

Weather Safety for Outdoor Workers and Emergency Responders



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Weather Safety for Outdoor Workers and Emergency Responders

- Introduction to National Weather Service Fire Weather Hazards
 - What is fire weather?
- Understanding Fire Weather Forecasts
 - Fire weather forecasts
 - What is a red flag warning and what does it mean?
 - NWS Spot Forecasts
- Communicating risk and impacts
 - National Weather Service Incident Meteorologists (IMETs)
 - Coordination across agencies and responders for high impact weather
 - NWS LNO to FEMA and NWS Liaison to FEMA N-IMAT White
 - Working in the heat
 - Smoke and air quality
 - Lightning



Introduction to National Weather Service Fire Weather Hazards

- What is fire weather?
 - Fire weather is the forecasting for the potential of wildfires, potential for fire spread as well as support for prescribed fire.
 - Combination of efforts between HQ (Fire Weather Operations), national forecast centers and local offices
 - Done in conjunction with forestry partners for fuels assessment
- NWS forecasts for numerous forestry and forestry related partners
 - Federal - US Forest Service, US Fish and Wildlife, Bureau of Land Management, National Park Service, military installations
 - State - work with all state's environmental and forestry departments
 - Other - work with organizations that partner with federal and state agencies
 - Examples: Pheasants Forever, Quail Unlimited, The Nature Conservancy, etc.



Introduction to National Weather Service Fire Weather Hazards

- The objective of the NWS Fire Weather Program is to provide fire weather and other products and decision support services to the fire, land management and emergency response community for the protection of life and property, promotion of firefighter and emergency responder safety, and stewardship of America's public lands.
- The Fire Weather Planning Forecast is a zone-type product used by land management personnel primarily for input in decision-making related to pre-suppression and other planning. The decisions impact firefighter safety, protection of the public and property, and resource allocation. Weather parameters represent average conditions across the given zone unless otherwise stated in the local AOP.



Understanding Fire Weather Forecasts

NWS Forecast Office Boise, ID

[Weather.gov](#) > Boise, ID

Boise, ID
Weather Forecast Office

[Current Hazards](#) [Current Conditions](#) [Radar](#) **Forecasts** [Rivers and Lakes](#) [Climate and Past Weather](#) [Local Programs](#)

Click a location below for detailed forecast

Last Map Update: Thu, Feb 19, 2026 at 8:52

Travel
Aviation Weather
Experimental HeatRisk
Forecast Discussion
Fire Weather
Local Area
Severe Weather
Hurricane Center
Soaring Forecast
Forecast Graphics
Idaho Statewide Forecast Discussion
Experimental Winter Weather
Experimental Avalanche Weather

Zoom Out

Weather Story

Current Weather

Location	Time	Weather	Temp (°F)	Wind (mph)	Cloud Bases (100s ft)	Vsby. (SM)	Pres. (in)
Boise, ID	7:53 am MST	Clear	22	ESE 10	-	10	29.91
Bogus Basin, ID	8:00 am MST	-	1	ENE 0	-	-	-
Caldwell, ID	7:56 am MST	Mostly Cloudy	22	ESE 7	BKN070	10	29.96
Fairfield, ID	8:00 am MST	-	10	SW 1	-	-	-

Probabilistic Mountain Weather
Cold Advisory for Newborn Livestock (CANL)



Understanding Fire Weather Forecasts

Fire Weather Planning Forecast For Extreme Southwestern California
National Weather Service San Diego CA
304 AM PST Wed Feb 18 2026

.DISCUSSION...

Showers will decrease today with areas of strong gusty south to southwest winds subsiding for the coast and valleys this morning and diminishing soon for the mountains and deserts for this afternoon and evening. Another Pacific storm will bring another round of strong gusty winds for Thursday and Thursday night along with more showers, but with lesser accumulations. The weekend will be drier with high temperatures warming through Monday. More showers are possible around Tuesday and Wednesday of next week.

Fire Weather Forecast for CAZ248

CAZ248-191515-
San Bernardino and Riverside County Valleys - The Inland Empire-
304 AM PST Wed Feb 18 2026

.TODAY...

Sky/weather.....Mostly cloudy...becoming partly cloudy. Chance of showers in the morning.

Max temperature.....47 to 56.

24 HR TREND.....Down 3 degrees.

Min humidity.....50 to 60 percent.

24 HR TREND.....Down 10 percent.

WIND (20 FT).....Winds west 8 to 18 mph with gusts to 30 mph.

CWR (>0.10 IN).....3 percent.

.TONIGHT...

Sky/weather.....Partly cloudy.

Min temperature.....34 to 41.

24 HR TREND.....Down 7 degrees.

Max humidity.....90 to 100 percent.

24 HR TREND.....Little change.

WIND (20 FT).....Winds southwest 6 to 11 mph. Gusts to 20 mph in the evening.

CWR (>0.10 IN).....5 percent.

.THURSDAY...

Sky/weather.....Cloudy. Slight chance of showers in the morning, then showers in the afternoon.

Max temperature.....45 to 53.

24 HR TREND.....Down 2 degrees.

Min humidity.....75 to 85 percent.

24 HR TREND.....Up 30 percent.

WIND (20 FT).....Winds southeast 6 to 14 mph with gusts to 25 mph becoming west 10 to 20 mph with gusts to 35 mph in the afternoon.

CWR (>0.10 IN).....78 percent.

FORECAST DAYS 3 THROUGH 7...

SUSTAINED WINDS LESS THAN 20 MPH EXCEPT WHEN SPECIFIED

.THURSDAY NIGHT...Partly cloudy. Chance of showers in the evening, then slight chance of showers after midnight. Lows in the mid 30s. West winds around 6 mph.

.FRIDAY...Mostly sunny. Highs in the mid 50s. Light winds.

.FRIDAY NIGHT...Mostly clear. Patchy frost after midnight. Lows in the upper 30s. Light winds.

.SATURDAY...Mostly sunny. Highs in the lower 60s. Light winds.

.SATURDAY NIGHT...Partly cloudy. Lows in the lower 40s. Light winds.

.SUNDAY...Mostly sunny. Highs in the upper 60s. Light winds.

.SUNDAY NIGHT...Partly cloudy. Lows in the upper 40s.

