



Expert Panel on Groundwater Sustainability

Energy & Environment Committee
November 7, 2024

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Water Resilience Policies and Strategies in Connect SoCal

Promote sustainable water use planning, practices and storage that improve regional water security and resilience in a drier environment

Collaborate with partners to foster adoption of systems and technologies that can reduce water demand and/or increase water supply



Connect SoCal[™]

Expert Speakers



Dr. Greg Pierce
Director – UCLA Water Resources Group
Co-Executive Director at Luskin School of Innovation



Anita Regmi
Senior Engineering Geologist
California Department of Water Resources



CALIFORNIA DEPARTMENT OF
WATER RESOURCES



Arne Anselm
Deputy Director of Water Resources
Ventura County Public Works



How important is groundwater for regional water supply and other factors?

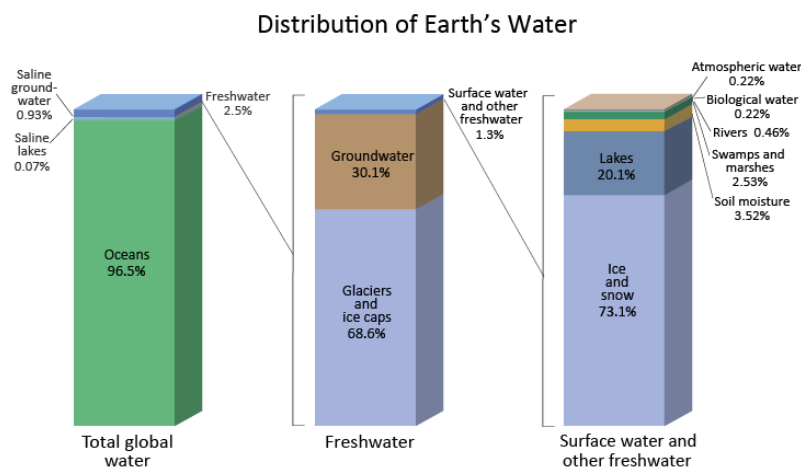
Greg Pierce, PhD
November 7, 2024

UCLA Luskin Center
for Innovation

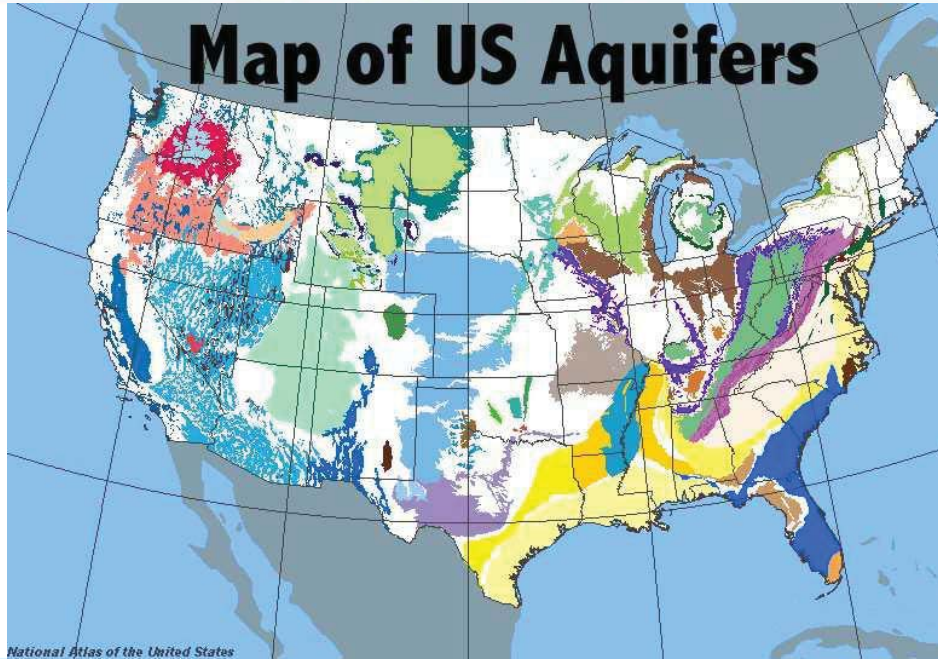
Overview

1. How important is groundwater for regional water supply and other factors?
 - a. For developed areas? For rural areas?
 - b. How is groundwater recharged?
 - c. How important is natural and agricultural lands preservation for groundwater recharge?

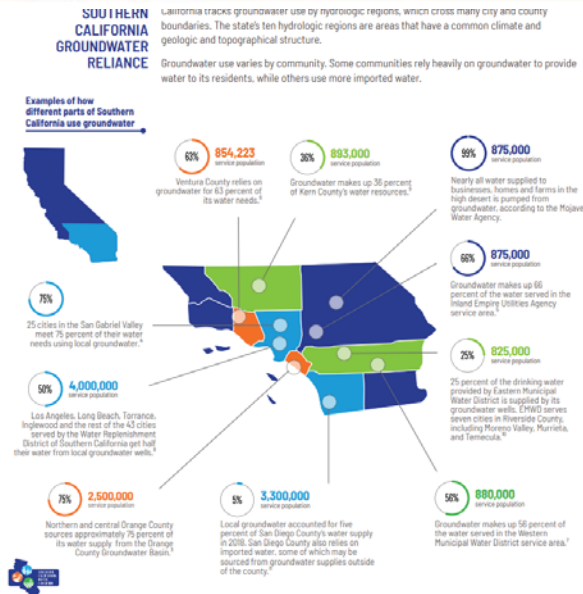
At any given point, water is:



Groundwater availability and management varies



Groundwater's Importance in SoCal

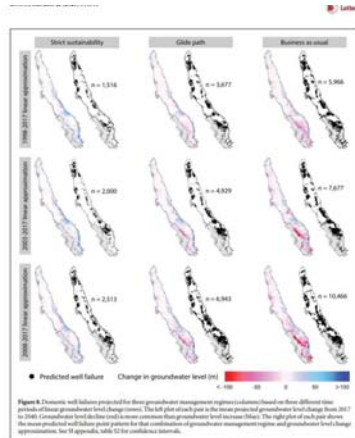


Source: Southern California Water Coalition, https://socalwater.org/wp-content/uploads/groundwater-fact-sheet-06202019_49398.pdf

Groundwater's Importance in rural areas

~90% of small publicly regulated water systems are 100% reliant on groundwater

~ 2-6% of Californians are 100% reliant on private groundwater wells

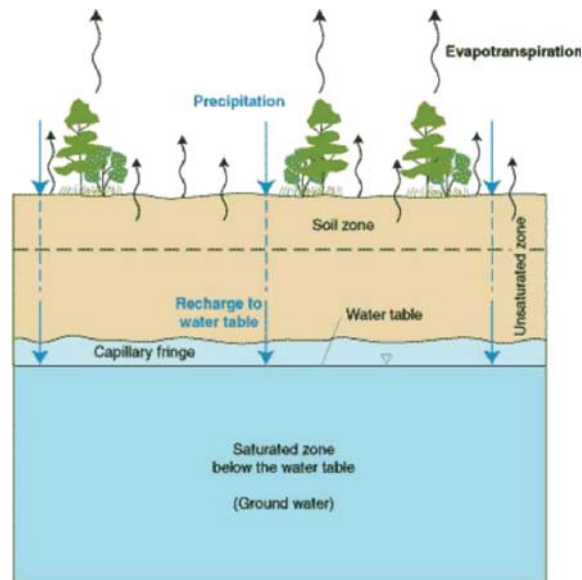


Domestic well vulnerability to drought duration and unsustainable groundwater management in California's Central Valley. R A Pauloo *et al* 2020 *Environ. Res. Lett.* **15** 044010

When water hits the ground it will:

- Infiltrate into ground (Groundwater)
- Runoff to body of surface water (Managed Stormwater)
- Evapotranspire (Irrigation)

How is Groundwater Recharged: Naturally



Groundwater Management Complexity

— 20 Years Ago a Pretty Good Idea: The UC Davis Center for Watershed Sciences

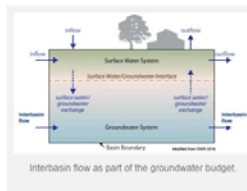
Accounting for groundwater movement between subbasins under SGMA

Posted on October 8, 2017 by [ssosis](#)

by [Christina Buck](#), [Jim Blanke](#), [Reza Namvar](#), and [Thomas Harter](#)

The Sustainable Groundwater Management Act (SGMA) presents many new challenges and opportunities. One challenge is accounting for 'interbasin flow,' or subsurface groundwater movement between subbasins, a piece of the overall water budget required in Groundwater Sustainability Plans (GSPs).

The Department of Water Resources is tasked with evaluating whether groundwater management in one subbasin will undermine an adjacent subbasin's ability to reach sustainability. Recognizing that subbasins throughout the Central Valley are interconnected, it's much better to address this technical and management challenge up front rather than have each subbasin individually submit their GSP and hope for the best.



To tackle this issue, the [Water Foundation](#) funded a project administered by [Butte County Department of Water and Resource Conservation](#) that gathered a group of Technical Collaborators (TC) to discuss and provide recommendations on quantification of interbasin flow in GSPs. Since interbasin flows cannot be measured directly, the project reviewed available groundwater models to investigate how they may or may not be suitable in estimating interbasin flows within the northern Sacramento Valley.

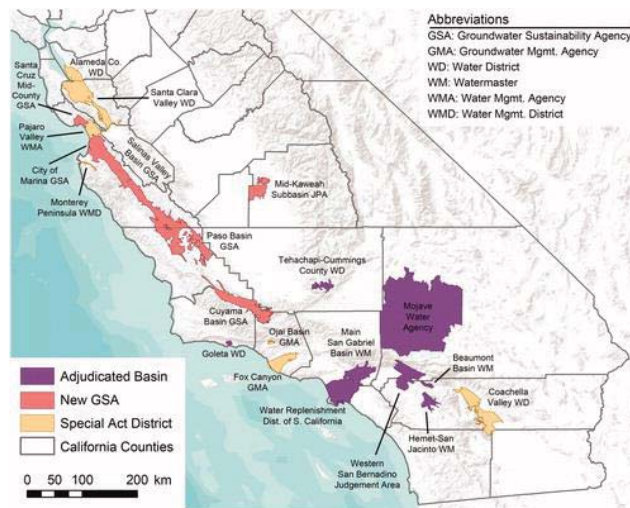
Enhancing GW recharge: technical steps

- Increase or return surface area to permeability
 - Paved= impervious
- Focus urban stormwater capture interventions where GW basins exist and can be reached
- Flood managed aquifer recharge (MAR) is a “new” technique in rural areas

Enhancing GW recharge: governance

- Adjudicated groundwater basins are a huge management success story in much of urbanized Southern California
- The recent Sustainable Groundwater Management Act required the formation of locally-controlled agencies in the State’s high- and medium-priority groundwater subbasins

Enhancing GW recharge: governance



See <https://www.tandfonline.com/doi/full/10.1080/08941920.2020.1801923>

Importance of Natural/Agricultural lands?

