

# Ojai Basin Boundary Modifications and The Quest for an Alternative Plan

OBGMA

Jordan Kear, PG, CHG  
27 October 2016



# Discussion

- SGMA Compliance
- Basin Boundary Changes
  - Sustainability
  - Alternative Plan

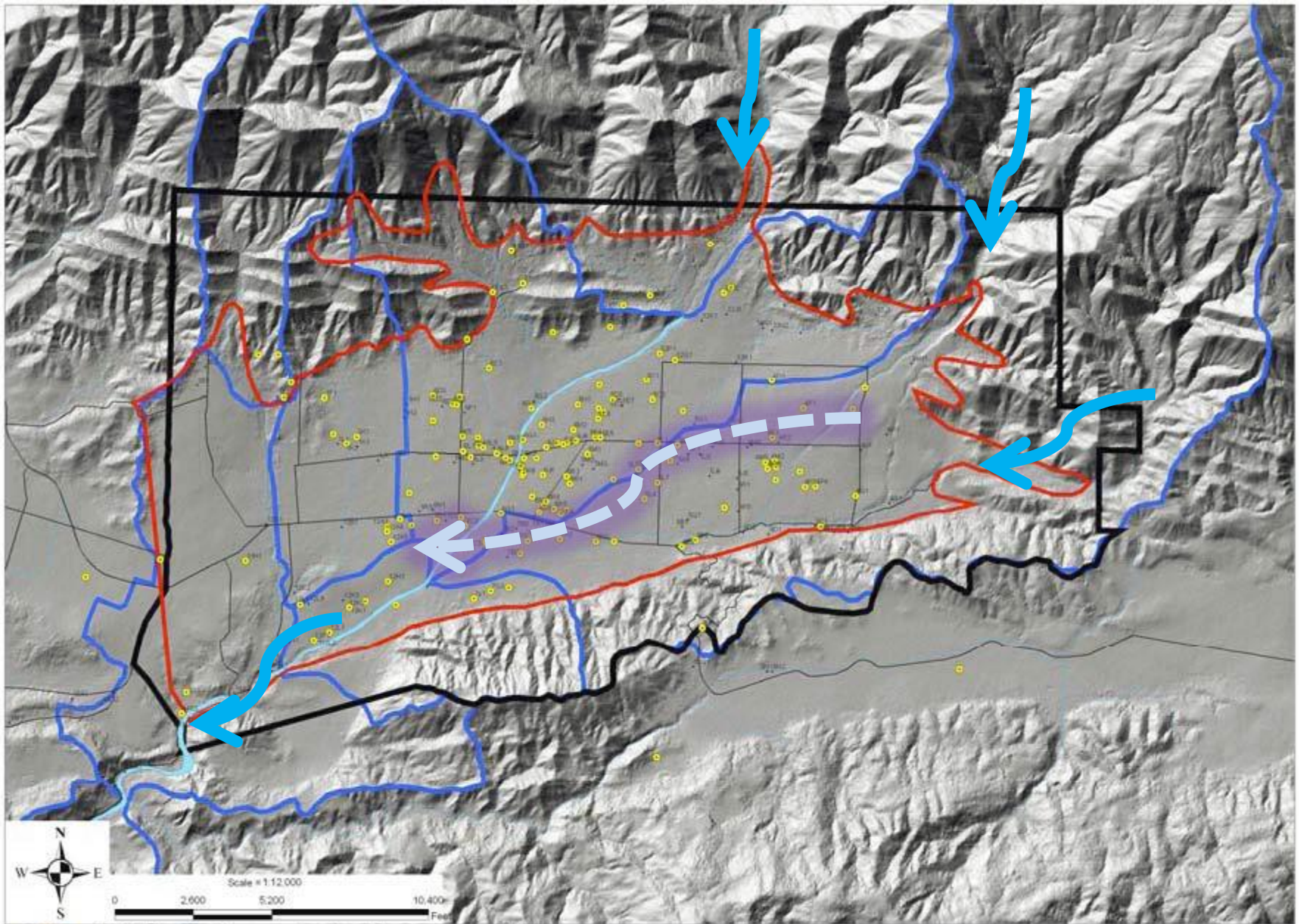
# SGMA defines Sustainability

- SGMA defines “sustainable groundwater management” as the “management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results”.

# Undesirable Results

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality
- Significant and unreasonable land subsidence
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water





### Ojai Basin Groundwater Management Agency

P.O. Box 1570  
 Ojai, CA 93024  
 Phone: (805) 640-1207  
 Fax: (805) 640-8134

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 Ojai Valley Groundwater Management Agency

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#### Legend

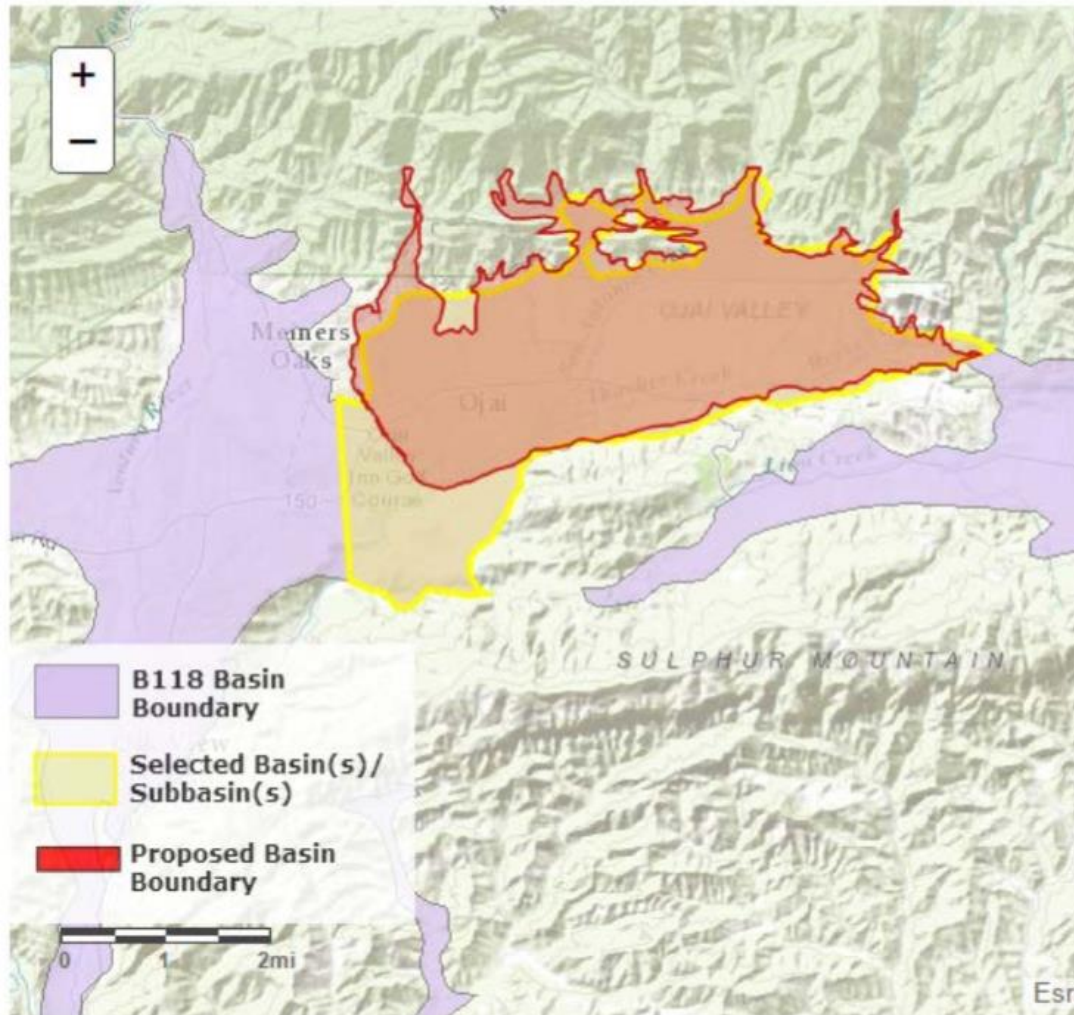
-  San Antonio Watershed
-  Ojai Valley Groundwater Basin
-  OJGMA Boundary
-  Active Wells

