

Groundwater Panel Delta Stewardship Council Meeting

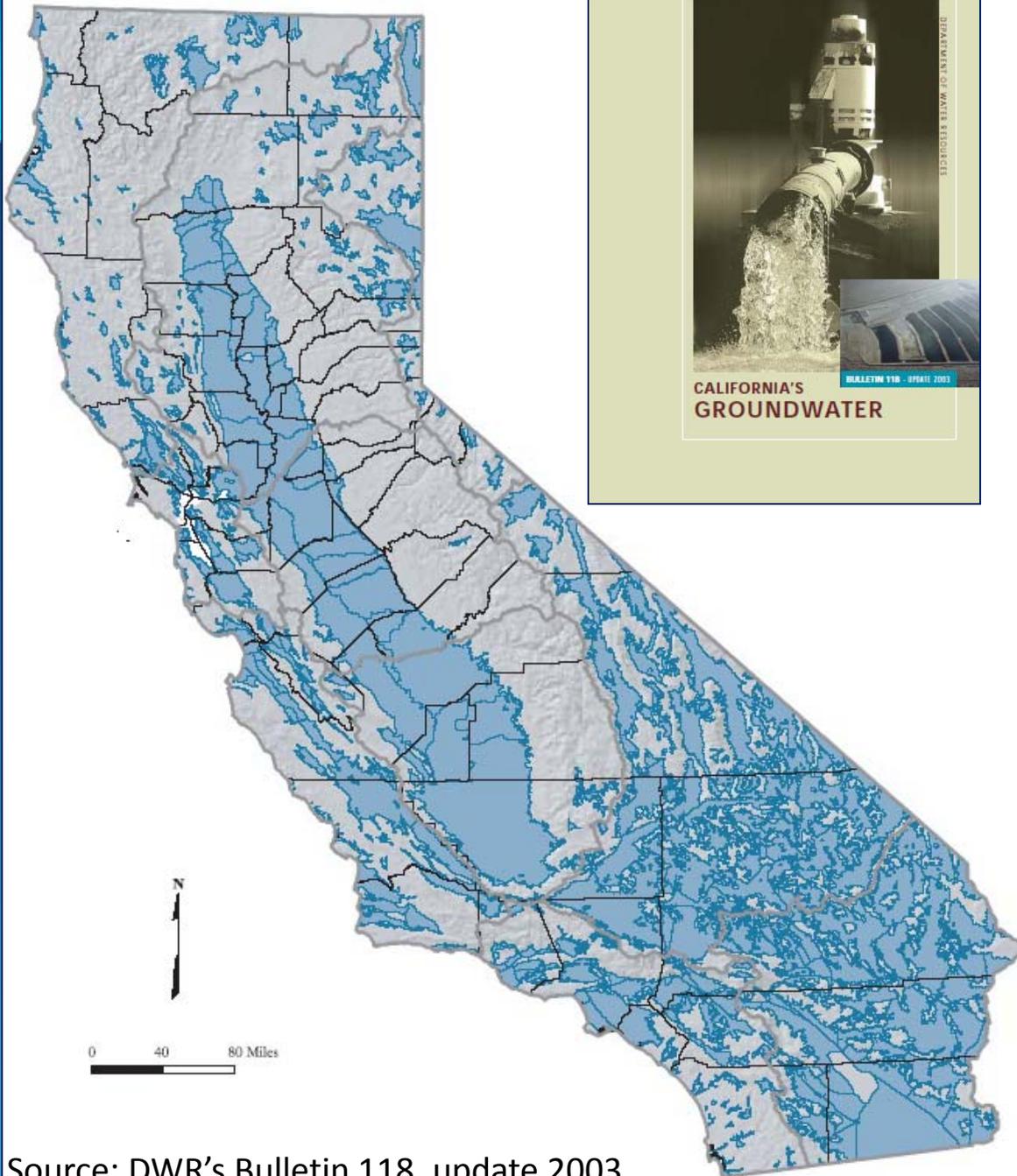
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California's Groundwater Basins

- 515 alluvial basins/subbasins
- ~ 30 to 45 % of state's water supply
- High variability among the basins



