What is a Drought Early Warning System?

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Seaside, CA

The National Integrated Drought Information System (NIDIS)

Goals:

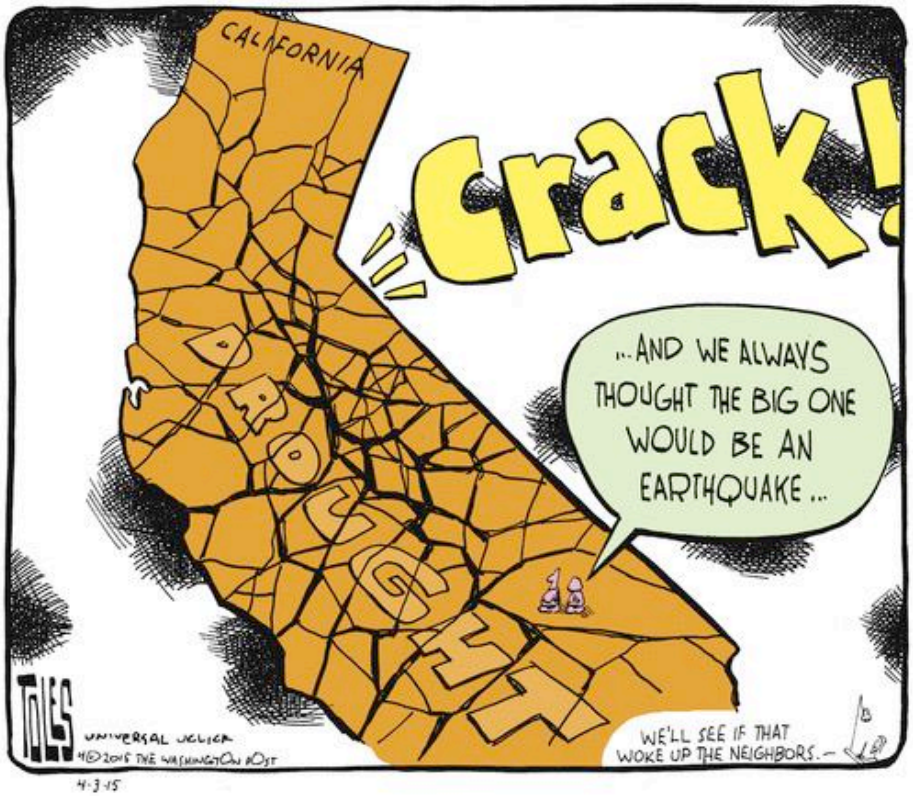
- Provide a better understanding of how and why droughts affect society, the economy and the environment.
- Improve accessibility, dissemination and use of early warning information for drought risk management.

How?

Build off of a network of Regional Drought Early Warning Systems (DEWS) to create a National Drought Early Warning System.

What *really* is Drought Early Warning?

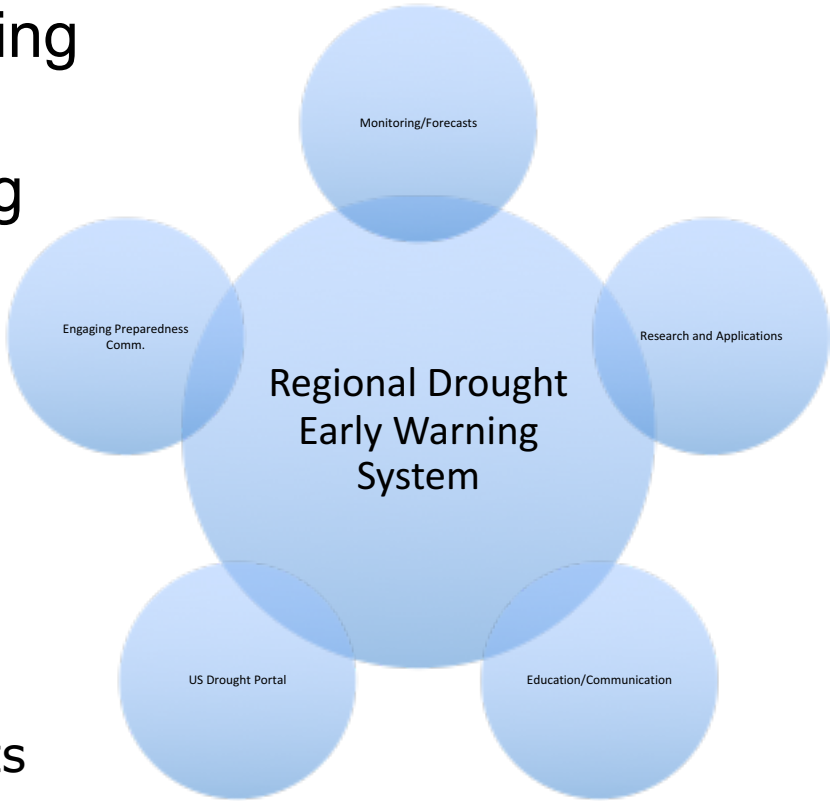
Provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response[1]