- Important for spreading grounds generally: permeable and larger surface area
- Managed aquifer recharge (MAR) on agricultural lands and working landscapes, includes but is not limited to refuges, floodplains, and flood bypasses.
- Just like broader stormwater management, Flood-MAR can be implemented at multiple scales

Importance of Natural/Agricultural lands?

Overall impacts and externalities too soon to tell but estimates:

- Restore 9-22% of overdraft in the San Joaquin Valley
- Up to 3 million Acre Feet at state level (~35-40 MAF total use)
- Tradeoffs with ecological surface water use

Questions?

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UCLA

**Luskin Center
for Innovation**

Overview of Groundwater Overdraft in California

Southern California Association of Governments

Energy and Environment Committee Meeting, November 7, 2024



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Anita Regmi, Senior Engineering Geologist

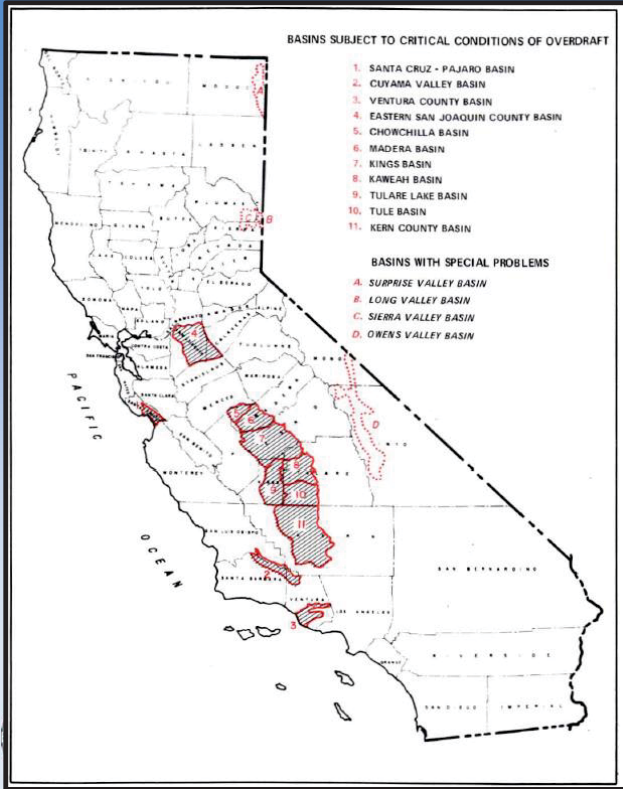
Definitions of Overdraft and Critical Overdraft Conditions

- **Bulletin-118, 1980 update, Critical Condition of Overdraft or Critically Overdrafted Basin (COD):**
A basin is subject to critical conditions of overdraft when the continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts.
- **Bulletin-118, 2020 update: Overdraft** “the condition of a groundwater basin or subbasin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions.
- **Water Code Section 10735 (a): “Condition of long-term overdraft”** means the condition of a groundwater basin where the average annual amount of water extracted for a long-term period, generally 10 years or more, exceeds the long-term average annual supply of water to the basin, plus any temporary surplus.

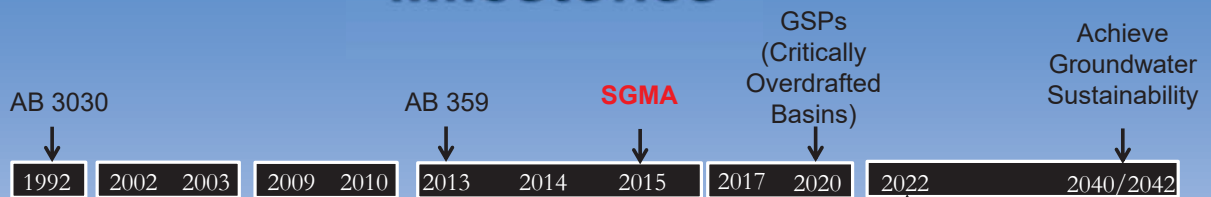


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Critical Overdraft Conditions in 1980 vs 2016



California's Groundwater Management Milestones



Voluntary Groundwater Management (Non-Regulatory)

- Service Area Planning
- Variable Levels of Implementation
- Variable Authority
- Grant Incentives

Legally Mandated Groundwater Management (Regulatory)

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

Impacts of Groundwater Overdraft

- Groundwater Level Decline
- Reduction of Groundwater Storage
- Seawater Intrusion
- Water Quality Degradation
- Land Subsidence
- Depletion of Interconnected Surface Water

