Drought Contingency Planning

RCAC Online Training Series
September 2015

WELCOME!

This training is presented by RCAC with funding provided by the California State Water Resources Control Board
Division of Drinking Water (DDW)

Rural Community Assistance Corporation

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Your Moderators Today…

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The Rural Community Assistance Partnership

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RCAC Programs

- Affordable housing
- Community facilities
- Water and wastewater infrastructure financing (Loan Fund)
- Classroom and online training
- On-site technical assistance
- Median Household Income (MHI) surveys

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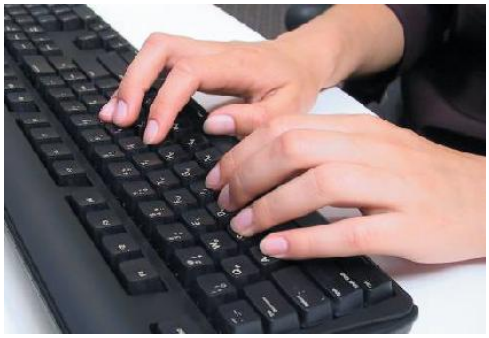
Questions?



Text your questions and comments anytime during the session

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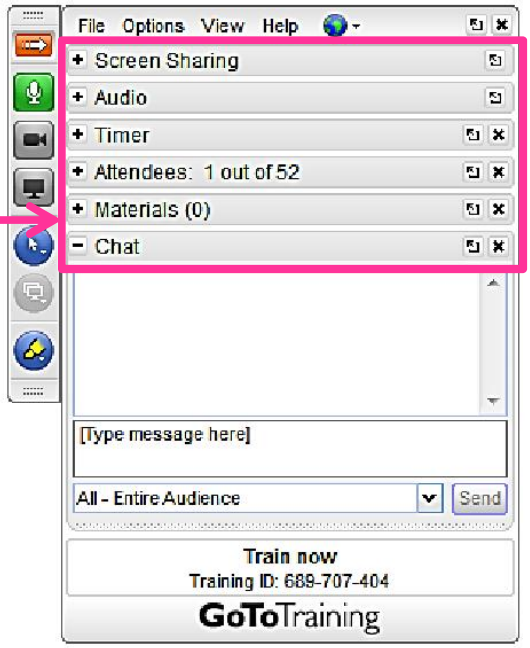
Control Tabs



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Audio Controls

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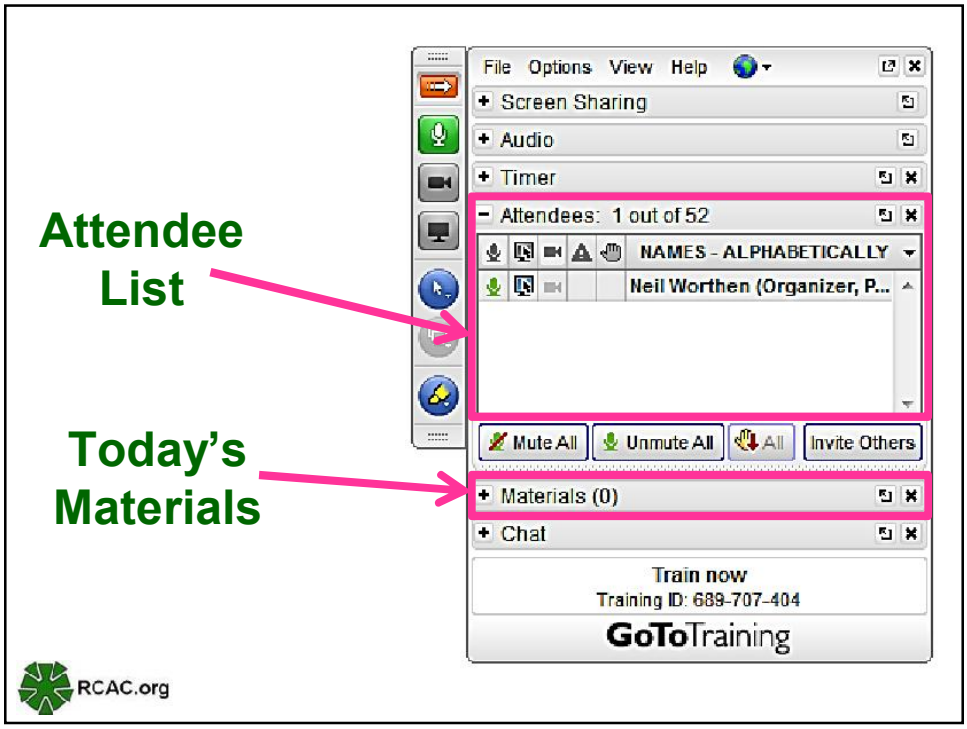

Text Chat…

- In the chat box, type one of your learning objectives for today

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Performance Assessment Rating Tool (PART)

- 4 to 6 weeks from today
- Email w/ today's workshop in subject line
- 3 questions – 3 minutes maximum
- How did you use the information that was presented today?
- Funders are looking for positive changes
- Help us continue these free workshops!

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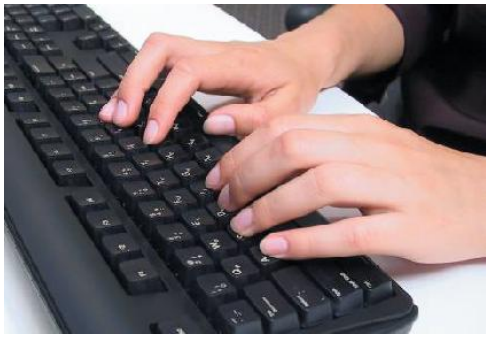
Questions?