[1]International Strategy for Disaster Reduction

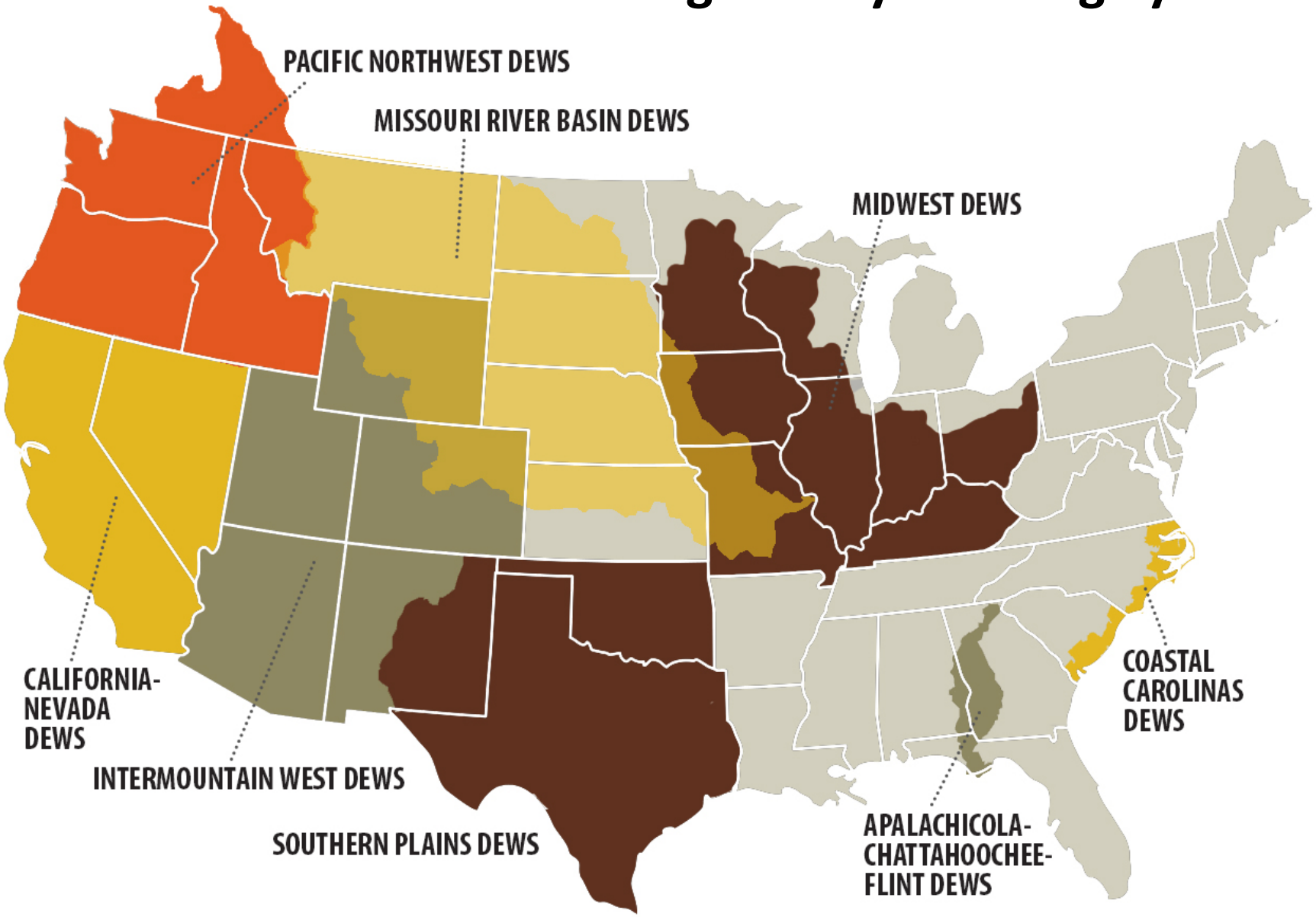
Regional Drought Early Warning Systems (DEWS)

Working with communities and existing networks to build capacity for better decision making for drought planning and mitigation.