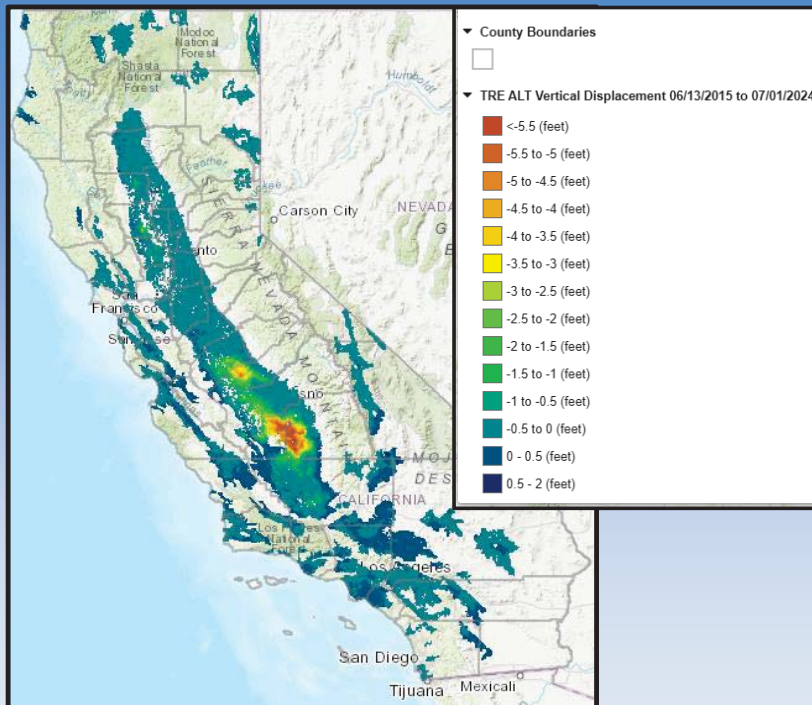


20-Year Groundwater Level Trends

Groundwater Level Change Spring 2023 to Spring 2024



Land Subsidence



Map of Current Groundwater Conditions Based on Historical Averages

Thank You!

Questions?

Email: anita.regmi@water.ca.gov

Phone: (818) 429-2414

Link to the dry well reporting system: <https://mydrywatersupply.water.ca.gov/report/>



