Groundwater in the Eel River Valley: Responding to the New State Groundwater Legislation

Eel River Forum

Riverwalk Lodge, Fortuna

May 20, 2015

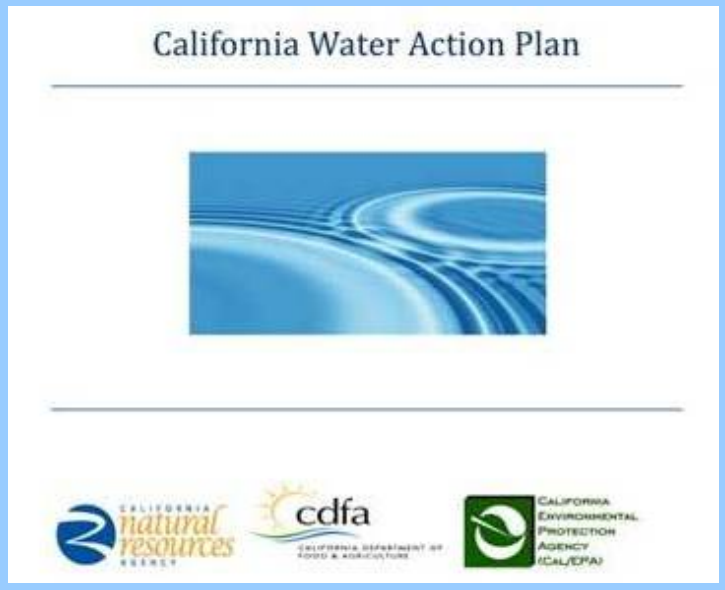
Public Works Department

Hank Seemann, Deputy-Director

The Sustainable Groundwater Management Act

Effective January 1, 2015

Signed by Governor Brown
September 16, 2014



Element of California Water Action Plan

New Addition to State Water Policy:

Water Code Section 113

It is the policy of the state that groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses. Sustainable groundwater management is best achieved locally through the development, implementation, and updating of plans and programs based on the best available science.

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Key Aspects of Sustainable Groundwater Management Act

