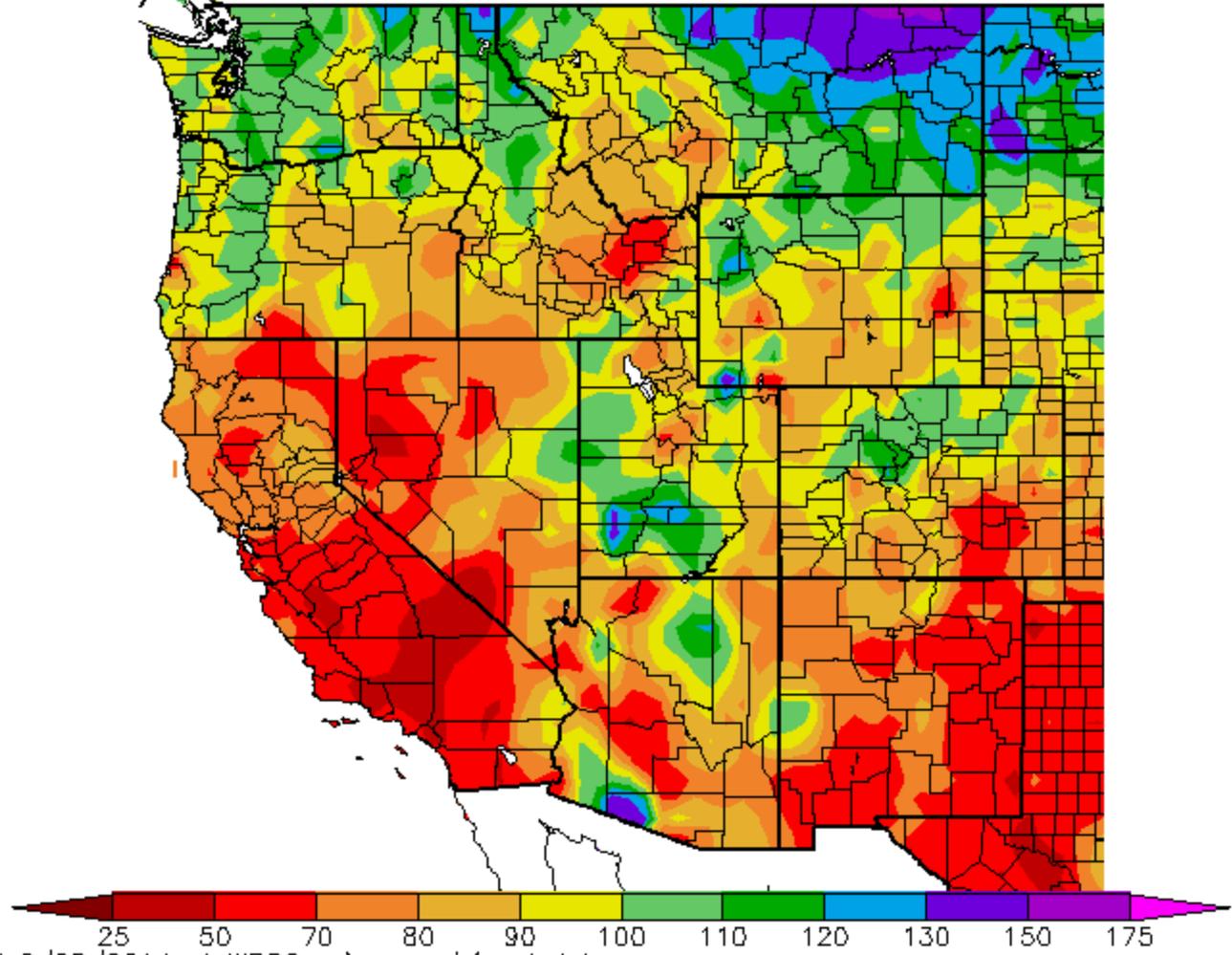




## **Small Water Systems & Drought Vulnerability**

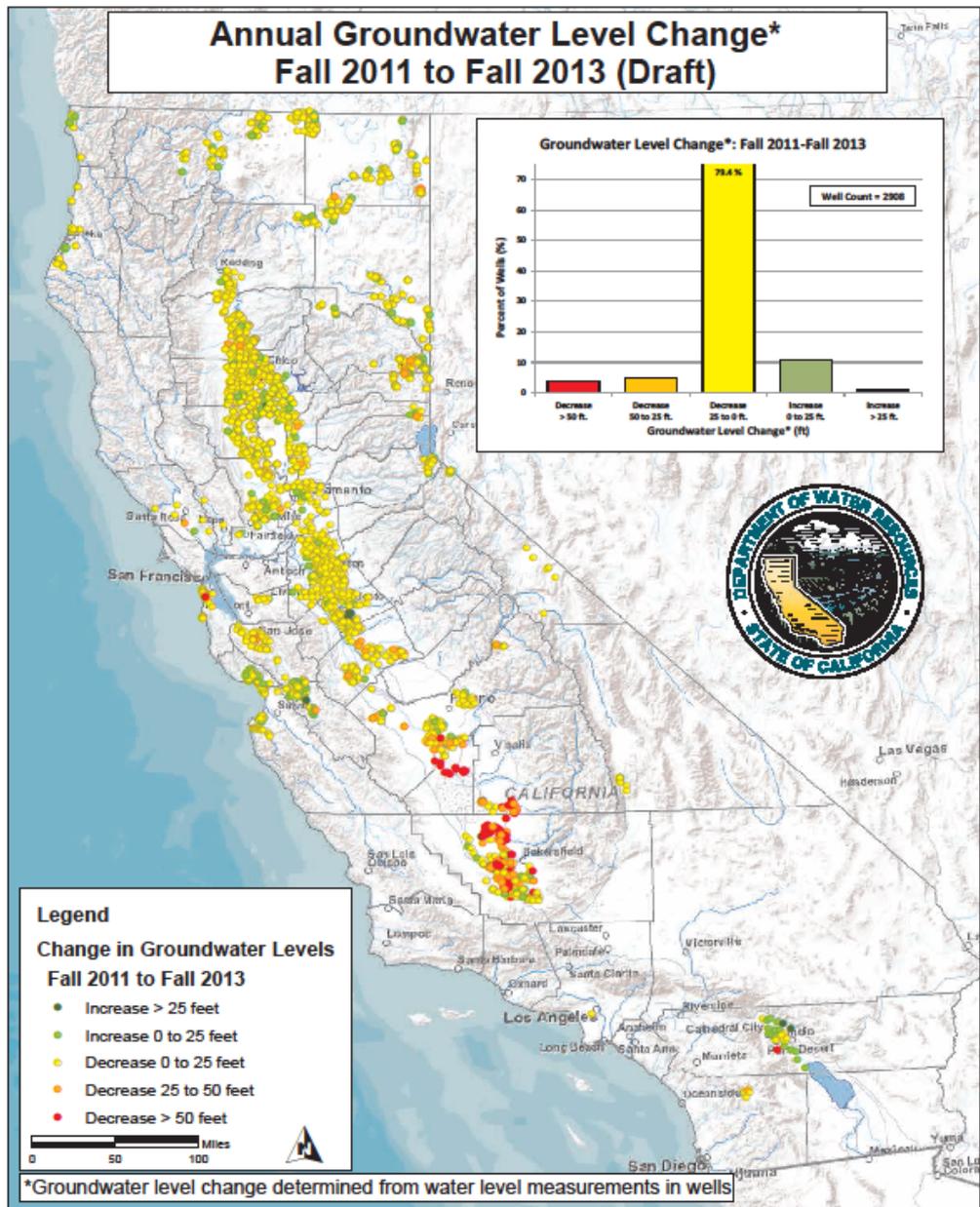
**Jeanine Jones, DWR**

# Percent of Average Precipitation (%) 2/28/2011 - 2/27/2014



Generated 2/28/2014 at WRCC using provisional data.  
NOAA Regional Climate Centers

# Annual Groundwater Level Change\* Fall 2011 to Fall 2013 (Draft)



**Draft -** Map and chart based on available data from the DWR Water Data Library as of 12/23/2013  
Document Name: DOTMAP\_F2011\_F2013\_JJ Updated: 12/23/2013 Print Date: 12/23/2013

# Lessons Learned from Past Droughts

- Impacts are highly site-specific, and vary depending on the ability of water users to invest in reliability
- Small water systems on fractured rock groundwater sources are at higher risk of public health and safety impacts
- Larger urban water agencies typically can manage 3-4 years of drought with minimal impacts to their customers

