Drought Termination and Amelioration Initiatives at NCEI

Russell Vose
NOAA National Centers for Environmental Information
With Sustained Support from...
Current NW Drought Conditions

Current Conditions and Outlooks: U.S. Drought Monitor

- **U.S. Drought Monitor Category**
  - D0 - Abnormally Dry: 52.7%
  - D1 - Moderate Drought: 40.2%
  - D2 - Severe Drought: 27.2%
  - D3 - Extreme Drought: 14.8%
  - D4 - Exceptional Drought: 4.6%

Source(s): NDMC, NOAA, USDA
Updates Weekly - 11/09/21

Current Conditions and Outlooks: CPC Seasonal Drought Outlook

- **Drought Outlook Category**
  - Drought persists: 32.1%
  - Drought remains but improves: 2.2%
  - Drought removal likely: 5.3%
  - Drought development likely: 8.9%

Source(s): CPC
Updates Monthly - 10/21/21

Drought.gov
Questions That Typically Arise

• How much rain is needed for this drought to get better?
• What the likelihood is that the drought will be over in a month? Or this winter?
• How bad could the drought get if it doesn’t rain again the rest of the month?
And the Obvious Question

Atmospheric river is drenching Pacific Northwest as waterlogged pattern continues

Some places have seen 30 inches or more in just the past month.

Will this thing finally end the drought around here?
### Overview

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Do Floods Terminate a Drought? A Workshop on Drought Recovery Tools, Perspectives, and Situational Awareness - June 2

Event Date & Time
Friday, June 2, 2017 (All day)
Pacific Time
Sierra Nevada College, Incline Village, NV

Please join the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI), the National Integrated Drought Information System (NIDIS), and the California Nevada Climate Applications Program (CNAP) for a one-day interactive workshop for current and potential users of the NCEI drought amelioration tool.

Information sharing dialogues are planned between climate experts and community members, including political leaders, TV media, and science writers with the following objectives:

- Identify current usage of the recently updated and modified National Centers for Environmental Information (NCEI) drought amelioration tool including users, application, and decisions supported.
- Provide an update on the NIDIS and NCEI project to improve drought amelioration tool.
- Facilitate open discussion on improvements to NCEI's drought amelioration web page.
- Discuss the impact of extreme rain falling during a long-term drought and evaluate whether existing tools/products sufficiently capture its effect on drought amelioration.

Additional contributors include the Western Regional Climate Center (WRCC) and California State Climatologist Michael Anderson.

Projected outcomes:

- Combining local knowledge with specialist technical input to generate accurate, timely, and regionally relevant content will facilitate the use of drought amelioration tools.
- The user community will be better informed about drought amelioration tools, and, as a result, able to make better decisions as they set priorities and allocate resources for future droughts.
- The provider community will be better informed about what problems and questions are most relevant with respect to drought amelioration, and, as a result, are better able to match products and services to user requirements.

For more information, please contact Michael Kruk, NOAA (michael.kruk@noaa.gov) or Amanda Sheffield, CNAP/NIDIS (amsheffield@ucsd.edu).
Compromise Was Inevitable

- Media outlets
- General public
- Academic community
- Water managers
- Weather Service
Use Peer-Reviewed Data and Science

**Improved Historical Temperature and Precipitation Time Series for U.S. Climate Divisions**

**Russell S. Vose, Scott Applequist, Mike Squires, Imke Durre, Matthew J. Menne, Claude N. Williams Jr., Chris Fenimore, Karen Gleason, and Derek Arndt**

NOAA/National Climatic Data Center, Asheville, North Carolina

(Manuscript received 26 July 2013, in final form 7 January 2014)

**ABSTRACT**

This paper describes an improved edition of the climate division dataset for the United States (i.e., version 2). The first improvement is to the input data, which now includes quality assurance reviews, and temperature bias adjustments. The second improvement is to the climatic elements, which now includes both minimum and maximum temperatures, and it employs climatically aided inferential methods. Version 2 exhibits consistent differences from version 1. For example, divisional averages in version 2 tend to be cooler on average than those in version 1. The divisional trends in temperature and precipitation in version 2 display greater consistency than those in version 1. The U.S. Historical Climatology Network provides no evidence of short-term changes in observing practices. Divisional errors in version 2 are less than 10% for precipitation at the start of the record, falling rapidly throughout.

**Drought Termination and Amelioration: Its Climatological Probability**

**Thomas Karl, Frank Quinlan and D. S. Ezell**

National Climatic Data Center, National Oceanic & Atmospheric Administration, Asheville, NC 28801

(Manuscript received 21 May 1984, in final form 15 March 1987)

**ABSTRACT**

The preliminary Palmer Drought Severity Index (PDSI) is calculated and disseminated operationally by the National Oceanic and Atmospheric Administration/United States Department of Agriculture's (NOAA/USDA) joint agricultural weather facility. On an operational basis, this index is more aptly described as the Palmer Hydrological Drought Index (PHDI). In order to differentiate it from its hindcast value, the PDSI. Using the PHDI the approximate precipitation required to ameliorate or terminate any ongoing drought was calculated across the United States for various precipitation periods. The climatological probability of receiving at least the needed precipitation was calculated using the gamma distribution. The probability calculations indicate that in many portions of the country it is quite unlikely that serious drought can be terminated in a single season or even in two seasons. Furthermore, due to the varying climatologies across the country, the probability of ending or ameliorating a drought varies both spatially and temporally in a systematic manner across the United States. The annual precipitation cycle and the probability of receiving substantial excess precipitation above normal (the skewness of the precipitation distribution) are two important characteristics of drought termination and amelioration in the Palmer Drought Model.
Use a Single, Trusted Indicator

• Palmer Hydrological Drought Index (PHDI)
  – Long-term precipitation deficits and recovery
  – Impacts on reservoir levels, ground water, etc.
Live with the Good, Bad, and Ugly

• The good
  – Uses temperature and precipitation (simple)
  – Puts conditions in historical perspective
  – Works well in much of the nation

• The not-so-good
  – No snow, no frozen ground
  – Doesn’t capture short-term changes
  – Can struggle in parts of the West
PHDI Map Similar to Drought Monitor
The App Itself

Current Drought Reduction

Select from the options below to view precipitation needed to end (PHDI value of -0.5) or ameliorate (PHDI value of -2.0) drought as it currently exists across the Contiguous U.S., assuming either a scenario of climatological conditions or a worst case scenario of no precipitation for the remainder of the month.

- Scenario: Climatological Conditions
- Reduction: Precip to End
- Duration: 1 Month

View
Current Conditions

Palmer Hydrological Drought Index

Year-to-Date Percent of Normal Precipitation

PHDI

Precipitation (%)
How Much Precipitation Is Needed?

• Amelioration
  – Recover to a less extreme state
  – Palmer value > -2.0 (“moderate drought”)

• Termination
  – End the drought entirely
  – Palmer value > -0.5 (“near normal”)

NOAA National Centers for Environmental Information
Amelioration Metrics for the Next Month

- Probability of Ameliorating Drought (%)
- Percent of Normal Precipitation Needed to

Probability (%)

Precipitation (%)
Termination Metrics for the Next Month

Probability of Ending Drought Conditions

Percent of Normal Precipitation Needed to

Probability (%)  Precipitation (%)
Feel Free to Give It a Try

https://www.ncdc.noaa.gov/temp-and-precip/drought/recovery/current
(or just Google ‘NCEI drought termination’)