

# Climate and Health Outlook

ISSUED DECEMBER 2023

The Climate and Health Outlook is an effort to inform health professionals and the public on how our health may be affected in the coming months by climate events and to provide resources for proactive action. The Climate and Health Outlook series will resume in February 2024. In the meantime, please visit the [associated webpage](#) for additional resources and information. You can also check out the new [Climate and Health Outlook Portal](#) for interactive maps with county-level forecasts for the current month along with county-level data on individual risk factors that may make people more vulnerable to negative health outcomes from these climate hazards..



**Northwest:** Drought is favored to persist across small portions of Washington, northern Oregon, and northern Idaho with improvement and removal in western Oregon and Washington. Winter temperatures during El Niño tend to be warmer than average in the Northwest, so precipitation tends to fall more as rain, creating unfavorable conditions for building mountain snowpack.



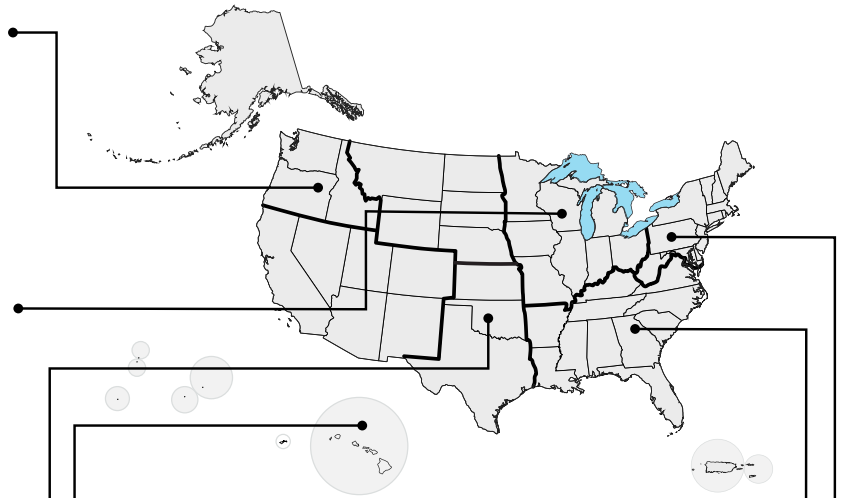
**Midwest:** Drought is favored to persist across most of Iowa, northern Missouri, and southern Illinois and Indiana, along with parts of Minnesota, Wisconsin, and Michigan. Drought improvement and removal is favored in southern Missouri. There is a general trend for below-normal snowfall across the Midwest during El Niño winters, and there is typically less ice on the Great Lakes.



**Southwest:** Drought is favored to persist across most of New Mexico and Arizona into parts of Colorado, Nevada, and Utah. El Niño tends to be associated with near-to-below average temperatures in the Southwest, but with the addition of recent climate trends, temperatures have been trending near-to-above average.



**Hawai'i and Pacific Islands:** Drought improvement and removal is forecast across all drought areas of the Hawaiian Islands. Probabilities favor above normal temperatures for Hawai'i, particularly in the western half of the state. For Micronesia, slightly warmer than normal temperatures are favored. American Samoa is expected to experience an increased risk of tropical cyclones through January, with slightly warmer than normal temperatures favored. Above normal significant wildland fire\* potential is forecast for the Islands of Hawai'i.



**Southeast:** Drought is favored to persist across most of Kentucky, western Virginia, northern Tennessee, along with portions of western North Carolina. Drought improvement and removal is favored for most of Louisiana, Mississippi, and Alabama, along with portions of northern and southern Georgia, northern South Carolina, northwestern North Carolina, central and eastern Virginia, southeastern Arkansas, southern Tennessee and western Florida. The Southeast experiences some of the strongest El Niño impacts with wetter-than-average conditions favored from the Carolinas to the central Gulf Coast. El Niño winters tend to be snowier than average in parts of Virginia into the southern Appalachians.