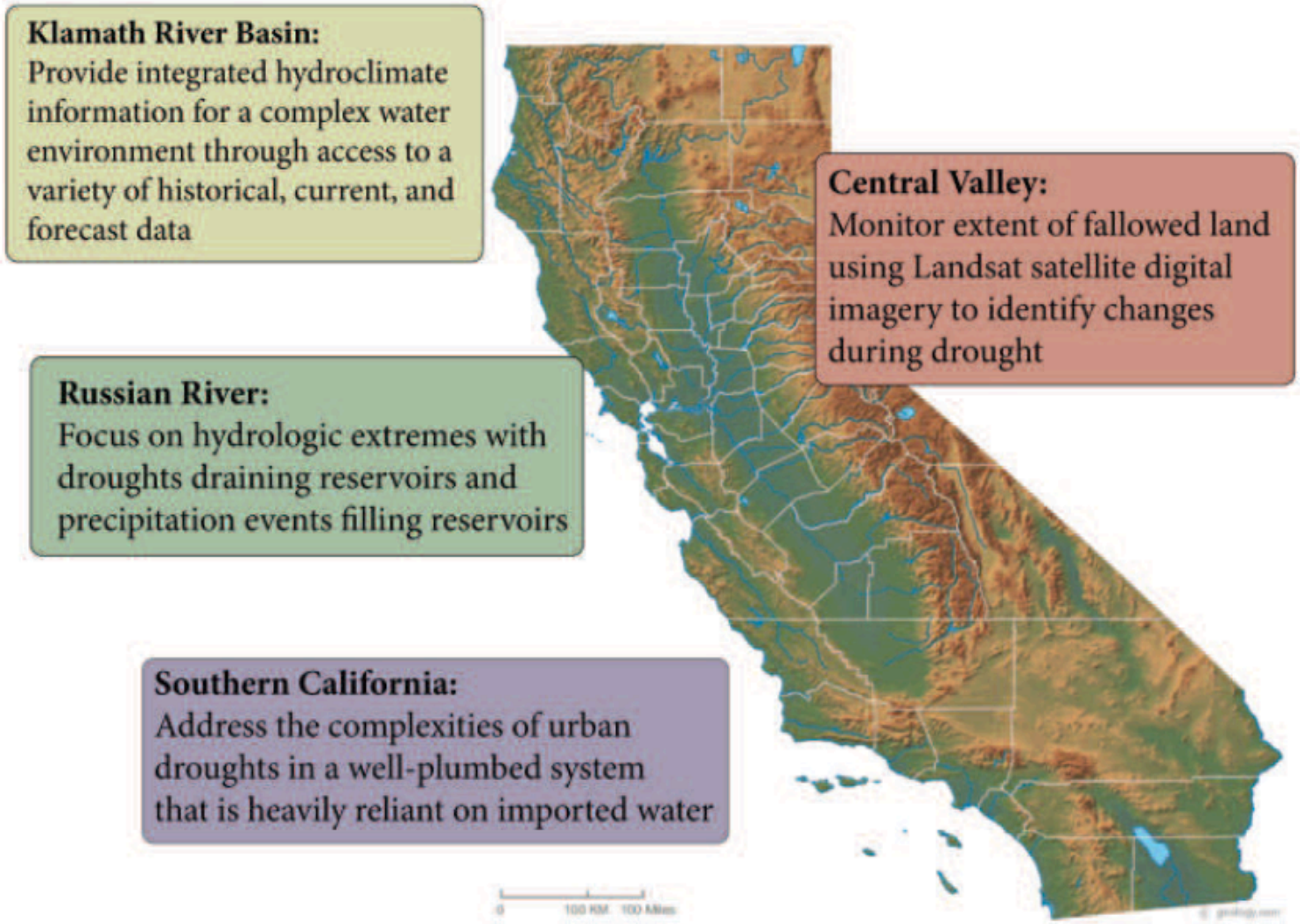


- ❑Drought assessments
- ❑Climate outlook forums
- ❑Education and outreach webinars – risk management
- ❑Engaging the preparedness community
- ❑Builds capacity to utilize existing products