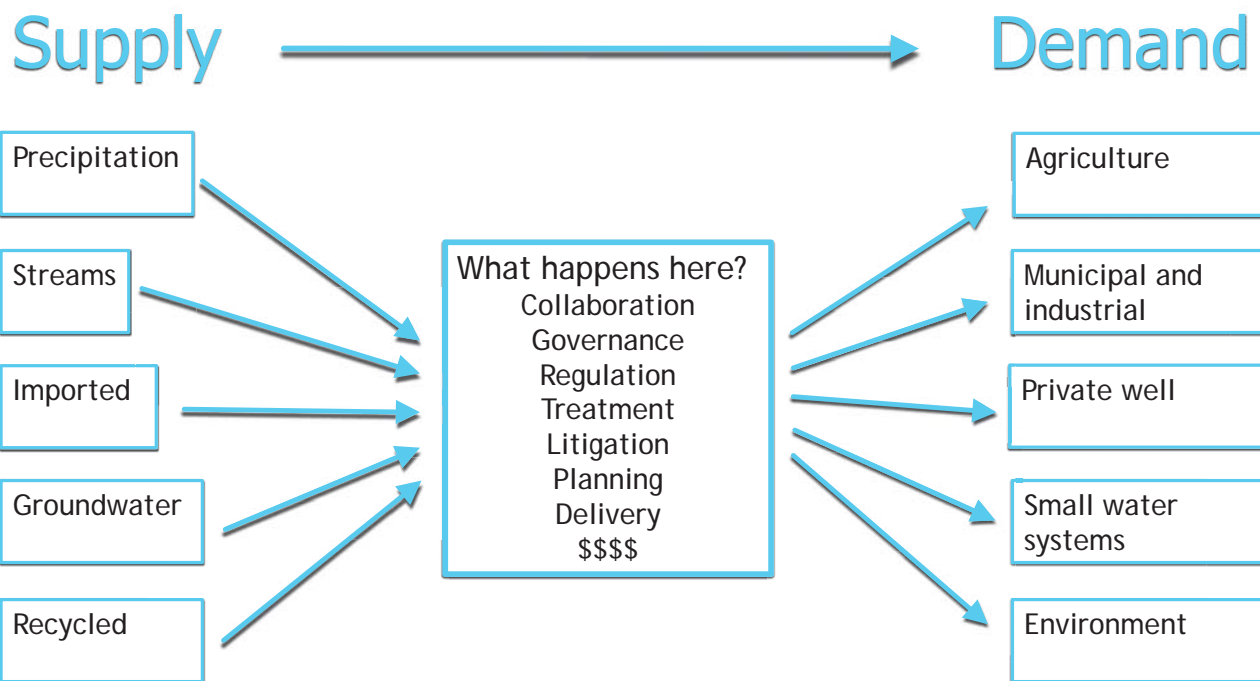


Means and Strategies to Ensure Sufficient and Safe Groundwater Supply

SCAG's Groundwater Sustainability Panel

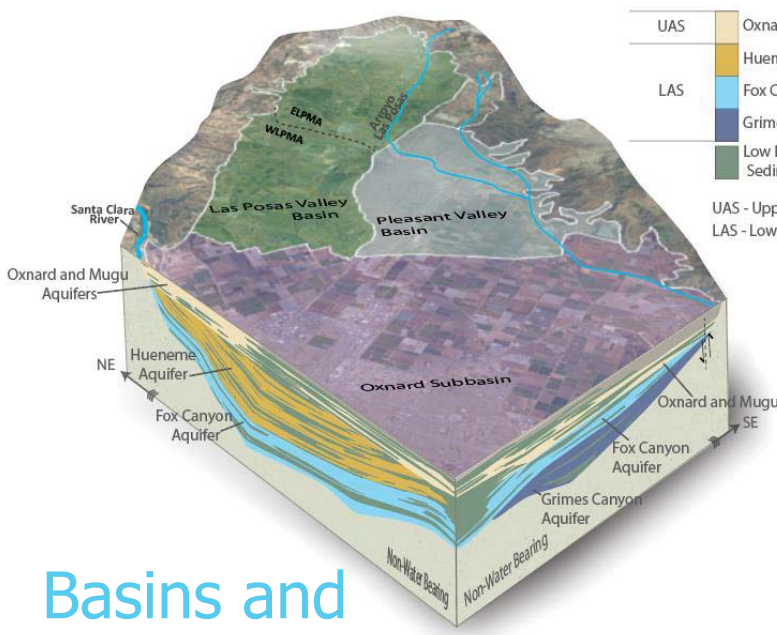
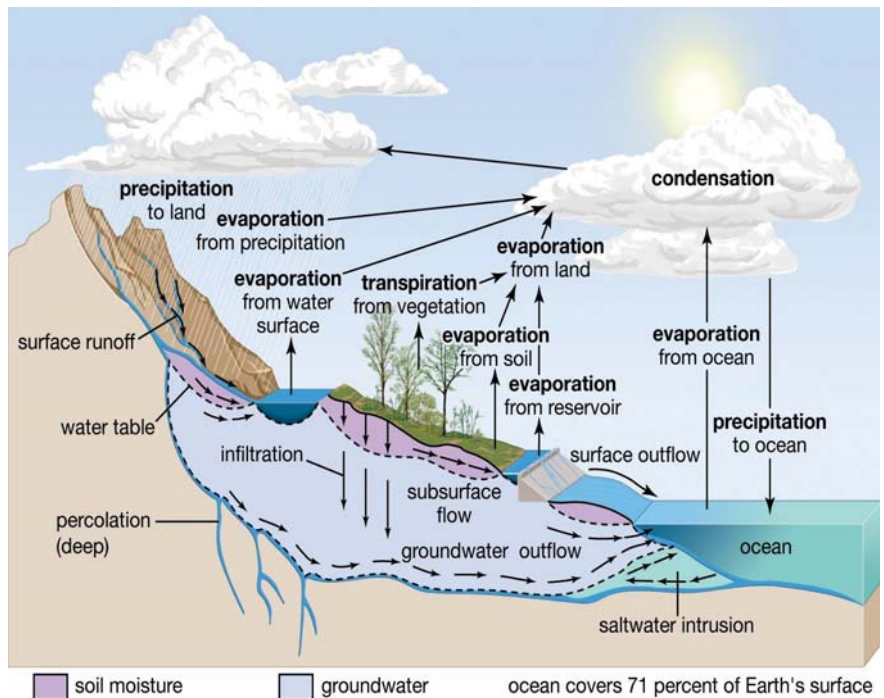
Arne Anselm, Deputy Director
Ventura County Public Works Agency

