

**NATIONAL WEATHER SERVICE INSTRUCTION 10-1202**

**MAY 17, 2020**

**Operations and Services**

**Drought Services, NWSPD 10-12**

**NATIONAL DROUGHT PRODUCTS**

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**NOTICE:** This publication is available at: <http://www.nws.noaa.gov/directives/>.

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**Type of Issuance:** Routine

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**SUMMARY OF REVISIONS:** This directive supersedes NWSI 10-1202, “National Drought Products” dated October 4, 2017.

This instruction has been updated for the following:

1. Sample products and generic formats for text products to reflect formatting changes at the Climate Prediction Center (CPC) and new regions added to the U.S. Drought Monitor.
2. Corrected formatting for bulleted lists and made minor text corrections.
3. Office of Water Prediction (OWP) precipitation products included in Section 3.3.2. OWP is otherwise not relevant in this document, as this instruction describes products issued by CPC.
4. Issuance time and valid time for the seasonal U.S. Drought Outlook, as per Sections 5.2.3 and 5.2.4.

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Date

Director, Analyze, Forecast and Support Office

## National Drought Products

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## **1 Introduction**

This instructional directive describes the narrative and graphical climate monitoring drought products issued by the National Weather Service's (NWS) Climate Prediction Center (CPC) and by the U.S. Drought Monitor author team (which includes CPC). World Meteorological Organization (WMO) headings and Advanced Weather Interactive Processing System (AWIPS) identifiers are listed, where relevant, for NWS dissemination systems. All products are available or linked through CPC's website (<http://www.cpc.ncep.noaa.gov>). For information concerning WFO Drought Information Statements, see NWSI 10-1201 (<https://www.nws.noaa.gov/directives/sym/pd01012001curr.pdf>).

## **2 Palmer Drought Severity Index**

Internet issuance only. There is no WMO heading or AWIPS ID.

### **2.1 Mission Connection**

The Palmer Drought Severity Index is prepared by CPC. This is produced for long-term planning by agricultural and water supply managers.

### **2.2 Issuance Guidelines**

#### **2.2.1 Creation Software**

CPC uses ArcGIS software.

#### **2.2.2 Issuance Criteria**

This is a scheduled product.

#### **2.2.3 Issuance Time**

CPC issues this product each Monday at around 1:30 p.m. Eastern local time.

#### **2.2.4 Valid Time**

This product is valid for one week after issuance.

#### **2.2.5 Product Expiration Time**

This product expires one week after issuance.

### **2.3 Technical Description**

CPC will follow the format and content described in this section.

#### **2.3.1 Content**

This index depicts prolonged (several months or longer) abnormal dryness or wetness. This index responds slowly and changes little from week to week. It reflects long-term moisture runoff, recharge and deep percolation, and evapotranspiration. This index is not generally indicative of short-term drought (instead, use the Crop Moisture Index; see NWSI 10-1002 (<https://www.nws.noaa.gov/directives/sym/pd01010002curr.pdf>)).

