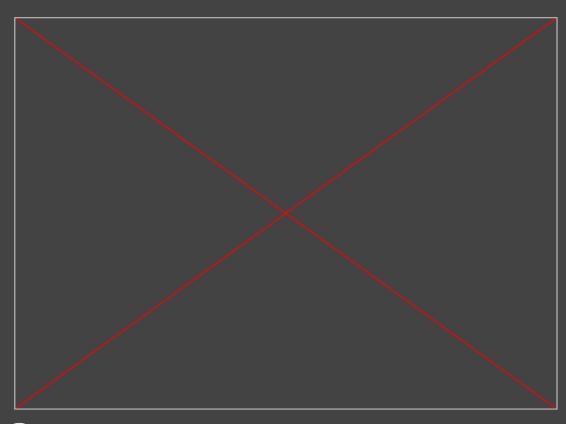




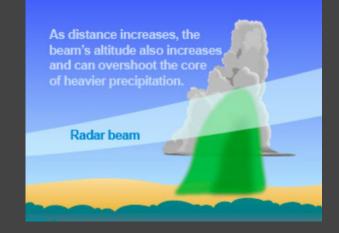
Weather Stations



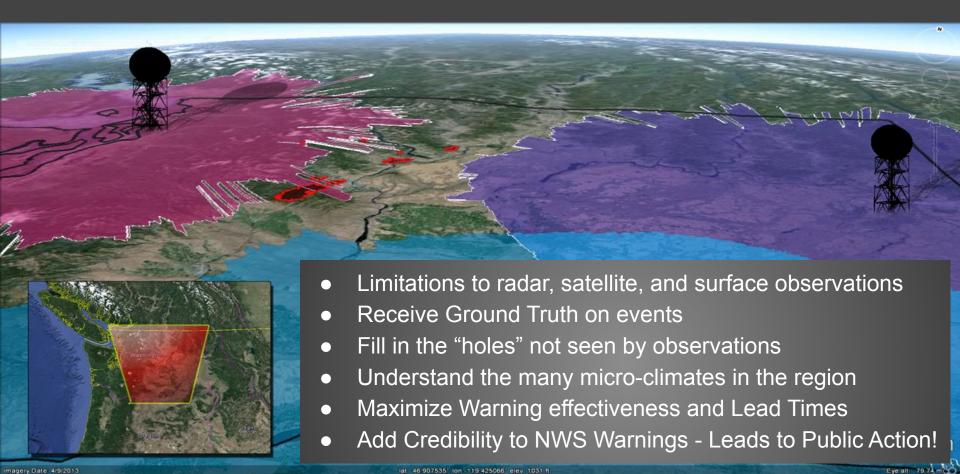
WHY DO WE TRAIN SPOTTERS?







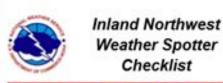
WHY DO WE TRAIN SPOTTERS?



#1 Poll Question

Why are weather spotters important?

What's in a Spotter Report?





Tornado or Funnel Cloud: ANY KING

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

NATIONAL WEATHER SERVICE
WEATHER FORECAST OFFICE SPOKANE, WA

Specifics...Tell us the Story!

- WHO you are (Spotter ID)
- WHAT you are reporting
- WHEN did the event occur?
- WHERE did the event occur?
- Estimates of wind speeds and hail size
- Damage and injury reports

If unsure - report your uncertainty

Feel free to include reports while traveling and any delayed or second hand reports

HOW TO REPORT: PHONE CALL

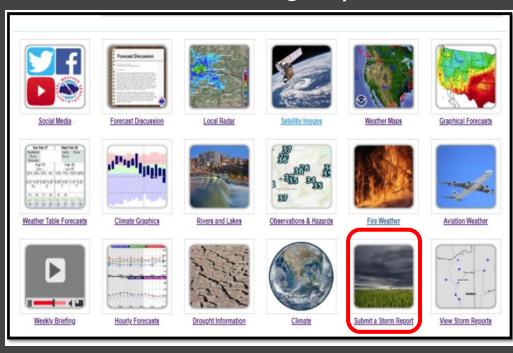


HOW TO REPORT: ONLINE



inws.ncep.noaa.gov/report/

www.weather.gov/Spokane



HOW TO REPORT: THE MPING APP

Meteorological Phenomena Identification Near the Ground

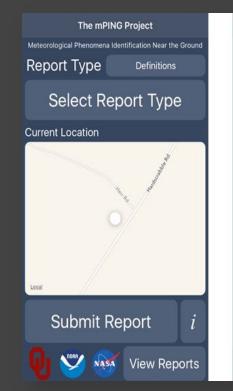
FREE APP!