**Northeast:** Most of the Northeast is forecasted to remain drought-free, except for small portions of West Virginia and western New York where drought is forecast to persist. Drought improvement and removal is forecast in Maryland into southeastern Pennsylvania. Snowfall tends to be above normal during El Niño winters in most of the Mid-Atlantic and below normal in northern New York and interior New England. Above-normal temperatures are generally favored with the greatest chance over northern New York and New England.

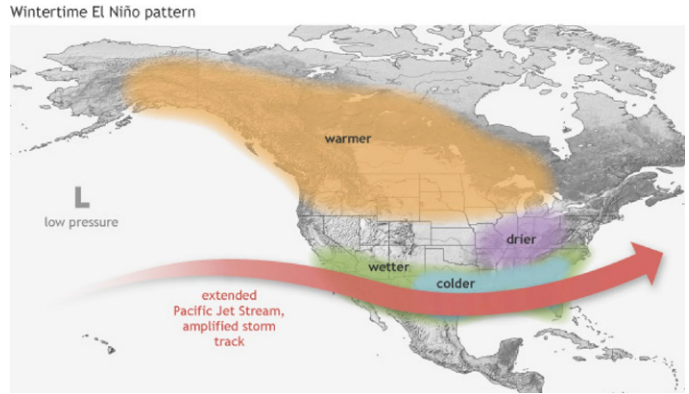
Drought Wildfire Hurricane Snowfall

\*Smoke from wildfires can impact health hundreds of miles from site of the fire.

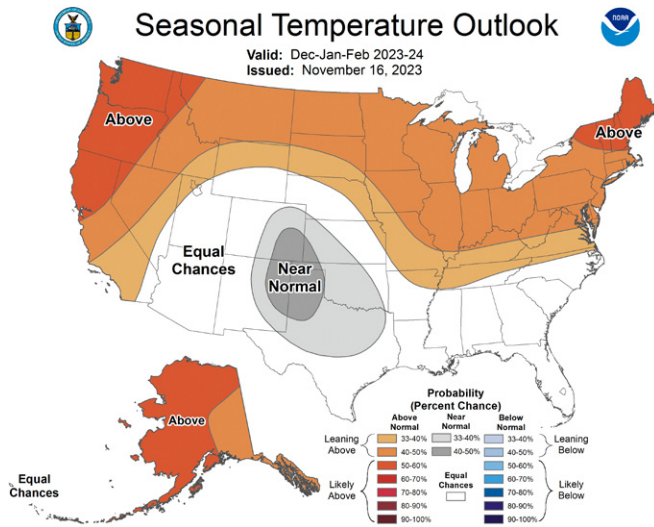
Developed with data from the Centers for Disease Control and Prevention, the National Oceanic and Atmospheric Administration, and the National Interagency Fire Center.

## Winter Weather Outlook

This year, El Niño is in place heading into winter for the first time in five years, driving the outlook for warmer-than-average temperatures for the northern tier of the continental U.S., according to [NOAA's U.S. Winter Outlook](#). El Niño occurs when ocean waters in the equatorial Pacific Ocean become warmer than average, which results in shifts in the jet stream that can drive changes in weather around the globe. El Niño tends to result in increased storms across the southern tier of the U.S. and milder conditions across much of the northern U.S. and Alaska. El Niño is just one factor driving winter weather, but it has a history of producing some significant winter storms in the southern U.S.