NIDIS Drought Early Warning Systems

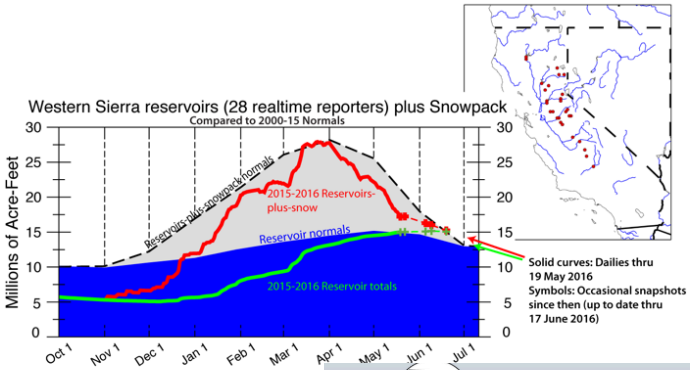


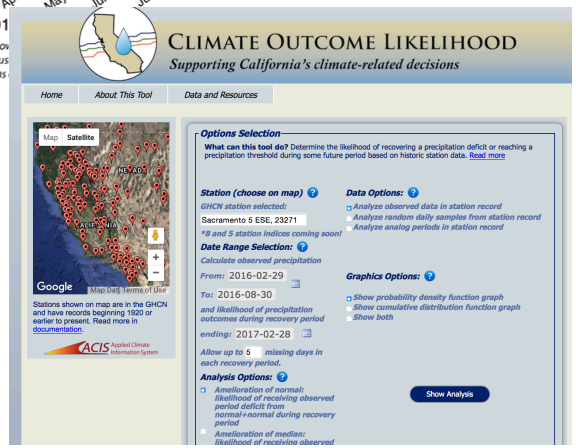
The original California DEWS

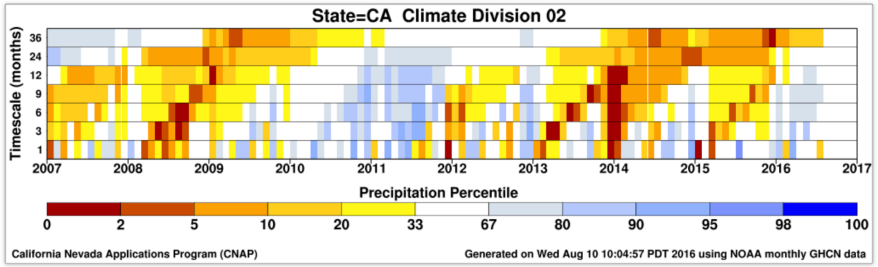


Continue Development of Drought Early Warning in CA

- Climate Outcome Likelihood Tool
- Evaluating and understanding seasonal forecast skill using the National Multi-Model Ensemble (NMME)
- Development of a historical catalogue of atmospheric rivers
- Investigation of the impacts of drought combined with higher temperatures on wildfires through analyzing wildfire occurrence, number, size, severity, and pollutant emissions.
- Evaluation of water supplies in California, including water stored in state's snowpack, reservoirs, and to the extent possible, groundwater storage
- Evaluation of historical atmospheric circulation patterns related to major precipitation events and lack thereof to aid forecasts of drought and drought busting
- Working with local agency planners and water utilities to develop 21st century drought scenarios using downscaled climate model projections focused on California
- Near real time ground water pumping in the Central Valley with USGS