Report everything EXCEPT TORNADOES OR FUNNEL CLOUDS





Reports are anonymous and sent directly to the NWS







HOW TO REPORT: SOCIAL MEDIA

X/Twitter

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

Facebook



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





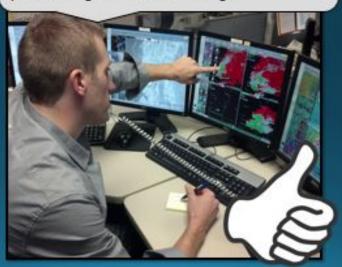
Share your weather photos



Examples of Spotter Reports

Good Spotter Report

This is Tom Smith, Spotter Spokane #25 calling from my home on the South Hill. There is currently large hail falling. I measured one stone and it's about the size of a quarter. It began about 30 minutes ago.



Needs Improvement

Hi there, how are you doing? Who is this?Well hi Steve! I'm a spotter in Okanogan County. I see lightning to the north and it rained here a little bit ago. The news is saying it's much worse to the south. Are we going to get another thunderstorm?How long is it supposed to last? How's your evening going?

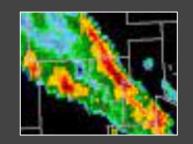


NWS may Contact You!

As a registered weather spotter, you'll share your phone number with the NWS.

If we see severe or hazardous weather near your location...

We will likely try to call you to get get information on what you are experiencing (ground truth) based on what is seen on radar!





Emails are Important

Besides a phone number, it's important to share your email address!

You will likely be notified by email before there is a WIDESPREAD Severe Weather Risk or Thunderstorm Outbreak.

We send periodic emails to share quarterly newsletters and upcoming training opportunities.

YOUR NATIONAL WEATHER SERVICE SPOKANE QUARTERLY REPORT

The Weather Watcher Of the Inland Northwest

www.weather.gov/Spokane



#2 Poll Question

What are essential pieces of information to communicate in a spotter report?

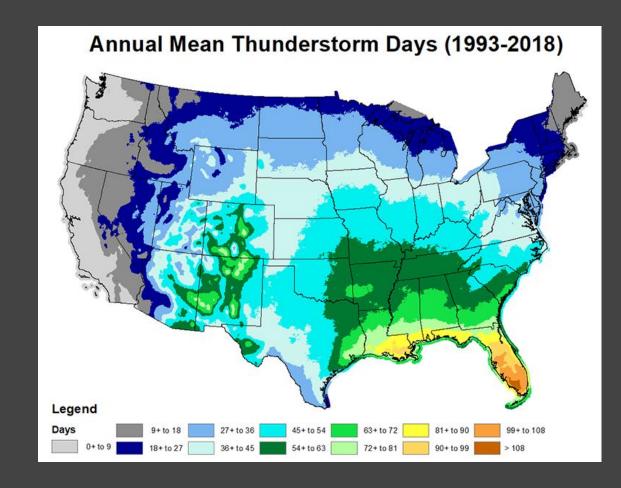
U.S. Thunderstorm Distribution

2023 Stats:

Spokane: 19 days

Lewiston: 18 days

Wenatchee: 14 days

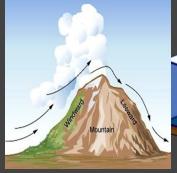


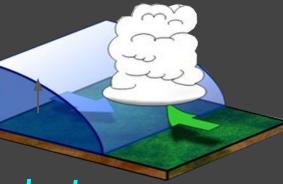


WHAT CREATES A THUNDERSTORM?