**Figure 2: Active Well Location Map**



**Basin ID:** 4-02 OJAI VALLEY

**DWR Region Office:** SRO



**Requesting Agency:** Ojai Basin Groundwater Management Agency, P.O.Box 1779, Ojai, CA 93024

**Modification Category:** Scientific External

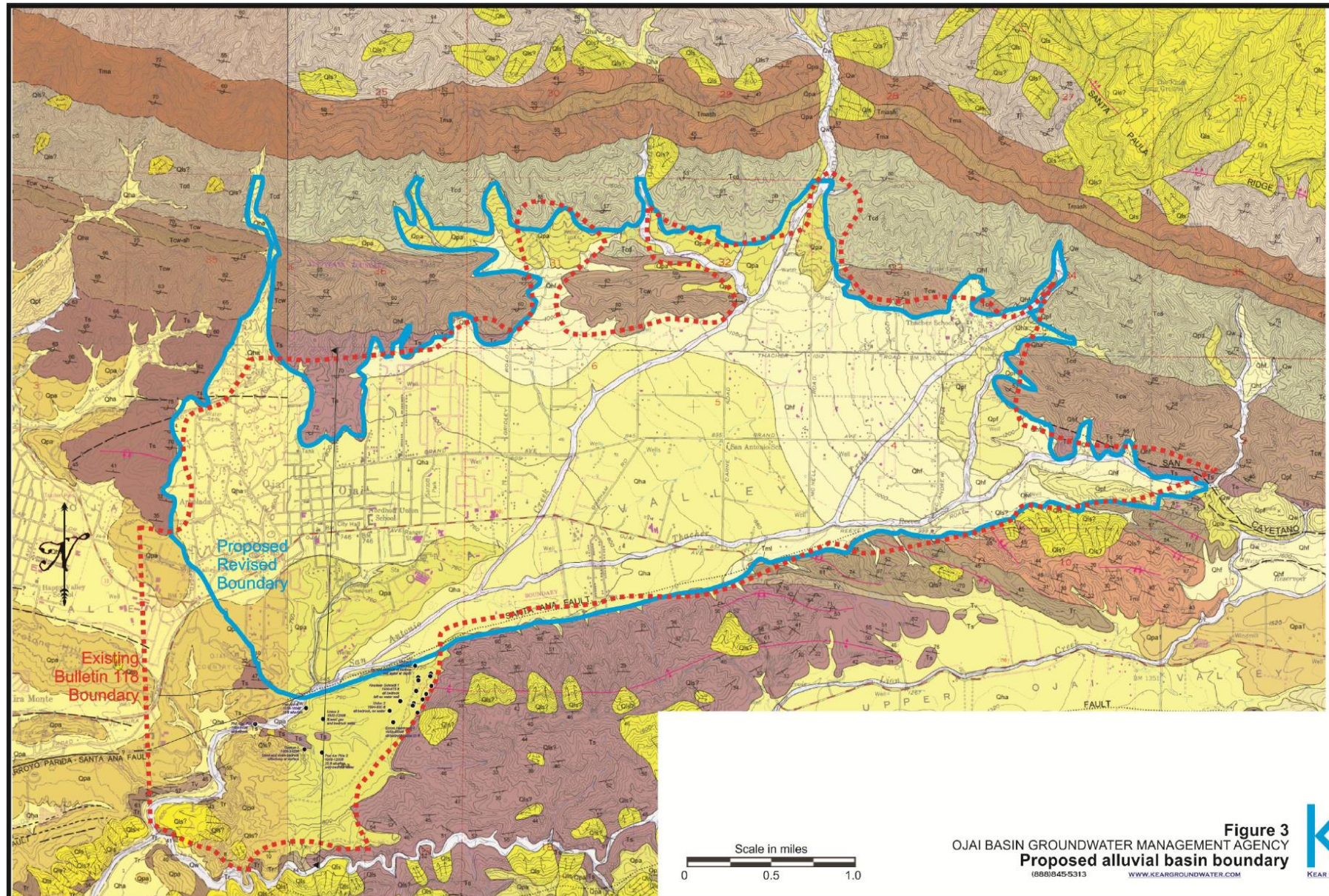
**Modification Overview:** To modify Bulletin 118 boundary of the Ojai Basin to be consistent with the geological boundary.

**Other Affected Basins:** None

**Commenters:** Steve McClary (City of Ojai), Erik Ekdahl (State Water Resources Control Board)

**DWR Recommendation:** Approved

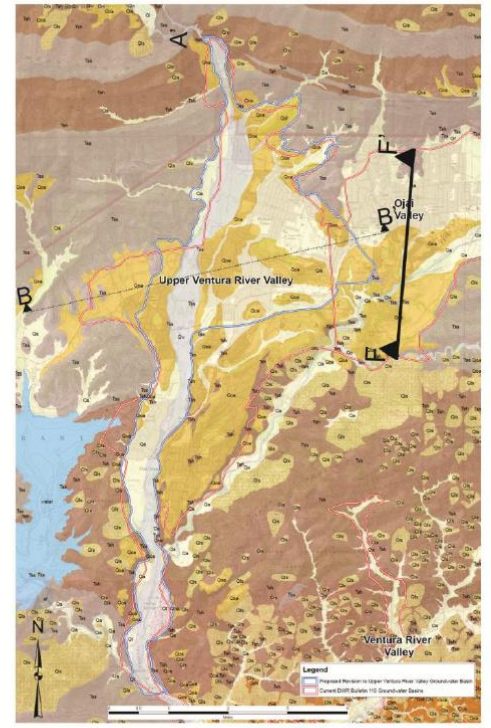
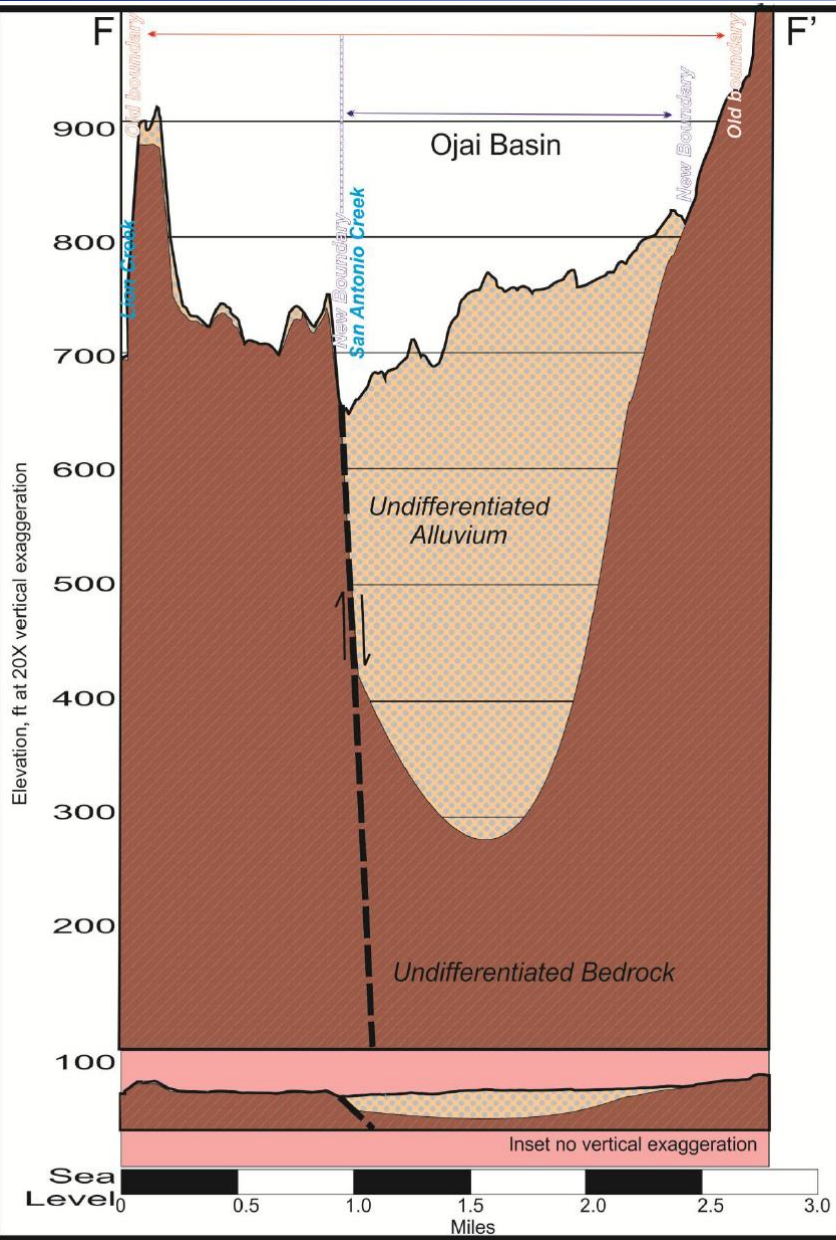