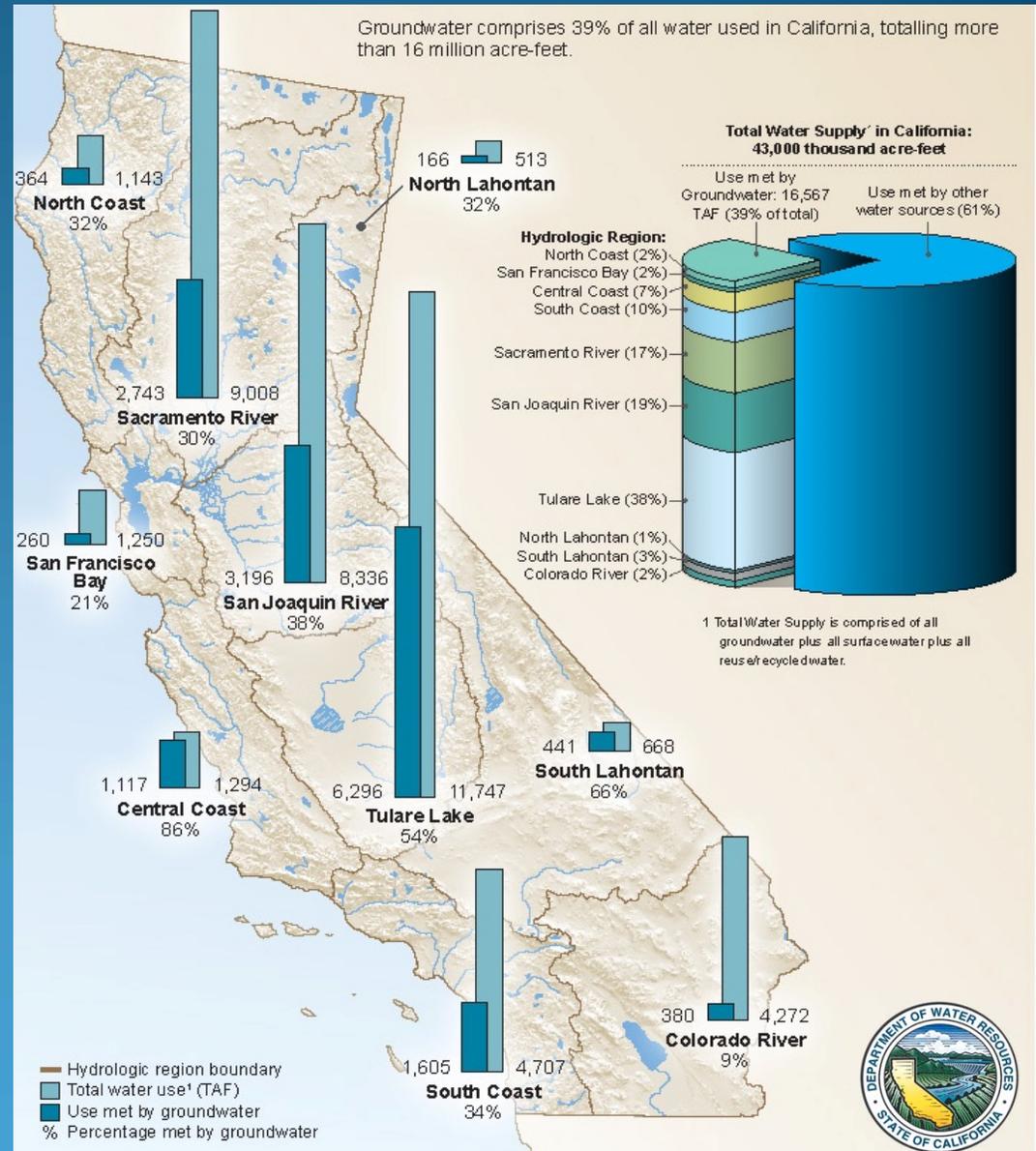
Source: DWR's Bulletin 118, update 2003



Groundwater Use in California

Groundwater accounts for almost 40% of CA water supply

Average annual groundwater use
 16.5 Million acre-feet
 (2005 – 2010)



California Water Law and Groundwater Management

- Surface waters and groundwater are regarded differently
- Surface waters are subject to a permit system
- Permit system excludes groundwater
- Groundwater is regulated at the local level (local ordinance and litigation)
- The State has encouraged and promoted voluntary, local groundwater management



Selected Groundwater Management Legislation

CA Water Code Sections 10750 et seq.