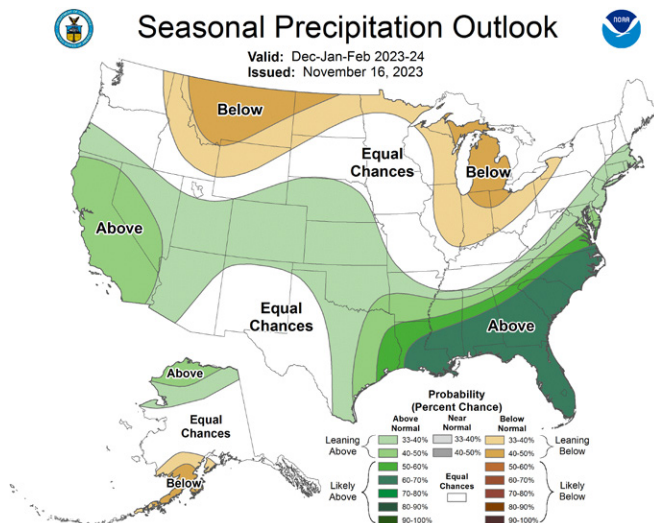


This figure from NOAA illustrates the wintertime El Niño pattern of an extended Pacific Jet Stream along with its regional influences of changing temperatures and precipitation.



For December 2023–February 2024, warmer-than-average temperatures are favored in Alaska and the West Coast into the Northern Great Plains and Midwest and into the Mid-Atlantic Coast from northern North Carolina to Maine. The greatest chance (50-60%) for warmer-than-average conditions is in Washington, much of Oregon and Alaska, and portions of northern California, Nevada, Idaho, and Montana, as well as Maine, New Hampshire, Vermont, and northern New York. Near-normal temperatures are favored from eastern Colorado southeast into Texas. Much of the remainder of the U.S. has equal chances for below-, near-, or above-average seasonal temperatures. Importantly, El Niño acts alongside long-term trends (due in part to climate change) to impact seasonal temperatures. Areas where El Niño historically favors below-normal temperatures can also have long-term warming trends, such as the southern U.S. and the North Slope of Alaska.

Figure: This [NOAA Climate Prediction Center winter temperature forecast](#) shows the most likely outcome where there is greater confidence, but this is not the only possible outcome.



For December 2023–February 2024, wetter-than-average conditions are favored across northern Alaska, much of the southern U.S. westward into California and the Great Basin, and along the Atlantic Coast from Massachusetts to Florida. The highest probabilities for above-normal precipitation extend along the Gulf and Atlantic coasts from southern Louisiana to southeastern Virginia. Drier-than-average conditions are more likely from Idaho east into the Great Lakes Region and in southern Alaska. The highest probabilities for below-normal precipitation are in southern Alaska, from Montana into northwest North Dakota, and from Michigan into northeast Indiana and northwest Ohio. The remainder of the U.S. will see equal chances for below-, near-, or above-average seasonal precipitation. For updated winter weather forecasts, please visit NOAA's [WPC Winter Weather Forecasts](#) or [CPC Week-2 U.S. Hazards Outlooks](#).

Figure: This [NOAA Climate Prediction Center winter precipitation forecast](#) shows the most likely outcome where there is greater confidence, but this is not the only possible outcome.

## Which parts of the country are at high risk from winter hazards?

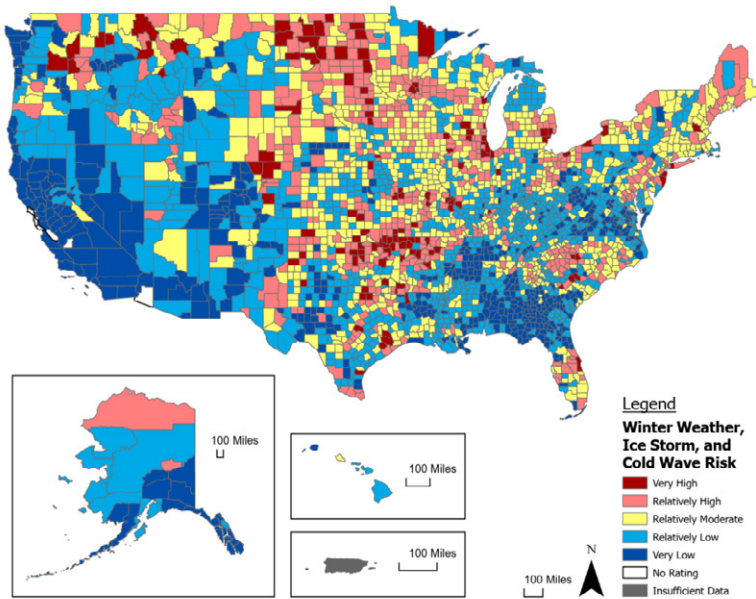


Figure: This map of the U.S. is colored by the combined National Risk Index composite ratings for Winter Weather, Ice Storm, and Cold Wave.