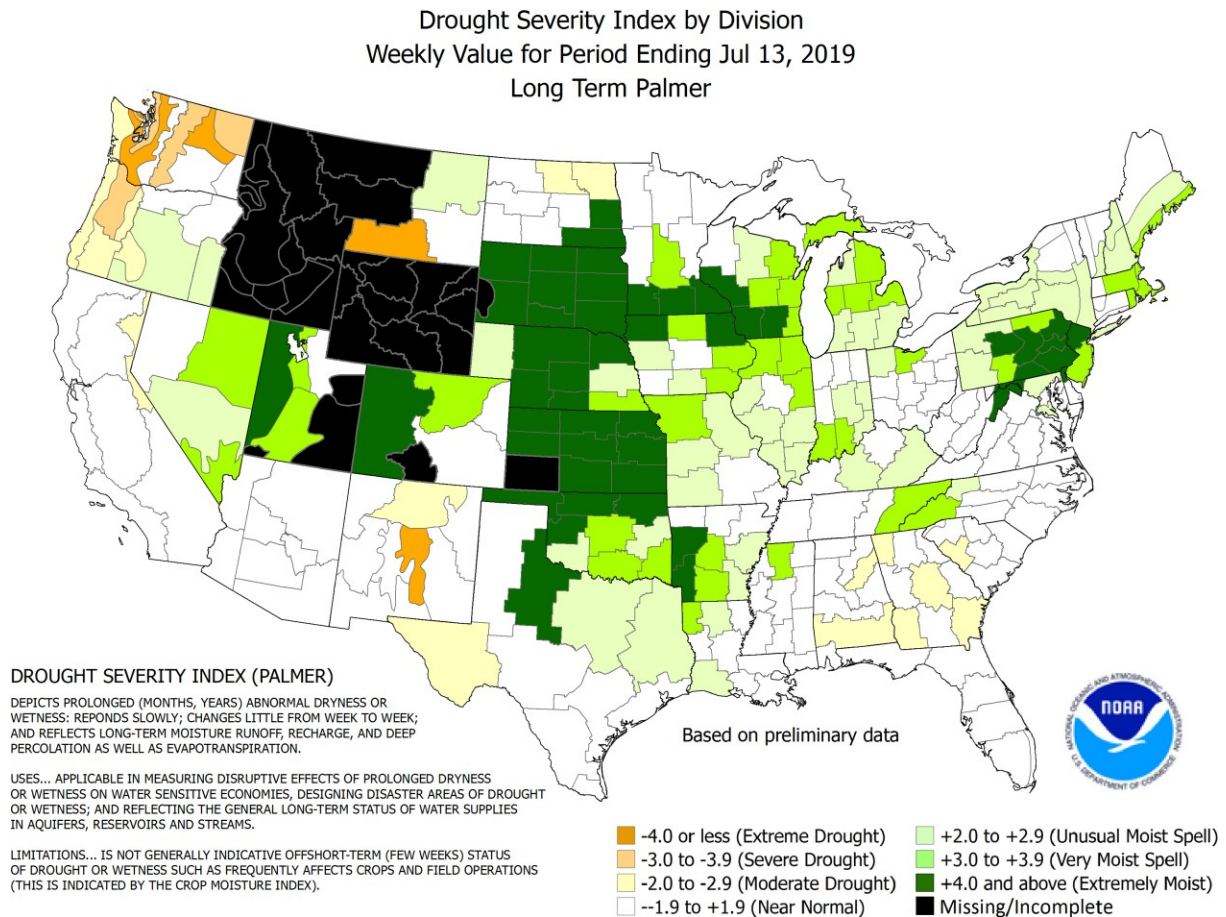
#### **2.3.2 Format**

CPC assigns numerical index values for each National Centers for Environmental Information

(NCEI) (<https://www.ncei.noaa.gov>) climate division within the contiguous U.S. (Figure 1). Black areas of the map indicate missing data.

## 2.4 Updates, Amendments and Corrections

CPC does not issue updates or amendments. Corrections will be issued as needed.



**Figure 1.** Sample product for Palmer Drought Severity Index.

## 3 U.S. Drought Monitor

WMO Heading = PYIA88 KWNC

The AWIPS ID = RBGDRO has been discontinued.

### 3.1 Mission Connection

This product is primarily intended for agricultural and water supply interests. A team of drought experts (“U.S. Drought Monitor authors”) from NOAA’s CPC and NCEI, USDA’s World Agricultural Outlook Board (WAOB), the University of Nebraska’s National Drought Mitigation Center (NDMC) (<http://drought.unl.edu>), and the Western Regional Climate Center (WRCC) issue this product. Lead responsibility rotates amongst team members.

## **3.2 Issuance Guidelines**

### **3.2.1 Creation Software**

The U.S. Drought Monitor author team uses ArcGIS software.