.MONDAY...Partly cloudy with slight chance of showers. Highs in the lower 70s.

.MONDAY NIGHT...Partly cloudy with chance of showers. Lows around 50.

.TUESDAY...Partly cloudy with chance of showers. Highs in the upper 60s.

CAZ248-191515-

F FORECAST DAYS 3 THROUGH 7...

N SUSTAINED WINDS LESS THAN 20 MPH EXCEPT WHEN SPECIFIED

3)

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.MONDAY NIGHT...Partly cloudy with chance of showers. Lows around 50.

.TUESDAY...Partly cloudy with chance of showers. Highs in the upper 60s.

morning, then showers in the afternoon.

Max temperature.....45 to 53.

24 HR TREND.....Down 2 degrees.

Min humidity.....75 to 85 percent.

24 HR TREND.....Up 30 percent.

WIND (20 FT).....Winds southeast 6 to 14 mph with gusts to 25 mph becoming west 10 to 20 mph with gusts to 35 mph in the afternoon.

CWR (>0.10 IN).....78 percent.



Understanding Fire Weather Forecasts

The screenshot displays the NOAA's Storm Prediction Center (SPC) website interface. At the top, the NOAA logo and 'Storm Prediction Center' are visible. The main content area is divided into three columns, each representing a different forecast period (Day 1, Day 2, Day 3). Each column includes a 'Local forecast by City, St* or ZIP' section with input fields for 'City, St' and 'Go'. Below these are social media links for Facebook and Twitter (@NWSSPC). A navigation menu on the left lists various services and information, including 'Home (Classic)', 'SPC Products', 'Weather Information', 'Research', 'Education & Outreach', and 'Misc.'. The right side of the page features a 'Day 1 Fire Weather Outlook' section with the following text: 'NWS Storm Prediction Center Norman OK 1035 AM CST Wed Feb 18 2026 Valid 181700Z - 191200Z ...CRITICAL FIRE WEATHER AREA FOR PORTIONS OF THE CENTRAL AND SOUTHERN HIGH PLAINS... ...CRITICAL FIRE WEATHER AREA FOR MOST OF IOWA...FAR SOUTHWESTERN WISCONSIN...AND FAR NORTHWESTERN ILLINOIS... ...Southern and Central High Plains... An expansive area of Critical fire weather conditions are still expected today across much of eastern CO, into portions of the Southern Plains and southeast NM. An 80-90 kt mid-level jet on the southern fringe of an approaching short wave, along with deepening lee troughing across the central/southern High Plains will support a favorable dry downslope regime across the region. A broad area of southwest winds between 15 and 25 mph along with afternoon relative humidity of 10-15 percent will yield high-end Critical fire weather conditions across much of the southern High Plains including portions of eastern CO and southeastern NM. Sporadic Extremely Critical conditions including 30+ mph southwest winds and single digit relative humidity are most likely across portions of southeast NM, although overall fuelscape remains only moderately receptive with ERC percentiles near to below normal. Less volatile but still Elevated fire weather conditions extend eastward into central TX, OK and KS where southwest winds of 10-20 mph and relative humidity of 15-20 percent align through the afternoon. ...Portions of the Midwest... Breezy west winds south of a surface low across along with anomalously dry boundary layer conditions will support a swath of Elevated to Critical fire weather conditions across portions of the Midwest today. West winds of 15-25 mph combined with relative humidity as low as 15 percent will align from far northeastern NE to much of IA into northwestern IL. Dry fuels combined with these Critical meteorological conditions will support wildfire spread over a region where considerable precipitation deficits have been observed. ..Williams.. 02/18/2026'. A map of the United States is visible in the background, showing the forecast area. The bottom right corner features the NWS Incident Meteorology logo.

Introduction to National Weather Service Fire Weather Hazards

What is a Red Flag Warning?

- Forecasters issue Fire Weather Watches/Red Flag Warnings (RFW) when the combination of fuels and weather conditions support extreme fire danger and/or fire behavior. These conditions alert land management agencies to the potential for widespread new ignitions or control problems with existing fires, both of which could pose a threat to life and property.

What is a Fire Weather Watch?

- Forecasters should issue a Fire Weather Watch when there is a high potential for the development of a Red Flag event. The watch will be issued 18 to 96 hours in advance of the expected onset of criteria. The watch may be issued for all, or selected portions within a fire weather zone or region. The overall intent of a Fire Weather Watch is to alert users at least a day in advance for the purpose of resource allocation and firefighter safety.



Introduction to National Weather Service Fire Weather Hazards

NWS Norman Home Page

Weather.gov > Norman, OK

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past Wea](#)

Critical Fire Danger
Wednesday

Critical Fire Danger
Thursday

Fire Weather
Outlook



Critical Fire Danger – Wednesday



Fire Risk	
Historic	
Extreme	
Critical	
Near-Critical	
Elevated	



Timing

→ **Red Flag Warning**
10 AM through 8 PM



Key Points

- **Near critical to critical** fire
- Relative humidity as low as 10
- Southwest winds of 15 to 25 n
35 mph.



Use extreme caution with poten
Report fires to local emerg

National Weather Service | Norman, Oklahoma

[f](#) [X](#) @NWSNorman

Near critical to critical fire weather conditions are expected once again on this afternoon and combination of very low relative humidity, gusty winds and dry fuels.

...RED FLAG WARNING REMAINS IN EFFECT UNTIL 8 PM CST THIS EVENING FOR INCREASING FIRE DANGER FOR WESTERN, NORTHERN, CENTRAL AND SOUTHWESTERN OKLAHOMA AND WESTERN NORTH TEXAS...

...RED FLAG WARNING REMAINS IN EFFECT FROM 10 AM TO 7 PM CST THURSDAY...

* WINDS...For today southwest 15 to 25 mph with gusts up to 40 mph. For Thursday west at 20-25 mph with gusts up to 35 mph.

* RELATIVE HUMIDITY...For today and Thursday low as 10-15 percent. For Thursday

* TEMPERATURES...Up to 75 today and up to 72 degrees Thursday.

* IMPACTS...Any fires that develop will likely spread rapidly. Outdoor burning is not recommended.

* SEVERITY...