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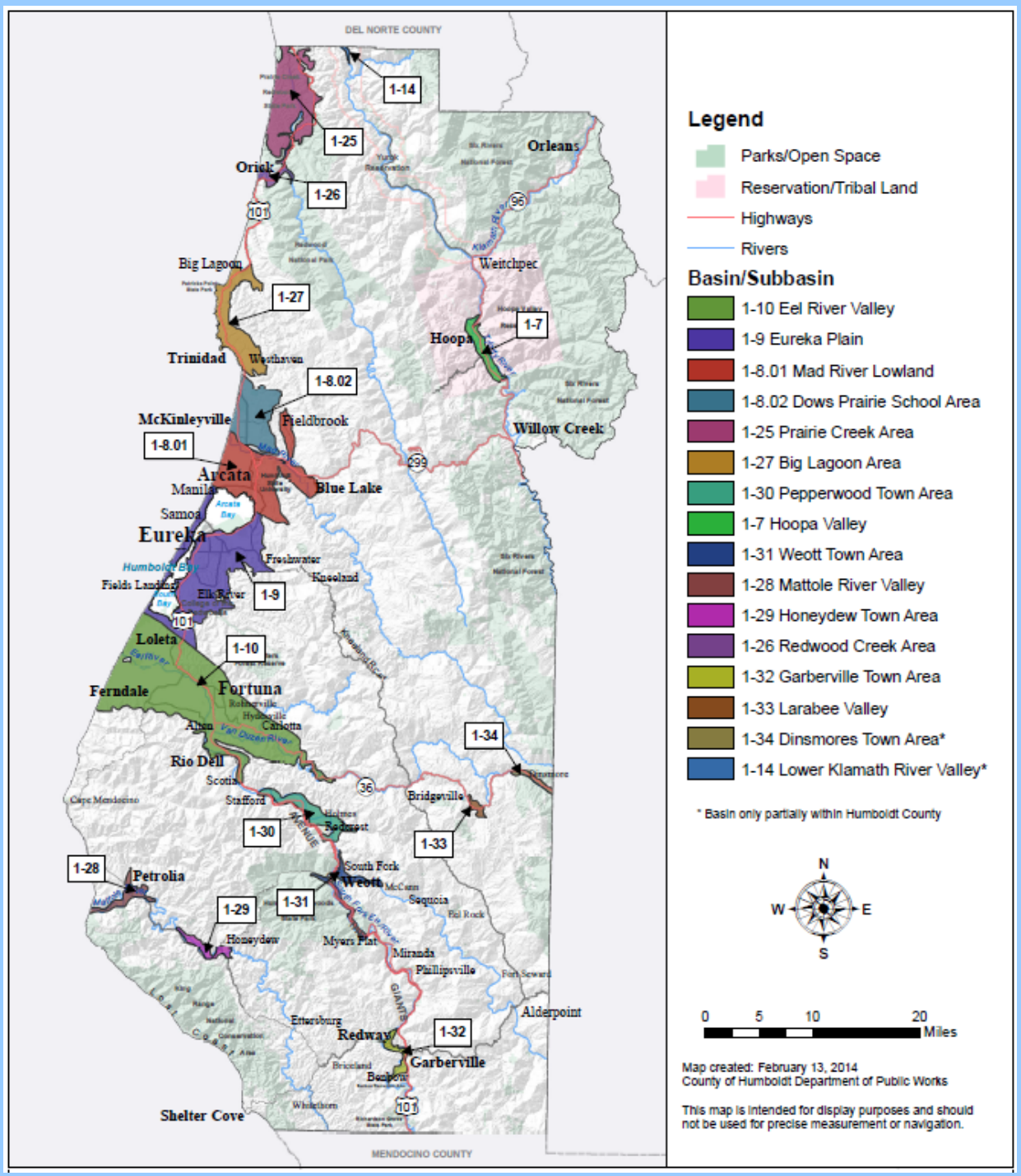
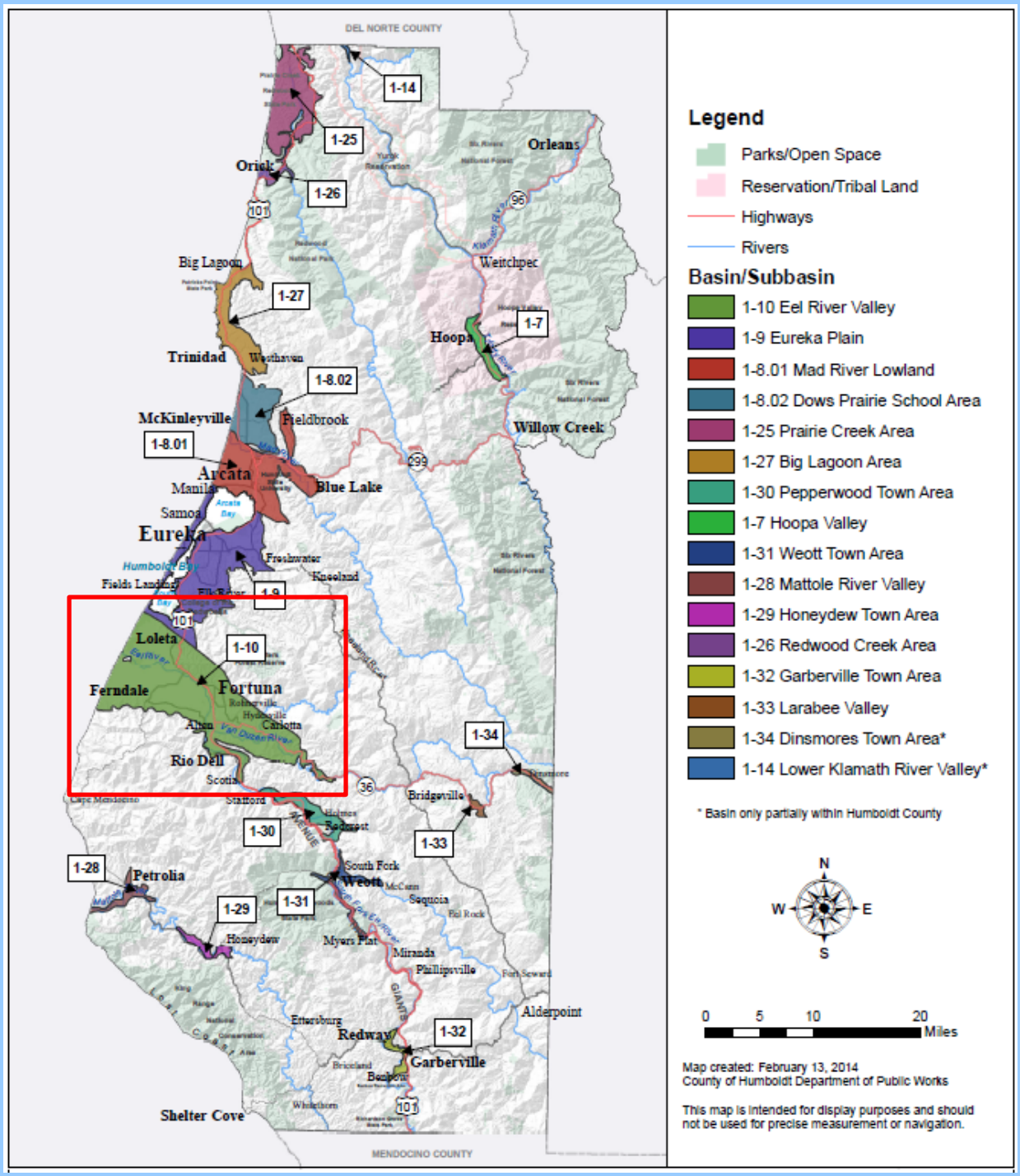
1. Organized around designated alluvial groundwater basins and their prioritization rankings