How It Feels
Dry
Comfortable
Slightly Humid
Humid
Very Humid
Oppressive

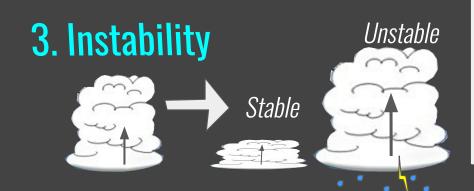


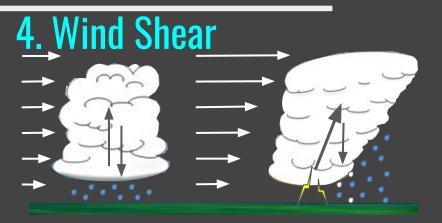




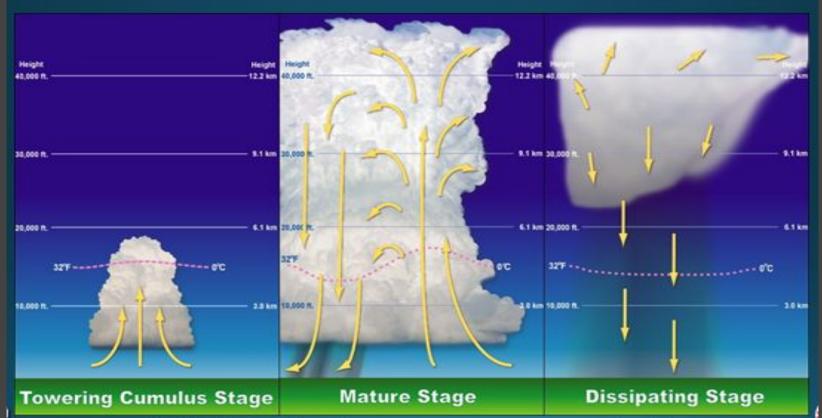
1. Moisture

2. Lifting Mechanism





Stages of a Thunderstorm



What is a Severe Thunderstorm?

Winds ≥ 58 mph





Hail ≥ 1" in diameter



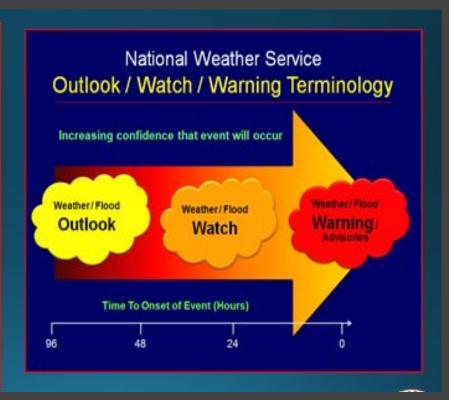
Tornado



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

STAY INFORMED: NWS Terminology

- Watch: Conditions are favorable, but not imminent, for severe weather or flooding
- Warning: Severe weather or flooding is imminent or already occurring
- Advisory: Minor nuisance or inconvenient weather or flooding is expected, but in most cases not anticipated to adversely affect plans.



Short fused

Tornado

Flash Flood

Severe Thunderstorm

Long fused

High Wind

Flood

Winter Storm

Red Flag

STAY INFORMED: Watch vs. Warning

TACO WATCH



TACO WARNING



The ingredients are in place for tacos to happen.



We're having tacos
RIGHT NOW!

STAY INFORMED: STORM PREDICTION CENTER CONVECTIVE OUTLOOKS

Thunderstorms 2-Slight 1-Marginal 3-Enhanced 4-Moderate 5-High Isolated severe Scattered severe Widespread severe Widespread severe No severe Numerous severe thunderstorms thunderstorms storms possible storms possible storms likely storms expected possible expected Long-lived, Long-lived, very Lightning & Limited in duration Short-lived and/or widespread and widespread and More persistent flooding threats and/or coverage not widespread, and/or particularly intense exist with all and/or intensity isolated intense widespread, a few intense thunderstorms storms possible intense

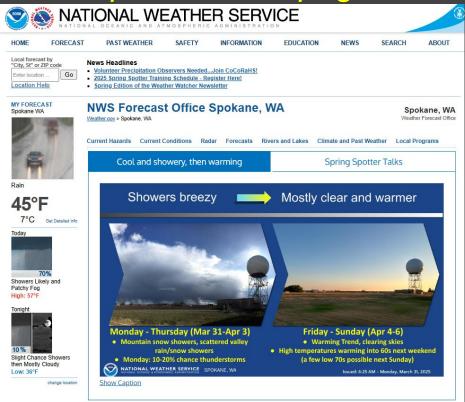


www.spc.noaa.gov

STAY INFORMED

www.weather.gov/Spokane

NWS Spokane Webpage





STAY INFORMED

Wireless Emergency Alerts (WEA)

WEA warns the public about dangerous weather, missing children, and other critical situations with a text-like message on your mobile device.