**Figure 3**  
 OJAI BASIN GROUNDWATER MANAGEMENT AGENCY  
**Proposed alluvial basin boundary**  
 (888)845-5313      WWW.KEARGROUNDWATER.COM







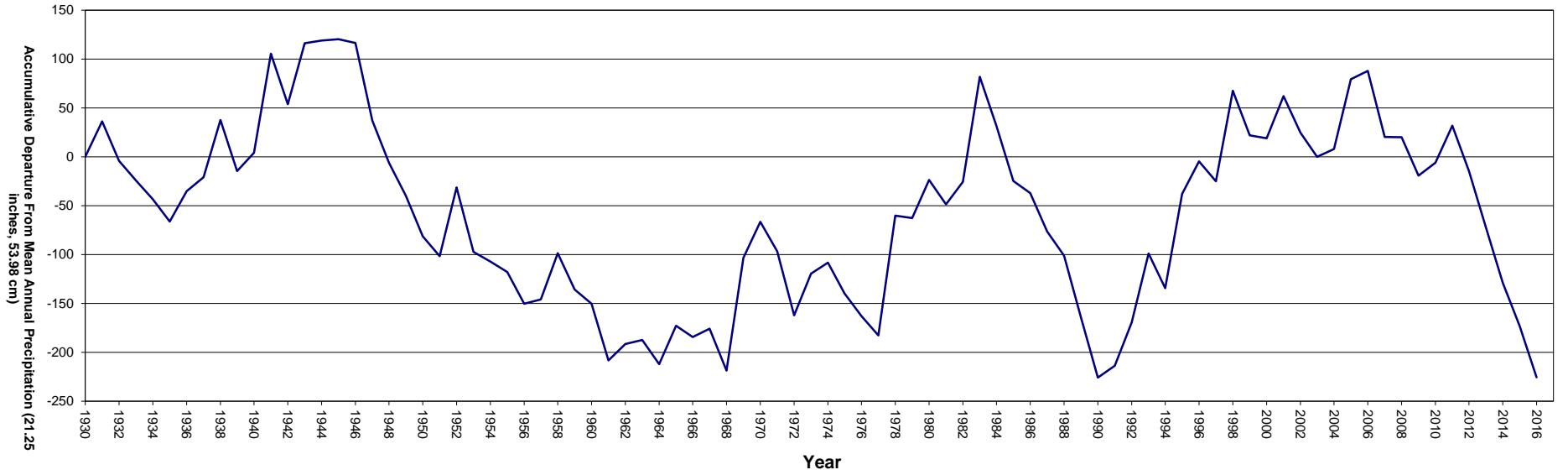
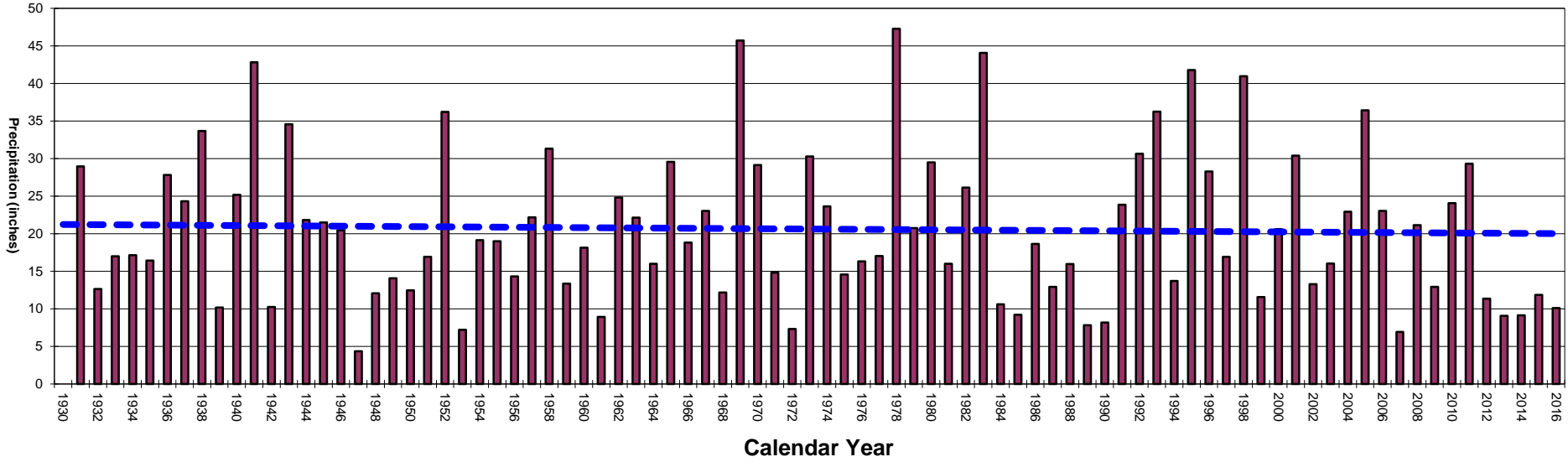
Ojai Basin  
**Figure 5**  
 Central Cross Section  
 Western Basin Area  
 View looking west