### **3.2.2 Issuance Criteria**

This is a scheduled product.

### **3.2.3 Issuance Time**

The lead team member issues this product every Thursday at 8:30 a.m. Eastern local time, except if Thursday is a Federal holiday. In the case of a Thursday holiday, this product is issued the Wednesday before the Thursday holiday at 8:30 a.m. Eastern local time.

### **3.2.4 Valid Time**

This product is valid as of 1200 Universal Coordinated Time (UTC) on the Tuesday prior to issuance until 1200 UTC the following Tuesday.

### **3.2.5 Product Expiration Time**

This product expires one week after issuance.

## **3.3 Technical Description**

The U.S. Drought Monitor author team will follow the format and content described in this section.

### **3.3.1 Content**

This product summarizes drought extent and intensity for U.S. and U.S.-affiliated territories.

### **3.3.2 Format**

The U.S. Drought Monitor classifies drought intensity and type for the contiguous U.S., Alaska, Hawaii, Puerto Rico (Figure 2), U.S. Virgin Islands and the U.S.-affiliated Pacific Islands (Figure 3).

The U.S. Drought Monitor follows a classification system analogous to the schemes for hurricanes and tornadoes. The classification system combines key indicators of drought (i.e., precipitation, soil moisture, drought indices) as well as local impact reports and expertise to produce the final drought intensity rating. Precipitation datasets include those managed through NOAA's Office of Water Prediction (OWP), including 24-hour total observed rainfall (<https://water.weather.gov/precip/>). Drought intensity categories range from D0 to D4 and are defined by the frequency with which similar or drier conditions can be expected for the given location and season. U.S. Drought Monitor authors approximate thresholds for the D0, D1, D2, D3, and D4 classifications by the 30<sup>th</sup> percentile, 20<sup>th</sup> percentile, 10<sup>th</sup> percentile, 5<sup>th</sup> percentile, and 2<sup>nd</sup> percentile occurrence frequencies respectively.

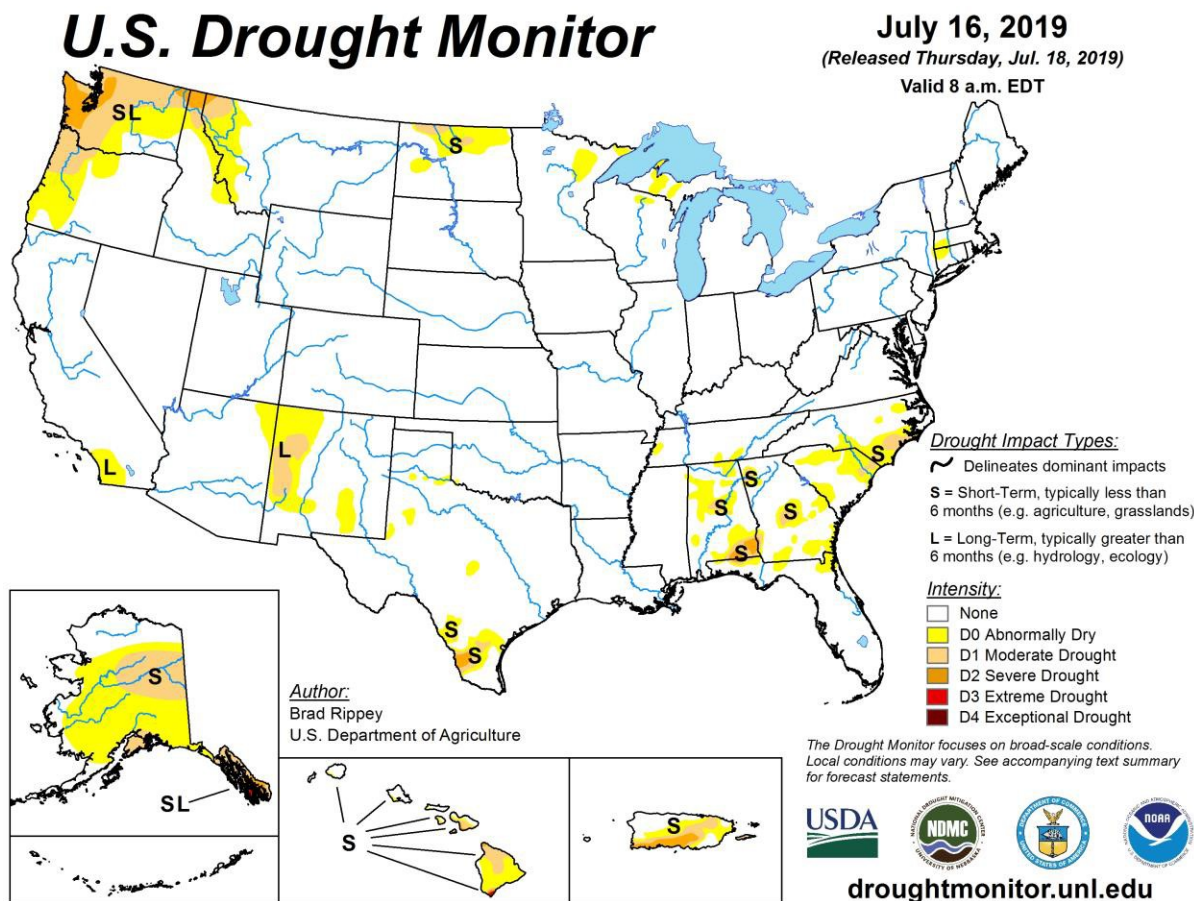
Table 1 provides examples of drought indicators which independently meet the D0 to D4 criteria. Note that the Palmer Drought Severity Index and Standardized Precipitation Index are not

