Presentation Outline

• Historical water development
• Current challenges and opportunities
• Where to from here
• Never let a crisis go to Waste
Historical Context

- Swamp and Overflow Act
- Central Valley Flood System
- Water System Development
California Water Systems

90% of annual runoff occurs in 40% of the state
California Water Systems

Los Angeles Aqueduct (1908)
California Water Systems

Hetch Hetchy Aqueduct (1913)
California Water Systems

Mokelumne Aqueduct (1926)
California Water Systems

Colorado River Aqueduct (1933)
California Water Systems

Central Valley Project (1937)
California Water Systems

State Water Project (1960)
California Water Systems

Fueled California economy
All had unintended consequences
All are less reliable today
U.S. Drought Monitor
California

October 6, 2015
(Released Thursday, Oct. 8, 2015)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
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</thead>
<tbody>
<tr>
<td>Current</td>
<td>0.14</td>
<td>99.86</td>
<td>97.33</td>
<td>92.36</td>
<td>71.08</td>
<td>46.00</td>
</tr>
<tr>
<td>Last Week</td>
<td>0.14</td>
<td>99.86</td>
<td>97.33</td>
<td>92.36</td>
<td>71.08</td>
<td>46.00</td>
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<tr>
<td>3 Months Ago</td>
<td>0.14</td>
<td>99.86</td>
<td>98.71</td>
<td>94.59</td>
<td>71.08</td>
<td>46.73</td>
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<tr>
<td>Start of Calendar Year</td>
<td>0.00</td>
<td>100.00</td>
<td>98.12</td>
<td>94.34</td>
<td>77.94</td>
<td>32.21</td>
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<tr>
<td>Start of Water Year</td>
<td>0.14</td>
<td>99.86</td>
<td>97.33</td>
<td>92.36</td>
<td>71.08</td>
<td>46.00</td>
</tr>
<tr>
<td>One Year Ago</td>
<td>0.00</td>
<td>100.00</td>
<td>100.00</td>
<td>95.04</td>
<td>81.92</td>
<td>58.41</td>
</tr>
</tbody>
</table>

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:
David Miskus
NOAA/NWS/NCEP/CFC

http://droughtmonitor.unl.edu/
Lake McClure, 2010 / 2015
U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for October 15 - January 31, 2016
Released October 15, 2015

Depicts 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. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

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).

Author:
Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center

http://go.usa.gov/3eZ73
Half Dome—3/19/2012
Half Dome—3/19/2013
Half Dome—3/19/2014
Water System Challenges

- Increasing Population
- Aging infrastructure
- Groundwater overdraft
- Degraded ecosystems
- Increasing conflict
- Management fragmentation
- Uncertainty due to climate change
Addressing the Challenge

- Achieving sustainable water management through:
  - Integrated Water Management
  - Groundwater Management
  - Urban Water Use Efficiency
  - Stormwater Capture
  - Recycled Water
  - Reservoir Reoperation
  - Flood Management
Groundwater in Context

- About 40% of supply in an average year; 60% in dry
- Many urban/rural areas 100% dependent
- Critical part of integrated management
- Excellent drought buffer (at risk)
- Groundwater overdraft impacts
Groundwater in Context

- Several decades of increasing use
  - Reduction in surface supplies
  - Hardening of demand
- Increasing landowner conflicts
Integrated Water Management

WATER SYSTEM INTERCONNECTIVITY
CWF Groundwater Efforts

- Develop and protect leadership
- Reframe the debate/compelling information
- New coalitions
- Policy reform
Leadership
REFRAMING THE DEBATE

EVERYONE’S TALKING ABOUT WATER.
FOR ONCE, THEY’RE SAYING THE SAME THING
Coalitions and Support

- Water Agencies
- Business Groups
- Environmental Nonprofits
- Ag Leaders
- Administration & Legislature
Media Statistics Editorials and Op-eds