FUELS (ERC)...70th-89th percentile...4 (out of 5).

WEATHER...Near Critical to Critical...2 to 3 (out of 5).

FIRE ENVIRONMENT...6 to 7 (out of 10).

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A Red Flag Warning means that critical fire weather conditions are either occurring now, or will shortly. A combination of strong winds, low relative humidity, and warm temperatures will contribute to extreme fire behavior.



Introduction to National Weather Service Fire Weather Hazards

- Spot Forecasts

- Site-specific (spot) forecasts are issued by WFOs in support of wildfire management and natural resource management. These forecasts aid the land management and fire control agencies in protecting life and property during wildland fires, hazardous fuels reduction, and rehabilitation and restoration of natural resources. Spot forecasts are also issued for hazardous materials incidents, marine incidents, search and rescue response and other threats to public safety.
- WFOs will not provide spot forecasts to private citizens or commercial entities not acting as an agent of a government agency.



Introduction to National Weather Service Fire Weather Hazards

Fire Weather

Weather.gov > Fire Weather

Fire Weather

National Program



Today's SPC Outlook



Tomorrow's SPC Outlook



Day 3-8 SPC Outlook



Current Wildland Fire Potential Outlook



Next Month's Wildland Fire Potential Outlook



Extended Wildland Fire Potential Outlook



Day 3-7 Hazards Outlook



Day 8-14 Hazards Outlook



Hot-Dry-Windy Index



U.S. Drought Monitor



U.S. Monthly Drought Outlook



U.S. Seasonal Drought Outlook



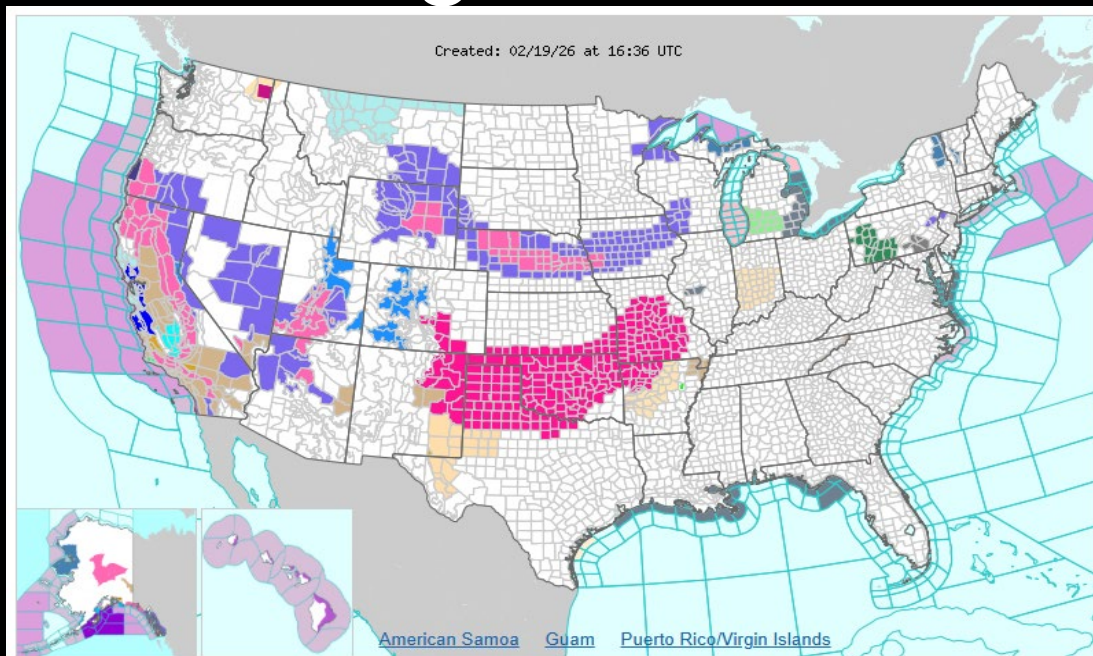
30.67337 - -76.21173
Leaflet | Powered by Esri | Austin Community College, Idaho State University, Montana State University, North Carolina State University, PSU Office of Physical Plant, South ...

Today's SPC Outlook Tomorrow's SPC Outlook Day 3-8 SPC Outlook Current Wildland Fire Potential Outlook Next Month's Wildland Fire Potential Outlook Extended Wildland Fire Potential Outlook

Day 3-7 Hazards Outlook Day 8-14 Hazards Outlook Hot-Dry-Windy Index U.S. Drought Monitor U.S. Monthly Drought Outlook U.S. Seasonal Drought Outlook



Communicating Risks and Impacts



Click on the map above for detailed alerts

[Public Alerts in XML/CAP v1.2 and ATOM Formats](#)



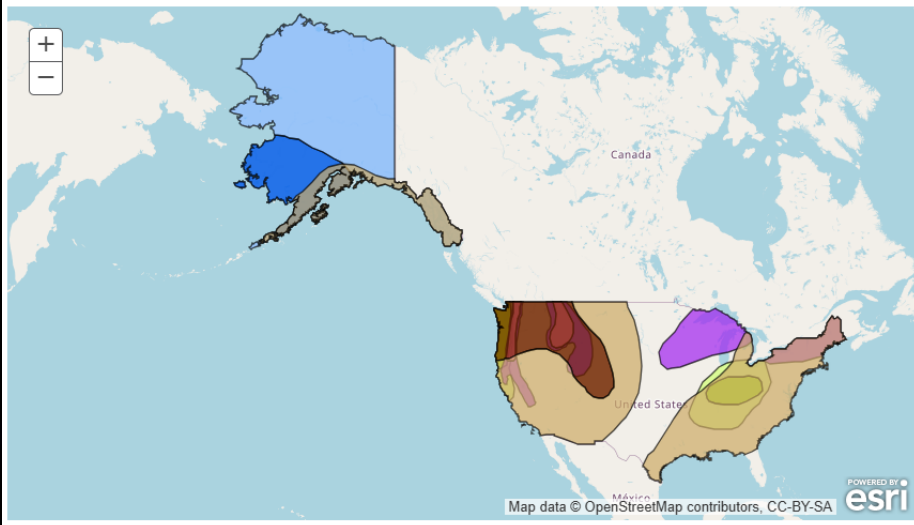
Messaging High Impact Weather to Partners