WEA-capable mobile devices will receive:

- → Tornado Warnings (TOR)
- → Severe Thunderstorm Warnings (SVR)*
- → Flash Flood Warnings (FFW)**
- → Dust Storm Warning
- → Extreme Wind Warning
- → Snow Squall Warning



Only *SVRs* with 80 mph wind or 2.75" diameter hail (baseball) tags will transmit over WEA!

Only *FFWs* with *CONSIDERABLE* or *CATASTROPHIC* damage tags will transmit over WEA!



Stay Informed *FEMA App*



Download the FEMA App Today

Get Access to:

- Weather Alerts
- Disaster Resources
- Preparedness Tips





Stay Informed NOAA Weather Radio

Continuous operation.

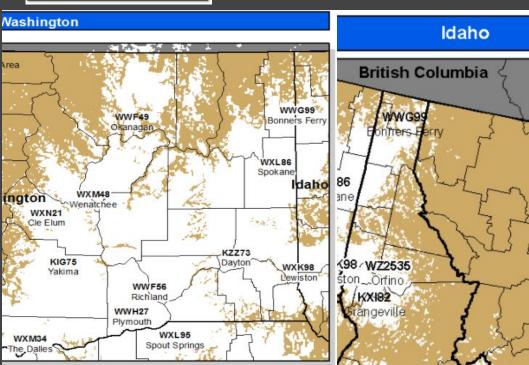
Battery backup capable.

Handheld device great for outdoor activities.

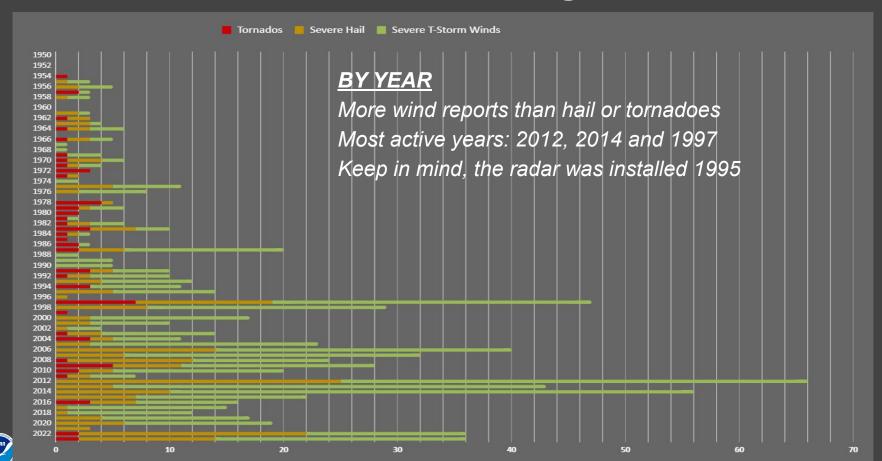
Can drive across the country and get info anywhere along path.



Radio stations broadcasting weather info 24/7/365.



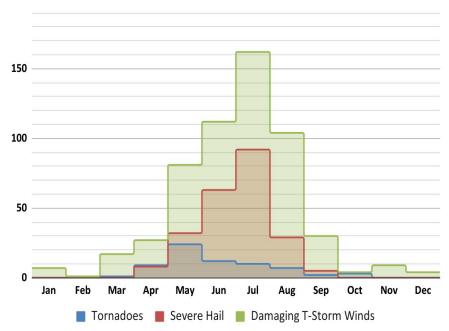
Local Severe Weather Climatology



Local Severe Weather Climatology

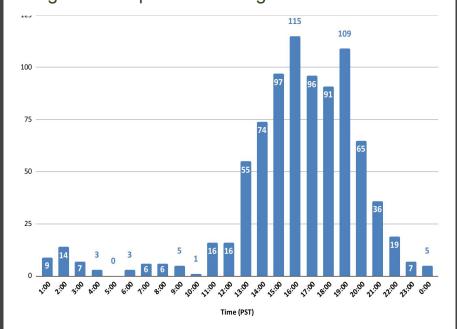
BY MONTH

Peak month for Damaging Winds/Hail – July Peak month for Tornadoes – May Had severe reports in Nov through Jan



BY TIME OF DAY

Most active mid afternoon to mid evening Less active in the morning Still get wind reports late at night



#3 Poll Question

What ingredients are needed to create a thunderstorm?

WHAT TO REPORT: TORNADOES

Look at the ground...look at the cloud base...is it in contact with both?