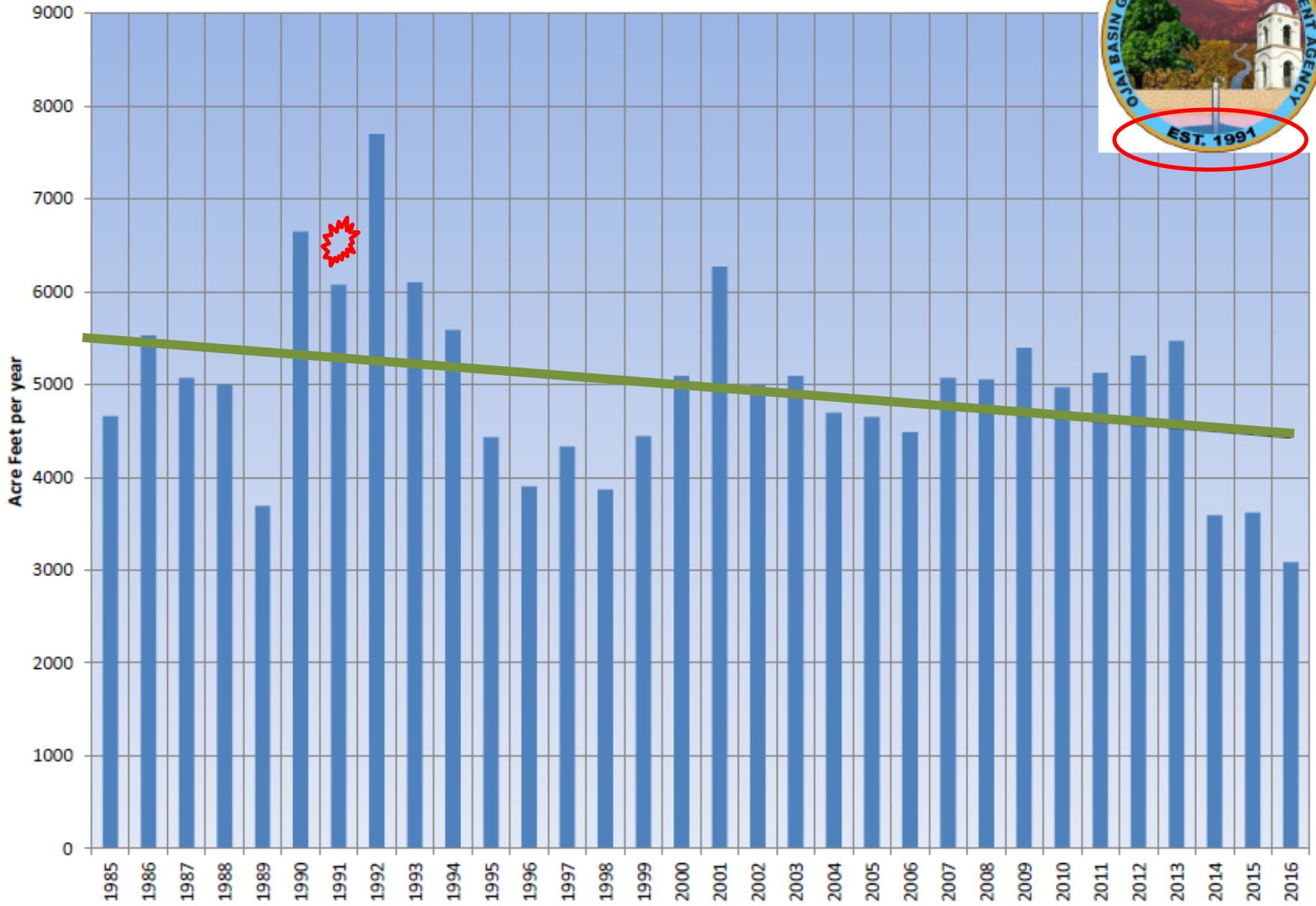


Rain Gauge Location: 34.4480 N 119.2300 W

Rain Gauge Elevation: 745 ft (227 m) above mean sea level

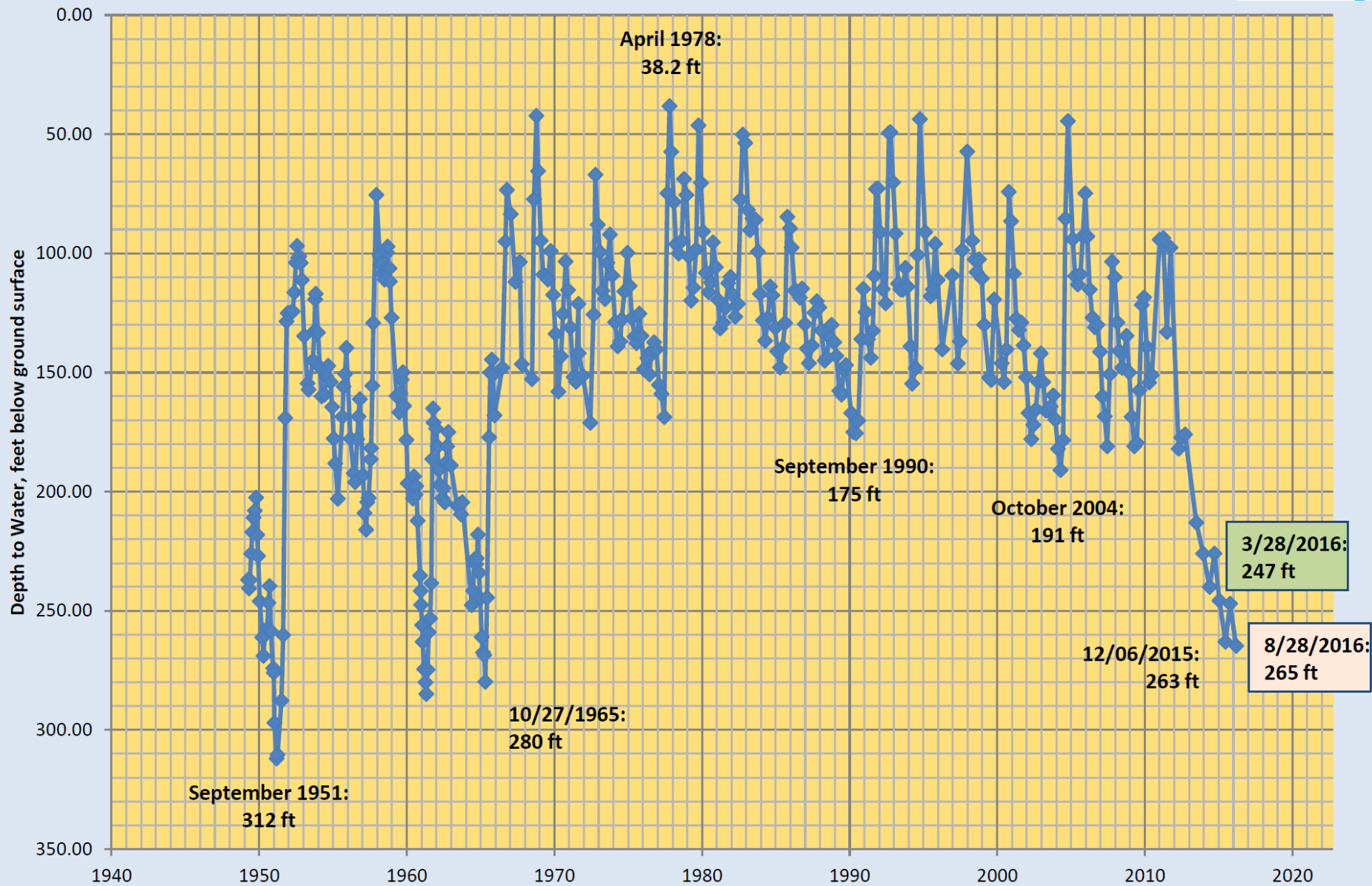


# Estimated Total Groundwater Extractions





# Depth to Water: Ojai Basin Key Well 04N/22W-5L8 (Carne and Grand)

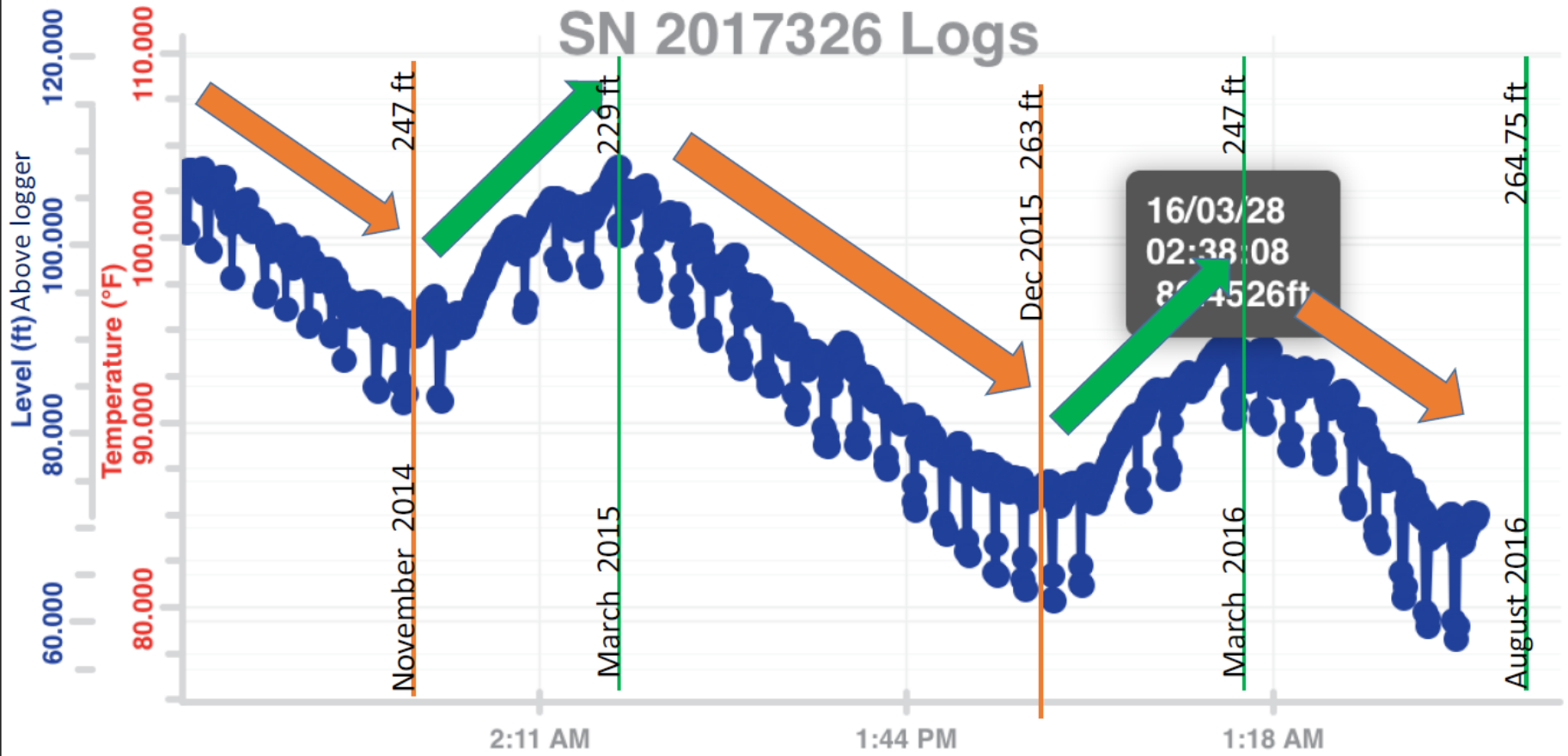




# Plot



## SN 2017326 Logs



May 2014 to date continuous water level record, Key Well area, Carne and Grand



# Perpetual Dynamic State

- Either in a state of recharge or recession
- No snapshot is accurate, outdated quickly
- Best to report to constituents