- 8-14 days in advance will be discussed in other high level presentations

able impacts which briefed to federal and

U.S. Week-2 Hazards Outlook - Made February 18, 2026 | [About the Hazards Outlook](#)

Type and Period	Temperature	Precipitation	Snow	Wind	Rapid Onset Drought
Composite Days 8-14 Map	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	No Hazards
Probabilistic Days 8-14 Map	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	



Extreme Heat High Risk Moderate Risk Slight Risk	Much Above Normal Temperatures High Risk Moderate Risk Slight Risk	Heavy Precipitation High Risk Moderate Risk Slight Risk	Composite Flooding Possible Rapid Onset Drought
Much Below Normal Temperatures High Risk Moderate Risk Slight Risk	High Winds Moderate Risk Slight Risk	Heavy Snow High Risk Moderate Risk Slight Risk	



Messaging High Impact Weather to Partners

- 8-14 days in advance messaging will be discussed in our meeting with other high level partners
- 5-7 days in advance local and briefing partners of interest
 - Critical infrastructure
 - Media partners will be briefed with expected conditions

KEY MESSAGE 2...Potential winter storm Sunday into Monday.

The model guidance continues to show low pressure moving off the Southeast or Mid-Atlantic coast later Saturday night or Sunday, then deepen as it moves out to sea by later Sunday into Monday. The variability in the model guidance continues to be high, with solutions ranging from an intense surface low tucked close to or on the Mid-Atlantic coast to a weaker and farther south and east surface low. The [ensemble](#) guidance also shows the varying solutions, although the [GFS ensemble mean](#) has shifting closer to the coast. The timing of short wave energy from the Midwest and also the West today will determine the amplification of the upper-level [trough](#) as it shifts eastward. Some guidance is phasing this energy with more of a neutral to negative [tilt](#) of the [trough](#), thus a much stronger storm close to the coast. While the uncertainty remains high, the outcome may become more in the middle with a [deepening](#) storm offshore but not as quick as the more robust guidance. May also have to [watch](#) an inverted surface [trough](#) to the northwest of the surface low. This [trough](#) is more evident especially on the weaker and farther south/east model solutions.

If the system is much stronger and closer to the coast, more intense [dynamics](#) would lead to more snow (heavier precipitation rates), while weaker and farther offshore solutions would favor lighter snow amounts with even precipitation potentially starting as rain. The [air mass](#) ahead of this system is forecast to not be all that cold, therefore [boundary layer](#) temperatures will come into play regarding rain versus snow and thus accumulations. Even a weaker storm will still result in an increasing northeasterly low-level wind into our coastal areas especially. This would increase the risk for at least some [coastal flooding](#) Sunday into Monday, and this would increase even more if the storm ends up being stronger (i.e. stronger onshore winds). Given the uncertainty, the only change from the NBM was to increase the wind and winds gusts Sunday into Monday mostly closer to the coast and over the marine areas.

In the [wake](#) of this storm, a colder [air mass](#) settles into our region Monday and Tuesday, with high temperatures mostly in the 30s (colder in the Poconos) and lows in the teens and 20s. It then turns milder for the second half of next week.

possible impacts which will be briefed to federal and state partners and refining the forecast with some detail of these briefings.



Messaging High Impact Weather to Partners

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NWS Norman Home Page
Weather.gov > Norman, OK

Current Hazards | Current Conditions | Radar | Forecasts | Rivers and Lakes

Critical Fire Danger Thursday | Fire Weather Outlook | Relative Humidity and Wind Gust Forecasts

Critical Fire Danger – Thursday

National Weather Service | Norman, Oklahoma

Near-critical to critical fire weather conditions will continue across Thursday. Surface winds will shift to northerly in the evening and early Thursday night.

Click a location below for detailed forecast.

Watch Warnings Advise
Red Flag Blowing Advise Hazards Outlook

Last Map Update: Thu, Feb 19, 2026 at 12:54:47 pm CST

NWS Norman Home Page
Weather.gov > Norman, OK

Norman, OK
Weather Forecast Office

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

Critical Fire Danger Thursday | Fire Weather Outlook | Relative Humidity and Wind Gust Forecast | Cooling Trend Tonight | Extended Forecast

Critical Fire Danger – Thursday

February 19, 2026 1:47 AM

Timing
→ **Red Flag Warning**
10 AM through 7 PM

Key Points
→ **Near-critical to critical** fire weather danger.
→ Relative humidity as low as 8-15% percent.
→ West to northwest winds of 20-25 mph with 30-40 mph gusts.

Use extreme caution with potential ignition sources! Report fires to local emergency officials!

National Weather Service | Norman, Oklahoma

Near-critical to critical fire weather conditions will continue across much of Oklahoma and western-north Texas into Thursday. Surface winds will shift to northerly in the evening and early Thursday night.

- which
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- ned
- INCIDENT METEOROLOGIST



Messaging High Impact Weather to Partners

National Weather Service Incident Meteorologists (IMETs)

- NWS meteorologists that, in addition to their current position, volunteer to become trained to deploy to wildfire and other incidents of significance
- Request for an IMET is done through the Incident Management Team (IMT) and routed through the regional Geographic Area Coordination Center (GACC)
- Integrated with the IMT, normally as a technical expert in the plans section
- Work in conjunction with the local NWS office to provide a consistent message to protect life and property of the incident personnel and the public
- Work very closely with the Fire Behavior Analyst (FBAN), Long Term Analyst (LTAN), Air Resource Advisor (ARA), Operations Section and others as needed
- Produce daily forecasts, outlooks, spot forecasts and critical updates
- Briefings for operational shifts, planning purposes as well as community briefings
- Able to launch weather balloons to obtain near incident conditions



Introduction to National Weather Service Fire Weather Hazards



Introduction to National Weather Service Fire Weather Hazards



NOAA LNO FEMA HQ



Daily Operations Briefing. Key Bridge Collapse FEMA HQ Washington DC. March 2024.