expressed as percentiles. Also note that the values shown in Table 1 represent the national and annual average conditions that suggest classification at the D0 to D4 level but will in practice vary with location and time of year. When the various indicators do not indicate the same drought intensity classification, the lead U.S. Drought Monitor author will decide on the final drought intensity classification for a region based on the majority of the indicators, how the drought indicators represent reported drought impacts, and how well drought indicators perform in various parts of the country and at different times of the year. In the western continental U.S., where winter snowfall has a strong bearing on water supply, U.S. Drought Monitor authors include additional indicators in making their final drought classification decisions.

U.S. Drought Monitor maps indicate whether short-term (S), long-term (L), or both (SL) drought is occurring since the severity and type of drought impacts depend on drought duration.

### 3.4 Updates, Amendments and Corrections

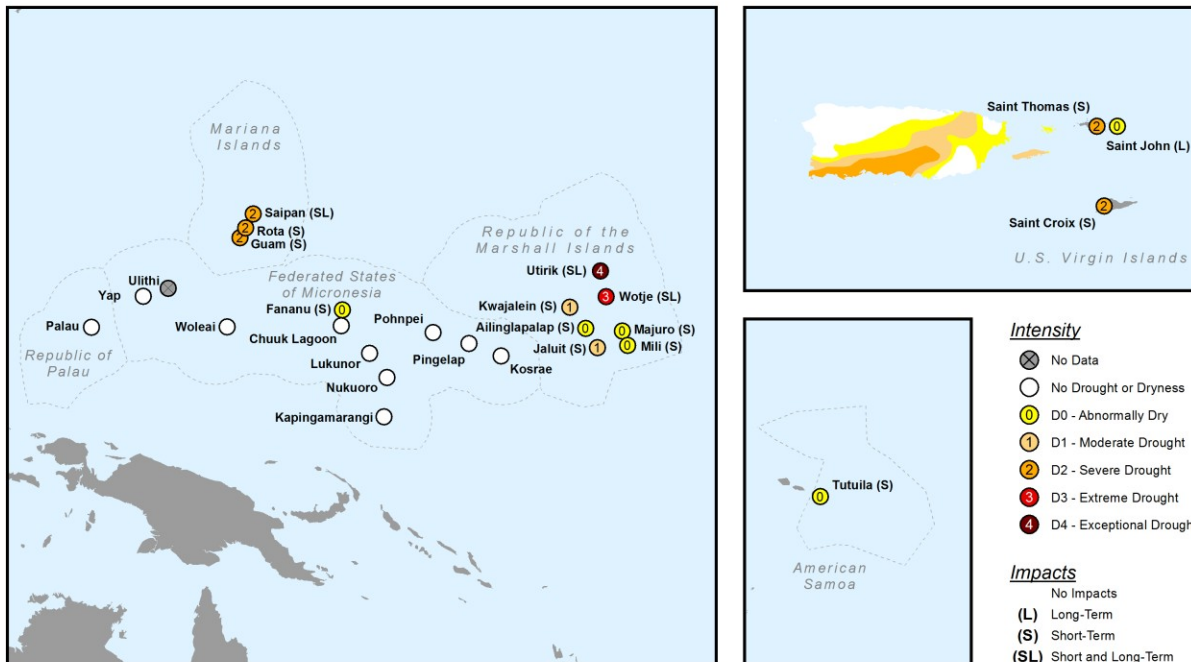
The U.S. Drought Monitor author team does not issue updates or amendments. Corrections will be issued as needed.



**Figure 2.** Sample product for page 1 of the U.S. Drought Monitor, covering the contiguous U.S., Alaska, the Aleutian Islands, Hawaii and Puerto Rico.

*U.S. Drought Monitor*  
**U.S. Affiliated Pacific Islands  
 and U.S. Virgin Islands**

**July 16, 2019**



*U.S. and Puerto Rico Author:*  
 Brad Rippey  
 U.S. Department of Agriculture  
*Pacific Islands and Virgin Islands Author:*  
 Richard Heim  
 NCEI/NOAA

[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

**Figure 3.** Sample product for page 2 of the U.S. Drought Monitor, covering U.S.-affiliated Pacific Islands and the U.S. Virgin Islands.



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**D0 Abnormally Dry**

*Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.*

Palmer Drought Severity Index (PDSI)	-1.0 to -1.9
