

Drought

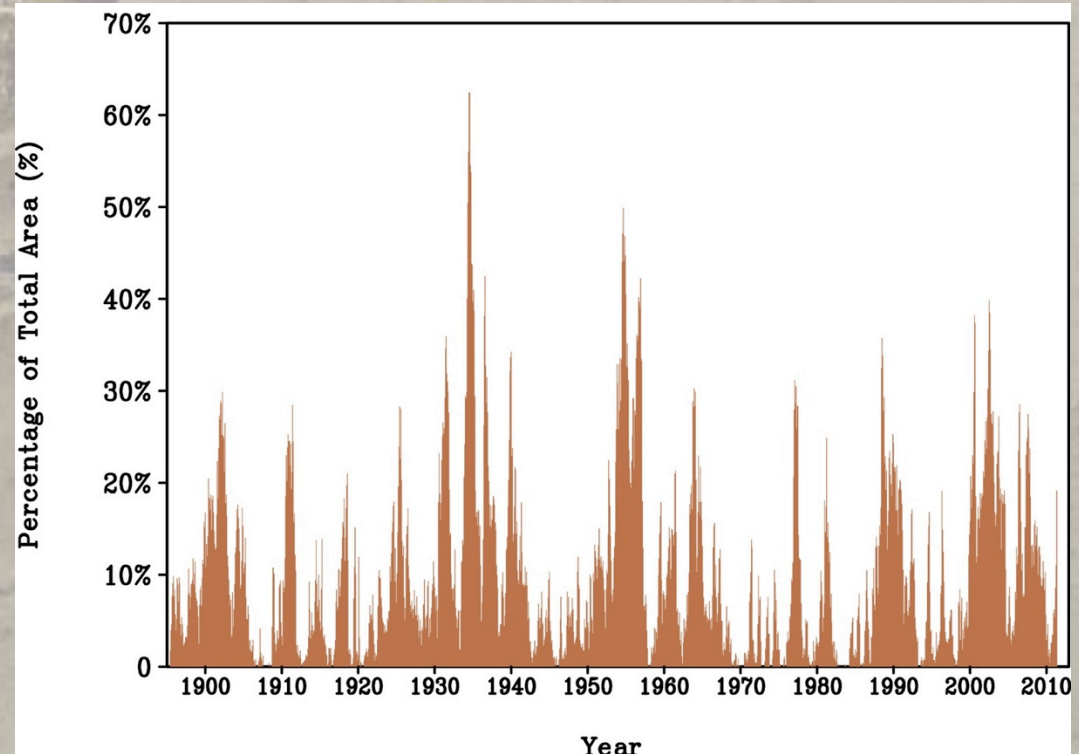
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National Integrated Drought Information System

*Percent Area of the
Contiguous USA in
Severe or Extreme
Drought, January 1895 to
May 2011*



Drought differs from other natural disasters

- **Slow onset, “creeping phenomenon”**, a non-event
- Difficult to determine drought **onset and end**
- Absence of a precise, **universal definition**
- Impacts are **nonstructural and spread over large areas**—makes assessment and response difficult
- Severity and impacts best defined by **multiple indicators**
- **No consistent methodology** for assessing impacts or data base for archiving impacts
- **Impacts are complex**, affect many people, and vary on spatial and temporal timescales, multiple and migrating epicenters
- Mitigation **interventions are less obvious**
- Water shortages **increase conflict**—regulatory, legal authority (interstate & transboundary issues)

National Integrated Drought Information System

Reauthorization Act of 2014 - Amends the National Integrated Drought Information System Act of 2006 to specify that the National Integrated Drought Information System (NIDIS) Program's **purpose shall be to better inform and provide for more timely decision making to reduce drought related impacts and costs.**

Revises NIDIS functions to require the NIDIS, among other things, to: (1) **provide an effective drought early warning system** consisting of certain information, forecasts, and assessments on both national and regional levels; (2) **build upon existing forecasting and assessment programs and partnerships** through designation of one or more cooperative institutes to assist with NIDIS functions; and (3) **continue ongoing research and monitoring activities related to drought and the role of extreme weather events and climate variability in drought.**

One Hundred Thirteenth Congress
of the
United States of America

AT THE SECOND SESSION

*Began and held at the City of Washington on Friday,
the third day of January, two thousand and fourteen*

An Act

To reauthorize the National Integrated Drought Information System.