(council, boards), as of October 27, 2016

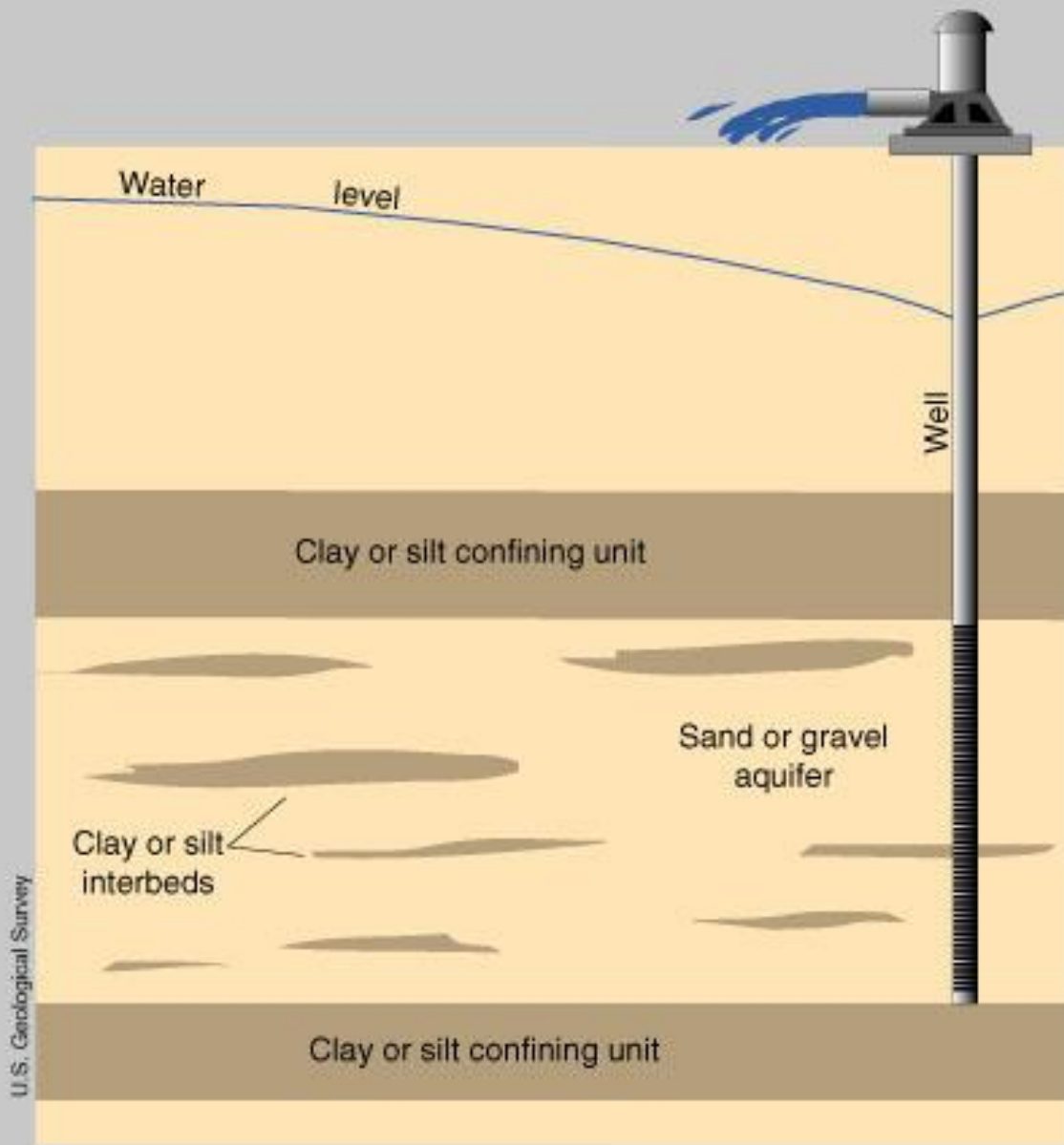
- *Ojai Basin is 45% full*
- *There are an estimated 37,400 acre feet in storage in the Ojai GW Basin*
- *Groundwater Levels and Basin storage are trending upward consistent with this time of year*

S. R. Anderson/U.S. Geological Survey



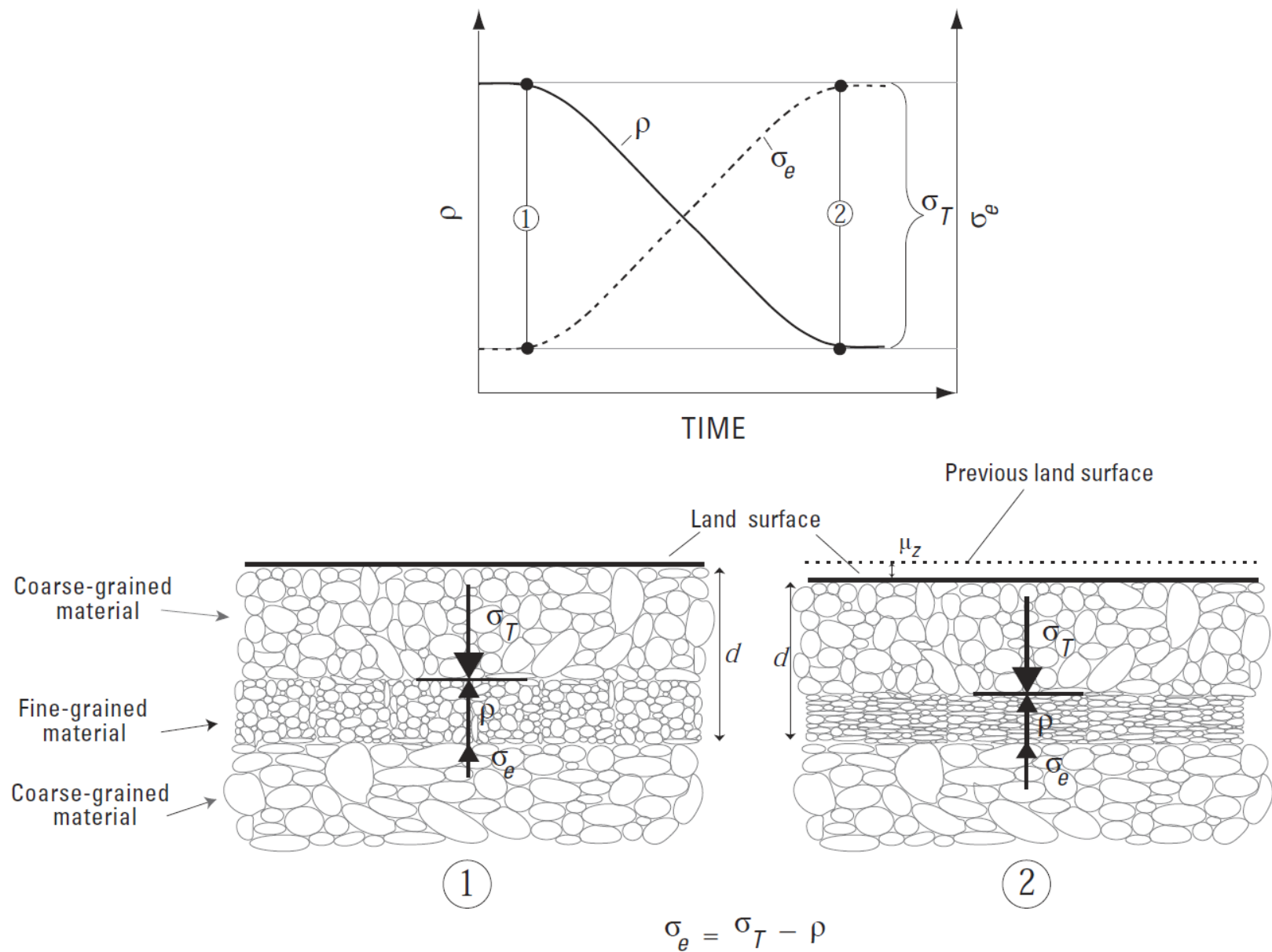
Sign warning motorists of subsidence hazard was erected after an earth fissure damaged Snyder Hill Road in Pima County, Arizona, 1981.