- 1992 - AB 3030 – Groundwater Management Plans (GWMP)
- 2000 - AB 303 – Local Groundwater Assistance grants
- 2002 - SB 1938 – Required elements in GWMPs to be eligible for grant funds
- 2009 - SBx7 6 (CASGEM) – Statewide seasonal and long-term groundwater elevation monitoring
- 2011 - AB 1152 - Modified GW elevation monitoring with alternative monitoring under specific conditions



Groundwater Management

Groundwater managed at the local level

- Local ordinances or joint powers agreements
- Adopted Groundwater Management Plans
- Adjudicated groundwater basins



Why Is Groundwater Data Important?

- Evaluate groundwater levels and trends
- Identify effects of pumping and recharge
- Track groundwater storage changes
- Baseline data is critical for evaluating groundwater basins
- Understand aquifer hydraulics and connectivity
- Assess impacts – land subsidence, overdraft, saline intrusion, drought



What Groundwater Information Is Needed, Especially For Critical Basins?

- Groundwater levels
- Groundwater flow directions
- Trend analysis (long term and short term)
- Groundwater storage calculation
- Water balance (groundwater budgets with estimated annual groundwater use)
- Well log information



Additional Necessary Groundwater Information

- Annual groundwater reports
- Conjunctive Management Projects
- Groundwater recharge zones
- Assessment of adverse conditions, subsidence, overdraft, salt water intrusion

- Priority of CA groundwater basins
- Updated inventory of Groundwater Management Plans



Importance of GW information and Bulletin 118

- Provides a standard framework
- Establishes basin boundaries
- Provides general basin description, geologic setting, aquifer properties, and impairments
- Provides basic education information on groundwater



California Water Action Plan

Action 6 - Expand Water Storage Capacity & Improve Groundwater Management

- Provide Essential Data to Enable Sustainable Groundwater Management
 - Expand and fund CASGEM
 - Some funding in Governor's FY 14/15 budget
 - Update Bulletin 118, California's Groundwater Systematic evaluation of major groundwater basins
 - No funding in FY 14/15 budget



Combined DWR Groundwater Efforts

- CASGEM and 2013 CWP Groundwater Enhancements consistent with Bulletin 118
- CASGEM and 2013 CWP Groundwater Enhancements have advanced statewide and regional groundwater efforts
- More work is needed



California Statewide Groundwater Elevation Monitoring (CASGEM)

Voluntary, long-term program to collect groundwater elevations statewide

- Collaboration between DWR and local agencies
- Local agencies collect groundwater elevation data to demonstrate seasonal and long-term trends
- Data readily and widely available to the public
- Requires DWR to prioritize groundwater basins, investigate groundwater basins, and provide status reports to Governor and Legislature
- CASGEM data augments groundwater data collected under other programs



Selected CASGEM Statistics

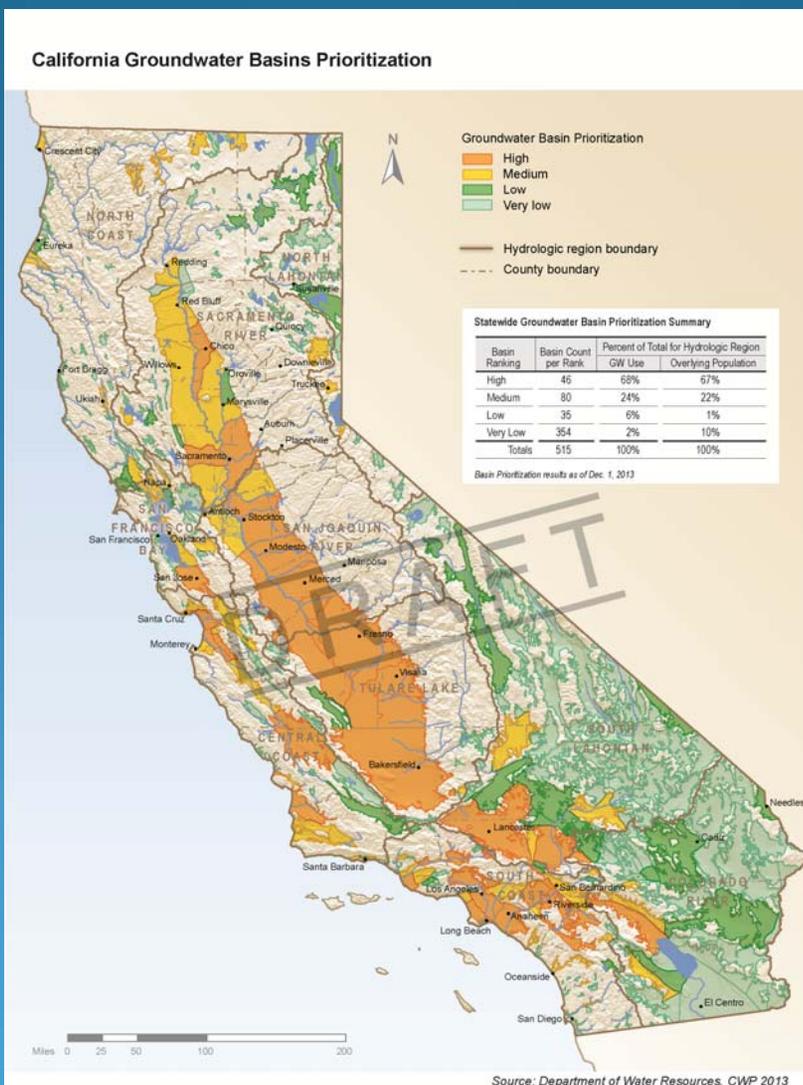
(as of Dec. 17, 2013)