*Be it enacted by the Senate and House of Representatives of
the United States of America in Congress assembled,*

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Integrated Drought Information System Reauthorization Act of 2014".

SEC. 2. NIDIS PROGRAM AMENDMENTS.

Section 3 of the National Integrated Drought Information System Act of 2006 (15 U.S.C. 313d) is amended—

(1) in subsection (a), by inserting before the period at the end the following: "to better inform and provide for more timely decisionmaking to reduce drought related impacts and costs";

(2) by striking subsection (b) and inserting the following: "(b) SYSTEM FUNCTIONS.—The National Integrated Drought Information System shall—

(1) provide an effective drought early warning system that—

"(A) collects and integrates information on the key indicators of drought and drought impacts in order to make usable, reliable, and timely forecasts of drought, including assessments of the severity of drought conditions and impacts; and

"(B) provides such information, forecasts, and assessments on both national and regional levels;

"(2) communicate drought forecasts, drought conditions, and drought impacts on an ongoing basis to public and private entities engaged in drought planning and preparedness, including—

"(A) decisionmakers at the Federal, regional, State, tribal, and local levels of government;

"(B) the private sector; and

"(C) the public;

"(3) provide timely data, information, and products that reflect local, regional, and State differences in drought conditions;

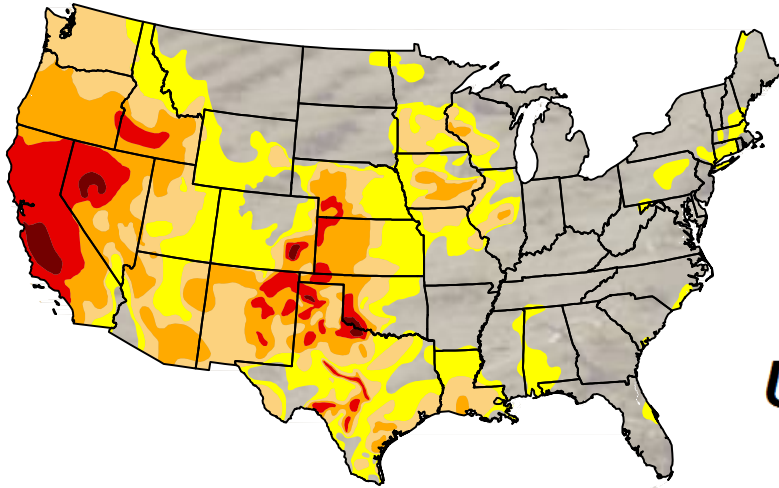
"(4) coordinate, and integrate as practicable, Federal research and monitoring in support of a drought early warning system;

"(5) build upon existing forecasting and assessment programs and partnerships, including through the designation of

2014 Drought Conditions

U.S. Drought Monitor
CONUS

February 4, 2014
(Released Thursday, Feb. 6, 2014)
Valid 7 a.m. EST



Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

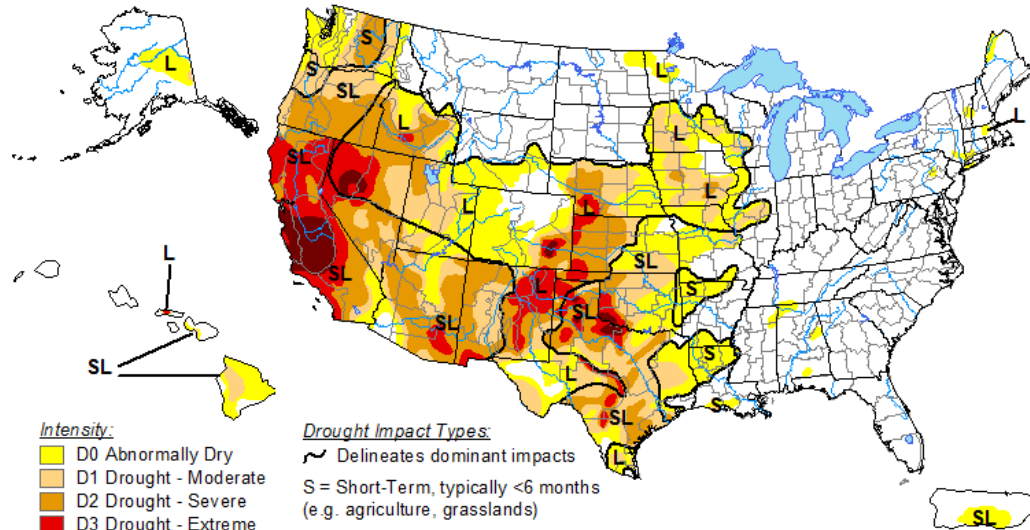
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Anthony Artusa
NOAA/NWS/NCI