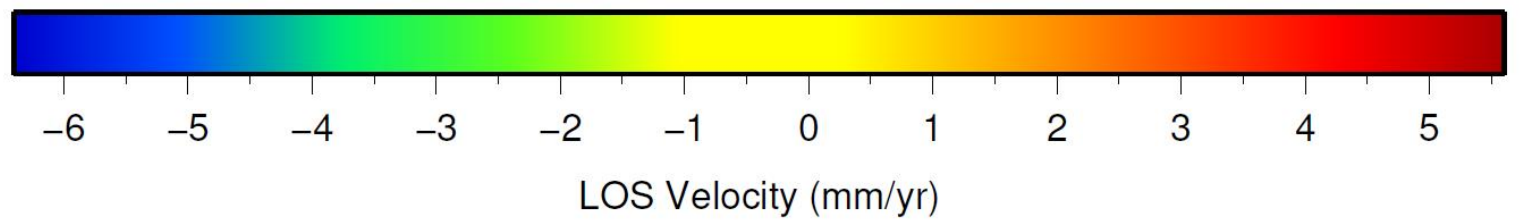
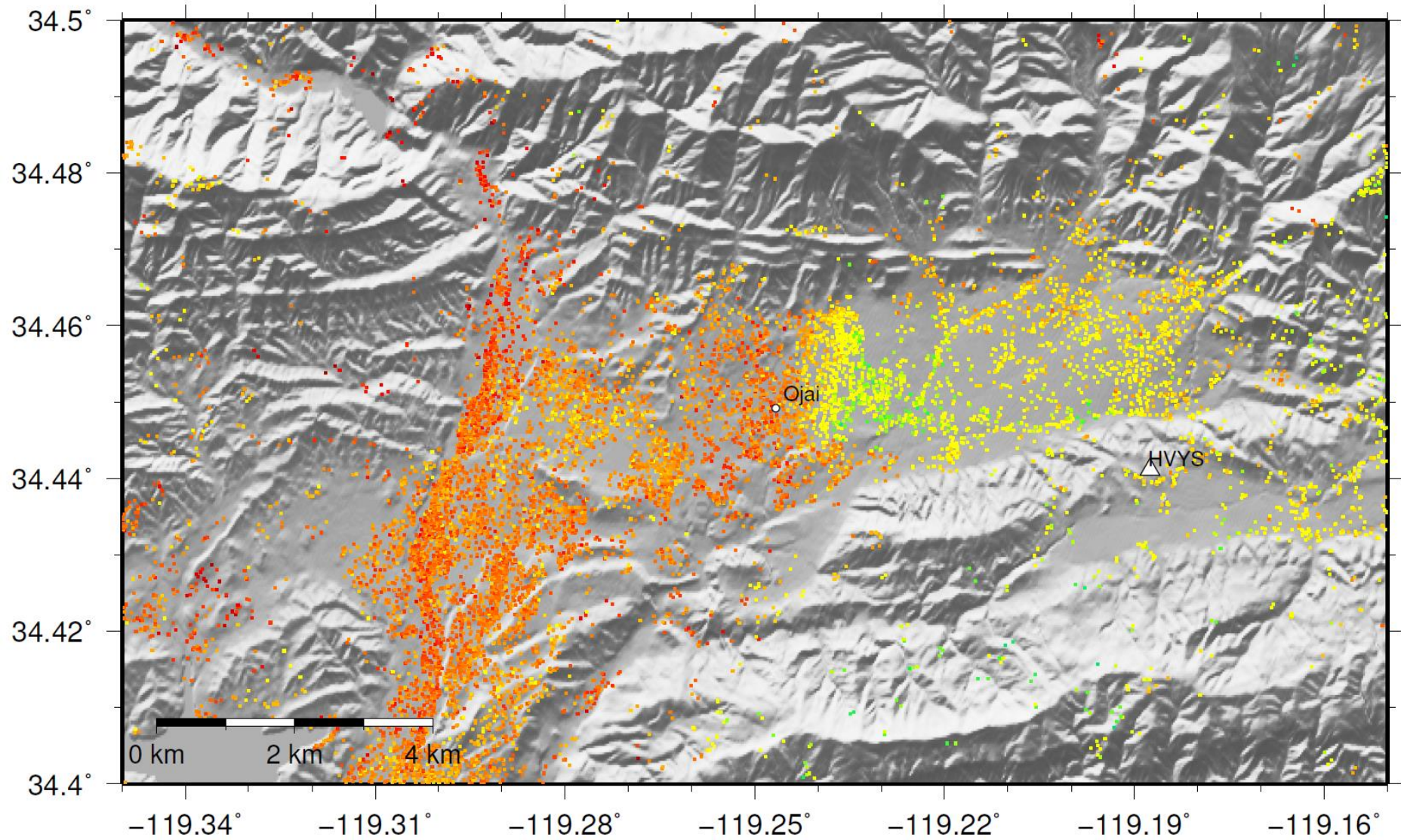
U.S. Geological Survey

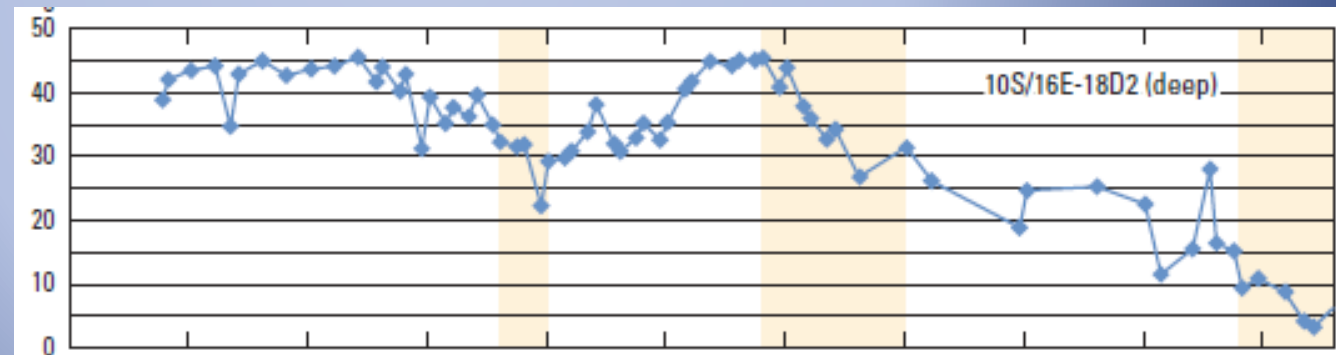
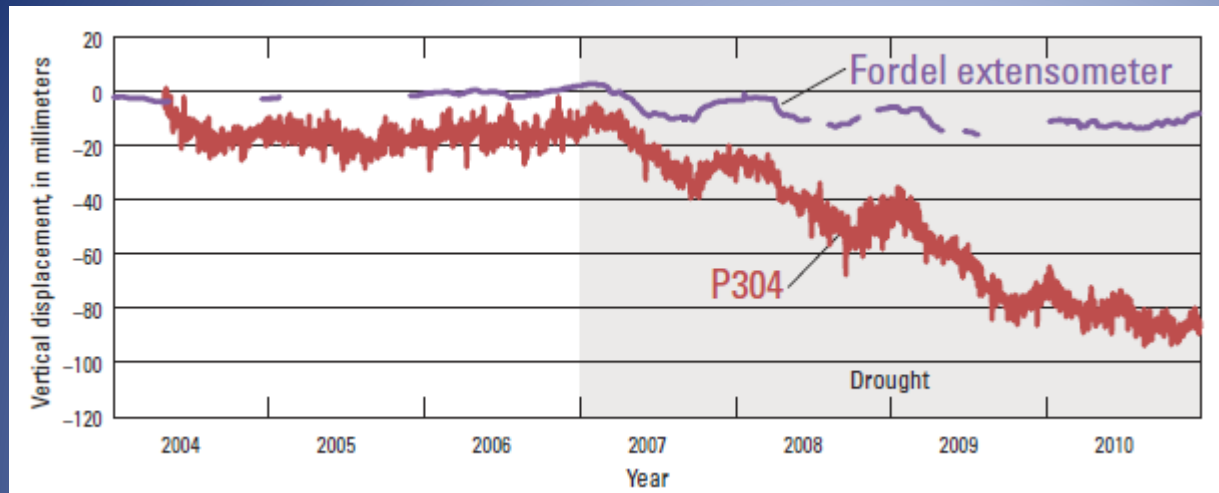
Figure 2. An aquifer system susceptible to compaction that results in land subsidence. Release of water from clay and silt confining units and interbeds causes a reduction in thickness of these compressible sediments.



**Figure 6.** Principle of effective stress, as applied to land subsidence. Vertical displacement ( $\mu_z$ ) of land surface as a result of a decrease in pore-fluid pressure ( $\rho$ ) and resultant increase in effective stress ( $\sigma_e$ ) exerted on a horizontal plane located at depth ( $d$ ) below land surface in fine-grained material under conditions of total stress ( $\sigma_T$ ) in a one-dimensional, fluid-saturated geologic medium (modified from Sneed and Galloway, 2000).