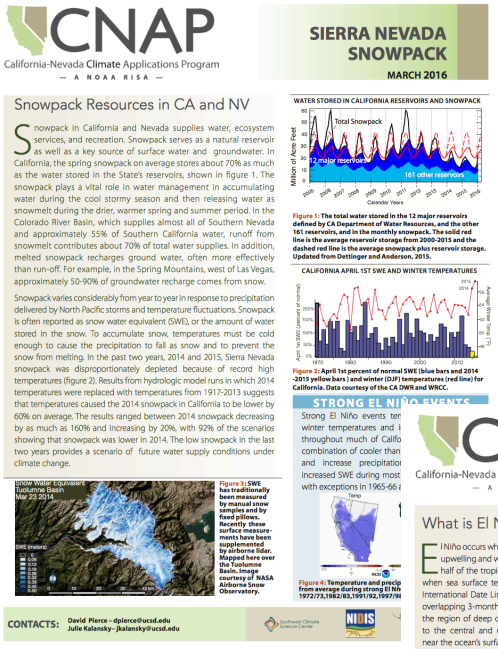


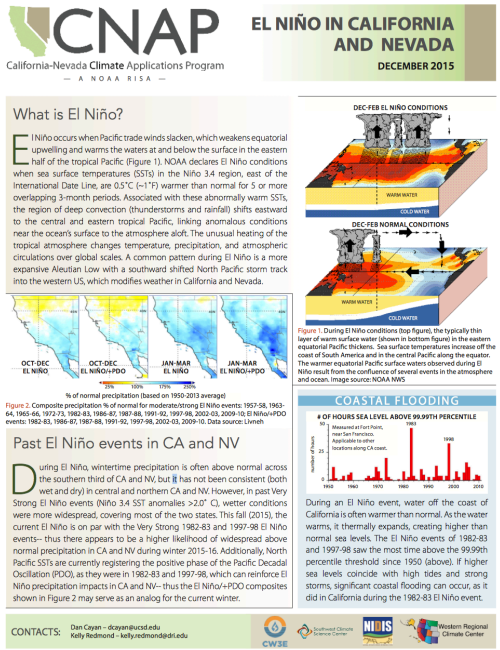




Continue Development of Drought Early Warning in CA

- Stakeholder and decision maker engagement through meetings, webinars, interviews, invited presentations, and other outreach activities at the state and regional scale.
- Timely two page informational handouts
- Southern California NIDIS Community Meeting, July 2015
- Winter Status Update Meeting (San Diego) and Webinar, January 2016

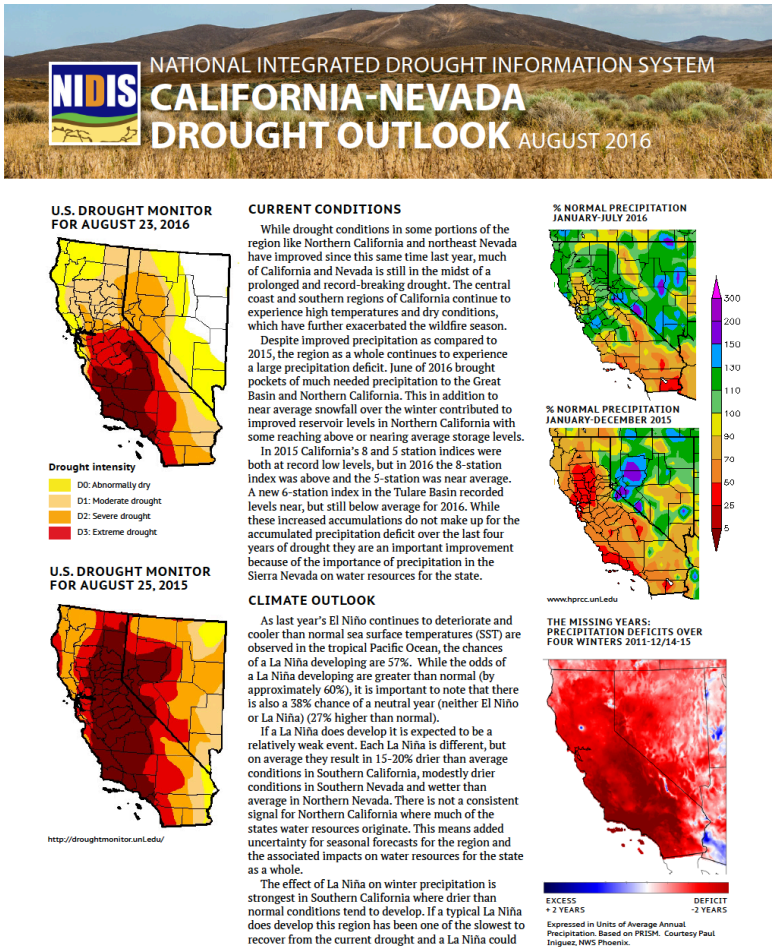




2016-2017 Activities

- Drought and Climate Outlook Webinar Series (Aug., Nov., Jan., March)
  - **Next webinar Nov 28th at 11am PT!**
- Several In-person Drought and Climate Outlooks and Information Gathering Meetings
  - Southern California – Sept 15th, Riverside
  - **North Central Coast – Oct 11th, Seaside**
  - Central Valley – Oct 13th, Fresno

- More information: https://drought.gov/drought/dews/california-nevada



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

CALIFORNIA-NEVADA DROUGHT OUTLOOK AUGUST 2016

U.S. DROUGHT MONITOR FOR AUGUST 23, 2016

Drought intensity

D0: Abnormally dry

D1: Moderate drought

D2: Severe drought

D3: Extreme drought

U.S. DROUGHT MONITOR FOR AUGUST 25, 2015

http://droughtmonitor.unl.edu/

CURRENT CONDITIONS

While drought conditions in some portions of the region like Northern California and northeast Nevada have improved since this same time last year, much of California and Nevada is still in the midst of a prolonged and record-breaking drought. The central coast and southern regions of California continue to experience high temperatures and dry conditions, which have further exacerbated the wildfire season.