- 18 positive editorials statewide
  - 4 supporting groundwater reform
  - 12 supporting specific legislation
  - 2 urging Governor to sign bills
  - 4 million print impressions, 31 million online

- 13 positive opinion pieces published
  - 5 by groundwater voices
  - 4 by Lester Snow
  - 4 by other supportive orgs, individuals
  - 750k print impressions, 1 million online
Recommendations for Achieving Groundwater Sustainability

Prepared by the Association of California Water Agencies

April 2014

Recommendations for Sustainable Groundwater Management:
Developed Through a Stakeholder Dialogue
May 2014
Crisis Into Opportunity
Problems With Overdraft

- Subsidence threatens infrastructure
- Reduced surface water flow/ecosystem impacts
- Reduced surface supplies
- Increased drilling/pumping costs/ghg emissions
- Increased costs for taxpayers, business, farmers
Change in Groundwater Storage for the Central Valley


- Annual Storage Change
- Cumulative Storage Change
Sustainable Groundwater Management Act (SGMA)

- Fundamental change in groundwater management
- Sustainability Goal (20 years with 5 year milestones)
- Local Empowerment
  - Local authorities to manage groundwater
  - Local agency formation (GSAs)
  - Local plans (GSPs)
  - “Exempts” adjudicated basins
- State Role
  - Assistance (financial and technical)
  - Plan Review
  - Back-Stop
Sustainability: Manage groundwater to prevent undesirable results (significant & unreasonable):

- Chronic lowering of groundwater levels
- Reduction of groundwater storage
- Seawater intrusion
- Degraded water quality
- Land subsidence
- Depletions of interconnected surface water
Transformative Moment for California Water

- Invest in water infrastructure
- Create markets to move water
- Drive water conservation
- Ensure everyone has safe, reliable water
Invest in Water Infrastructure

- Water reuse and recycling
- DAC connection and treatment
- Stormwater capture and use
- Storage and Conveyance (small and large)
- Infrastructure Funding
  - Bonds, Fees, 218
## Time Frame for Success

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
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<tbody>
<tr>
<td>6/30/2017</td>
<td>Formation of GSAs</td>
</tr>
<tr>
<td>1/31/2020</td>
<td>Completion of GSPs in critically overdrafted basins</td>
</tr>
<tr>
<td>1/31/2022</td>
<td>Completion of GSPs in all other basins</td>
</tr>
<tr>
<td>20-year implementation period</td>
<td>Implementation of GSPs under local management</td>
</tr>
</tbody>
</table>

Taking these actions shields local managers from state intervention.
**The “Backstop” State Board Intervention**

<table>
<thead>
<tr>
<th>After</th>
<th>Cause of Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/30/2017</td>
<td>No GSAs</td>
</tr>
<tr>
<td>1/31/2020</td>
<td>In critically overdrafted basins, no GSA or GSP is inadequate</td>
</tr>
<tr>
<td>1/31/2022</td>
<td>In other basins, no GSA or GSP inadequate and basin in long-term overdraft</td>
</tr>
<tr>
<td>1/31/2025</td>
<td>GSP is inadequate and significant depletions of interconnected surface waters</td>
</tr>
</tbody>
</table>

In all triggering events, interventions is the result of a failure by the locals to create a GSA and adopt and implement a GSP.
Moving to Implementation

- Shape agency rules
- Support progressive leaders
- Manage legislative follow-up
CASGEM Groundwater Basin Prioritization

Prioritized groundwater basins are depicted from the Final Basin Prioritization Results published on June 10, 2014 on the CASGEM website and graphically represented using the DWR Bulletin 118 basin boundaries. Adjudicated Basins and Hydrologic Region Boundaries obtained from DWR.
Prioritized groundwater basins are depicted from the Final Basin Prioritization Results published on June 10, 2014 on the CASGEM website and graphically represented using the DWR Bulletin 113 basin boundaries. Adjudicated Basins and Hydrologic Region Boundaries obtained from DWR.
Problems with Overdraft