# But In Ojai?

- Gravel matrix supported aquifer system
- Not “fine grained”
- Limited extent compared to large basins
- Recharge to aquifers occurs over the long term period of record
- “1951 low”
- Yet to be reached
- Historic point of maximum compaction or minimum pressures
- No observed surface evidence
- No observed subsurface evidence (Crushed Can Casings)





Figure 3. Visible effect of subsidence on land surface. Concrete pad on well casing was originally at land surface. The rigid well casing has not sunk along with the land surface.

M.C. Carpenter/U.S. Geological Survey



Figure 4. Earth fissure near Picacho, Arizona.

# Perfect Candidate Basin for Alternative Plan

- Long Term Records
- Absent Overdraft
- Climate Driven Conditions
- Return to “Full” quickly with recharge



# Key points of Alternative Plan

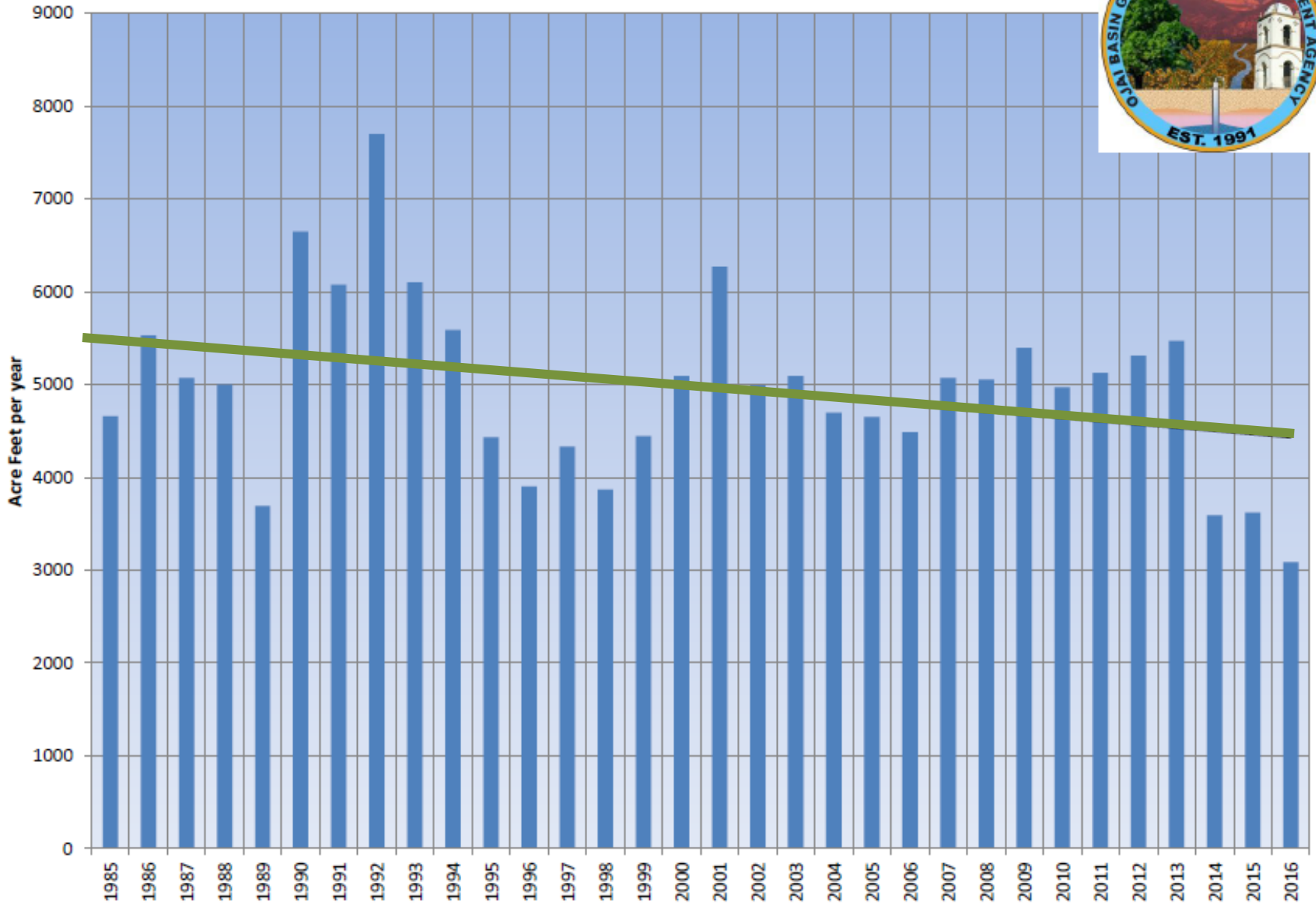
- Submitted by January 1, 2017 (Draft for Board Review October 27, 2016)
- Submitted every 5 years thereafter
- Submitted Pursuant to WC Section 10733.6(b)(3):
  - *Shall provide information demonstrating that the basin has operated within its sustainable yield over a period of at least 10 years*
- Functionally equivalent to a Full GSP

# Alternative Plan

- Ideal for basins with existing management and models
- Ideal for basins with detailed measurement histories
- Ideal for basins with no overdraft
- Ideal for basins where conjunctive use and self-regulating conditions have been ongoing for years.

Ideal For Ojai

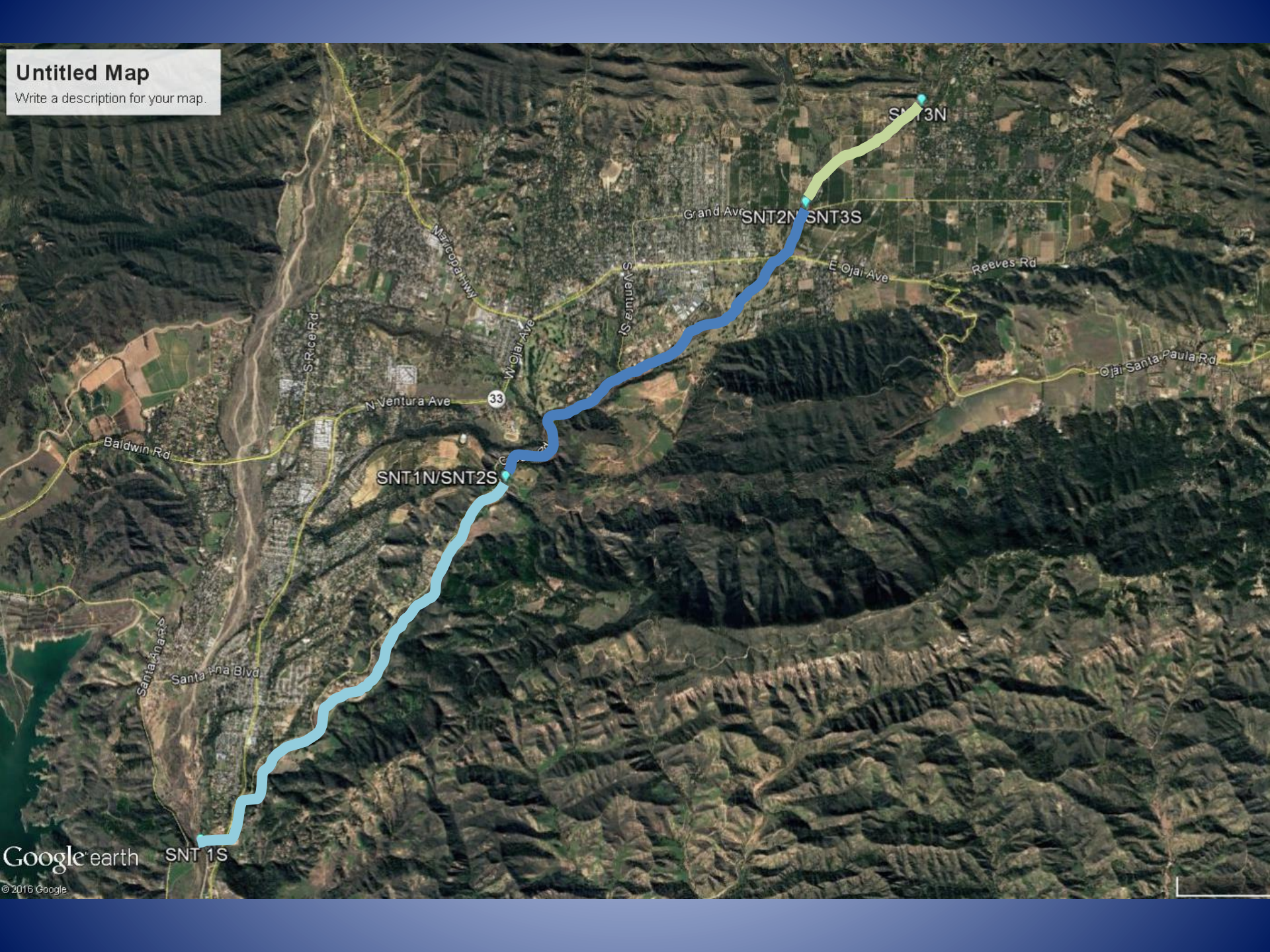
# Estimated Total Groundwater Extractions