As our climate changes, extreme weather events are increasing in both frequency and intensity, and for some places, that means an increased risk of winter hazards. The Federal Emergency Management Agency (FEMA) provides information on the risk of different climate hazards across the 50 states and Washington, D.C., through the National Risk Index (NRI) platform. The NRI leverages available data for natural hazards and community risk factors to develop a baseline relative risk measurement for each U.S. county and census tract. The combined NRI for Winter Weather, Ice Storms, and Cold Waves, shown on the map above, represents a community’s relative risk for winter weather (winter storm events in which the main types of precipitation are snow, sleet, or freezing rain), ice storms (freezing rain events with significant ice accumulations), and cold waves (rapid falls in temperature within 24 hours and extreme low temperatures for an extended period), based on the historical annualized frequency of such weather, when compared to the rest of the U.S.

**1,505 counties** across **49 states plus D.C.** are estimated to have “very high,” “relatively high,” or “relatively moderate” winter weather risk (all states have at least one county in these risk categories except for Nevada; insufficient data are available for U.S. territories). In these counties, the total population at risk is **223,204,711 people** and, of those, **23,209,898 people** work outdoors. Risk factors vary across the 1,505 counties identified by FEMA. Of these counties:

- 567 (38%)** have a high number\* of people aged 65 or over, living alone.
- 581 (39%)** have a high number of children under 5 years old.
- 550 (37%)** have a high number of people living in poverty.
- 198 (13%)** have a high number of people with frequent mental distress.
- 319 (21%)** have a high number of people spending a large proportion of their income on home energy.
- 498 (33%)** have a high number of people with electricity-dependent medical equipment enrolled in the HHS emPOWER program.
- 469 (31%)** have a high number of people in mobile homes.
- 299 (20%)** have a higher number of adults with asthma.
- 232 (15%)** have a high number of adults with coronary heart disease.
- 561 (37%)** have a high number of people with one or more disabilities.
- 276 (18%)** are identified as highly vulnerable by CDC’s Social Vulnerability Index.


\*“A high number” indicates that these counties are in the top quartile for this indicator compared to other counties.


### Recommendations to Protect Your Health from Winter Weather Hazards


- **Prepare your home** to keep out the cold with weatherization measures, check your heating system, inspect and clean fireplaces and chimneys, have a safe alternate heating source and alternate fuels available, learn how to keep pipes from freezing, and install and test smoke alarms and carbon monoxide detectors with battery backups.
- **Build [disaster supplies kit\(s\)](#) for the home and car** keeping in mind each person’s specific needs, including medication.
- Follow best practices for preventing [fires](#) and [carbon monoxide poisoning](#) while heating your home in the winter.
- Additional guidance on preparing for, enduring, and responding to winter hazards is available at the CDC’s [Preparing for a Winter Storm](#), [Extreme Cold Prevention Guide](#), and [Stay Safe During & After a Winter Storm](#) webpages as well as FEMA’s Ready.gov webpage, [Be Prepared for a Winter Storm](#).


## Winter Weather Affects Health in Many Ways


Winter can bring extreme cold, freezing rain, snow, ice, and high winds which can last a few hours or several days.


 Those with inadequate indoor heating or clothing coverage, and those who work outdoors are at greater risk of **hypothermia** and **frostbite** with prolonged exposure to excessive cold.


 Winter storms can lead to **outages of power, heating, and communication systems** which can pose safety hazards, especially for people who critically depend on electricity-dependent medical equipment.