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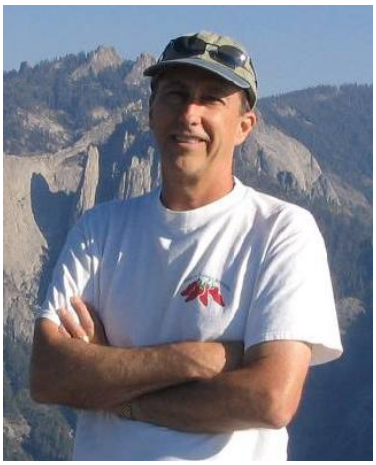
Your Presenter Today…



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Drought Contingency Planning

CALIFORNIA Water Boards

What Exactly Is a "Drought"?

- No unique definition!
- National Drought Policy Commission:
  - *" a persistent and abnormal moisture deficiency having adverse impacts on vegetation, animals, and people".*
- ***Meteorological*** **-** rainfall deficit (supply-demand)
- ***Agricultural*** **-** topsoil moisture deficit; crop impacts
- ***Hydrological*** **-** surface or sub-surface water supply shortage

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Drought Preparedness

- Droughts are long-term
- Droughts occur slowly and recede slowly
- Normal part of the hydrologic cycle
- Impacts are site-specific and sector-specific
- Drought conditions are directly relative to supply and demand

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California's 20th & 21st Century Statewide Droughts

- 1918-20
- 1922-24
- 1929-34
- 1947-50
- 1959-61
- 1976-77
- 1987-92
- 2007-09

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Drought Indices

- Numerous drought indices - all have strengths and shortcomings
  - Percent of normal precipitation
  - Standardized Precipitation Index, or SPI
  - Palmer Drought Severity Index
  - Stream flows
  - Surface and ground water storage