Thursday, November 7, 2024

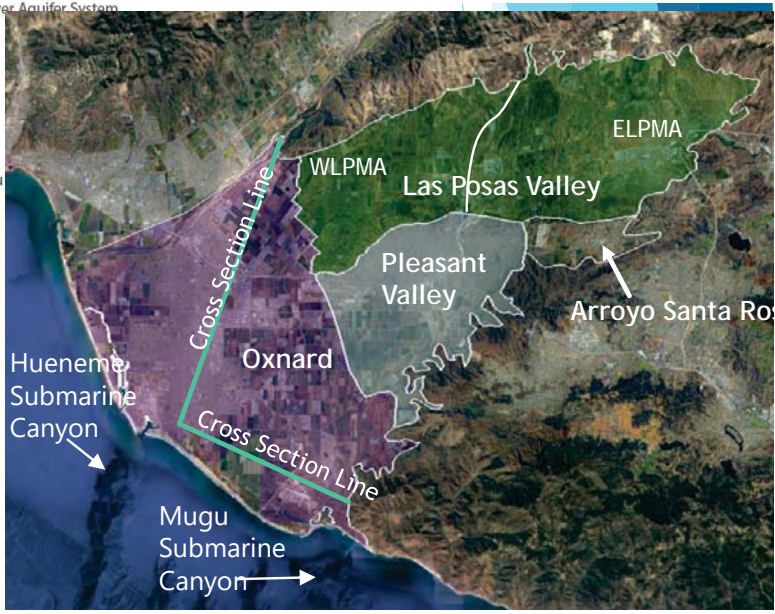


Hydrologic Cycle

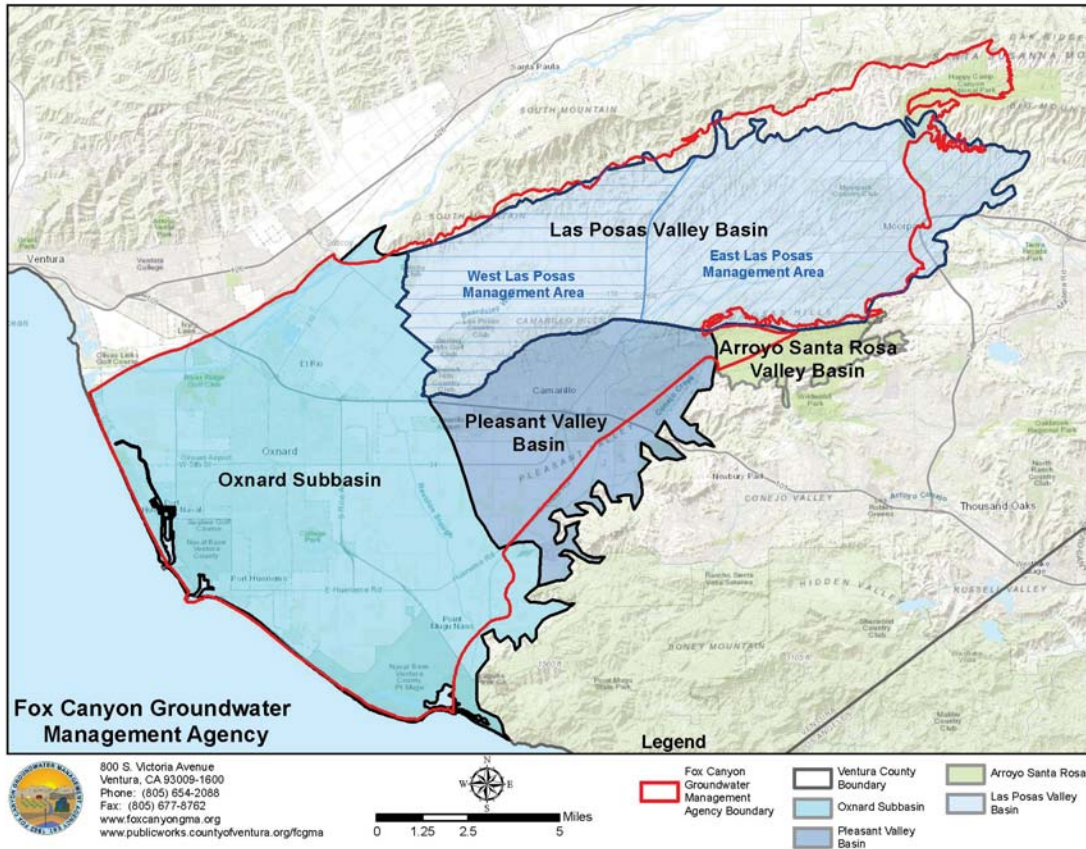
- Protect infiltration
 - Outcrop area
 - Low Impact Development
- Minimize losses
 - Arundo
 - Outflow / Saltwater
- Conjunctive use



Complicated hydrogeology

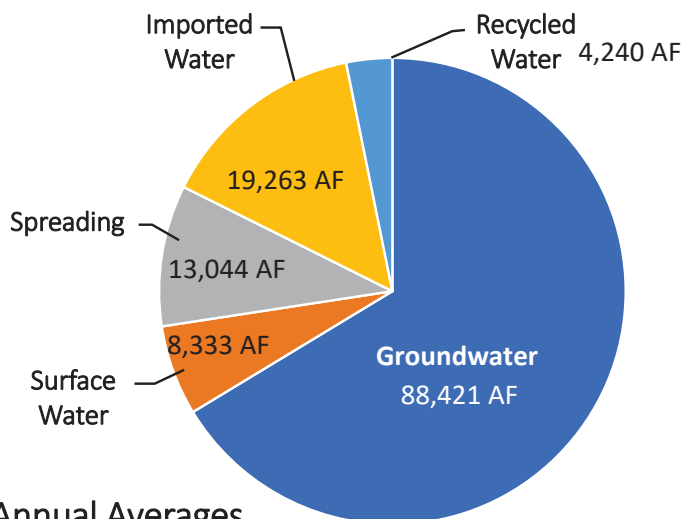


Basins and Aquifers are interconnected



Water Sources & Usage – Oxnard & PV Basins

Water Sources

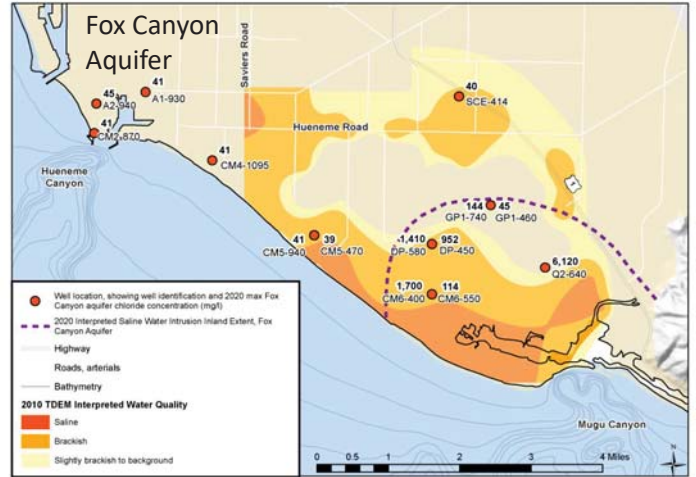
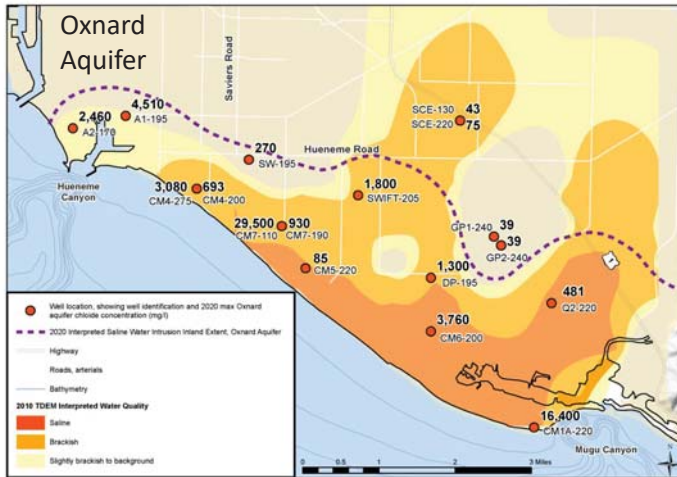