If yes...TORNADO!
If no...most likely funnel cloud or dust devil





Typical Inland NW Tornado

- Less than 5 minutes on the ground (radar scan ~4mins)
- ½ mile track
- Max wind speeds of 80-110 mph
- Mostly EF0 to EF1







How are Tornadoes Measured?

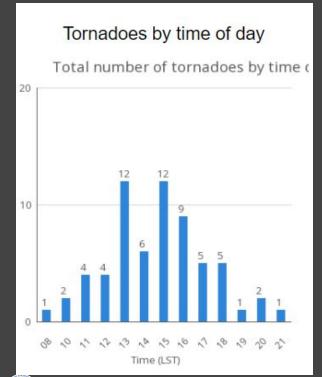
EF Rating	Wind Speeds	Ехрес	ted Damage	
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.	A A A A A A A A A A A A A A A A A A A	AIL
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.	Salar .	
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

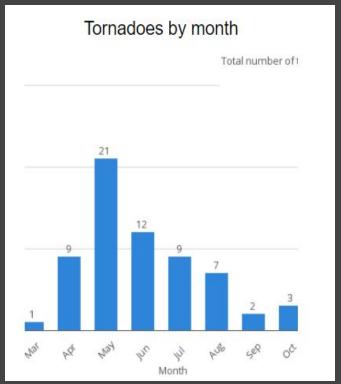
After the storms have passed, NWS will conduct surveys to assess the tornado damage. We use a list of damage indicators that align with the Enhanced Fujita Scale.

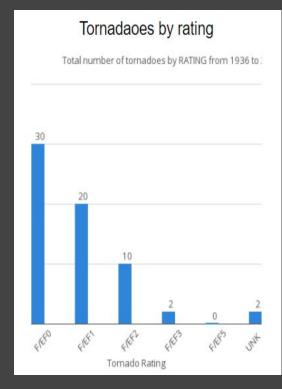
Inland NW Tornado Stats ~ 64 reports

(1936-2016)

In Spokane metro area: last time tornado spotted was 2022 There have been 15 tornadoes in the metro area.

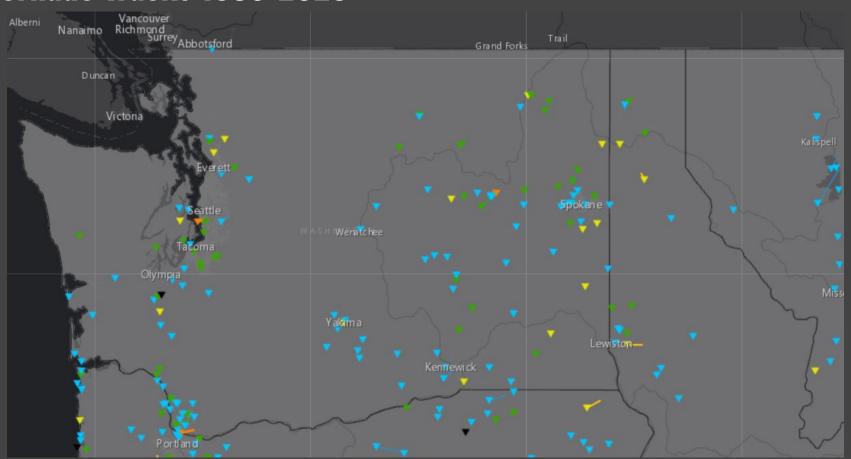






Tornado Tracks 1950-2023

https://mrcc.purdue.edu/gismaps/cntytorn#



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!











Tornado - May 6, 2022 - Spokane



NON-SUPERCELL TORNADOES



- Landspouts are narrow, rope-like condensation funnels that reach the ground.
- Landspouts form during the towering cumulus or mature stage of a thunderstorm.
- There is no rotating updraft spinning originates near the ground.

Cloud Types













#4 Poll Question

Identify this image.



WHAT TO REPORT: STRONG WINDS



30-40 mph

Whole trees in motion



40-50 mph

• Twigs / Small branches breaking



50-58 mph

Branches / Small limbs breaking



58-75 mph

Large branches broken / Structural damage?



Over 75 mph

Loss of roofing / Trees uprooted or snapped





WHAT TO REPORT: HAIL



Pea = $\frac{1}{4}$ inch



Penny= 3/4 inch



Nickel = .88 inch



Quarter = 1 inch



Half Dollar = $1\frac{1}{4}$ inch



Walnut = $1\frac{1}{2}$ inch



Golf Ball = $1\frac{3}{4}$ inch



Egg = 2 inch



Billiard Ball = $2\frac{1}{4}$ inch



Tennis Ball = $2\frac{1}{2}$ inch



Baseball = $2\frac{3}{4}$ inch



Softball = $4\frac{1}{2}$ inch

If a ruler isn't available, reference hail to a common object



NO MARBLES!