# Small Water System Challenges

- Typically lack financial/technical resources
- Small ratepayer base means limited ability to do capital improvement projects
- Mutual water companies common in rural areas -  
- ineligible for some financial assistance programs
- May use less reliable groundwater sources  
(fractured rock groundwater, small coastal terrace groundwater basins)
- Often located in rural areas – more difficult to do interconnections, potentially higher wildfire vulnerability (Southern California in 2003 & 2007)

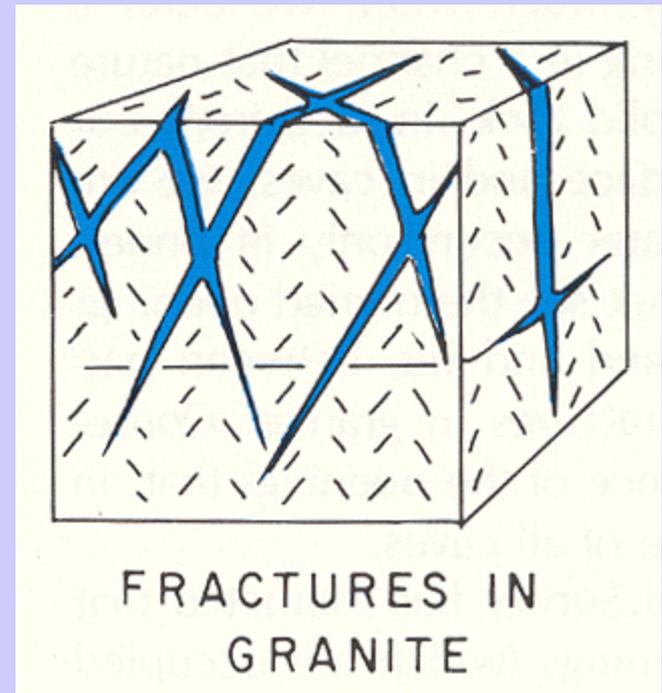
# Small Water System Drought Considerations

- Revenue impacts
- Monitoring groundwater levels & well production
- Identification of shortage triggers (lack of)
- Staffing needs for conservation activities, leak detection, etc

# Location, Location, Location



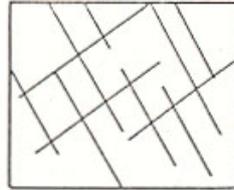
# Fractured Rock Groundwater



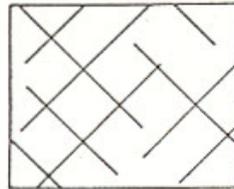
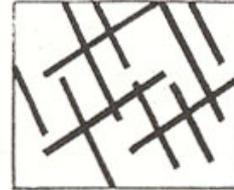
# Fracture System Characteristics Controlling Ground Water Development

Unfavorable

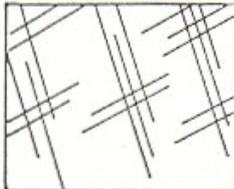
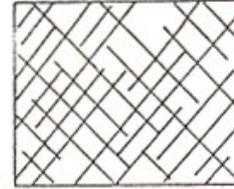
Favorable



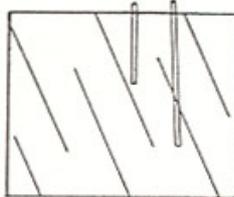
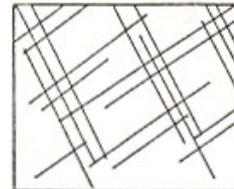
Aperture  
(opening size)



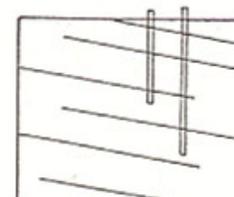
Spacing  
(density)



Interconnection  
(over a large area)