U.S. Drought Monitor

March 4, 2014
Valid 7 a.m. EST



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- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

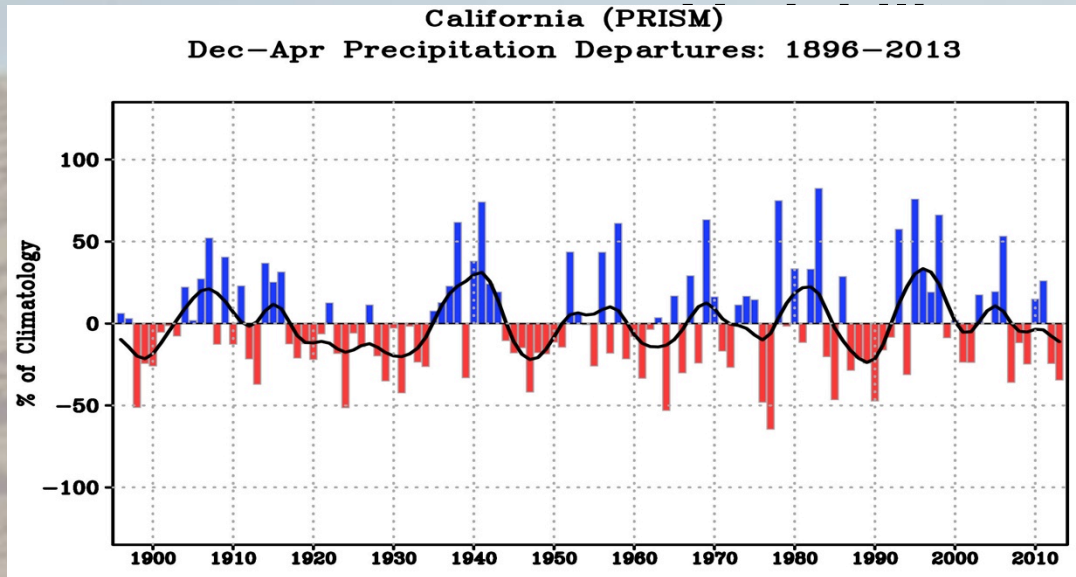
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Released Thursday, March 6, 2014
Author: Brad Rippey, U.S. Department of Agriculture