- 200 Designated Notifications
 - ✓ 152 basins/subbasins (or portion)
 - ✓ 71 Designated Monitoring Entities
- 3,700+ CASGEM wells (since 2012)
- 100k records (includes historical data)



Draft CASGEM Basin Prioritization Statewide Results



Basin Prioritization Results

- Prioritization does not reflect basin management or monitoring
- Preliminary Statewide Results
 - ✓ 46 High Priority Basins
 - ✓ 80 Medium Priority Basins
 - ✓ 35 Low Priority Basins
 - ✓ 354 Very Low Priority Basins
- 75% are Low and Very Low Priority Basins
- 25% are High and Medium Priority Basins
 - ✓ 92% of groundwater use, 89% of population overlying the groundwater basin



How Will the CASGEM Program Use the Basin Prioritization?

- Utilize prioritized results and assess groundwater basins on a statewide scale.
- Focus on evaluating the status of groundwater level monitoring in High and Medium Priority groundwater basins, where monitoring has greatest benefit.
- Does not diminish importance of groundwater on the local scale



How Else Could Basin Prioritization Be used?

- Promote informed decision making
- Provide a common understanding of the statewide significance of the 515 groundwater basins and subbasins
- Prioritize allocation of limited resources
- Identify and prioritize basins needing to improve groundwater management practices



Next Steps for FY 13/14

- **Identify High and Medium Priority Basins that are not monitored and/or not designated with a Monitoring Entity**
 - Preliminary results:
 - 58% (73) of High and Medium Priority basins are monitored under CASGEM
 - 8% (10) of High and Medium Priority Basins are partially monitored under CASGEM
 - 34% (43) of High and Medium Priority Basins are not monitored under CASGEM