Usage by Sector

Agricultural	53%
Municipal	37%
Spreading	10%

Annual Averages
2016-2021

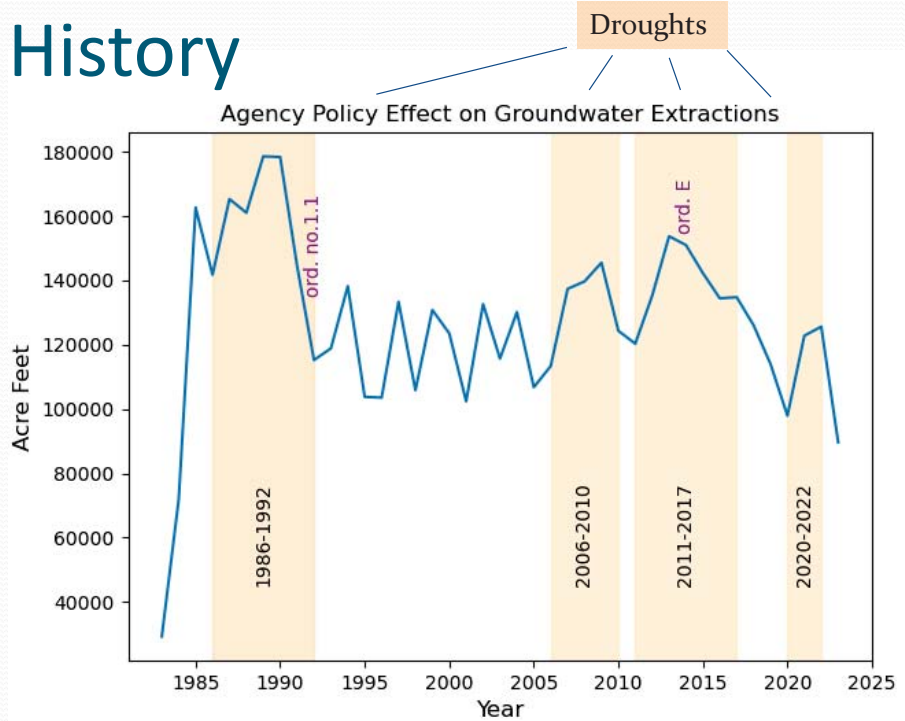
Seawater Intrusion



Figures: UWCD OFR 2021-03, November 2021

FCGMA Brief History

- AB 2995 (1982)
- Fox Canyon Aquifer
- Multiple basins
- Hydrological connectivity
- Complicated



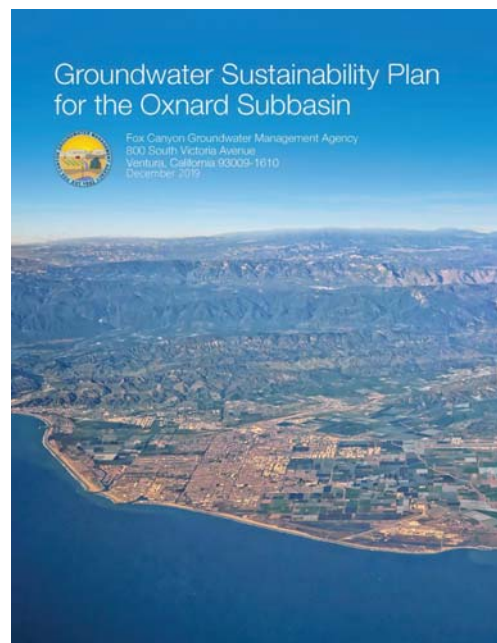
Groundwater Sustainability Agencies

Groundwater Sustainability Agency
Cuyama
Carpinteria
Upper Ventura River
Fillmore and Piru
Mound
Arroyo Santa Rosa
Fox Canyon Oxnard Pleasant Valley Las Posas Valley