Standard Precipitation Index (SPI)	-0.5 to -0.7
CPC Soil Moisture Model	21-30 percentile
U.S. Geological Survey (USGS) Weekly Streamflow	21-30 percentile
Objective Short and Long-term Drought Indicator Blends	21-30 percentile

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**D1 Moderate Drought**

*Some damage to crops, pasture; streams, reservoirs, or wells low; some water shortage developing or imminent; voluntary water use restrictions requested.*

PDSI	-2.0 to -2.9
SPI	-0.8 to -1.2
CPC Soil Moisture Model	11-20 percentile
USGS Weekly Streamflow	11-20 percentile
Objective Short and Long-term Drought Indicator Blends	11-20 percentile

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**D2 Severe Drought**

*Crop or pasture losses likely; water shortages common; water restrictions imposed.*

PDSI	-3.0 to -3.9
SPI	-1.3 to -1.5
CPC Soil Moisture Model	6-10 percentile
USGS Weekly Streamflow	6-10 percentile
Objective Short and Long-term Drought Indicator Blends	6-10 percentile

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**D3 Extreme Drought**

*Major crop/pasture losses; widespread water shortages or restrictions.*

PDSI	-4.0 to -4.9
SPI	-1.6 to -1.9
CPC Soil Moisture Model	3-5 percentile
USGS Weekly Streamflow	3-5 percentile
Objective Short and Long-term Drought Indicator Blends	3-5 percentile

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**D4 Exceptional Drought**

*Exceptional and widespread crop/pasture losses; shortage of water in reservoirs, streams and wells creating water emergencies.*

PDSI	-5.0 or less
SPI	-2.0 or less
CPC Soil Moisture Model	0-2 percentile
USGS Weekly Streamflow	0-2 percentile
Objective Short and Long-term Drought Indicator Blends	0-2 percentile

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**Table 1.** Examples of key drought indicators and impacts that could designate a region as belonging to a particular intensity classification by the U.S. Drought Monitor. PDSI is further described in Section 2.