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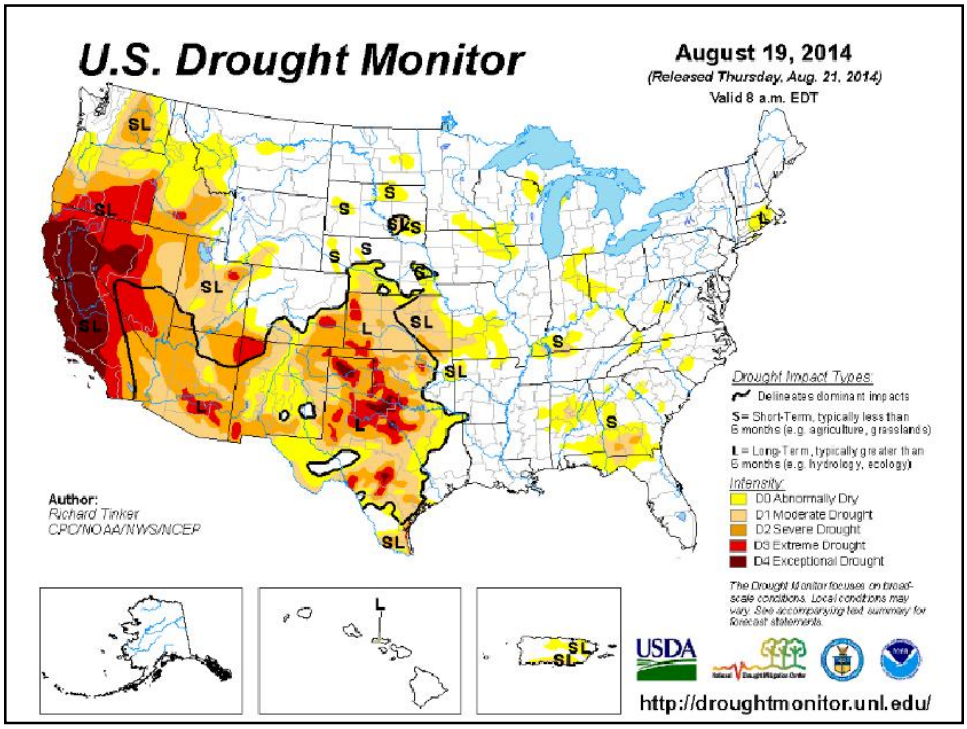
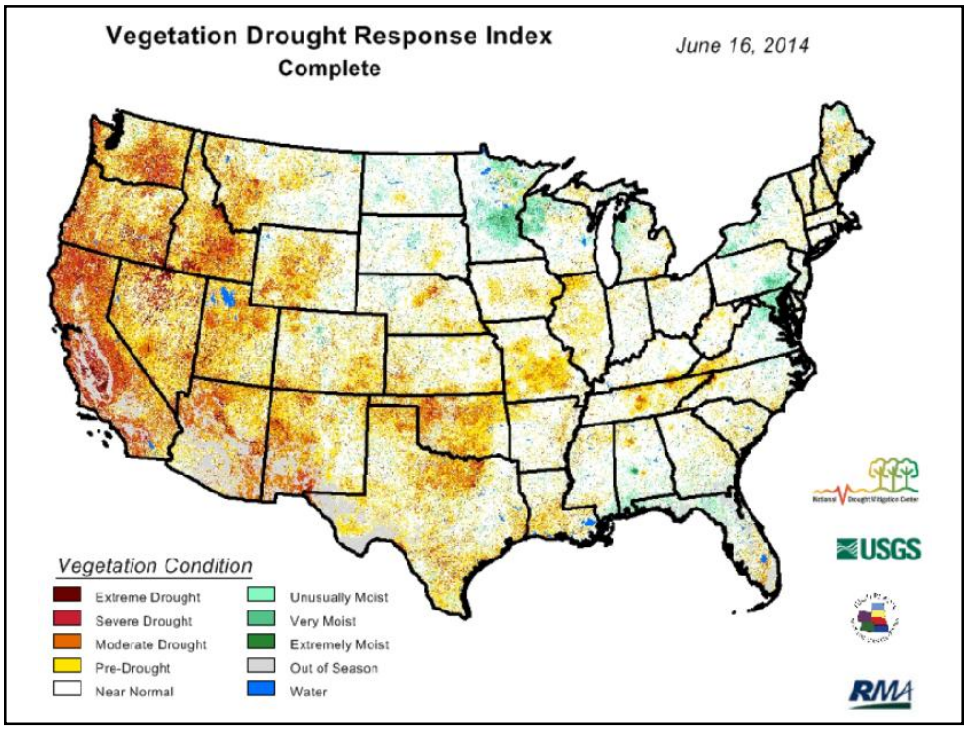
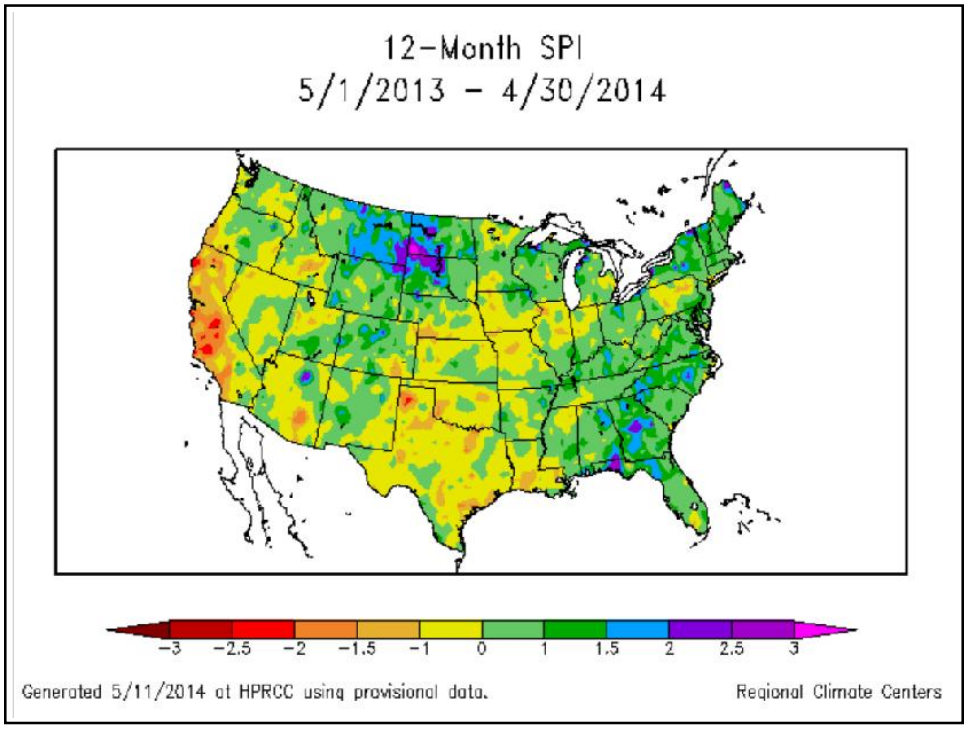
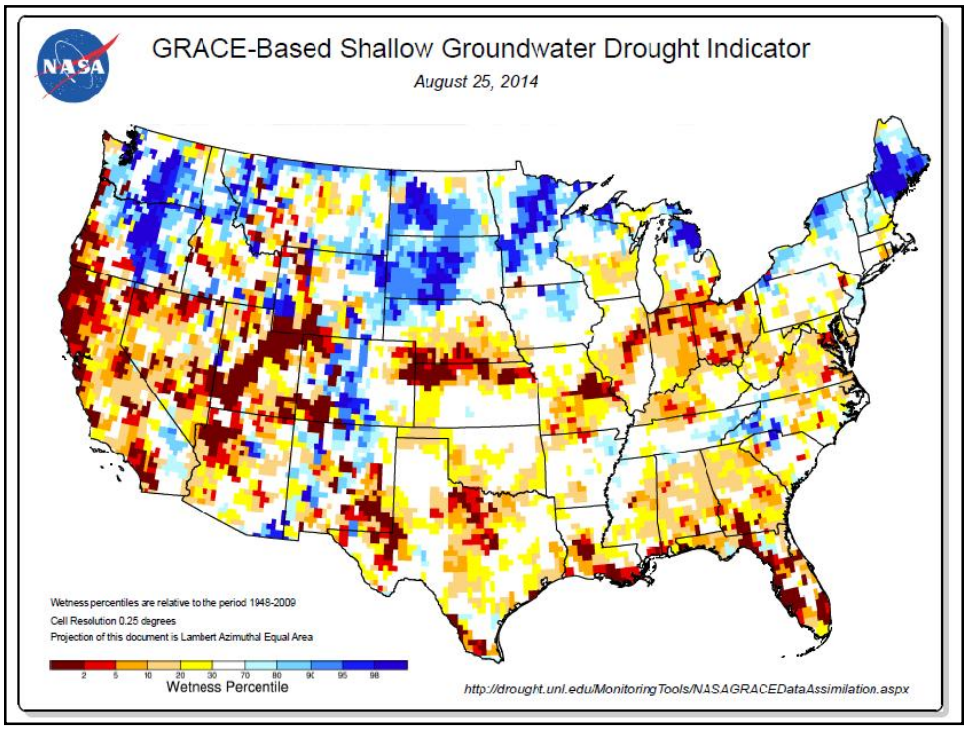
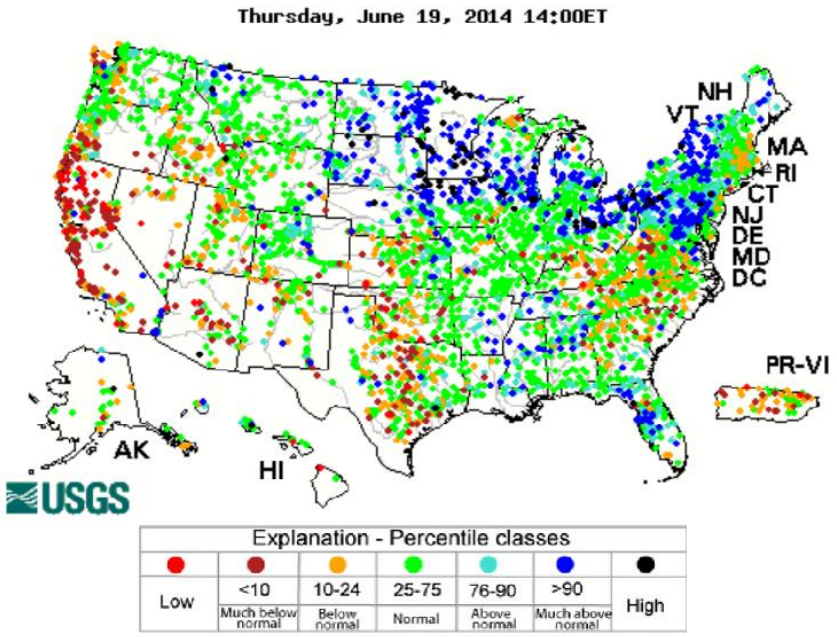