Weather Support

- On-site Meteorologist at FEMA HQ
 - Morning Weather Briefing
 - FEMA Office of Response and Recovery
 - FEMA National Watch Office
 - FEMA LNO's
 - NHC, NWC, & SPC
 - Field Leadership, Logistics, Emergency Support Functions Leadership Group
- National Response Coordination Center (NRCC)
- NOAA Coordination
 - National Ocean Service
 - Office of Response and Restoration
 - Disaster Preparedness Program
 - Marine Debris Program
 - Disaster Response Center
 - Coastal and Geodetic Survey



NOAA LNO FEMA HQ



Secretary of Homeland Security Winter Storm Briefing FEMA HQ Washington DC. Jan 2026

Weather Support

- On-site Meteorologist at FEMA HQ
 - Morning Weather Briefing
 - FEMA Office of Response and Recovery
 - FEMA National Watch Office
 - FEMA LNO's
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 - Marine Debris Program
 - Disaster Response Center
 - Coastal and Geodetic Survey



NATIONAL RESPONSE COORDINATION CENTER



NRCC Activation Hurricane Beryl FEMA HQ Washington DC. July 2024.

Weather Support during activations

- Briefing Support
- Event Summaries
- Rumor Control

FEMA Emergency Support Functions

ESF #1 Transportation	ESF #2 Communications	ESF #3 Public Works & Engineering	ESF #4 Firefighting	ESF #5 Information and Planning
ESF #6 Mass Care, Emergency Assistance, Temporary Housing, & Human Services	ESF #7 Logistics	ESF #8 Public Health & Medical Services	ESF #9 Search & Rescue	ESF #10 Oil & Hazardous Materials Response
ESF #11 Agriculture & Natural Resources	ESF #12 Energy	ESF #13 Public Safety & Security	ESF #14 Cross-Sector Business and Infrastructure	ESF #15 External Affairs



CHALLENGES



Impact Based Decision Support Services (IDSS) Boot Camp Kansas City, MO

- Communication
 - Filtering Information.
 - Making sure the forecast is understood.



NOAA LNO FEMA NIMAT WHITE



Field briefing and instruction - Chris Mountain Fire June 2023.

Weather Support - Steady State

- NOAA Physical Scientist assigned to Team
 - Daily Weather/Impact Briefing
 - FEMA Nation Incident Management Assistance Team
 - One of four LNO for US
 - Coordinate weather/impact message with NRCC/NOAA
- National Response Coordination Center (NRCC)
- NOAA Coordination
 - Consolidate weather intel from field offices, regional partners and national centers.
 - Tropical, Severe
 - Drought/Fire
 - Winter/Marine/Earthquake
- What does this weather mean to me?



NOAA LNO FEMA NIMAT WHITE



Aviation and drone weather briefing - Cedar Creek Fire 2022

Weather Support

- On-site/remote Meteorologist for NIMAT White
 - Daily Morning Weather Briefing
 - Environmental Science Team Support
 - Weather
 - Climate (normal v. anomalies)
 - Impacts (short term and long term)
 - Field Leadership, Logistics, Emergency Support Functions Leadership Group
- NOAA Coordination
 - National Weather Service Regions/Filed Offices
 - National Forecast Centers
 - NHC (Tropical), SPC (Severe)
 - IMET (Fire and Wildland support)
 - NWC (hydro/flooding)
 - WPC/CPC
 - Longer range climate
 - Coastal and Geodetic Survey



Communicating Risk and Impacts - Other Agencies

- The NWS issues several statements in coordination and at the request of partner agencies
 - Partner agencies may be federal, state or local
 - Examples: civil emergency messages, burn bans, air quality advisories, silver alert, amber alert, etc.
- The NWS does not develop guidelines or recommendations for heat, cold, air quality, evacuations, sheltering in place, etc.
 - Even for hurricanes - evacuations are done by federal, state or local authorities
 - NWS serves as a technical expert and information provider for authorities to maintain awareness to make decisions and/or recommendations



Working in the Heat - Wet Bulb Globe Temperature

The WetBulb Globe Temperature (WBGT) is a measure of the heat stress in direct sunlight, which takes

Wet Bulb Globe Temperature Category Work/Rest and Water Intake

08/07/15

Unacclimated and Acclimated Work/Rest and Water Intake Chart

Heat Risk Category		Wet Bulb Globe Temp	Light Work		Moderate Work		Heavy Work	
			Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)
No Risk	Unacclimated	78 – 79.9	50/10 min	1/2	40/20 min	3/4	30/30 min	3/4
	Acclimated	78 – 79.9	continuous	1/2	continuous	3/4	50/10 min	3/4
Low	Unacclimated	80 – 84.9	40/20 min	1/2	30/30 min	3/4	20/40 min	1
	Acclimated	80 – 84.9	continuous	1/2	50/10 min	3/4	40/20 min	1
Moderate	Unacclimated	85 – 87.9	30/30 min	3/4	20/40 min	3/4	10/50 min	1
	Acclimated	85 – 87.9	continuous	3/4	40/20 min	3/4	30/30 min	1
High	Unacclimated	88 – 90	20/40 min	3/4	10/50 min	3/4	avoid	1
	Acclimated	88 – 90	continuous	3/4	30/30 min	3/4	20/40 min	1
Extreme	Unacclimated	> 90	10/50 min	1	avoid	1	avoid	1
	Acclimated	> 90	50/10 min	1	20/40 min	1	10/50 min	1

Adapted from: 1) USGS Survey Manual, Management of Occupational Heat Stress, Chapter 45, Appendix A. 2) Manual of Naval Preventive Medicine, Chapter 3: Prevention of Heat and Cold Stress Injuries. 3) OSHA Technical Manual Section III: Chapter 4 Heat Stress. 4) National Weather Service Tulsa Forecast Office, Wet Bulb Globe Temperature.