## **4 National Drought Summary**

WMO heading – FXUS25 KWNC

The AWIPS ID = PMDDRO has been discontinued.

### **4.1 Mission Connection**

Similar to the U.S. Drought Monitor (Section 3), the National Drought Summary is primarily intended for agricultural and water supply interests. A team of drought experts (“U.S. Drought Monitor authors”) issue this product. Lead responsibility rotates amongst team members.

### **4.2 Issuance Guidelines**

#### **4.2.1 Creation Software**

The U.S. Drought Monitor author team uses text editing software.

#### **4.2.2 Issuance Criteria**

This is a scheduled product.

#### **4.2.3 Issuance Time**

This product is issued concurrently with the U.S. Drought Monitor (see Section 3). The lead team member issues this product every Thursday at 8:30 a.m. Eastern local time except if Thursday is a Federal holiday. In case of a Thursday holiday, the lead team member will issue the product the Wednesday before the Thursday holiday at 8:30 a.m. Eastern local time.

#### **4.2.4 Valid Time**

This product is valid as of 1200 UTC on the Tuesday prior to issuance until 1200 UTC the following Tuesday.

#### **4.2.5 Product Expiration Time**

This product expires one week after issuance.

### **4.3 Technical Description**

#### **4.3.1 Content**

This product is a text summary that accompanies the U.S. Drought Monitor. The team summarizes the drought intensity and extent, recent climatic and hydrologic conditions, and a summary of weather conditions expected in the ensuing 10 days. This product covers the same regions as the U.S. Drought Monitor: the contiguous U.S., Alaska, the Aleutian Islands, Hawaii, Puerto Rico, the U.S. Virgin Islands and U.S.-affiliated Pacific Islands.

#### **4.3.2 Format**

This product includes: the product title and issuance date, an executive summary describing key conditions and changes since the previous issuance, regional drought summaries (e.g., U.S.-affiliated Pacific Islands), a summary of expected weather conditions and changes in drought conditions, and the lead author’s name and affiliation. The generic format is shown in Figure 4.

**National Drought Summary for <issuance date>****Summary:** <text of executive summary>

&lt;Region name (e.g., Northeast)&gt;: &lt;text of regional summary&gt;

&lt;further regional summaries&gt;

**Looking ahead:** <summary of expected weather and changes in drought conditions>**Author:** <lead author name and affiliation>**Figure 4.** Generic format for the National Drought Summary.**4.4 Updates, Amendments and Corrections**

The U.S. Drought Monitor author team does not issue updates or amendments. Corrections will be issued as needed.

**5 Monthly and Seasonal U.S. Drought Outlooks**

WMO heading – PMNV88 KWNC

The AWIPS ID = RGBDRK has been discontinued.

**5.1 Mission Connection**

CPC issues the monthly and seasonal U.S. Drought Outlooks for planning by agricultural, water supply, and fire weather managers and other stakeholders (e.g., tourism industry).

**5.2 Issuance Guidelines****5.2.1 Creation Software**

CPC uses ArcGIS software.

**5.2.2 Issuance Criteria**

This is a scheduled product.

**5.2.3 Issuance Time**

The monthly U.S. Drought Outlook is issued at 3:00 p.m. Eastern local time on the last day of each calendar month concurrently with the finalized one-month temperature and precipitation outlooks. The initial seasonal U.S. Drought Outlook is issued at 8:30 a.m. Eastern local time on the third Thursday of the month concurrently with the three-month and initial one-month temperature and precipitation outlook products. The updated seasonal U.S. Drought Outlook is issued concurrently with the release of the monthly U. S. Drought Outlook to ensure consistency between the two products.