U.S. Drought Monitor
August 19, 2014
(Released Thursday, Aug. 21, 2014)
Valid 8 a.m. EDT
Drought Impact Types:
Delineates dominant impacts
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)
Intensity:
D0 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:
Richard Tinker
CPC/NOAA/NWS/NCEP
USDA
http://droughtmonitor.unl.edu/


Vegetation Drought Response Index
Complete
June 16, 2014
Vegetation Condition
Extreme Drought
Severe Drought
Moderate Drought
Pre-Drought
Near Normal
Unusually Moist
Very Moist
Extremely Moist
Out of Season
Water
USGS
RMA


12-Month SPI
5/1/2013 – 4/30/2014
−3 −2.5 −2 −1.5 −1 0 1 1.5 2 2.5 3
Generated 5/11/2014 at HPRCC using provisional data.
Regional Climate Centers


GRACE-Based Shallow Groundwater Drought Indicator
August 25, 2014
Wetness percentiles are relative to the period 1948-2009
Cell Resolution 0.25 degrees
Projection of this document is Lambert Azimuthal Equal Area
2 5 10 20 30 70 80 90 95 98
Wetness Percentile
http://drought.unl.edu/MonitoringTools/NASAGRACEDataAssimilation.aspx

Daily Streamflow Conditions



Just How Bad Is California's Drought?