Otis Orchards -August 2022



WHAT TO REPORT: 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





WHAT TO REPORT: FLOODS

Rising water on rivers, streams & low spots Give specific locations of streams & streets



WHEN
FLOODED
TURN AROUND
DON'T
DROWN









WHAT TO REPORT: MUD & DEBRIS FLOWS

Water-saturated rock, mud and debris moving down a slope Give specific locations, roadways or intersections

Post-fire Floods











WHAT TO REPORT: DUST STORMS

- Prolonged dry spell + strong winds + plowed fields
- Sudden reduction in visibility
- Give locations of roads and intersections
- Also called Haboobs
- If widespread, can lead to air quality issues
- Keep in mind Smoke can limit visibilities as well.











#5 Poll question

Identify this image.



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
 - o Don't put yourself under objects that have the potential to fall or be blown over
- ACES Awareness, Communication, Escape Route and Safe Zones







WEATHER SAFETY: LIGHTNING

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



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







storm to resume activities.



WEATHER SAFETY: LIGHTNING



WEATHER SAFETY: LARGE HAIL









Speeds of Falling Hail By Size

Dime size	35 mph
Quarter size	50 mph
Golf Ball	66 mph
Baseball	85 mph
Softball	100+ mph

Terminal velocity of an object assumes a round smooth surface

WEATHER SAFETY: TORNADOES



OUTSIDE

- Cars are NOT safe!
 - Drive to the nearest sturdy building and seek shelter
 - Abandon the vehicle and find an area noticeably lower than the level of the road – lie down and cover your head.

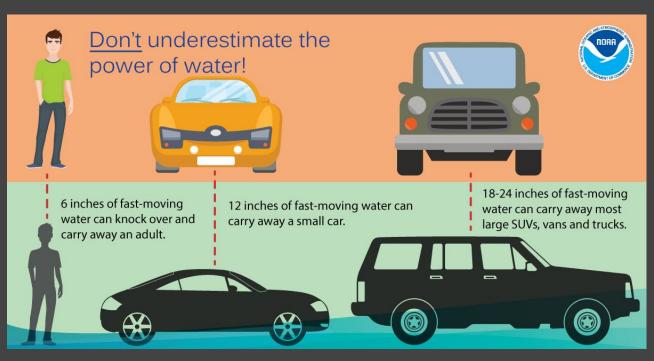
Treat Severe Thunderstorm or High Wind Warnings Seriously! Straight line winds can be as destructive as a Tornado

INSIDE

- Seek shelter in a strong building
- Lowest level of a sturdy building (basement is best)
- Small interior room away from windows (bathroom or closet)
- Put as many walls between you and the outside as possible
- Abandon mobile homes move to a sturdy shelter close by



WEATHER SAFETY: FLASH FLOODS







IT ONLY TAKES about 12-18" to turn your vehicle into a



#6 Poll question

Where is a safe place to go during a flood?

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

Other Ways to Get Involved

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



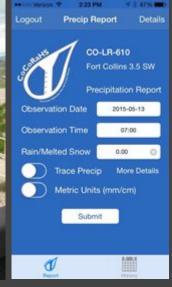
Community Collaborative Rain, Hail and Snow Network - CoCoRaHS

Help Observe Precipitation in your Community www.cocorahs.org
Volunteer take readings once a day - transmit on mobile device

CoCoRaHS Volunteers Across The Country





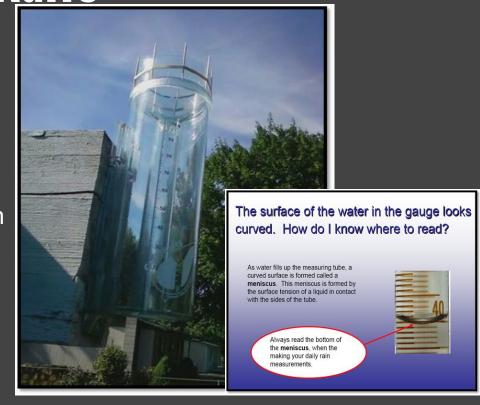




Community Collaborative Rain, Hail and Snow Network - CoCoRaHS

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





Citizen Weather Observer 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

Different programs - All useful to the NWS

Spotter

Severe Weather

No instruments required

Event driven

Weather.gov

CoCoRaHS

Precipitation only

Rain gauge required

Daily commitment

Cocorahs.org

CWOP

Weather data

Weather station

Daily commitment

Wxqa.com



Weather Spotter Resources Online

weather.gov/otx/Spotter Resource Page

- 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
- www.weather.gov/jetstream/

What about Weather Spotter Training?