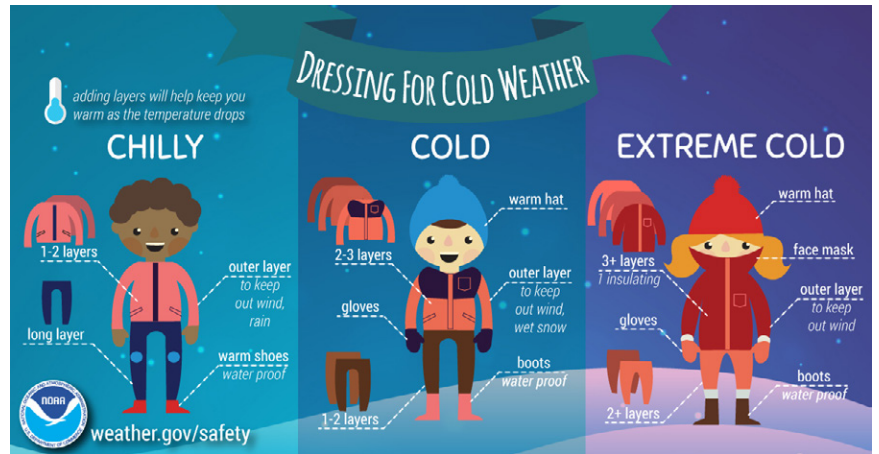
 Using space heaters, fireplaces, or appliances that are not meant for heating, such as ovens or stoves, can increase the **risk of fire** and **worsen indoor air quality**.

 Running a generator indoors or outdoors without adequate ventilation can cause carbon monoxide [CO] exposure, which can lead to **loss of consciousness** and **death**. Over 400 people die each year from accidental CO poisoning.

 Walking or driving on slippery surfaces in the winter can lead to **injuries** and **vehicle accidents**.

 Extreme cold can cause pipes to freeze and burst. Standing water from burst pipes can lead to mold growth, which increases risk of respiratory issues, particularly for people with **asthma, allergies, or other breathing conditions**.

 The combination of cold temperatures, which can increase blood pressure, and potential overexertion while shoveling snow can increase the risk of **heart attack**.



This [figure from NOAA](#) provides recommendations for clothing layers to keep you safe in varying degrees of coldness.

## Staying Safe Indoors This Winter: New LIHEAP Eligibility Tool

The **Low Income Home Energy Assistance Program (LIHEAP)** helps households struggling with their energy bills to stay safe indoors in the winter. LIHEAP benefits provide support to households with low incomes, especially those who are particularly vulnerable to the negative health impacts of unsafe indoor air temperatures including households with older adults, individuals with disabilities, and young children.

Reaching households in need of energy assistance is critical to keeping families and individuals safe and healthy in their homes. The new user-friendly [LIHEAP eligibility tool](#) allows households across the country to quickly identify if they might be eligible for LIHEAP assistance by inputting basic information like income and household size. The LIHEAP eligibility tool is available in English, Spanish, traditional Chinese, and simplified Chinese. Individuals interested in applying for energy assistance can also visit [energyhelp.us](#) or call the National Energy Assistance Referral (NEAR) hotline toll free at 866-674-6327.

### LIHEAP funding can be used to:

- ✓ Help with heating bills
- ✓ Restore or prevent disconnection
- ✓ Repair or replace heating equipment
- ✓ Install weatherization measures to help keep homes safe and warm