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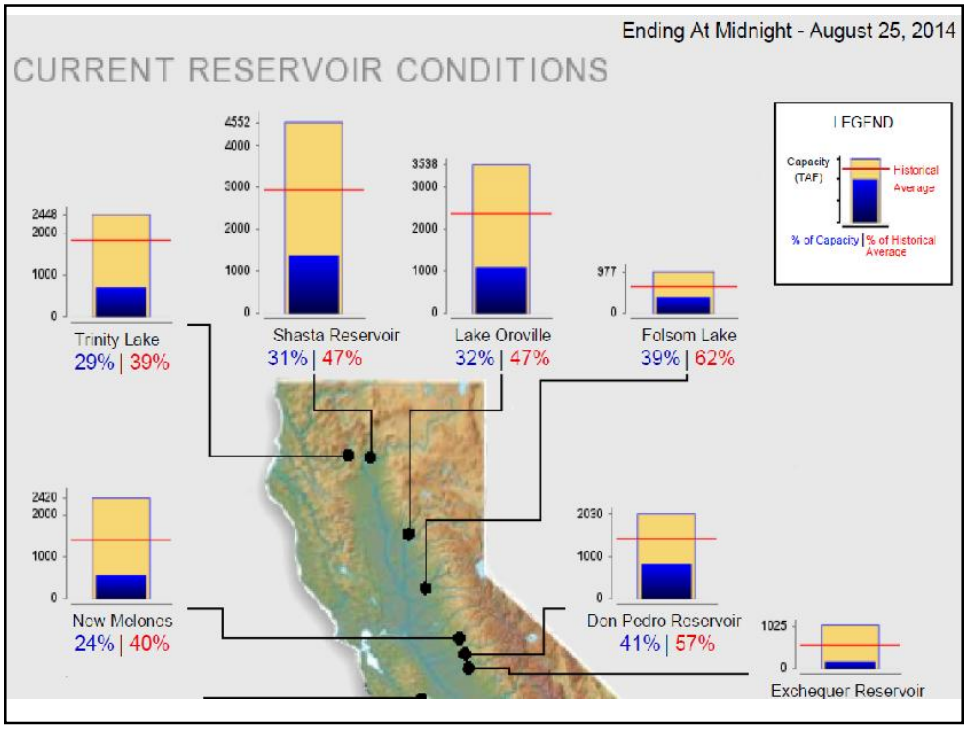
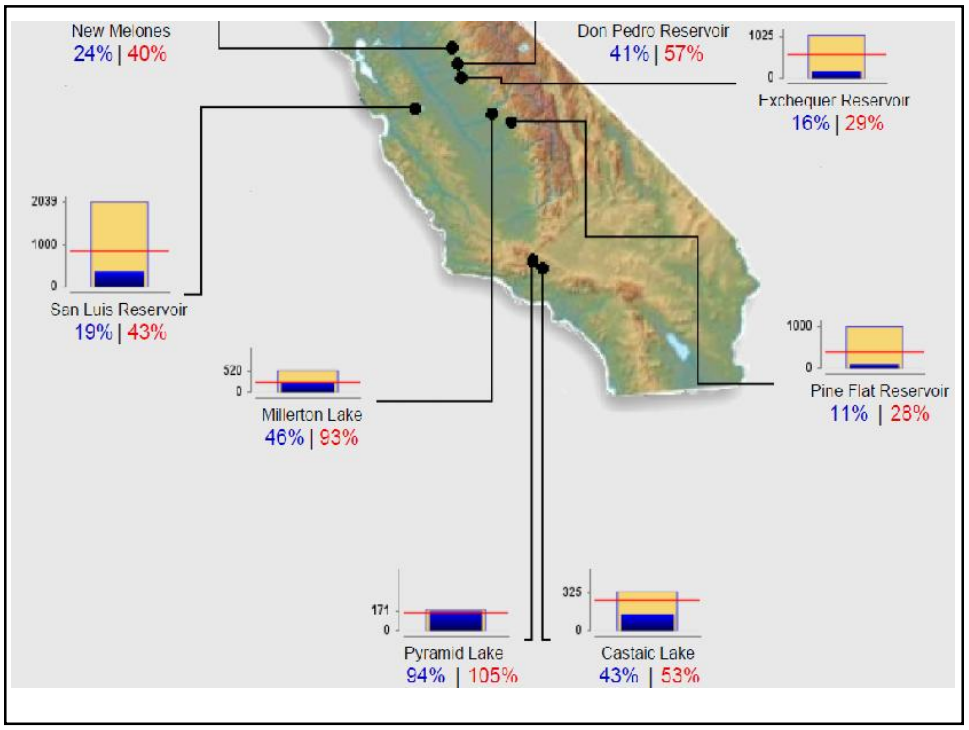
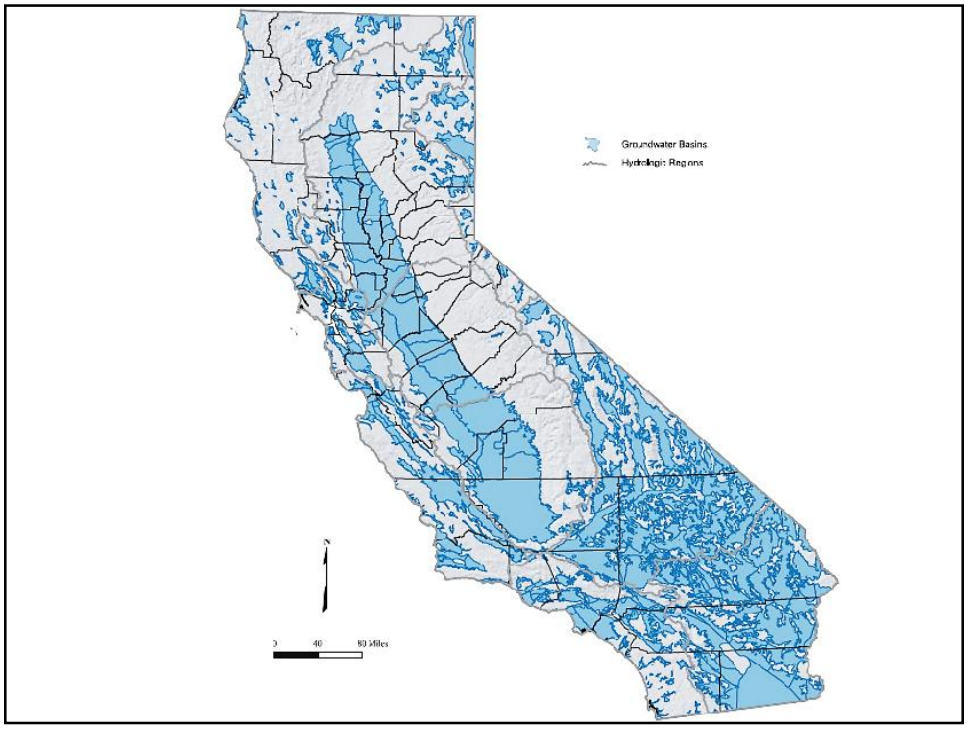
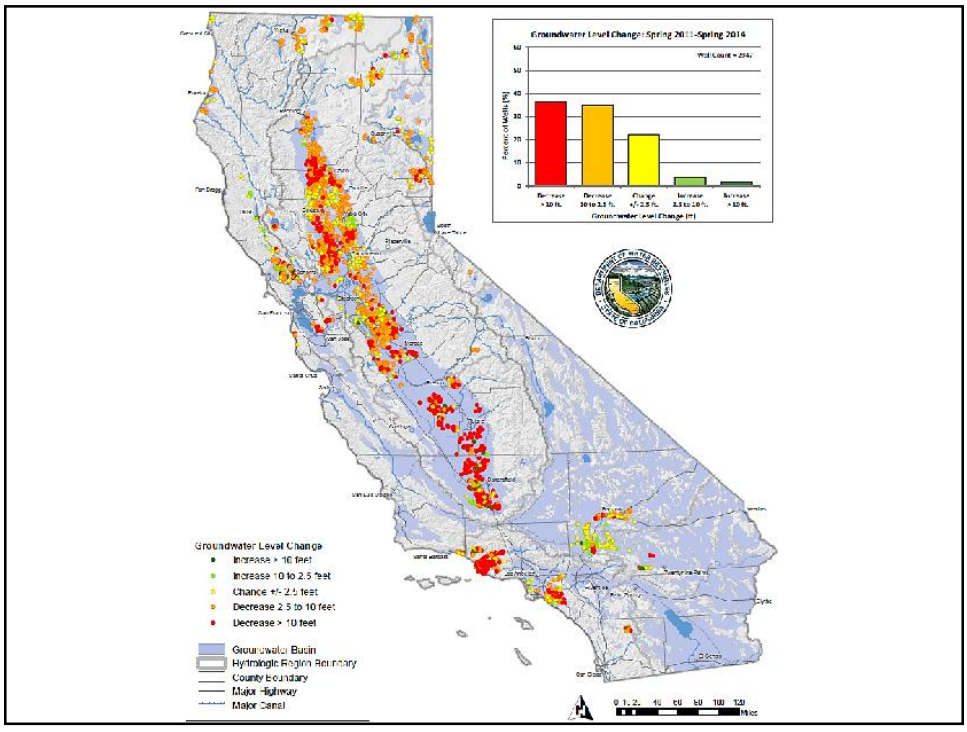