Future CASGEM Efforts

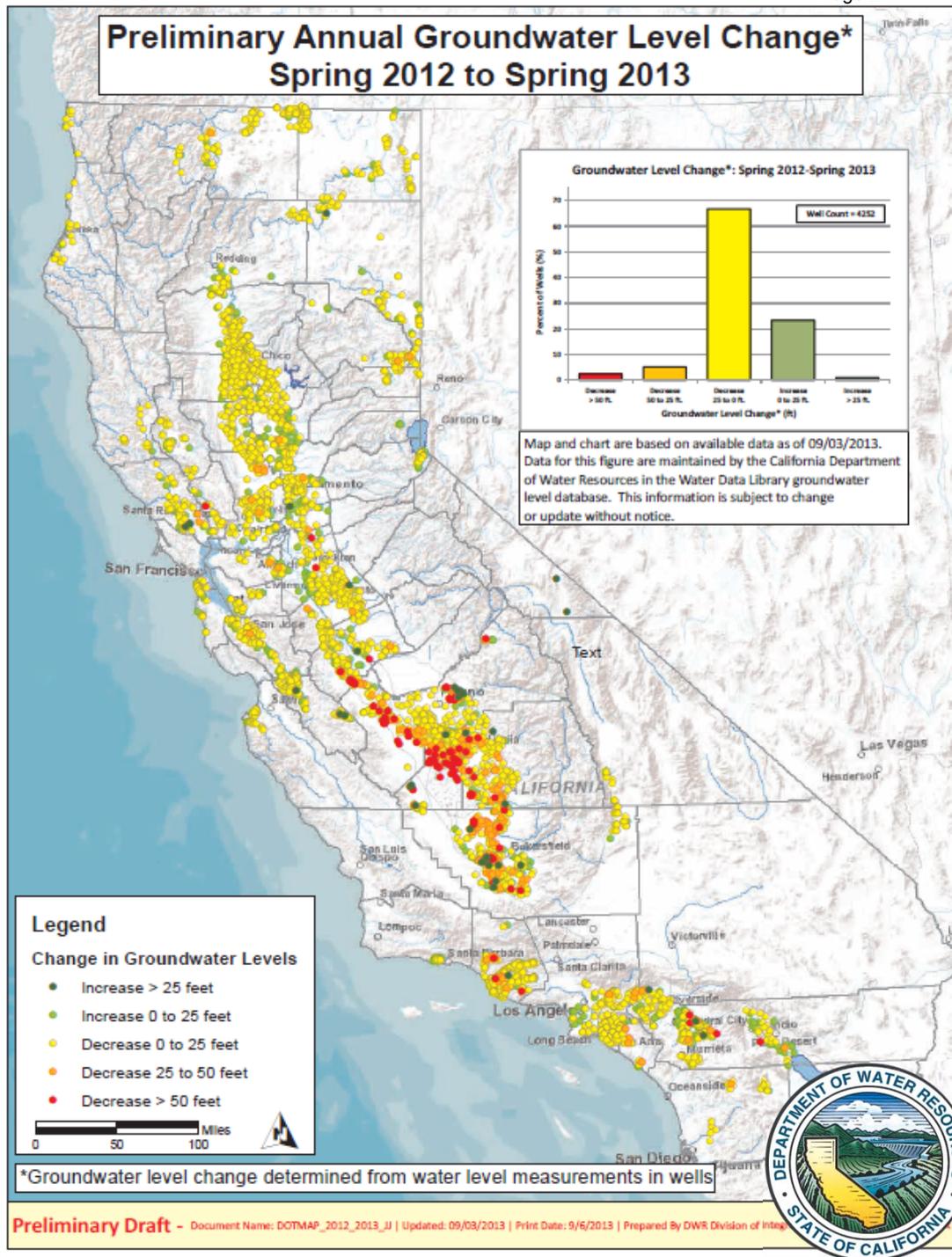
(Contingent on Funding)

- Continue designation of Monitoring Entities
- Evaluate extent of groundwater monitoring
- Using prioritization results, collaborate with local agencies to conduct groundwater basin assessments
- Identify regional trends
- Identify basins subject to overdraft
- Update Bulletin 118 boundaries



Statewide Groundwater Level Change

Spring 2012 to Spring 2013



California Water Plan (CWP) Update

2013 Groundwater Content

- **Groundwater Supply & Development**
 - Aquifer Descriptions
 - Well Infrastructure
 - Groundwater Use
 - Groundwater Monitoring (levels, quality, subsidence)
- **Aquifer Conditions**
 - Groundwater Elevation
 - Depth to Groundwater
 - Change in Aquifer Storage
 - Tell-a-Story Hydrographs
 - Groundwater Quality
 - Land Subsidence
- **GWMP Inventory and Assessment**
- **Conjunctive Management Inventory and Assessment**

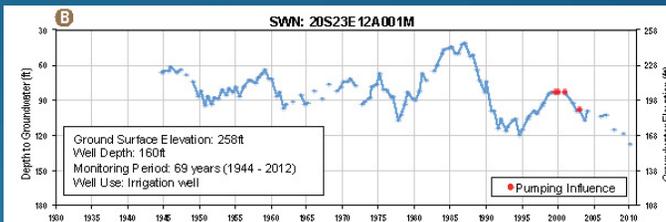
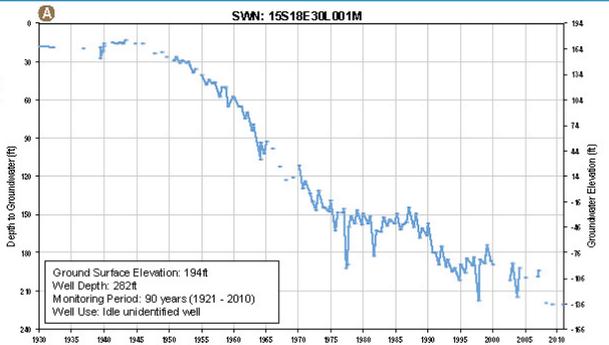