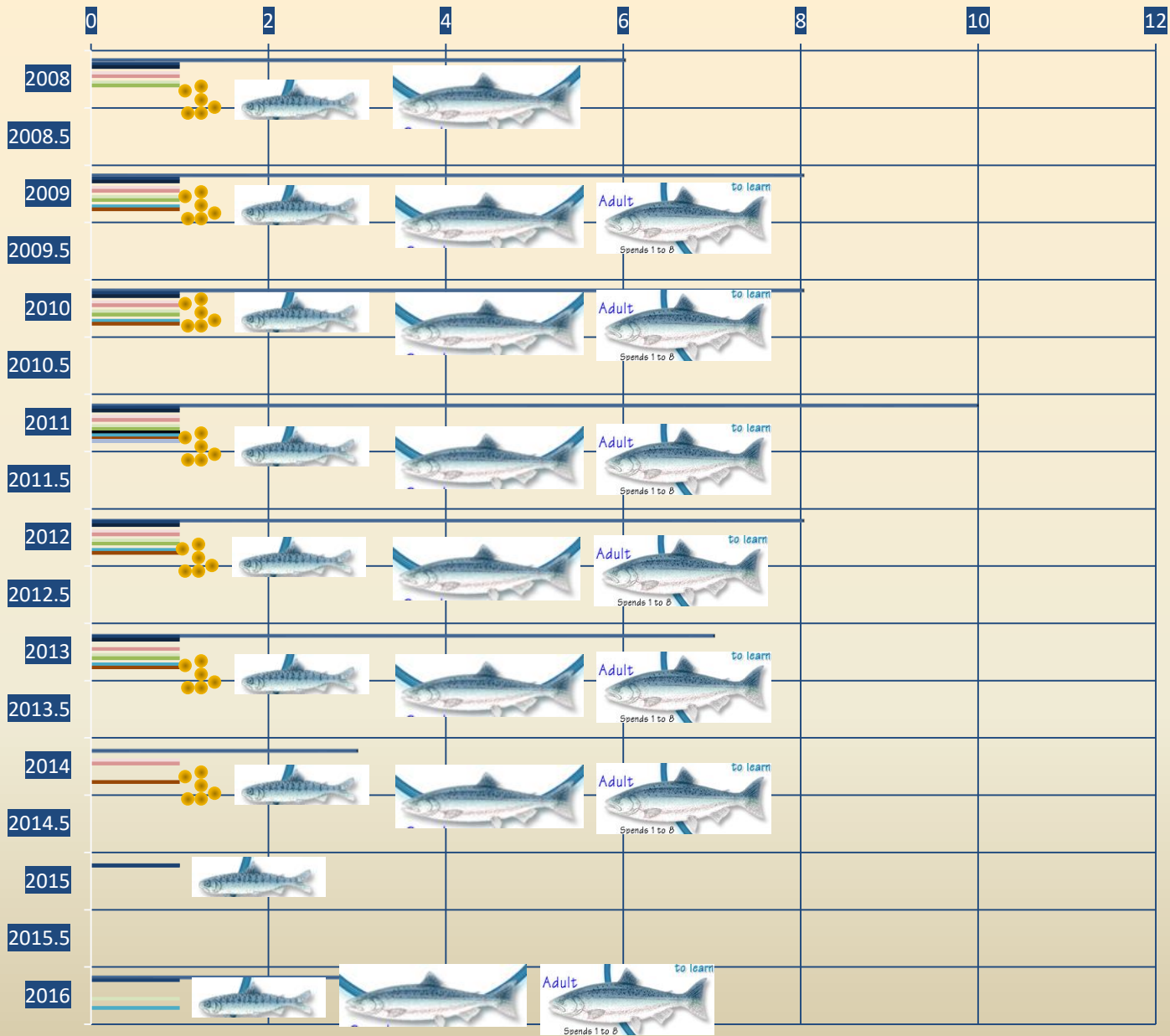


# Untitled Map

Write a description for your map.



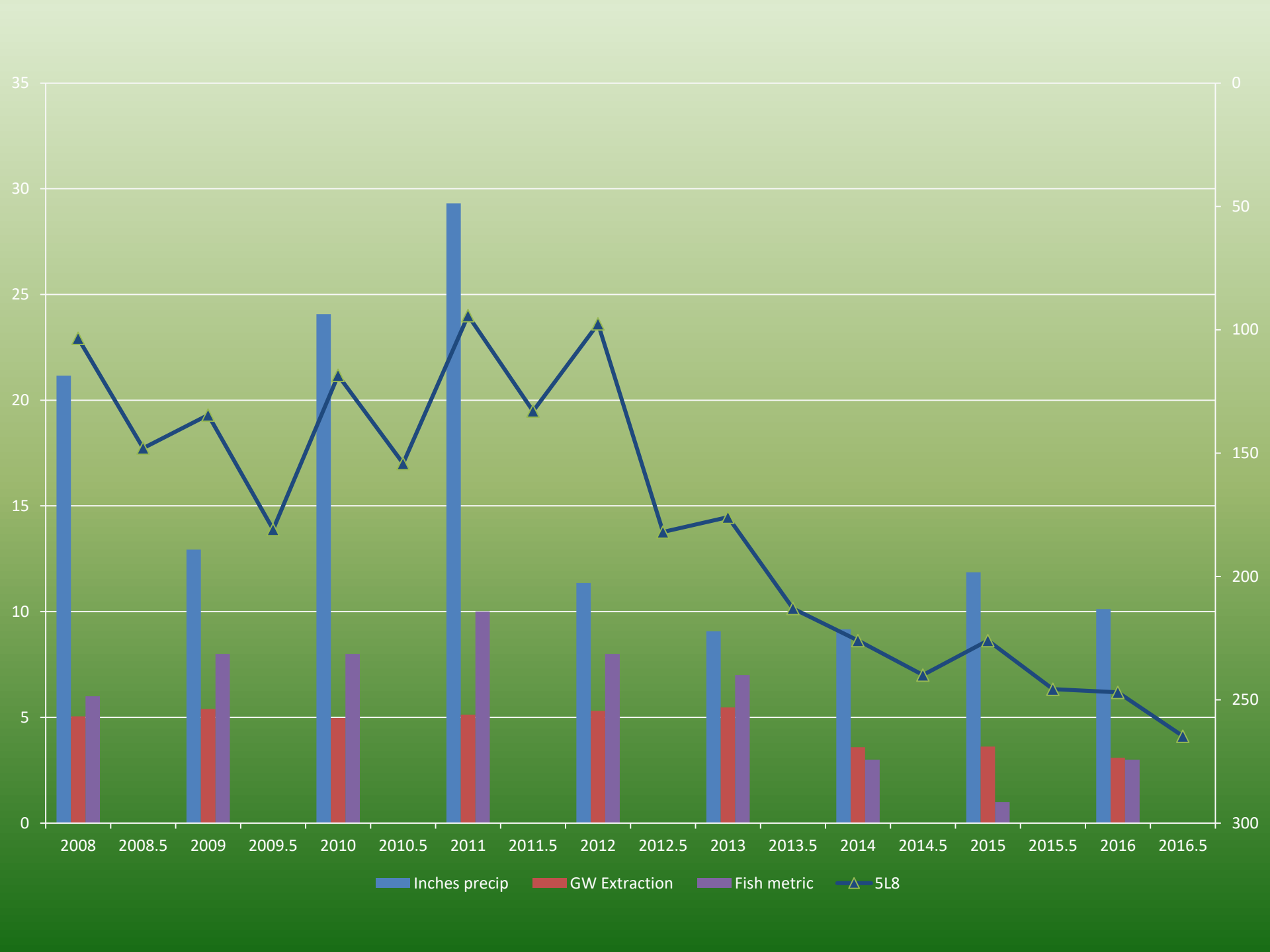




- Sum Criteria
- Parr 1
- Parr 2
- Parr 3 (0)
- Redd 1
- Redd 2
- Redd 3 (0)
- Smolt 1
- Smolt 2
- Smolt 3
- Adult 1
- Adult 2
- Adult 3









Thank You  
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