SGMA & GSPs

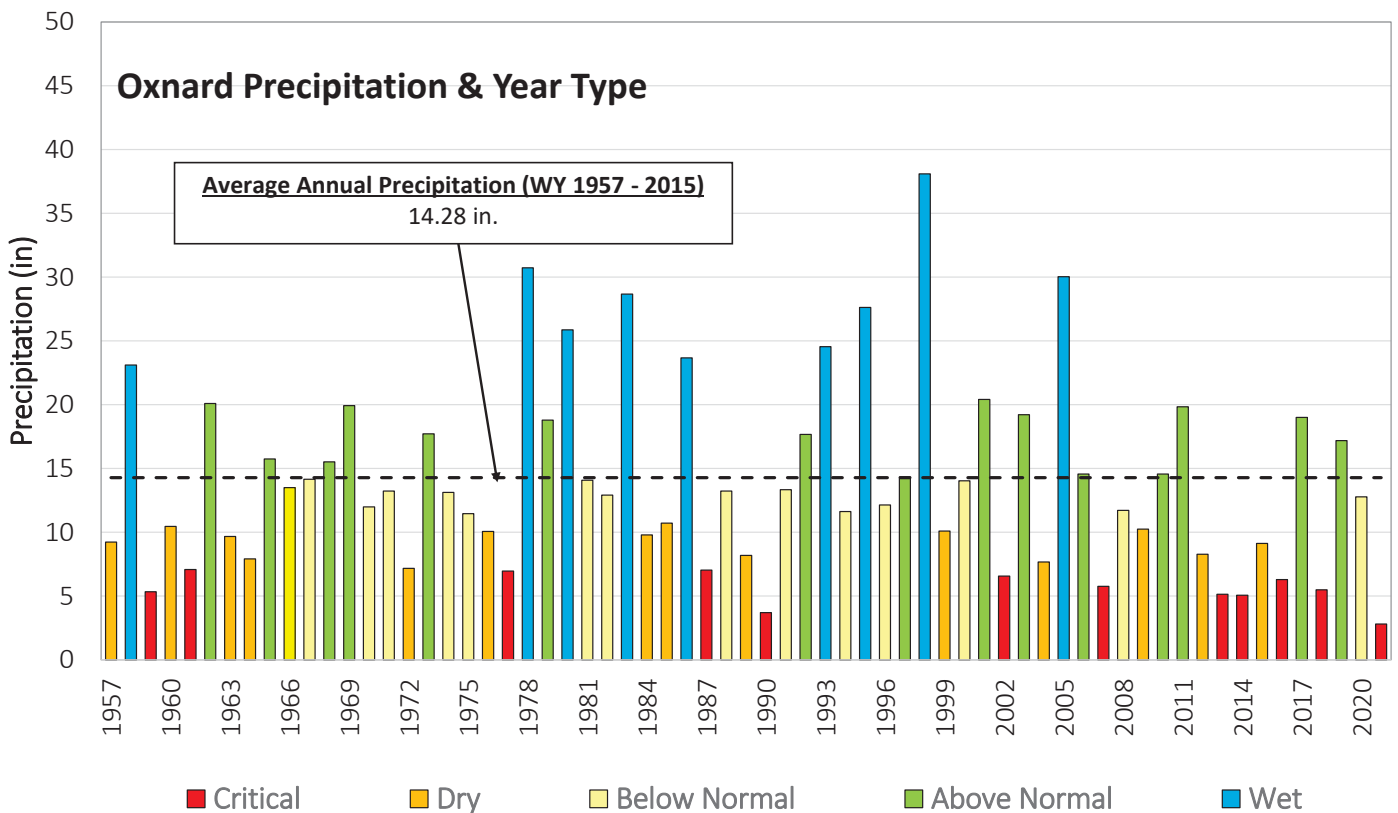
- Sustainable Groundwater Management Act (SGMA)
 - Effective January 2015
 - Requires sustainable management by 2040
 - New authority for Fox Canyon GMA to implement projects
- Groundwater Sustainability Plans (GSPs)
 - Adopted Dec 2019
 - Approved by DWR Nov 2021 & Jan 2022
 - Technical information about basins
 - Undesirable results and sustainable yield
 - Plan to sustainable management
 - Reviewed and updated minimum of every 5 years



Challenges

- Groundwater use exceeds sustainable yield – will lead to undesirable results
- No “low hanging fruit” – easy stuff has been done
- Future uncertainties
 - Precipitation
 - Flows in the Santa Clara River
 - Availability of State Water Project imported water
- Project planning
 - Feasibility, environmental permitting / restrictions
 - Funding / cost
(\$100s of millions for projects under consideration)
 - Timelines

OPV Sustainable Yield ≈ 51,000 AFY
Avg Extractions ≈ 88,000 AFY



Opportunities & Solutions

Projects

- **Infrastructure Projects**
 - Pipelines for interconnection
- **Water Supply Projects**
 - Recycled water
 - Stormwater capture (recharge limited by clays in many areas)
 - Imported water
 - Brackish / saline desalting
- **Mitigation Projects**
 - Seawater intrusion barriers

Management Actions

- Stakeholder Engagement
- Regional Partnerships
- Water Market
- **Extraction Reductions - least preferred**

\$15.2 Million SGM Grant award to FCGMA for projects in Oxnard & PV Basins

- Camarillo Stormwater Diversion Feasibility Study
- UWCD Ferro-Rose Recharge Basin
- UWCD Recycled Water Interconnection Pipeline
- UWCD Monitoring Wells
- PVCWD Recycled Water Connection Pipeline
- PVCWD Private Reservoir Program
- FCGMA Monitoring Wells – more and better data

Questions

ARNE ANSELM

Deputy Director, Water Resources
Ventura County Watershed Protection District

Interim Executive Officer
Fox Canyon Groundwater Management Agency



THANK YOU!

For more information, please visit:

www.scag.ca.gov