Tulare Lake Region

Regional Hydrographs



A Hydrograph
15S18E30L001M:
 demonstrates the imbalance between aquifer recharge and groundwater extraction for this portion of the Kings Subbasin, and the unsustainability of relying on groundwater resources to maintain the existing level of groundwater extraction and management practices



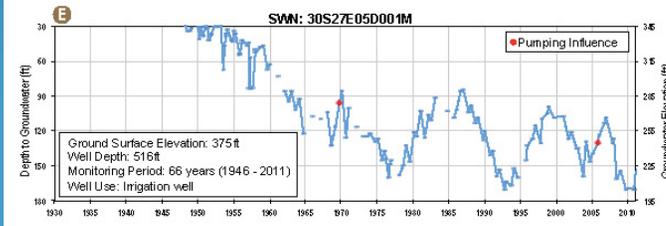
B Hydrograph
20S23E12A001M:
 illustrates the local aquifer response to changes in groundwater recharge and extraction, due to changes in precipitation and surface water supply deliveries.



C Hydrograph
26S18E18G001M:
 highlights recovering groundwater levels associated with the introduction of imported surface water from the California Aqueduct, which resulted in decreasing groundwater demand and facilitating in-lieu groundwater recharge.

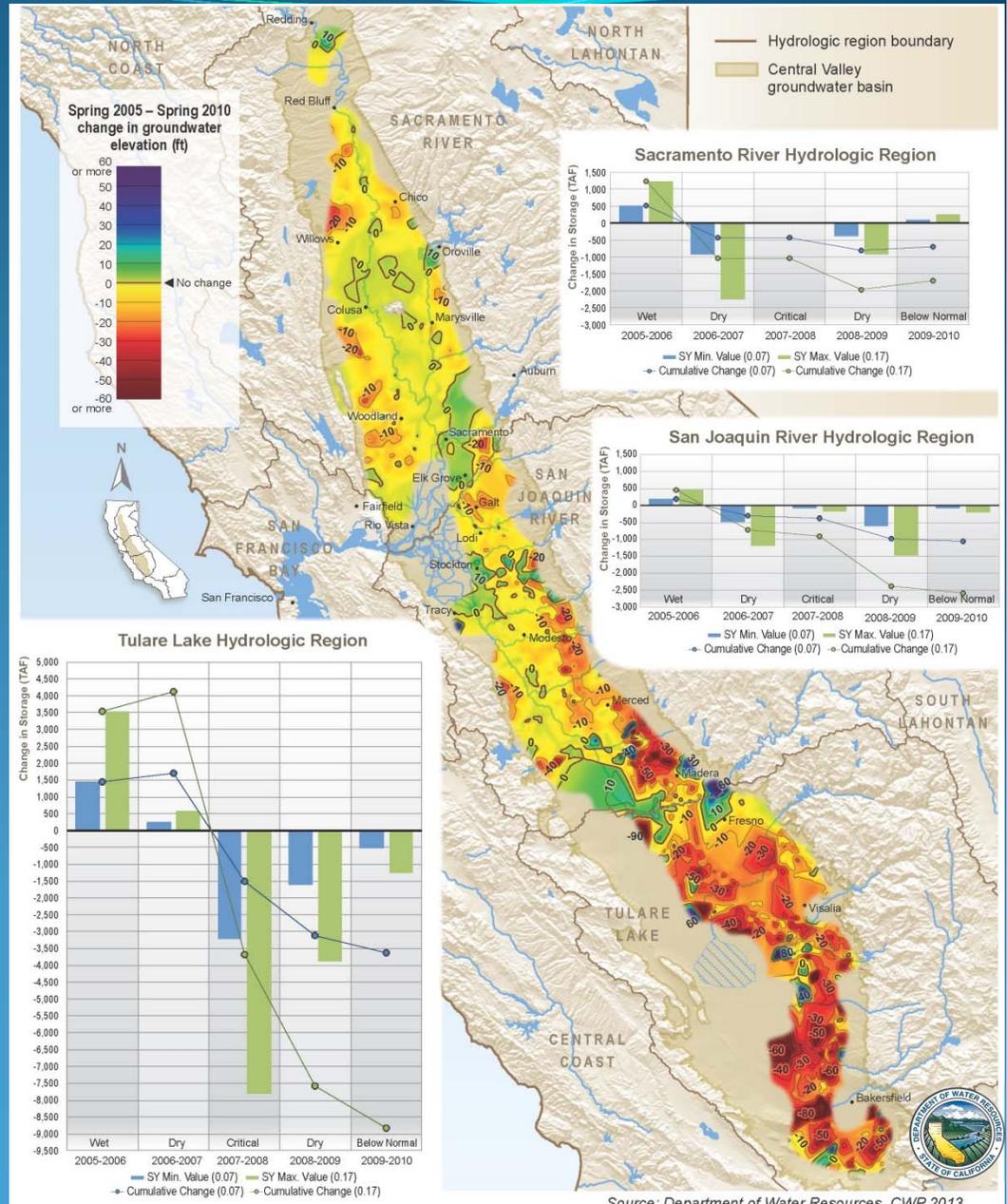
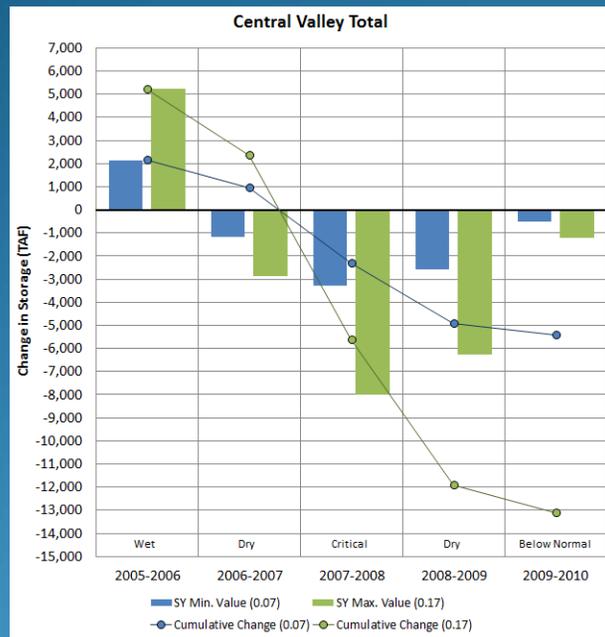