Despite improved precipitation as compared to 2015, the region as a whole continues to experience a large precipitation deficit. June of 2016 brought pockets of much needed precipitation to the Great Basin and Northern California. This in addition to near average snowfall over the winter contributed to improved reservoir levels in Northern California with some reaching above or nearing average storage levels.

In 2015 California's 8 and 5 station indices were both at record low levels, but in 2016 the 8-station index was above and the 5-station was near average. A new 6-station index in the Tulare Basin recorded levels near, but still below average for 2016. While these increased accumulations do not make up for the accumulated precipitation deficit over the last four years of drought they are an important improvement because of the importance of precipitation in the Sierra Nevada on water resources for the state.

CLIMATE OUTLOOK

As last year's El Niño continues to deteriorate and cooler than normal sea surface temperatures (SST) are observed in the tropical Pacific Ocean, the chances of a La Niña developing are 57%. While the odds of a La Niña developing are greater than normal (by approximately 60%), it is important to note that there is also a 38% chance of a neutral year (neither El Niño or La Niña) (27% higher than normal).

If a La Niña does develop it is expected to be a relatively weak event. Each La Niña is different, but on average they result in 15-20% drier than average conditions in Southern California, modestly drier conditions in Southern Nevada and wetter than average in Northern Nevada. There is not a consistent signal for Northern California where much of the states water resources originate. This means added uncertainty for seasonal forecasts for the region and the associated impacts on water resources for the state as a whole.

The effect of La Niña on winter precipitation is strongest in Southern California where drier than normal conditions tend to develop. If a typical La Niña does develop this region has been one of the slowest to recover from the current drought and a La Niña could

% NORMAL PRECIPITATION JANUARY-JULY 2016

% NORMAL PRECIPITATION JANUARY-DECEMBER 2015

300 200 150 130 110 100 90 70 60 25 5

www.hprcc.unl.edu

THE MISSING YEARS: PRECIPITATION DEFICITS OVER FOUR WINTERS 2011-12/14-15

EXCESS + 2 YEARS

DEFICIT -2 YEARS

Expressed in Units of Average Annual Precipitation. Based on PRISM. Courtesy Paul Iniguez, NWS Phoenix.

August 24th Webinar Summary

Again….what is a Drought Early Warning System?

A DEWS utilizes new and existing partner networks to optimize the expertise of a wide range of federal, tribal, state, local and academic partners in order to make climate and drought science and impact data readily available, easily understandable and usable for decision makers; and to improve the capacity of stakeholders and economic sectors to better monitor, forecast, plan for and cope with the impacts of drought at all spatial and time scales.

First two years of a DEWS

Year 1

- Scoping the Drought Early Warning System
  - Gap analyses
    - What information exists?
    - How is it used?
  - Identify 2-3 critical issues
  - Characterize and communicate risks across timescales

Year 2

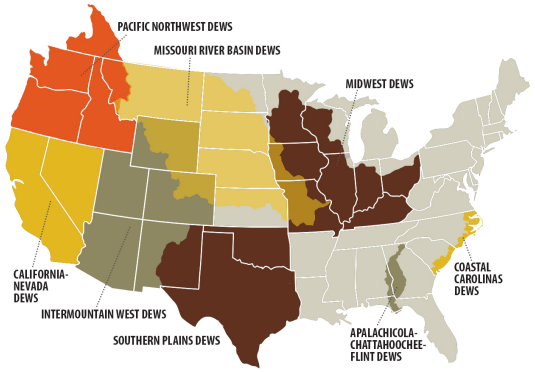
- Implementation of the DEWS
  - Consider seasonal, multi-year, longer term trends
  - Develop drought sub-portals
  - Embed information into preparedness & adaptation plans
  - Establish network for ongoing communication on impacts and projects

Strategic Plan

- Roadmap for moving forward with the CA-NV DEWS
- Identify existing and new drought- related activities throughout the region
- Living document w/ 2-yr time frame
- Focus is on activities in the region

Benefits of a DEWS Strategic Plan

- Fostering a regional network
- Collaboration and coordination
- Reference to help generate policy and governmental support
- Resource to assist with leveraging funds
- Foster sharing of activities and info within and across other DEWS



Questions?

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