Working in the Heat

assessment to mitigate exposure

- Consider removing life pack when performing non-critical freeline tasks following a risk
- Ensure clothing is clean to allow dissipation of heat and sweat from body
- Remove hazards on the freeline
- Allow personnel to loosen clothing and remove gloves during rest periods when away from hazards on the freeline

Follow clothing recommendations

- Salt tablets are not recommended.
- High (very hot/extremely hot)
- Table salt may be added to food or eat more salty foods when the heat category is high
- Encourage snacking throughout the work shift
- Ensure firefighters hydrate before, during, and after work shifts
- Carry water on freeline
- Spot checks by supervisor, and assigned buddy
- Hour or 1 1/2 quarts per day
- Encourage frequent drinking (water and sports drinks) Do not exceed 1 1/2 quarts per

Monitor personnel for hydration and food consumption

- Reschedule non-mission critical tasks when HI is lower
- Ensure emergency medical response plan is in place, and known to personnel
- Set up buddy system/teach firefighters to watch for signs of HRI
- Adjust operational tactics during hottest part of day (e.g., bi-modal or reduce production)
- Adjust work/rest cycle following Heat Index Risk and Mitigation Chart
- Determine heat index hourly through weather observations

Heat Injury Mitigation(s)

- Individual Risk Factors:**
The more factors, the higher the risk
- Sources of Heat**
Internal heat generated by physical labor
- Environmental conditions**
- High heat environments can restrict the body's ability to evaporate sweating and to cool itself
 - Direct sunshine can increase heat index values up to 15°F
- Not acclimatized**
- Initial exposure (<4-5 days) of any of the following:
 - Increased heat exposure
 - Increased exertion levels of work/training
 - Lack of quality sleep
- Lower fitness level** requires more acclimatization time
- Overweight**
- Minor illness**
- Taking medications, either prescribed or over-the-counter and/or dietary aids. Example: Allergy or cold remedies, certain antibiotics, statins (cholesterol lowering drugs), ephedra and creatine
- Dehydration** occurs during prolonged exertion when fluid loss is greater than fluid intake.
- Excessive caffeine intake**
- Supplements** are not regulated and have potential to impact firefighters.
- Prior history of heat illness – a heat stroke event at any point, or an episode of lesser HRI in previous 24-48 hours
- Skin disorders such as heat rash and sunburn that prevent effective sweating

HIP Pocket Guide (Heat Illness Prevention Guide)

The intent of this guide is to provide a concise collection of Heat Related Illness (HRI) prevention information for operational field use. Its contents are not absolute rules and HRI potential and prevention mitigations should be evaluated and balanced with all the risks associated with wildland fire operations.

- This Guide includes:
- Hazards
 - Individual Risk Factors
 - Fluid Replacement and Work/Rest Guide
 - Heat Illness Mitigation
 - Warning Signs and Symptoms of HRI

- Hazards:**
- Heat Index, high ambient temperature and relative humidity
 - Exertion level of training or work output, especially on several sequential days
 - Acclimatization (and other individual risk factors – see reverse side)
 - Time of exposure, duration of exposure will determine level of mitigation

Heat Index Risk and Mitigation Chart *Reference Heat Index Chart Below*						
Heat Index	Risk Level	Moderate Work Mitigation		Arduous Work Mitigation		Protective Measures
		Rest per Hour	Water Intake per Hour	Rest per Hour	Water Intake per Hour	
Very Warm 80°F - 83°F	Caution	10 min.	3/4 qt.	20 min.	3/4 qt.	Basic heat safety and planning
Hot 90°F - 104°F	Moderate	20 min.	3/4 qt.	30 min.	1 qt.	<ul style="list-style-type: none"> • Implement precautions and heighten awareness • Consider bi-modal shift
Very Hot 105°F - 123°F	High	30 min.	3/4 qt.	40 min.	1 qt.	<ul style="list-style-type: none"> • Additional precautions to protect workers • Implement bi-modal shift • Reduce production rates
Extremely Hot ≥130°F	Very High to Extreme	40 min.	1 qt.	50 min.	1 qt.	<ul style="list-style-type: none"> • Triggers additional aggressive protective measures • Implement bi-modal shift • Reduce production rates

Moderate Work = Patrolling, hiking on level/moderate terrain, mop-up, calisthenics, etc

Hard Work = Initial Attack, freeline construction, hiking on steep terrain, endurance exercising, carrying weight, etc.

Bi-Modal Work Shift = Move essential work tasks to coolest part of operational period, and/or adjust tactics (patrol/holding, etc) during hottest part of day.

CAUTION: Hourly fluid intake should not exceed 1 1/2 qts. Daily fluid intake should not exceed 12 qts.

Index Heat Chart Temperature (°F)

	84	86	88	90	92	94	96	98	100	102	104	106	108	110
10	81	82	84	85	87	89	90	92	94	96	98	100	102	104
15	81	83	84	86	88	90	92	94	96	98	101	103	106	108
20	81	83	85	86	88	90	93	95	97	100	103	106	109	112
25	82	83	85	87	89	92	94	97	100	104	106	110	113	117
30	82	84	86	88	90	93	96	99	102	106	110	114	118	122
35	83	85	87	89	92	95	99	102	106	110	114	119	124	129
40	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	84	87	90	93	96	100	104	109	114	119	125	131	136	144
50	85	88	91	95	99	103	108	113	118	124	131	137	144	152
55	86	89	93	97	102	107	112	117	124	131	138	145	154	162
60	88	91	95	100	105	110	116	123	129	137	145	153	162	171
65	89	93	98	103	107	115	121	128	136	145	153	162	172	
70	90	95	100	106	112	119	126	134	143	152	161	172	182	
75	93	98	104	110	117	124	132	141	151	160	172	180		
80	94	100	106	113	121	129	138	148	158	169	181			

Download the OSHA Heat Safety Tool App, free online through your application store.

Radiant Heat = sun/flame can increase HI values by up to 15°



Communicating risk and impacts

Warning Signs and Symptoms of Heat Stress and Illness

Indications of Possible Heat Related Illness

COMMON SIGNS/SYMPTOMS

- Dizziness
- Headache
- Nausea
- Unsteady walk
- Weakness or fatigue
- Muscle Cramps

IMMEDIATE ACTIONS

- Stop current activity
- Allow person to rest in shade
- Take sips of water
- Call for medical assistance to evaluate individual

SERIOUS SIGNS/SYMPTOMS

- Hot body, high temperature
- Altered mental status
- Vomiting
- Involuntary bowel movement
- Convulsions
- Weak or rapid pulse
- Unresponsive/Unconscious
- Hyperventilating

If no emergency medical personnel are available, call for ambulance or medical transport. Immediately implement medical emergency plan and call for an ambulance and/or medivac for emergency transport while doing the following:

- Lay individual down in shade until MEDEVAC or ambulance arrives
- Remove clothing from individual
- Apply ice packs, or move individual to vehicle with air conditioning
- Pour or immerse body in cold water and fan
- Give sips of water while awaiting ambulance (if conscious)
- Monitor airway and breathing until ambulance or MEDEVAC arrive
- Continue cooling during transport or until body reaches 100° F

Warning Signs and Symptoms of Heat Stress and Illness

An important sign that the firefighter is in a **serious life-threatening** condition is an altered mental status (with or without increased temperature).