D, E Hydrographs
30S24E02C001M and 30S27E05D001M:
 illustrate the successful stabilization of sharply declining groundwater levels through implementation of in-lieu and active groundwater recharge projects via active conjunctive management practices.



CWP Change in GW Storage

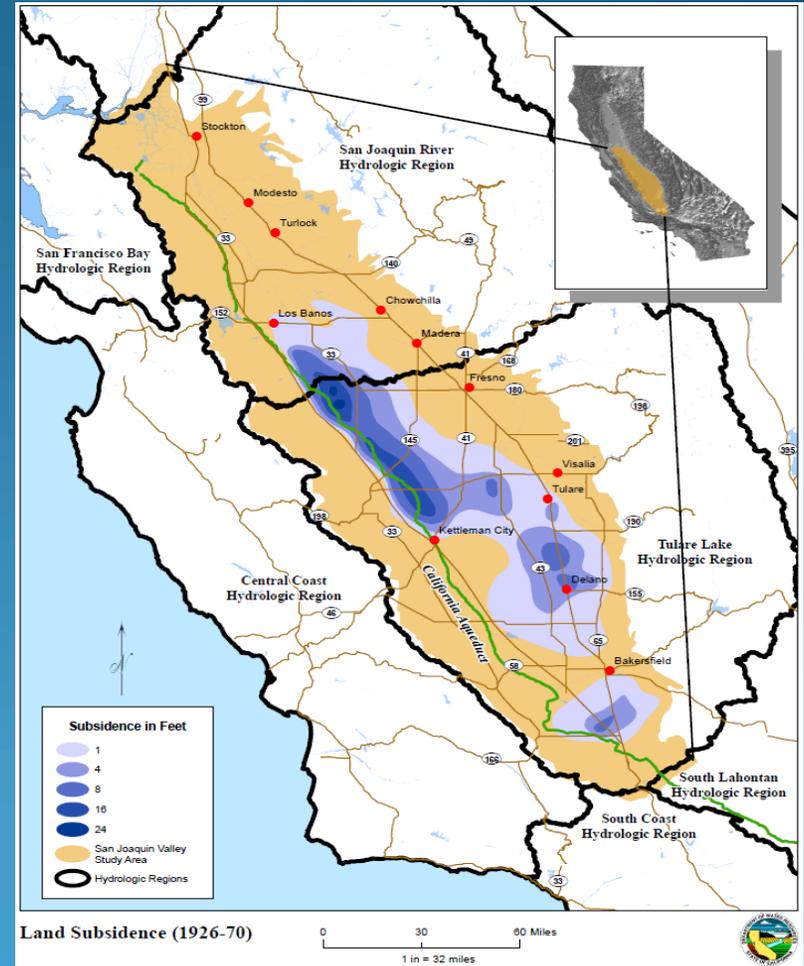
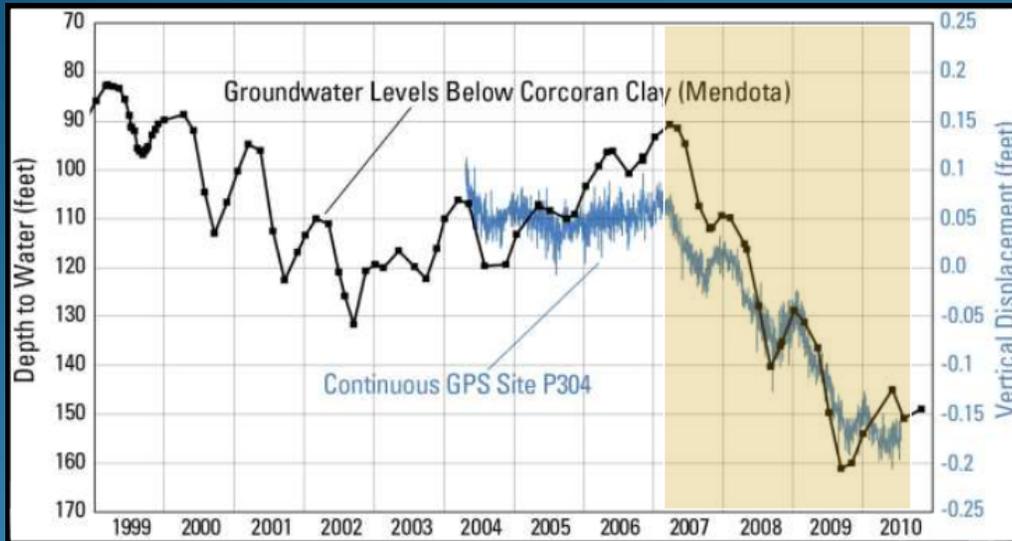
2005 – 2010 Central Valley



SR: -0.7 to -1.7 MAF
 SJR: -1.0 to -2.6 MAF
 TL: -3.7 to -8.9 MAF
 CV Total: -5.4 to -13.2 MAF

CWP Groundwater Content

Renewed Land Subsidence



Renewed land subsidence threatens infrastructure, buildings, water delivery systems, and long-term water supply capacity.

Adapted from Ireland, 1983.



CWP Groundwater Content

Key Messages

1. Highly dependent on groundwater, 40 percent of supply
2. Groundwater extraction varies by hydrologic region (average 16 MAF)
3. 1980 DWR Bulletin 118: 11 basins subject to critical overdraft; 31 basins with evidence of overdraft- *30 years later - many show signs of continued depletion and impacts not adequately addressed*
4. Renewed land subsidence
5. Only 17% of B118 basins are covered by GWMPs that include all the SB 1938 CA Water Code requirements
6. Significant efforts have been made to improve groundwater management, bolder actions are needed



Recommendations to Improve Groundwater Management in California

1. Promote public education regarding groundwater
2. Improve understanding of California groundwater basins
3. Improve collaboration and coordination among State, federal, tribal, local, and regional agencies and organizations
4. Increase availability and sharing of groundwater information
5. Strengthen and expand the CASGEM Program for the long-term
6. Assess SB 1938 groundwater management plans
7. Develop guidelines to promote groundwater BMPs
8. Develop analytical tools to assess conjunctive management
9. Increase Statewide groundwater recharge and storage



Actions

- **Advance Integrated Water Management**
 - **No transfer of impacts between regions**
 - **Regions accept responsibility for assessing risk due to climate change, population growth, groundwater overdraft, etc.**
 - **Develop IRWM Plans to manage risk appropriately**
- **Develop and adopt stronger standards for local/regional groundwater management plans for sustainable groundwater management**
- **Consider legislation needed to provide needed local/regional authority**
- **Convene interagency groundwater coordinating committee to assist local entities manage groundwater while considering impacts to surrounding regions and state as a whole**



In Closing

- Look forward to working together to implement the actions
- Funding needed at State and local level to implement actions for improved management and long term reliability and sustainability



Questions?



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www.water.ca.gov/groundwater/casgem

www.waterplan.water.ca.gov/cwpu2013