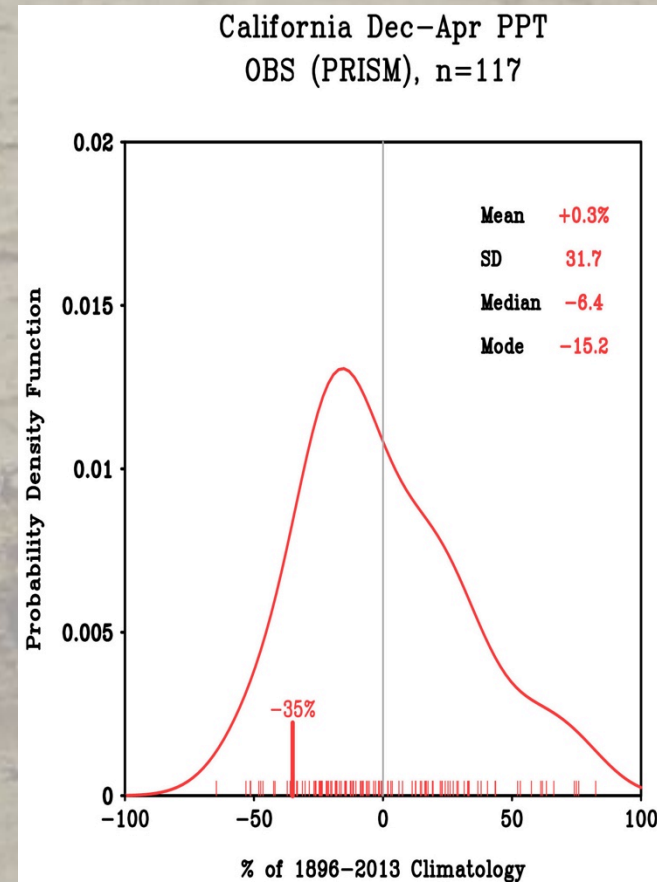
<http://droughtmonitor.unl.edu>

Historical Characteristics of California Rainy Season



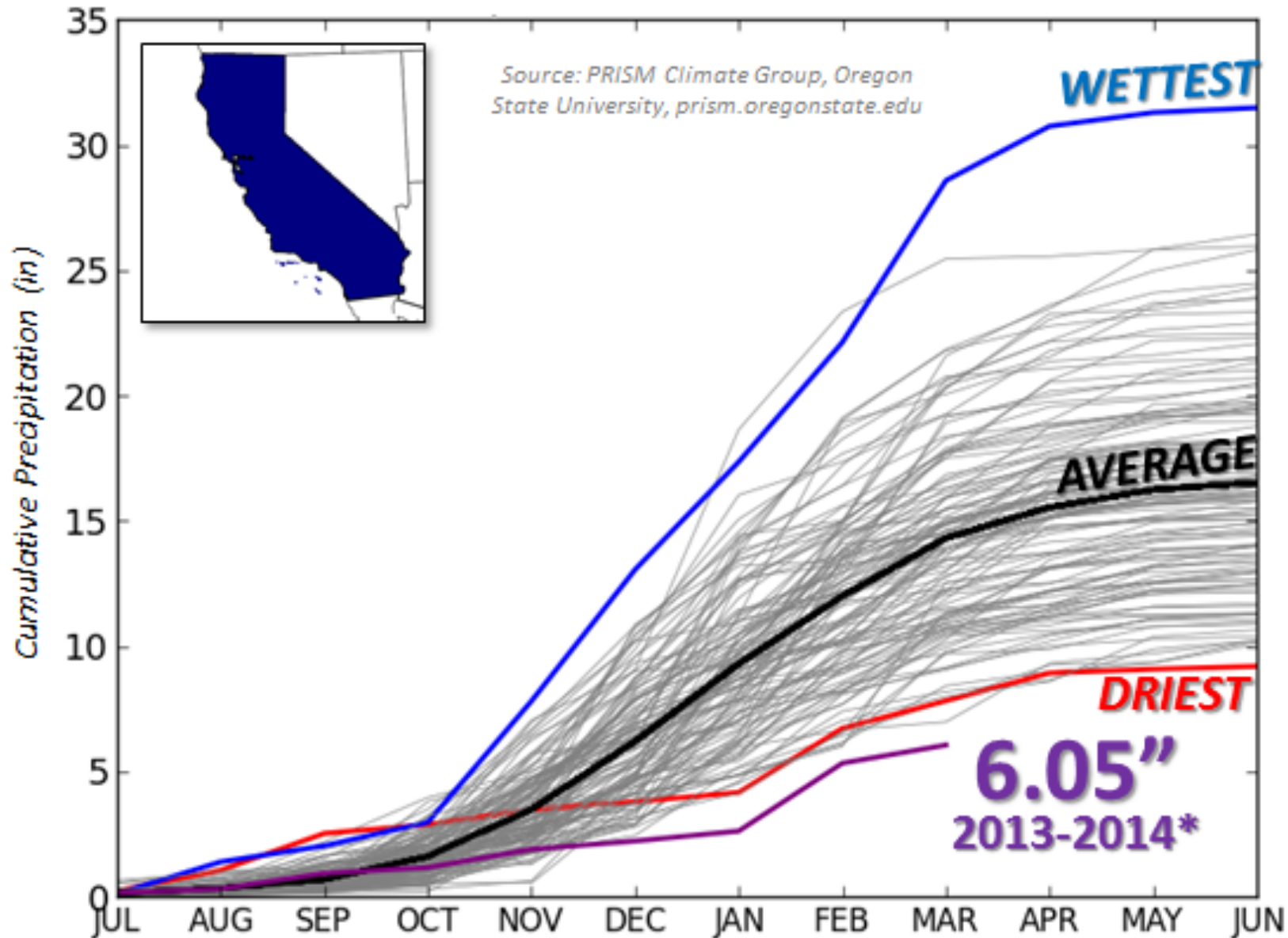
CA Rainy Season is Highly Variable

- The coefficient of year-to-year variability is ~ 30%
- 2012-13 precipitation deficit is ~ 1 standardized departure
- 2012-13 ranked 13th driest since 1896
- Due to skewness, ~60% CA rainy seasons below historical average