Humboldt County Designated Alluvial Groundwater Basins and Sub-basins



Source:
DWR Bulletin 118



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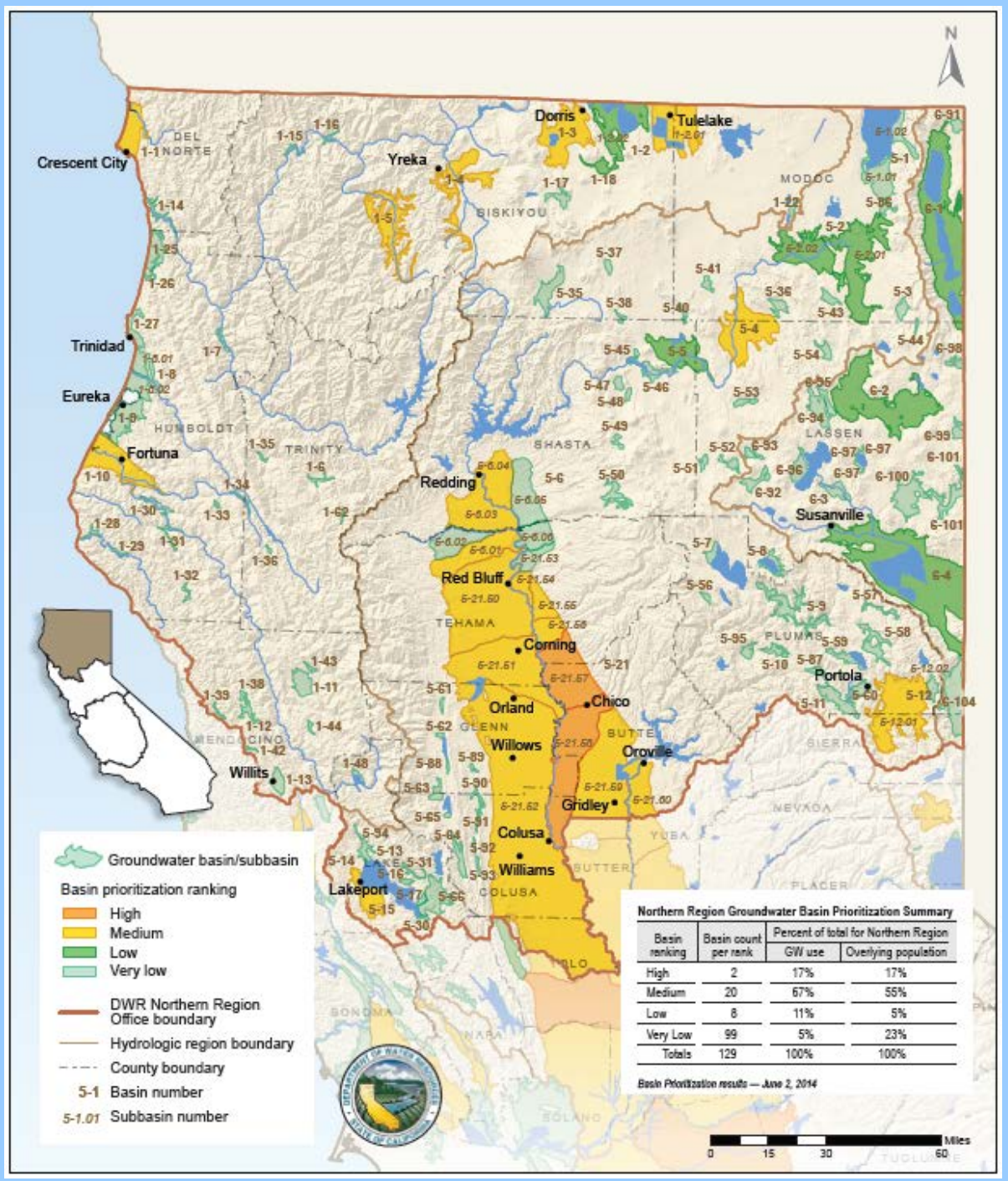
Ranking of Groundwater Basin Importance – Northern California