Ending At Midnight - August 25, 2014
CURRENT RESERVOIR CONDITIONS
LEGEND
Capacity (TAF)
Historical Average
% of Capacity | % of Historical Average
Trinity Lake
29% | 39%
Shasta Reservoir
31% | 47%
Lake Oroville
32% | 47%
Folsom Lake
39% | 62%
New Melones
24% | 40%
Don Pedro Reservoir
41% | 57%
Exchequer Reservoir


New Melones
24% | 40%
Don Pedro Reservoir
41% | 57%
Exchequer Reservoir
16% | 29%
San Luis Reservoir
19% | 43%
Millerton Lake
46% | 93%
Pine Flat Reservoir
11% | 28%
Pyramid Lake
94% | 105%
Castaic Lake
43% | 53%


Groundwater Basins
Hydrologic Regions
0 40 80 Miles


Groundwater Level Change: Spring 2013–Spring 2014
Well Count = 2941
Percent of Wells (%)
Groundwater Level Change (ft)
Groundwater Level Change
Increase > 10 feet
Increase 2.5 to 10 feet
Change +/- 2.5 feet
Decrease 2.5 to 10 feet
Decrease > 10 feet
Groundwater Basin
Hydrologic Region Boundary
County Boundary
Major Highway
Major Canal
0 10 20 40 60 80 100 120
Miles

Lessons Learned From Past Droughts

- Impacts are highly site-specific
  - Ability of water systems to invest in reliability
- Small water systems on fractured rock groundwater sources are most at risk
- Larger urban water agencies can manage 3-4 years of drought with minimal impacts to their customers

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What Actions Have Your Water System Taken During Previous Droughts?

Adopted a water conservation ordinance?	Nothing – previous droughts did not affect us
Asked for voluntary conservation?	Looked for new sources?
Adopted a drought mitigation plan?	Purchased bulk, hauled or bottled water?
Deepened an existing well?	Imposed mandatory restrictions?
Drilled a new well?	Increased leak detection and repair?
Connected to another system?	Imposed excess-use surcharges?

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Tools For Managing Drought

- California's water infrastructure which facilitates water transfers & exchanges
- Groundwater
- Water shortage planning (e.g. UWMPs)
- Response actions such as outreach & conservation

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Greatest Risks if 2015 Remains Dry

- **Health & safety**
  - Catastrophic wildfires (e.g., Southern California in 2003 and 2007)
  - Impacts to small water systems in rural areas (including wildfire damage)
- **Environmental**
  - Continued San Joaquin Valley land subsidence
  - Delta spawning beds
- **Economic**
  - Minimal agricultural water allocations, particularly in the San Joaquin Valley