Accumulated Rainfall in California

1895-96 through 2013-14



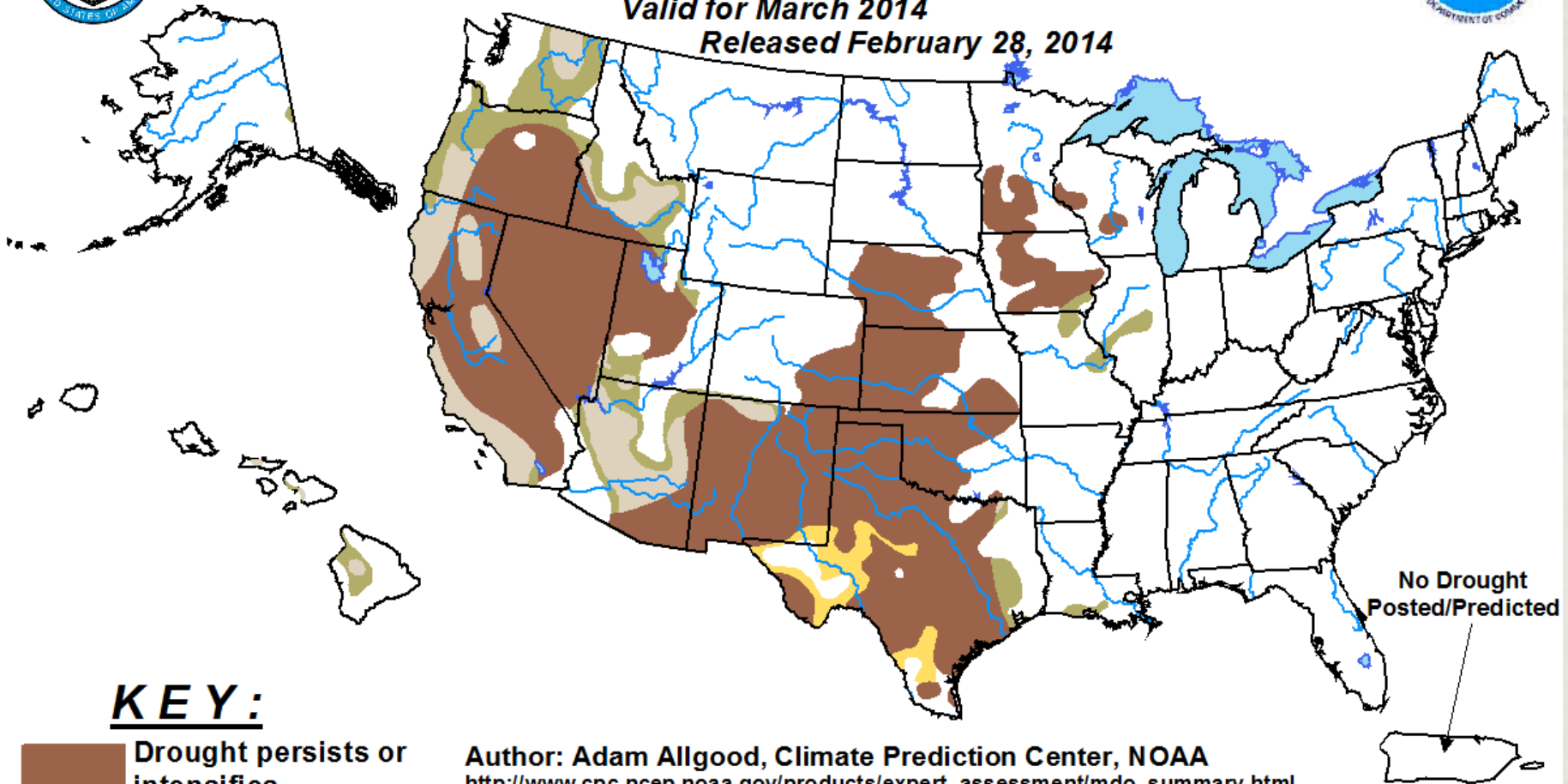


U.S. Monthly Drought Outlook





Drought Tendency During the Valid Period

Valid for March 2014

Released February 28, 2014



KEY:

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

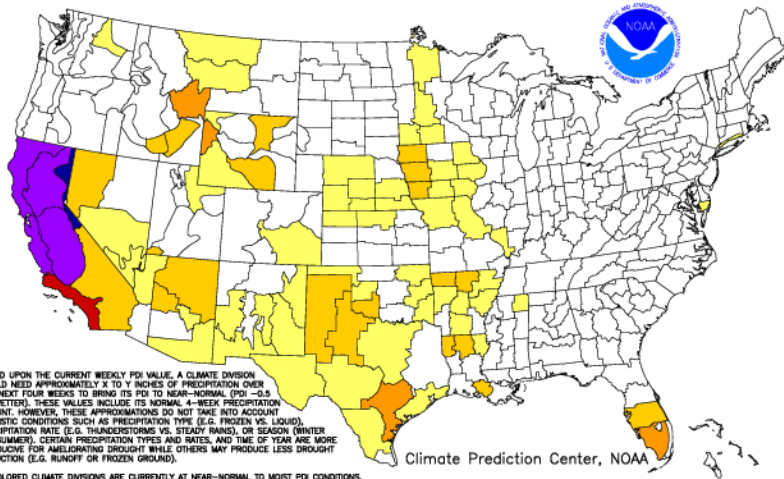
Author: Adam Allgood, Climate Prediction Center, NOAA
http://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.html

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.

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)

Possibility of Drought Recovery

Additional Precip. Needed (In.) to Bring PDI to -0.5
Weekly Value for Period Ending MAR 1, 2014