DEPARTMENT OF HEALTH & HUMAN SERVICES  
OFFICE OF COMMUNITY SERVICES

LIHEAP  
Low Income Home Energy Assistance Program



**U.S. Monthly Drought Outlook**  
Drought Tendency During the Valid Period

Valid for December 2023  
Released November 30, 2023

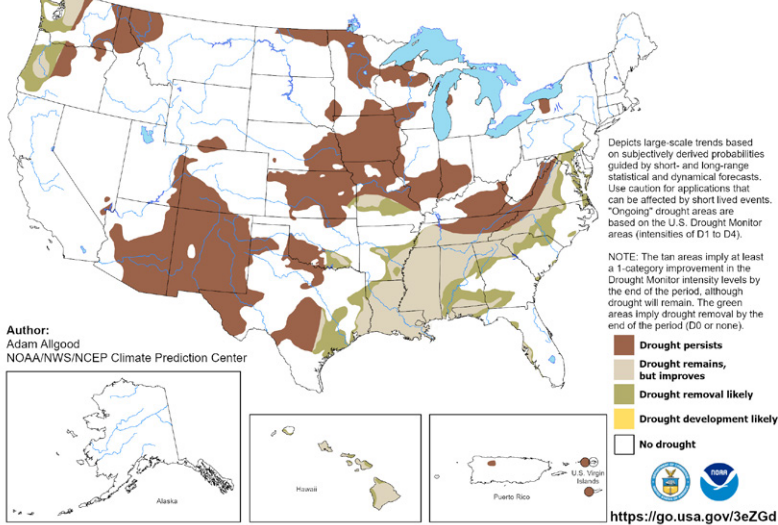


Figure: The National Weather Service Climate Prediction Center’s Monthly Drought Outlook is issued at the end of each calendar month and is valid for the upcoming month. The outlook predicts whether drought will persist, develop, improve, or be removed over the next 30 days or so. For more information, please refer to [drought.gov](https://drought.gov).

During December, drought improvement is favored for the Northwest coast, all drought areas in Hawai’i, and portions of the Southern Great Plains, the Midwest, and the Southeast. There are no areas of forecasted drought development across the US. In contrast, drought persistence is forecasted across portions of the Northwest, Southwest, Midwest, Great Plains, Southeast, Northeast, Puerto Rico, and the Virgin Islands. Drought can have direct and indirect impacts on health—increasing incidence of illness among those living in the affected area and worsening mental health outcomes as livelihoods are challenged.

**Who is at high risk in the counties projected to have drought in December?**


As indicated in the map to the left, **1,035 counties** across **31 states** are projected to have persistent/remaining drought or drought development in November. In these counties, the total population at risk is **64,195,571 people** and, of those, **822,086 people** work in agriculture. Of these counties:


- 314 (30%)** have a high number\* of people aged 65 or over, living alone.
- 289 (28%)** have a high number of people living in rural areas.
- 198 (19%)** have a high number of people living in poverty.
- 224 (22%)** have a high number of people with frequent mental distress.
- 169 (16%)** have a higher number of adults with asthma.
- 197 (19%)** have a high number of people without health insurance.
- 253 (24%)** have a high number of uninsured children.
- 42 (4%)** have a high number of Black or African American persons.
- 147 (14%)** have a high number of people with severe housing cost burden.
- 212 (20%)** have a high number of people in mobile homes.
- 270 (26%)** have a high number of people with one or more disabilities.
- 184 (18%)** are identified as highly vulnerable by CDC’s Social Vulnerability Index.


\*“A high number” indicates that these counties are in the top quartile for this indicator compared to other counties.


**Drought Affects Health in Many Ways**


Drought increases the risk for a diverse range of health outcomes. For example:


 Low crop yields can result in rising food prices and shortages, potentially leading to **malnutrition**.

 Dry soil can increase the number of particulates such as **dust and pollen** that are suspended in the air, which can irritate the bronchial passages and lungs.

 Dust storms can spread the fungus that causes coccidioidomycosis (**Valley Fever**).

 If there isn’t enough water to flow, waterways may become stagnant breeding grounds for **disease vectors** such as mosquitoes as well as viruses and bacteria.

 Drought’s complex economic consequences can increase **mood disorders, domestic violence, and suicide**.

 Long-term droughts can cause **poor-quality drinking water** and leave inadequate water for hygiene and sanitation.

**THANK YOU** to the partners who provide invaluable information, expertise, and data for the Climate and Health Outlook series:

