DWR’s Sustainable Groundwater Management Implementation
- Tools to Support SGM Decisions -

Water in the West Workshop
June 3, 2016
Stanford, CA
Presentation Overview

- Background
- DWR Approach to SGMA Support
  - Data Management
  - Technical Assistance
- Next Steps
Background

>20 – Websites containing SGMA data

“Data Rich”
Background

17% - Basin Area Covered by Compliant GMP’s
“Information to make informed Decisions Poor”

Central Valley (1962-2015): - 80 MAF
~ 1.5 maf/yr

Central Valley: (2005-2010)
~ 1.5 maf/yr
GW Use

Voluntary Groundwater Management (Non-Regulatory)
- Service Area Planning
- Variable Levels of Implementation
- Variable Authority
- Grant Incentives

Required Groundwater Management (Regulatory)
- Entire Basin Planning
- Required Implementation
- New GSA Authorities
- State Backstop (SWRCB)

... and Management

USGS, 2016

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GSP Regulation Overview

Regulation Articles:
1. Introductory Provisions
2. Definitions
3. Technical & Reporting Standards
4. Procedures
5. Plan Contents
6. Department Evaluation & Assessment
7. Annual Reports and Periodic Evaluations by the Agency
8. Interagency Agreements
9. Alternatives
GSP Regulation Overview

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DWR’s water information is organized and integrated in such a manner that it is universally accessible and supports watershed-based water budgets for integrated water management.
“A central feature of these bills is the recognition that groundwater management in California is best accomplished locally.”
Governor Jerry Brown, September 2014
DWR Technical Assistance

- Data Architecture
- Statewide Datasets
- Analytics and Tools
### Potential Data Architecture

#### Analysis
- Maps & Hydrographs
- Current and Future Water Budgets
- Other Analytical Tools

#### Data From
- DWR Programs
- Other Local, State, or Federal Agencies

#### Data To:
- GSA’s, Stakeholders, Public
- Data Services
- Map Applications

#### Data Set Data Mgmt.

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#### Sustainability Indicators
- Maps & Hydrographs
- Current and Future Water Budgets
- Other Analytical Tools

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Existing Statewide Datasets

https://gis.water.ca.gov/app/gicima/
Existing Statewide Datasets

Water Levels
Groundwater level data can be viewed in 3 different ways:
Depth below Ground Surface
Groundwater Elevation
Groundwater Change in Elevation

Depth Below Ground Surface
Updated May 2016
These layers show the depth to groundwater below the ground surface. Depth information is represented in feet below the ground surface. Increasing values indicate increasing depth to groundwater (or deeper/lower water levels). Negative values indicate that the groundwater level is above ground surface.

Points show the depth to groundwater values collected from wells. The contours and color ramp layers provide a smoothed approximation of the groundwater level "surface" based on the measurement data. The measurement values may not exactly match the contour or color ramp values because of the surface and contour smoothing process.

Water level measurements are selected based on measurement date and well construction information (where available) and approximate groundwater levels in the unconfined to uppermost semi-confined aquifers.

Layer Attribute Explanation:
Site Code: Unique Well ID
Local Well Name: Well ID defined by local agency or well owner
State Well Number: DWR State Well Number
WCR Number: Well Completion Report number (DWR Form 188)
Well Use: Intended use of well
Mgmt Date: Date water level measurement was collected
Mgmt Agency: Agency that collected the measurement
Existing Statewide Datasets
Existing Statewide Datasets
Existing Statewide Datasets
Potential Statewide Datasets

Groundwater Information Center Interactive Map Application

Select Data Type:
- Depth
- Elevation
- Change

Select Layer Group:
Spring 2015 Depth

Show Layers:
- Points
- Contours
- ColorRamp

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Visit Website
Potential Statewide Datasets

- USGS GW Data
Potential Statewide Datasets

- USGS GW Data
- Well Data
  - Domestic
  - Production
- Aquifer Data
Potential Statewide Datasets

- GWL and GWS
  - USGS GW Data
  - Well Data
    - Domestic
    - Production
  - Aquifer Data
- Water Quality
- GAMA

Groundwater Information Center Interactive Map Application

[Map Image]
Potential Statewide Datasets

GWL and GWS
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- GAMA
- Base of Fresh GW

Groundwater Information Center Interactive Map Application

Base of Fresh Water

Last Updated: 05/04/2016

The purpose of this base of fresh groundwater (BFW) map is to identify the approximate lower limit and the thickness of the fresh water aquifer system in the Sacramento Valley. Fresh groundwater is defined in this study as water containing less than 1,000 mg/l total dissolved solids (TDS) (approximately 1,550 μS/cm conductivity). The BFW was estimated based on a comparative analysis of geophysical logs and lithologic data from 2,065 geophysical logs from groundwater resources wells and CA Division of Oil, Gas, and Geothermal Resources (DOGGR) well records.

The BFW is an uneven boundary that in some places reflects the major geologic structures underlying the Sacramento Valley, and in other areas, transgresses underlying geologic structures. In some areas, the BFW boundary is well above the base of post-Eocene marine strata. This is most likely caused by high artesian pressures and upward vertical gradients in deep aquifers in the Sacramento Valley, which have been documented in Department of Water Resources (DWR) monitoring wells. This suggests that migration of poor quality water into continental sediments that previously contained freshwater that occurred over geologic time. This finding has implications for brackish and saline water upconing beneath areas of prolonged groundwater pumping in the Sacramento Valley.

A PDF of the BFW map which contains additional information such as criteria for approximating the base of fresh groundwater, definition of fresh groundwater, data sources and references can be found [here].

Groundwater Resources Data: This layer depicts the location and approximate base of fresh groundwater elevation of 58 groundwater resources wells.

Layer Attribute Explanation:

Download
Potential Statewide Datasets

GWL and GWS
- USGS GW Data
- Well Data
  - Domestic
  - Production
- Aquifer Data

Water Quality
- GAMA
- Base of Fresh GW

Subsidence
- USGS Data
- NASA – InSAR
- Infrastructure
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- Infrastructure

- SW/GW Interaction
  - Stream Gages
  - GDE’s
  - Interconnected SW

TNC, 2016
Potential Statewide Datasets

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  - GDE’s
  - Interconnected SW
- Water Budget
  - Land Use
  - ET
Potential Analytics and Tools

DWR Technical Assistance Objectives:

• General Information and Importance of GW
• Technical Information for Practitioners

Analysis

Sustainability Indicator Specific
• GW contour maps & storage estimates
• GDE’s & Interconnected streams

SGMA Performance
• GSP Evaluation – Dashboard Concept

Summary Reports
• B-118 “CA Groundwater”
• B-160 “CA Water Plan”

Tools

DWR Developed
• IWFM (C2VSim)
• Contour and Hydrograph Tools

DWR Services
• Surveying
• Well Video
• Well Logging?

Non-DWR Tools
Next Steps

• **Engage** — Stakeholders and Tech Experts
  – What is the most effective and efficient way to setup our “Big Data Platform”?  
  – What statewide datasets and tools should be prioritized?  
  – What data delivery methods will work best for GSA’s and Stakeholders?

• **Prioritize** — Datasets and Tools

• **Build & Expand** — Data Platform & Tech. Assistance

• **Maintain** — Data Collection, Standards, Funding