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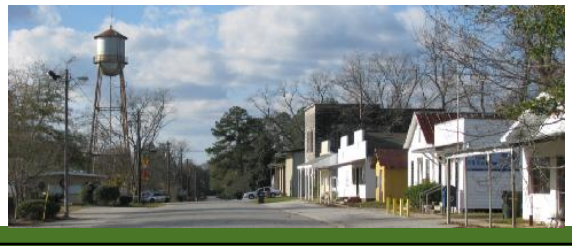
Drought Challenges For Small Systems

- Isolated rural communities
- Small groundwater basins w/ minimal recharge/storage capacities
- Typically operate with little margin
- Lack SDWA's "technical, managerial, financial" capacity



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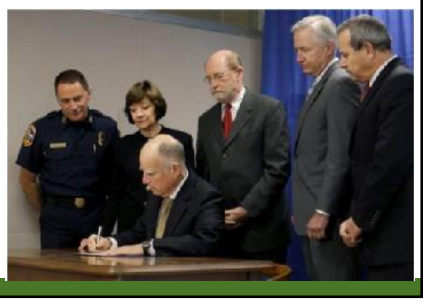
Recent State of California Actions

- California Water Plan Update - draft Oct 2013
- State Drought Task Force - Dec 2013
- Governor's Drought Proclamation - Jan 2014
- Water Action Plan - Jan 2014
- SB-103 & SB-104 Drought Relief Bills – March 2014



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Drought Legislation Summary

$549 million - Local and regional projects
$30 million - Improve water use efficiency, save energy and reduce GHG emissions
$14 million - Groundwater management and assistance to disadvantaged communities
$10 million - Irrigation and water pumping systems that reduce water & energy use
$15 million - Address emergency water shortages due to drought
$13 million - Expand water use efficiency and conservation activities and to reduce fuel loads
$25 million - Food assistance to those impacted by the drought
$21 million - Housing related assistance for individuals impacted by the drought

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Short Term Actions

- Conservation!
- Review / activate drought contingency plans
- Tap into local / regional information and assistance
- Expedite system improvements

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Drought Preparedness

- Difference between conservation measures and drought measures
- Assessment of supply and demand
- Key tool is a ***Drought Preparedness Management Plan***

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Drought Management Plan

- **Seven steps**
  1. Obtain public input and involvement
  2. Define goals and objectives
  3. Assess water supply and demand conditions
  4. Define drought indicators
  5. Identify drought mitigation measures

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Drought Management Plan

- Seven steps (cont'd)

  6. Assess mitigation measures
  7. Adopt and implement the plan

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1. Public Involvement

- Need public "buy-in" for plan to be successful
- Create a task force or committee
- Major water users
- Other water agencies
- Civic groups
- Public agencies
  - Law Enforcement, Fire Dept., Parks Dept.
- Others? _____

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2. Define Goals and Objectives

- Which users can and should be restricted
- General or targeted restrictions
- Legal requirements
- Minimum flow requirements
- Some users take priority over others (fire departments, hospitals)

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3. Assess Supply and Demand

- Identify water supply sources
  - Who ultimately controls sources
  - Treatment infrastructure
- Determine the maximum yield of current sources

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3. Assess Supply and Demand

- Determine total demand
  - Average and peak demand
  - Historic demand trends
  - Use by customer sector
  - Interior vs. Exterior use
  - Projected future demand
  - Environmental demand

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3. Assess Supply and Demand

- Identify Local Conditions
  - State Water Law
  - Current Conservation Efforts
  - Third-party effects on your groundwater
- Compare water demand with supply yield
- Forecast potential deficits

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Poll Question…

How much reduction in water use will you need to achieve in the next 6 months?

4. Define ***Your Own*** Drought Indicators

- Palmer Index
  - Based on soil moisture supply and demand
  - Long Term
- Reservoir Storage
  - Reflects precipitation, surface runoff, and groundwater
- Groundwater Levels
  - Well drawdown resources for gauging groundwater levels

5. Identify Mitigation Measures

- Water loss reduction (audit)
- Additional/alternative supply
- Additional storage (large scale)

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5. Identify Mitigation Measures

- Public information and education
  - Bill stuffers/fliers
  - Advertisements
  - Press conferences
- Restrictions/bans on nonessential use
  - Ornamental use (fountains, ponds)
  - Pavement/street/car washing

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5. Identify Mitigation Measures

- Pricing
  - Excessive-use surcharges
  - Drought surcharges
- Rationing (limit available supply)
- Local regulations/ordinances
  - Excess-use penalties
  - Criminal penalties for noncompliance (fines)
  - Interagency cooperation

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6. Assess Mitigation Measures

- Anticipated water-use reduction
- Consumer acceptance
- Equity
- Cost
- Sustainability
- Legal/contractual issues
- History
- Ease of implementation

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7. Develop Plan

- Adapt drought index and management strategy template that works best for you
- Use data and materials collected during assessment stages
  - Statistics
  - Maps
  - Graphics
  - Charts
  - Historical data

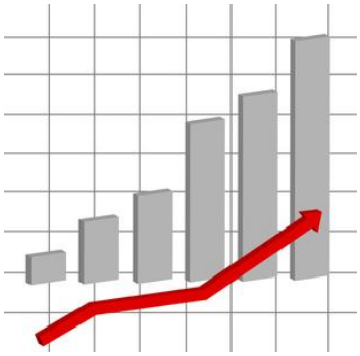

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Table 1. Drought Preparedness Plan Summary