Ask the following questions:

- What is your name? (Does not know their name.)
- What month is it? What year is it? (Does not know the month or year.)
- Where are we/you? (Is not aware of location or surroundings.)
- What were you doing before you became ill? (Does not know the events that led to the present situation.)

Call for emergency MEDEVAC or ambulance

Indications of Possible Water Intoxication (Over-Hydration)

Water intoxication (hyponatremia) occurs when an individual drinks excessive amounts of water and decreases the sodium to water concentration in the body.
Signs and Symptoms: Confusion, Weakness, and Vomiting

For a full reference list for the HIP Pocket Guide, go to: <http://www.nwcg.gov/branches/pre/rmc/index.htm>



Smoke and Air Quality



Smoke and Air Quality

- Varies from state to state
- Some states only run their air quality program only during specific seasons
- Messages about air quality from the NWS are relayed from the state agency charged with air quality monitoring and forecasting
- Large wildfires, or those in sensitive areas, will request an Air Resource Advisor (ARA) to specifically handle smoke monitoring and forecasting
 - ARAs will bring additional monitoring equipment to the incident and are able to set up the monitors according to greatest need
- A good portion of the smoke which impacts the eastern half of the US originates from Canadian wildfires.



Smoke and Air Quality

FireSmoke.ca Home Services Resources Contact Fr

AirNow

Current For

Monitors

NowCast AQI

Show temp mo

- Ozone and PM (PM2.5 and PM10)
- Ozone
- PM (PM2.5 and PM10)
- PM2.5
- PM10

Contours

NowCast AQI

Show green con

- Ozone and PM (PM2.5 and PM10)
- Ozone
- PM2.5

Boundaries

FireSmoke Canada

Welcome to the Canadian portal for information about wildland fire weather and smoke. From here you can access the BlueSky Canada smoke forecasts, fire weather forecasts, fire information, and the BlueSky Playground. The Weather Forecast Research Team at the University of British Columbia produces these research forecasts with support from multiple agencies. These tools and data serve professionals in the air quality, health & safety, emergency management, and science & research communities as well as the public. We are also a community of practice that advances policies, plans & organizations to address wildland fire and smoke issues.

Smoke Forecasts



High resolution, interactive forecasts of hourly, daily average and daily maximum concentrations of PM2.5 smoke particles.

News

Playground - Full Now Available

September 23, 2024 We are pleased to announce that **BlueSky Playground - Full** is now available. The Full version of our ad-hoc, on-demand smoke modelling tool uses comprehensive fuel data to calculate emission rates, and includes an expert mode to allow users to customize individual parameters. You can access Playground - Full from the [Playground](#) page.

New Playground Available


July 3, 2024 We are pleased to announce that a new, improved version of BlueSky Playground is now available. Playground is an ad-hoc, on-demand smoke modelling tool which allows users to create emissions scenarios for prescribed burns and wildfires, then model the resulting smoke dispersion. You can access Playground - Express from the [Playground](#) page; more advanced versions are under development.

Planned Maintenance Outage

June 19, 2024 A maintenance outage is planned for **Thursday, June 20, 18:00-23:59 PDT (UTC-7)** to upgrade network infrastructure in the data centre. Access to firesmoke.ca may be interrupted during this time.