Long Term Palmer Drought Severity Index (PDI)



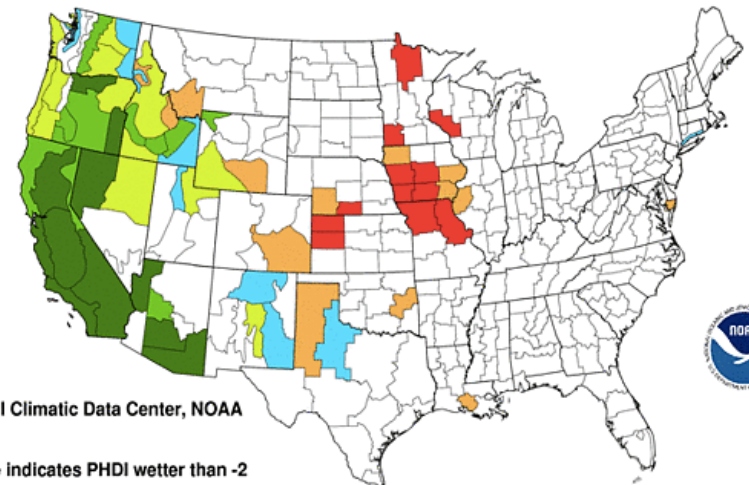
BASED UPON THE CURRENT WEEKLY PDI VALUE, A CLIMATE DIVISION WOULD NEED APPROXIMATELY X TO Y INCHES OF PRECIPITATION OVER THE NEXT FOUR WEEKS TO BRING ITS PDI TO NEAR-NORMAL (PDI -0.5 OR WETTER). THESE VALUES INCLUDE ITS NORMAL 4-WEEK PRECIPITATION AMOUNT. HOWEVER, THESE APPROXIMATIONS DO NOT TAKE INTO ACCOUNT REALISTIC CONDITIONS SUCH AS PRECIPITATION TYPE (E.G. FROZEN VS. LIQUID), PRECIPITATION RATE (E.G. THUNDERSTORMS VS. STEADY RAINS), OR SEASON (WINTER VS. SUMMER). CERTAIN PRECIPITATION TYPES AND RATES, AND TIME OF YEAR ARE MORE CONDUCTIVE FOR AMELIORATING DROUGHT WHILE OTHERS MAY PRODUCE LESS DROUGHT REDUCTION (E.G. RUNOFF OR FROZEN GROUND).