Spotter training sessions are important and needed to stay current on severe weather spotting. The sessions are conducted by the National Weather Service in the spring and fall. It's an opportunity for spotters to review basic spotter techniques and weather safety concerns.

- Spotter Training Schedule will be posted when and where classes are offered.
- Recorded Spotter training is available locally and nationally

Locally Recorded Spotter Training

Fall Spotter Training 2024	Snow Measurement Training 2024
Slides	Slides
Basic Spotter Training 2024	Advanced Spotter Training 2024
Slides	Slides

National Spotter and Observer Training

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





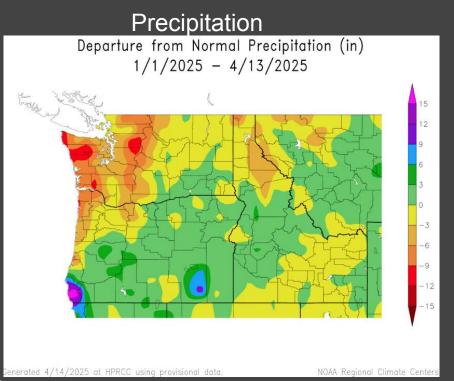
SKYWARN Spotter Convective Basics

#7 Poll question

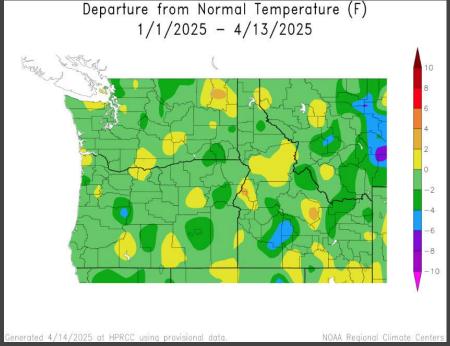
What are some items to have in an Emergency Kit?

wrcc.dri.edu/

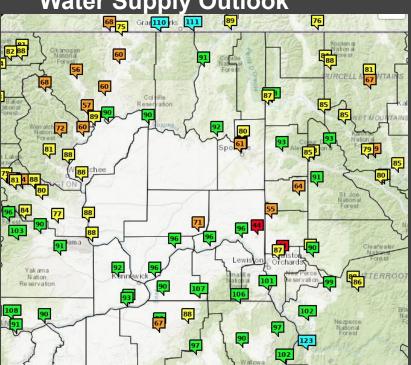
Since the start of the Calendar Year...



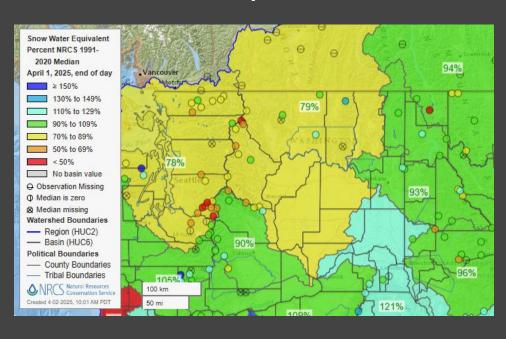
Temperature



Water Supply Outlook



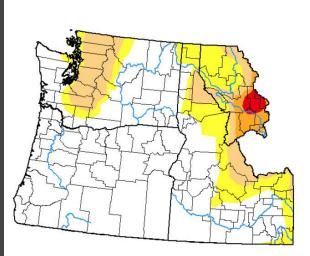
Snow Water Equivalent



US Drought Monitor & Seasonal Outlook

cpc.ncep.noaa.gov

U.S. Drought Monitor Pacific Northwest DEWS



April 8, 2025 (Released Thursday, Apr. 10, 2025) Valid 8 a.m. EDT Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	69.99	30.01	14.22	3.01	0.87	0.00
Last Week 04-01-2025	69.99	30.01	14.22	3.09	0.87	0.00
3 Month's Ago 01-07-2025	61.17	38.83	14.59	4.29	1.75	0.00
Start of Calendar Year 01-07-2025	61.17	38.83	14.59	4.29	1.75	0.00
Start of Water Year 10-01-2024	13.07	86.93	56.26	11.40	2.27	0.49
One Year Ago	58.41	41.59	19.67	7.06	0.00	0.00