**5.2.4 Valid Time**

The monthly U.S. Drought Outlook is valid for the next calendar month following the release date (e.g., the October 31st release would be valid for the month of November). The initial

seasonal U.S. Drought Outlook is valid for the remainder of the release month plus the next three calendar months, while the updated seasonal U.S. Drought Outlook is valid for the next three calendar months.

### **5.2.5 Product Expiration Time**

The monthly/seasonal products expire when the next monthly/seasonal outlook is issued.

## **5.3 Technical Description**

### **5.3.1 Content**

CPC depicts large-scale trends based on subjectively derived probabilities and guided by numerous indicators, including short- and long-range statistical and dynamic forecasts. CPC indicates predicted trends of ongoing drought, as depicted in the U.S. Drought Monitor, as well as areas of potential drought development.

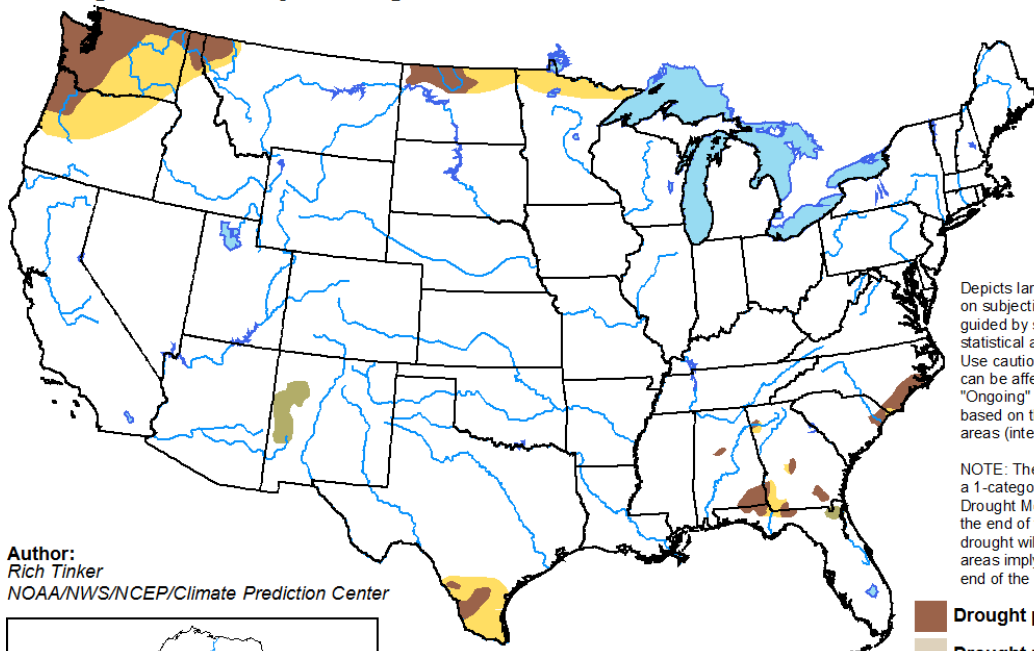
### **5.3.2 Format**

CPC uses four categories to depict expected drought conditions for the contiguous U.S., Alaska, Hawaii, and Puerto Rico for the upcoming month and season. The same color-coding of expected drought areas applies to both the monthly (Figure 5) and seasonal (Figure 6) U.S. Drought Outlooks. White areas of the map indicate that drought conditions are not expected.