UNCOLORLED CLIMATE DIVISIONS ARE CURRENTLY AT NEAR-NORMAL TO MOIST PDI CONDITIONS. (EXAMPLE - IF 4-WEEK NORMAL PRECIPITATION IS 3 INCHES AND PDI DEFICIT TO BRING TO -0.5 IS 4 INCHES, THE VALUE IS 7)

- | | |
|---------------------|-------------------|
| □ Zero Inches | ■ 9 to 12 Inches |
| ■ Trace to 3 Inches | ■ 12 to 15 Inches |
| ■ 3 to 6 Inches | ■ Over 15 Inches |
| ■ 6 to 9 Inches | |

Percent of Normal Precipitation Required to End Current
Drought Conditions in Four Months

January 2014



White indicates PHDI wetter than -2

- | | | | | | | |
|-------------|---------------|----------------|----------------|----------------|----------------|----------------|
| ■ below 75% | ■ 75% to 100% | ■ 100% to 125% | ■ 125% to 150% | ■ 150% to 175% | ■ 175% to 200% | ■ 200% to 250% |
|-------------|---------------|----------------|----------------|----------------|----------------|----------------|

Base period 1961 - 90

California Drought Outlook Forum

February 20, 2014

Sacramento, CA

One-day event to address and provide information on critical drought topics: current conditions; the outlook for continuing drought; impacts and responses among different sectors; assistance programs; and resources for early warning information and preparedness.

The Forum brought together government officials, agencies, industries, non-governmental organizations, decision-makers, scientists, tribes, and other stakeholders to discuss drought information needs and ways to improve preparedness.

CA Drought Outlook Forum Takeaway Points - 1

- 1) Depending on the timeframe of analysis, the statewide amount of precipitation during the current California drought is either at a record low or near-record low in the 117 year observational record.
- 2) There is a low probability of recovery from the drought conditions across California in the next few months, although a precipitation event forecasted for the end of February may help ameliorate drought severity in some regions.
- 3) The projected cost of the current California drought is expected to end up being at least than five-times greater than the similar magnitude drought spanning 1976-77.
- 4) NIDIS regional drought activities in California are prototyping targeted science products and services that are being used for early warning, the assessment of impacts, and to inform preparedness.