Water supply conditions	Drought stage	Objective	Response actions
Normal 0% Total Supply Reduction	Drought Stage Zero - Ongoing Conservation. Water waste prohibition in effect.	Public awareness	Normal actions
Slightly Restricted Water Supplies (below normal) Up to 15% Total Supply Reduction	Drought Stage 1 – Introductory Stage. Voluntary reductions in use	Initiate public awareness of predicted water shortage and encourage conservation	Encourage voluntary measures to decrease "normal" demand up to 15%
Moderately Restricted Water Supplies Up to 30% Total Supply Reduction	Drought Stage 2 – Voluntary Phase for water use reductions and potential subsequent Mandatory Phase with restrictions on use.	Increase public under standing of worsening water supply conditions, encourage voluntary conservation measures, and enforce some mandatory conservation measures	Encourage some voluntary measures and enforce mandatory measures and implement water rationing to decrease "normal" demand up to 30% Drought surcharge enacted (potential in-house trigger and board action)
Severely Restricted Water Supplies Up to 50% Total Supply Reduction	Drought Stage 3 – Mandatory restrictions (severe prohibitions) on use	Ensure that water use is limited to health and safety purposes	Enforce extensive restrictions on water use and implement water rationing to decrease demand up to 50% of "normal" demand

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Implementing The Plan

- Formally adopt the Plan
  - Approval of citizen/community task force
  - Approval of local officials
  - Approval of your board of directors

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Implementing The Plan

- Public information and education
  - Pick one person to deal with the media
  - Let water users know where to ask questions
  - Staff booths at local events
  - Bill stuffers and fliers: drought fact sheet
  - Demonstrate conservation equipment
  - Provide updates

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Implementing The Plan

- Enforce drought restrictions
  - City/County/State ordinances
  - Incentive Programs
    - Supply retrofit devices
    - Conservation kits
    - Provide rebates for water-saving appliances
  - Disincentive programs
    - Fees/penalties

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Implementing The Plan

- Monitoring drought restrictions
- Reactive
  - Respond to complaints made by other consumers
- Proactive
  - Actively patrol and issue warnings/fines

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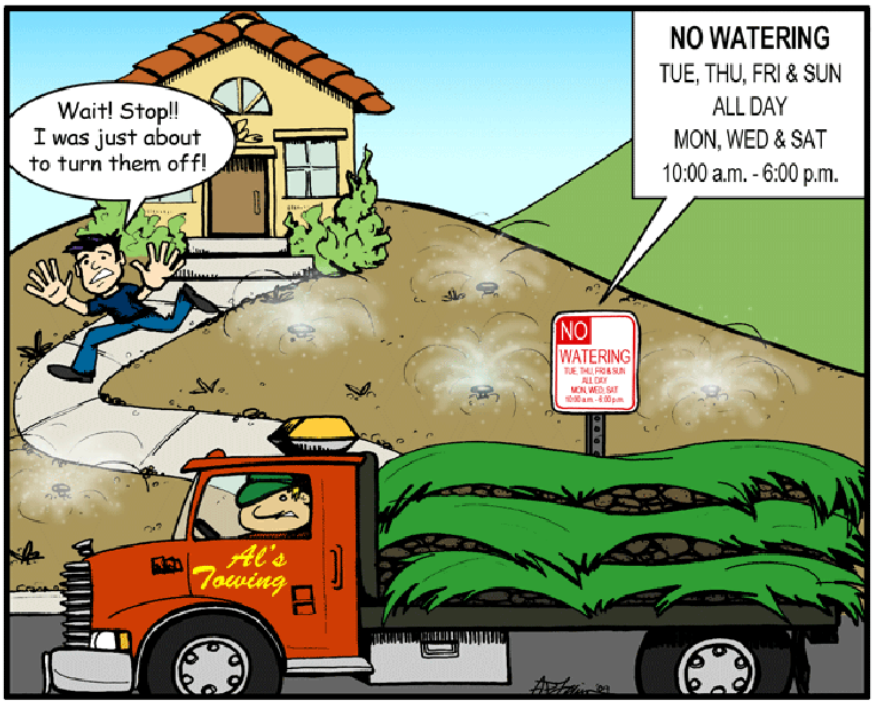

What actions do you plan to take in response to the CURRENT drought?

Adopt a water conservation ordinance?	Nothing – the drought is not a problem for us
Ask for voluntary conservation?	Look for new sources?
Adopt a drought mitigation plan?	Purchase bulk, hauled or bottled water?
Deepen an existing well?	Impose mandatory restrictions?
Drill a new well?	Increase leak detection and repair?
Connect to another system?	Impose excess-use surcharges?

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Bottom Line!

- Proper planning can help alleviate drought impact!

Web Tour Of CA Drought Resources

Drought.CA.Gov: California's Drought Information Clearinghouse

Governor's Proclamation of Drought Emergency
State's Water Conservation Campaign, Save our Water
Local Government Clearinghouse and Toolkit
California Department of Food and Agriculture, Drought information
California Department of Water Resources Current Water Conditions
California Data Exchange Center, Snow Pack/Water Levels
California State Water Resources Control Board, Water Rights, Drought Info and Actions
California Natural Resources Agency, Drought Info and Actions
California Department of Public Health, Drinking Water CDPH Drinking Water Program
California State Water Project, Information
USDA Drought Designations by County CA County Designations
USDA Disaster and Drought Assistance Information USDA Programs
Small Business Administration Disaster Support: www.sba.gov/disaster


Thank You For Joining Us!
That's all Folks!
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