address or place

maps Legend

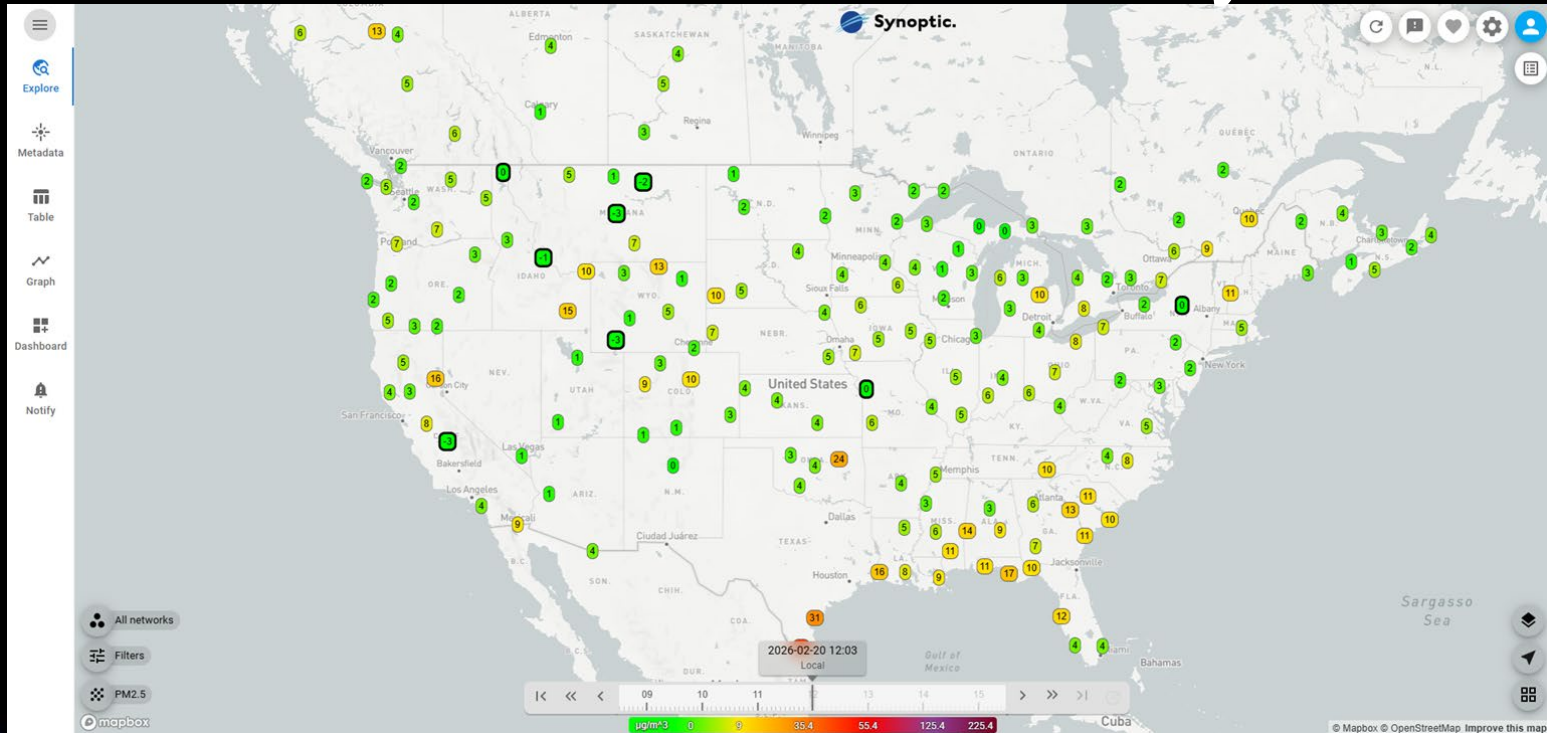


January 20, 2026 at 09:00 AM MST

AAA, USGS, EPA, USFWS esri



Smoke and Air Quality



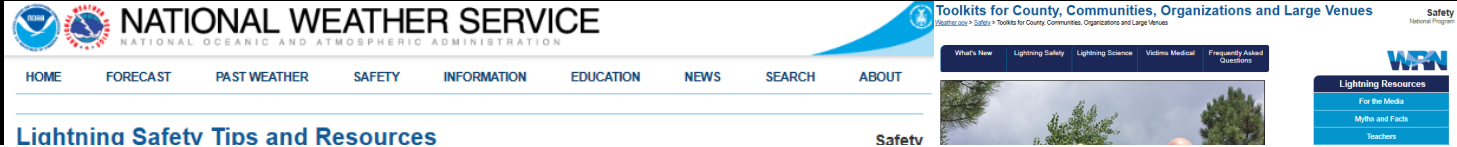
Lightning Safety



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Lightning Safety



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Lightning Safety Tips and Resources

Toolskits for County, Communities, Organizations and Large Venues

Safety National Program

Lightning Resources
For the Media
Myths and Facts
Teachers

LIGHTNING SAFETY TOOLKITS

The Lightning Safety Toolkit program was founded in 2011 to increase lightning safety and preparedness at outdoor venues. These toolkits have been developed with the input and best practices of key stakeholders. Sites that show a commitment to lightning safety by filling out the appropriate toolkit below in concert with your [local Warning Coordination Meteorologist \(WCM\)](#) will be listed on our [website](#) as a lightning safety site. This program is a key component of NOAA's commitment to a Weather Ready Nation. Complete an interactive form (must review and accept Terms of Use) or a fillable Word document to create a draft lightning safety plan for your organization. After you complete your draft plan, email it to your local NWS office for review. After NWS approval, your organization can then be recognized for having a written plan for lightning safety.



<http://www.lightningsafety.noaa.gov> has changed to a more secure link:
<https://www.weather.gov/safety/lightning>. Please bookmark the new link.

Lightning strikes the United States about 25 million times a year. Although most lightning occurs in the summer, people can be struck at any time of year. Lightning kills about 20 people in the United States each year, and hundreds more are severely injured. This website will teach you how to [stay safe](#) and offer insight into the [science of lightning](#). You'll find [animated books about lightning](#), [safety tips](#) for all kinds of situations, [games for kids](#) and [resources for teachers](#). You'll learn about [lightning victims](#) and [survivors](#). Explore our site, and come and visit often! [En Espanol](#)

What's New

UPDATED Lightning Safety Toolkits

- Lightning Safety Brochure
- U.S. Lightning Deaths in 2025: 20
- Youtube: Lightning Safety for the Deaf and Hard of Hearing: ASL and Closed Captioned
- "Flash, Dash Inside" slogan and sign created by and for the Deaf and Hard of Hearing
- Lightning Safety for Hard of Hearing: [jag](#), high res [png](#)
- YouTube: [Lightning Safety Tips](#)
- Lightning Safety When Working Outdoors: OSHA Factsheet
- What You Need to Know: [Tips for Safety](#)
- Analysis of Lightning Fatalities: 2006-2024 (from National Lightning Safety Council)
- YouTube: Don't Catch the Big One: [PSA1](#), [PSA2](#)
- How People are Struck by Lightning
- Tornado, High Wind and Hail Safety Site

- Lightning Photos
- Information, Brochures
- International, Links, Partners



Golf Facility

[Interactive Form](#) | [Download & Fill](#) (Word Doc)



Wilderness Area

[Interactive Form](#) | [Download & Fill](#) (Word Doc)



Community

[Interactive Form](#) | [Download & Fill](#) (Word Doc)



Lifeguard and Beach Patrol

[Interactive Form](#) | [Download & Fill](#) (Word Doc)



Boating and Sailing

[Interactive Form](#) | [Download & Fill](#) (Word Doc)

Check out our [safety](#) and [outreach](#) web pages as well.



Questions



Resources and Links

<https://www.weather.gov/>

<https://www.weather.gov/fire>

https://www.spc.noaa.gov/products/fire_wx/overview.html

<https://www.cpc.ncep.noaa.gov/products/predictions/threats/threats.php>

<https://www.wpc.ncep.noaa.gov/threats/threats.php>

<https://www.osha.gov/heat-exposure/wbgt-calculator>

<https://www.weather.gov/tsa/wbgt>

<https://www.nwccg.gov/committee/emergency-medical-committee>

<https://www.airnow.gov/>

<https://firesmoke.ca/>

<https://viewer.synopticdata.com/>

<https://www.weather.gov/safety/lightning>

<https://www.weather.gov/safety/lightning-toolkits>