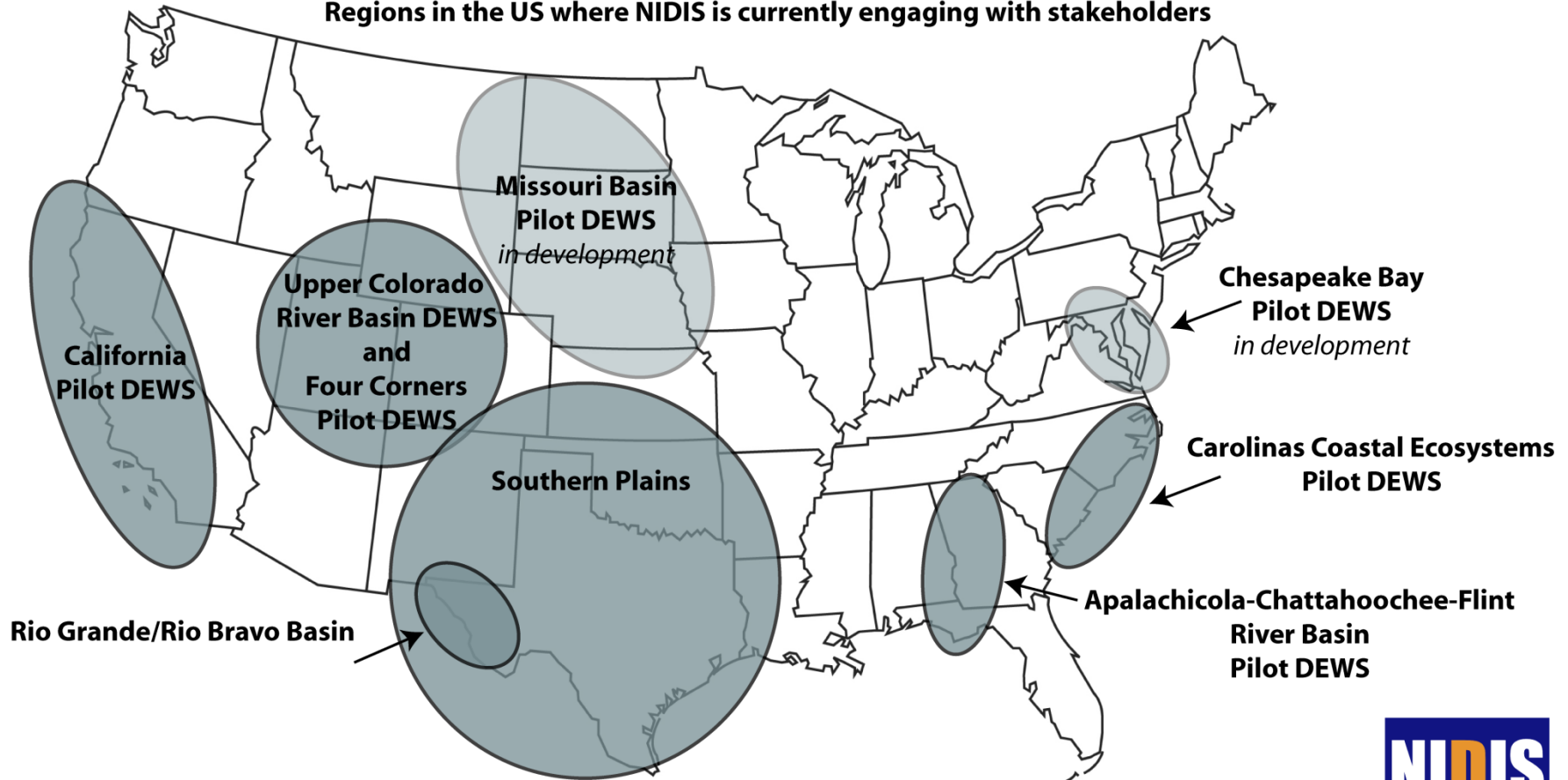
CA Drought Outlook Forum Takeaway Points - 2

- 5) An extensive portfolio of federal, California-state and NGO programs is now in place to provide individuals and communities with resources for drought assistance, preparedness, and recovery
- 6) California has a diversity of regional and sectoral drought impacts that require continued regional engagement by NIDIS and California partners to advance the use of drought information products and services to provide early warning and inform preparedness.
- 7) The ongoing extreme drought conditions in California provide an opportunity for NIDIS and California partners to engage policy, planning and decision makers across the state to identify information needs and to work to develop region and sectoral specific early warning systems and drought management plans which will help communities prepare and respond to the drought.

NIDIS Regional Experiments

- Engaging Stakeholders and Users
- Identifying Information and Research Requirements
- Exploring Approaches and Fostering Good Practices
- Capacity Building
- Transitioning Prototypes into Sustained Services

Regions in the US where NIDIS is currently engaging with stakeholders



National Drought Forum

“To understand the extent of 2012 drought impacts and response in 2012, and help provide new information and coordination for improving the nations’ drought readiness for 2013 and in the future”

- Increase public awareness of current drought and potential impacts for next year
- Technical assistance
- Ensure sustained support for monitoring - stream gages and other data
- Outreach with impacted communities
- Conservation plans

December 12-13, 2012

Washington, DC

DRAFT

National Drought Forum

Summary Report and Priority Actions

2012

Drought and U.S. Preparedness
in 2013 and Beyond