Developing a regional drought outlook product using seasonal forecast information

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Drought Monitoring in the United States
USDM Fact Sheet

- Started in 1999
- Weekly maps released every Thursday
- Based on conditions as of Tuesday morning
- 11 rotating authors
- “Convergence of Evidence” approach – objective blend with impacts

USDM process uses...

- precipitation
- evaporative demand
- soil moisture
- snowpack
- streamflows
- temperature
- vegetation conditions
- impacts
The **U.S. Drought Monitor** is used to activate **state and local** level drought response plans and in triggering **federal** aid programs.
Drought Early Warning
Find a Drought Early Warning System (DEWS)

A Drought Early Warning System (DEWS) utilizes new and existing networks of federal, tribal, state, local and academic partners to make climate and drought science accessible and useful for decision makers; and to improve the capacity of stakeholders to monitor, forecast, plan for, and cope with the impacts of drought.

Drought and its impacts vary from region to region. The development and implementation of regional DEWS allows for responsiveness to particular geographic and hydrologic circumstances, as well as value-added information needs specific to stakeholders in the respective areas.
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Intermountain West DEWS
Temperature Anomalies

Departure from Normal Temperature (°F)
7/27/2018 - 8/2/2018

Evaporative Demand Drought Index

NOAA’s Evaporative Demand Drought Index (EDDI) is currently an experimental product. Contact Mike Hobbs for more information. Maps are updated weekly.

Reference Evapotranspiration

Temperature maps are updated daily and are provided by the High Plains Regional Climate Center.
Recommendations

UCRB: Some degradations are recommended in western CO, eastern UT, and central UT (see map). Areas recommended for a 1-category deterioration are showing December-May (6-month) SPIs below -1.5, month-to-date precipitation less than 25% of average, and no precipitation in the last week. Accumulated reference ET in western CO (see Olath CoAgMET station) is currently at a record high for this growing season. 7-day and 28-day averaged streamflows in all areas recommended for degradation are below the 10th percentile (with several gages reporting record low flows).

Eastern CO: Some degradations along the Arkansas valley are recommended (see map). Similar justification to the UCRB recommendations, the boundaries follow low 6-month SPIs and low % of average month-to-date precipitation. This area shows more variable streamflows and evaporative losses. But the reported impacts from producers in the area (early and below average harvest, crop losses, dry ponds, prevent planting, livestock liquidation) support deteriorations.

In far southeast CO - eastern Prowers and eastern Baca counties - some minor trimming of D3 is recommended (see green shapes on change map). Heavy precipitation last week, extending west from Kansas, brought over 2 inches of precipitation to these areas. Year-to-date precipitation is now close to normal along the CO-KS border. While some westward trimming of D3 is recommended, Lamar in Prowers County and Campo in Baca County should stay in D3 (and no changes should be made in eastern Kiowa County). We defer to the U.S. Drought Monitor author on how to depict conditions at the eastern borders of Prowers and Kiowa and if improvements to the D2 need to be made to align with Kansas improvements.
Increased regional monitoring has led to improvements in drought early warning…

now the prediction component of “early warning” needs to be addressed.
Seasonal Prediction
Current Tools for Drought and Water Seasonal Prediction
Current Tools for Drought and Water Seasonal Prediction
Current Tools for Drought and Water Seasonal Prediction

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

Valid for July 19 - October 31, 2018
Released July 19, 2018

Author: David Mobius/Yan Fan
NOAA/NWS/NCEP/Climate Prediction Center

Droughts 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. "Degrading" drought areas are based on the U.S. Drought Monitor area averages of 11h 64th.

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 (DO or none).

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

http://go.usa.gov/3eZ73
Current Tools for Drought and Water Seasonal Prediction
Current Tools for Drought and Water Seasonal Prediction
Current Tools for Drought and Water Seasonal Prediction
Creating a region specific seasonal climate forecast tool

July 2018 NMME Forecast for Colorado Climate Division 2
Conversation with a rancher…

“This map shows me that the precipitation could be above average, but I DON’T KNOW WHAT AVERAGE IS!!”

How do we communicate climate outlooks in a way that is meaningful to the people who will use the information?
We need products that…

- Show the probable range of outlooks
- Communicate uncertainty
- Give historical context that people understand
- Orient people to identify what’s normal and what’s extreme
- Provide the information in a way that people can use it to better understand and/or make a decision
CORTEZ Precipitation Accumulation Projections

- **WY2015 Projection:** 93% of Average
- **Average Projection:** 52% of Average
- **WY2018 as of 4/16:** 1.90"
  1981-2010 Average: 6.63"
  Currently 29% of Average
- **WY2000 Projection:** 33% of Average

**COLORADO CLIMATE CENTER**
What’s coming next?

adding probabilistic range of values

http://hydro.rap.ucar.edu/s2s/
Thank you

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