# U.S. Monthly Drought Outlook

## Drought Tendency During the Valid Period

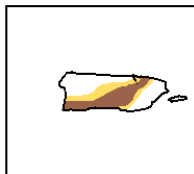
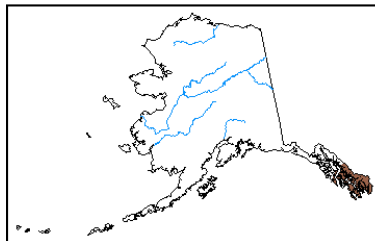
Valid for July 2019  
Released June 30, 2019



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

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

Author:  
Rich Tinker  
NOAA/NWS/NCEP/Climate Prediction Center



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



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

Figure 5. Sample Monthly U.S. Drought Outlook.

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

Valid for July 18 - October 31, 2019  
Released July 18



Figure 6. Sample Seasonal U.S. Drought Outlook.

## 6 Monthly and Seasonal U.S. Drought Outlook Summaries

WMO heading – FXUS22 KWNC  
The AWIPS ID = PMDDRK has been discontinued.

### 6.1 Mission Connection

CPC issues the monthly and seasonal U.S. Drought Outlook Summaries for seasonal planning by agricultural, water supply, and fire weather managers.

### 6.2 Issuance Guidelines

#### 6.2.1 Creation Software

CPC uses text editing software.

#### 6.2.2 Issuance Criteria

This is a scheduled product.

### **6.2.3 Issuance Time**

CPC issues the seasonal U.S. Drought Outlook Summary at 8:30 a.m. Eastern local time on the third Thursday of the month concurrently with the release of the initial seasonal U.S. Drought Outlook. CPC issues the monthly U.S. Drought Outlook Summary at 3:00 p.m. on the last day of each calendar month concurrently with the updated monthly U.S. Drought Outlook.

### **6.2.4 Valid Time**

The monthly U.S. Drought Outlook Summary is valid for the next calendar month following the release date (e.g., the October 31<sup>st</sup> release would be valid until the end of November). The seasonal U.S. Drought Outlook Summary is valid for the remainder of the release month plus the next three calendar months.

### **6.2.5 Product Expiration Time**

The monthly/seasonal U.S. Drought Outlook Summaries expire when the next monthly/seasonal U.S. Drought Outlook Summaries are issued.

## **6.3 Technical Description**

### **6.3.1 Content**

To accompany the graphical U.S. Drought Outlooks (see Section 5), CPC provides a prognostic discussion detailing the atmospheric, hydrologic, and climatic conditions affecting the persistence, worsening, or removal of drought areas.

### **6.3.2 Format**

Figures 7 and 8 provide the generic format for the Monthly and Seasonal U.S. Drought Outlook Summaries. Note that this product contains two parts: an Executive Summary (generic format for the Monthly Executive Summary is shown in Figure 7) as well as a link to a Discussion (generic format for the Monthly Discussion is shown in Figure 8). The generic formats for the seasonal products are the same for the monthly product but for the word “monthly” and the valid time. The Executive Summary provides a 1-2 paragraph summary of expected changes in drought conditions for the valid time. The Discussion will include a more detailed explanation of the monthly/seasonal expected changes in drought conditions by region along with a discussion of the weights given to various forecast tools and an indication of forecast confidence.

**Monthly U.S. Drought Outlook Executive Summary**

*<valid time (e.g., April 2020)>*

**Summary:** *<text of executive summary>*

Author: *<lead author name and affiliation>*

*<next product issuance date>*

*<link to the Monthly U.S. Drought Outlook Discussion>*

**Figure 7.** Generic format for the Executive Summary portion of the Monthly U.S. Drought Outlook Summary.

**Monthly U.S. Drought Outlook Summary**

*<valid time (e.g., April 2020)>*

**Summary:** *<text of executive summary>*

**<Region name (e.g., Northeast)>:** *<text of regional summary>*

*<further regional summaries>*

Author: *<lead author name and affiliation>*

*<next product issuance date>*

**Figure 8.** Generic format for the Discussion portion of the Monthly/Seasonal U.S. Drought Outlook Summary.

#### **6.4 Updates, Amendments and Corrections**

CPC does not issue updates or amendments. Corrections will be made as needed.