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

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: David Simeral

David Simerai Western Regional Climate Center

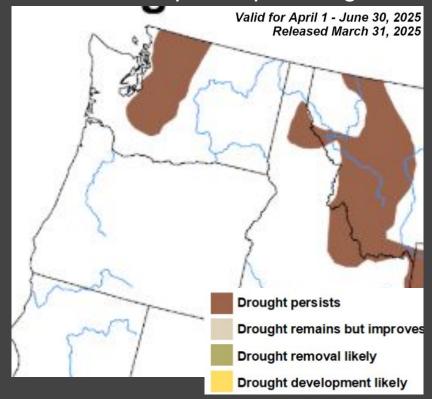








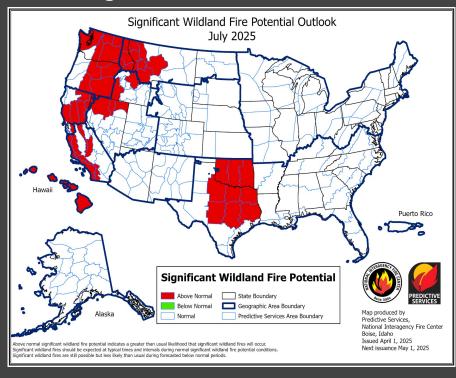
droughtmonitor.unl.edu



Wildland Fire Potential

www.nifc.gov

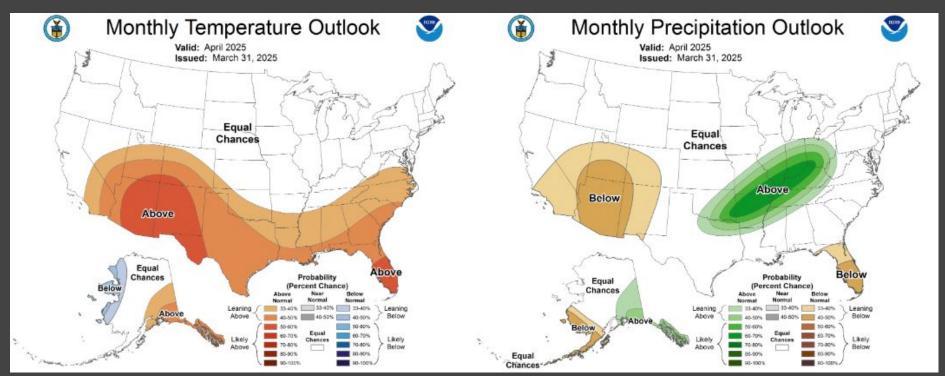




Monthly Outlook 2025 - April

One Month Outlook

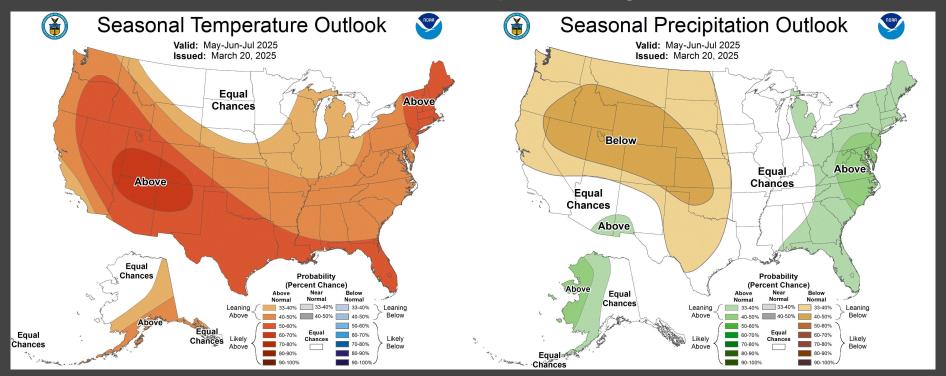
www.cpc.noaa.gov



Seasonal Outlook 2025 - May through July

3 Month Outlook

www.cpc.noaa.gov



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 certification

Any Questions?

I will unmute you - then you unmute yourself to talk.

View from Steptoe Butte, May 2018