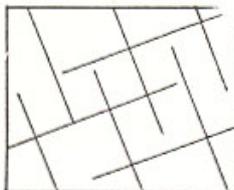


Orientation

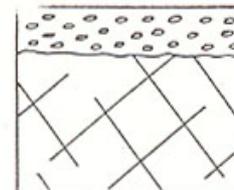


wells intersect few  
steeply dipping fractures

wells intersect many  
gently dipping fractures



Soil Cover



low storage and  
infiltration

high storage and  
infiltration

# California Groundwater Basins

Preliminary Subject to Change



50 0 50 Miles

# Small Water Systems Outside Groundwater Basins

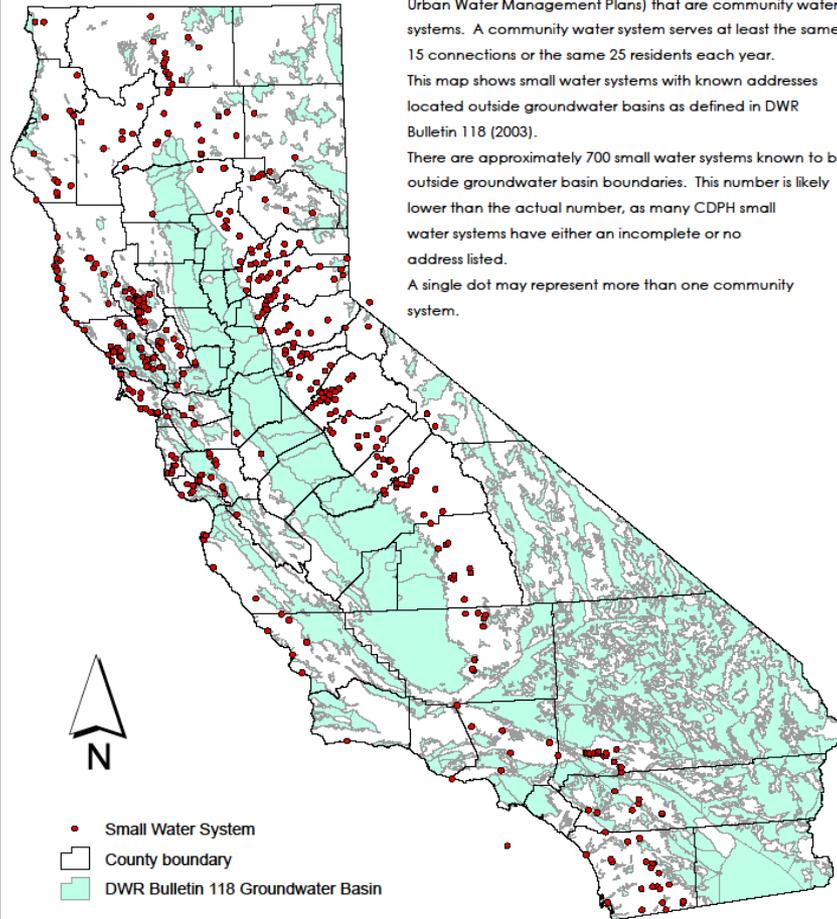
As of February 21, 2014

This map shows those CDPH small water systems serving less than 3,000 connections (the threshold for preparation of DWR Urban Water Management Plans) that are community water systems. A community water system serves at least the same 15 connections or the same 25 residents each year.

This map shows small water systems with known addresses located outside groundwater basins as defined in DWR Bulletin 118 (2003).

There are approximately 700 small water systems known to be outside groundwater basin boundaries. This number is likely lower than the actual number, as many CDPH small water systems have either an incomplete or no address listed.

A single dot may represent more than one community system.



# Improving small system reliability

- Infrastructure
- System consolidation
- Financial assistance
- Technical assistance
  - TMF capacity development, including emergency response planning
  - Assistance in grant & loan applications
  - Drought/shortage planning

# Roles of State Agencies

- CDPH – regulates drinking water systems, administers State Revolving Fund pursuant to Safe Drinking Water Act
- DWR – General responsibilities for water supply planning, water data collection, administration of water use efficiency programs, Urban Water Management Act

# Water Shortage Planning Framework

- Safe Drinking Water Act emergency/disaster response planning (applies to regulated drinking water systems)
- Urban Water Management Planning Act (plans required for systems >3,000 connections)

# SDWA Emergency/Disaster Response Plans

- Required as part of TMF demonstration for systems seeking State Revolving Fund assistance
- Required for new systems
- Required for changes of system ownership
- Are emergency plans, not drought plans

# Urban Water Management Planning Act

- Applies to systems with >3,000 connections or serving > 3,000 AF annually.
- Requires systems to submit plans to DWR & update them every 5 years.
- Must include contingency plan for shortages (droughts) of up to 50%

# So where can we go from here?