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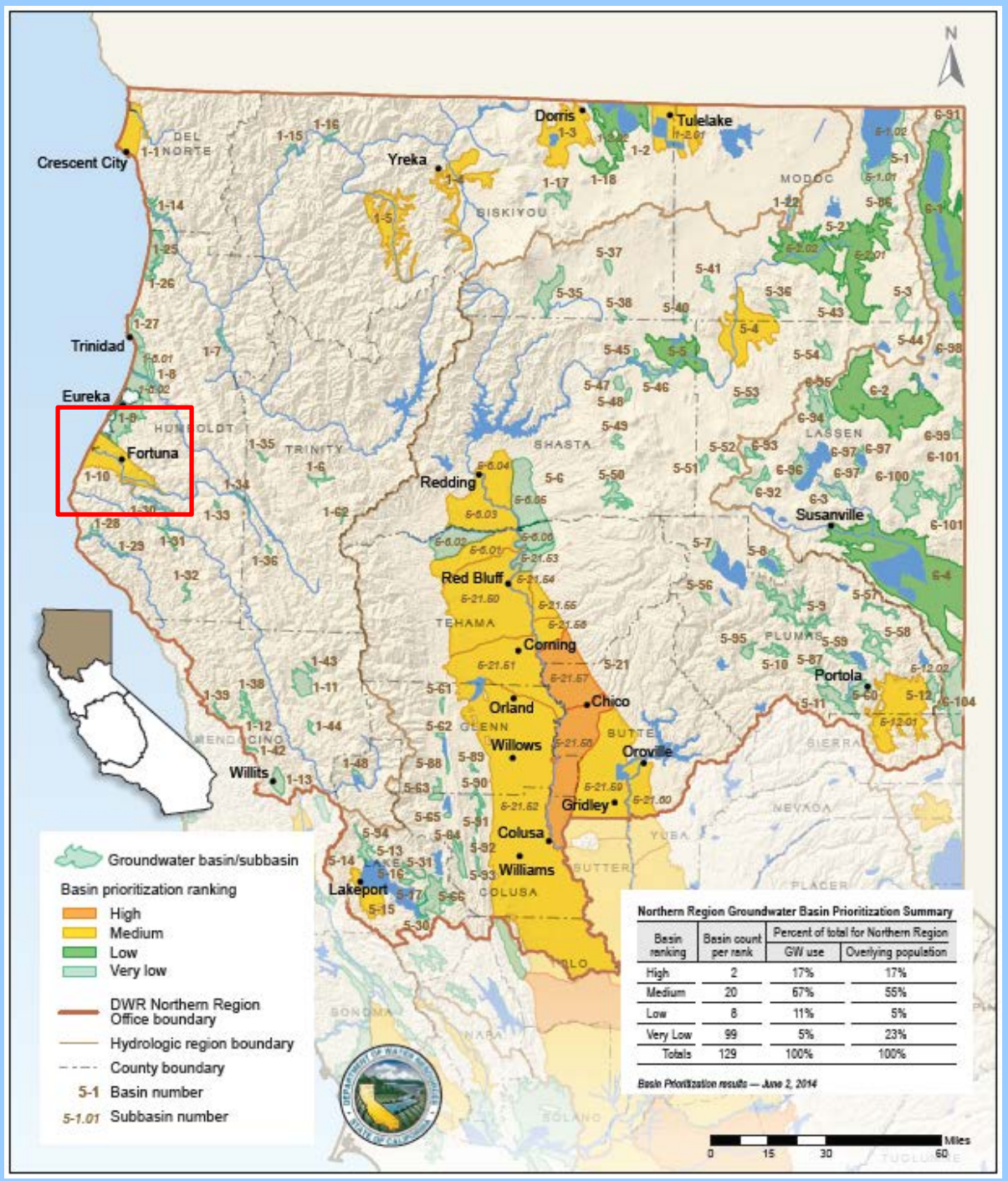
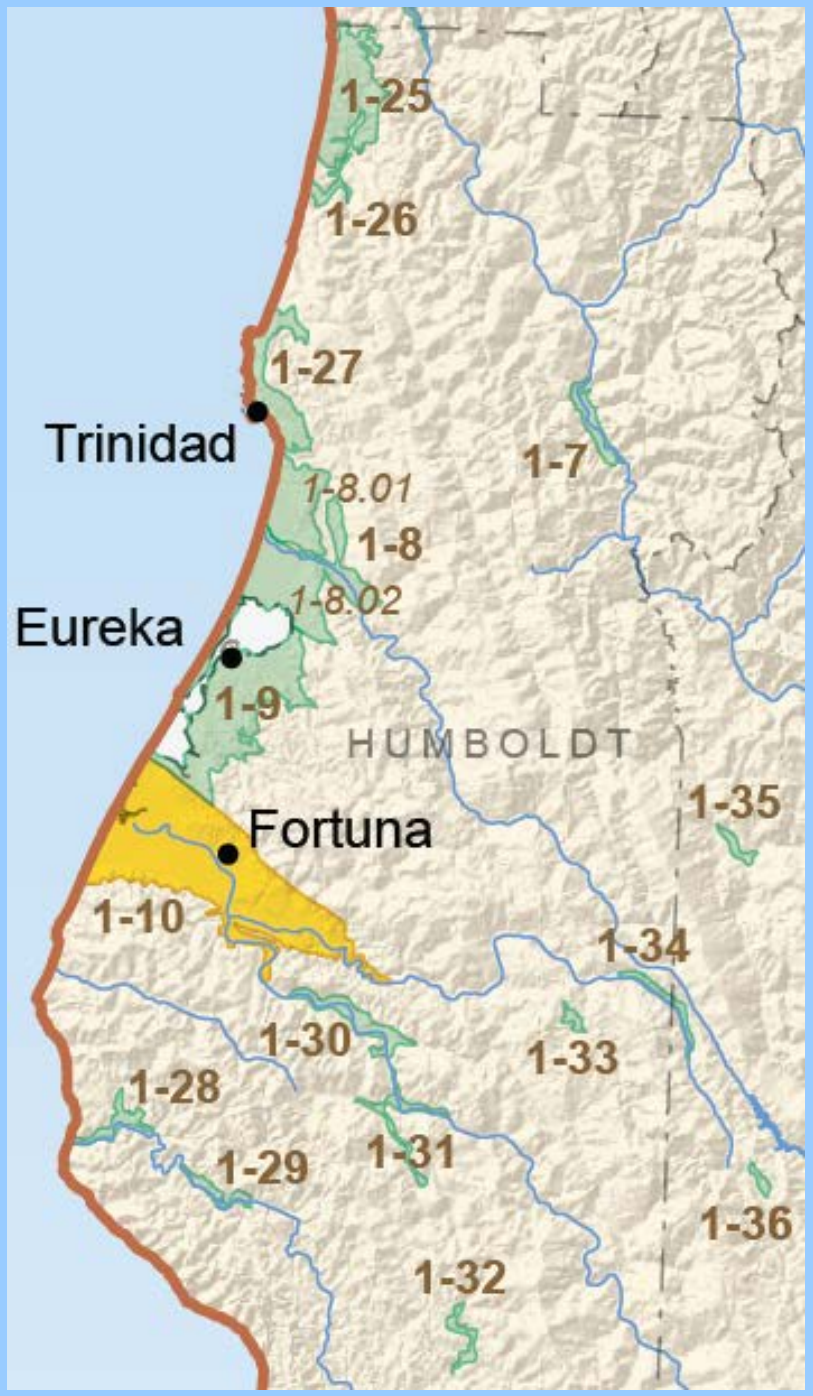


Northern Region Groundwater Basin Prioritization Summary

Basin ranking	Basin count per rank	Percent of total for Northern Region	
		GW use	Overlying population
High	2	17%	17%
Medium	20	67%	55%
Low	8	11%	5%
Very Low	99	5%	23%
Totals	129	100%	100%

Basin Prioritization results — June 2, 2014

Ranking of Groundwater Basin Importance – Humboldt County



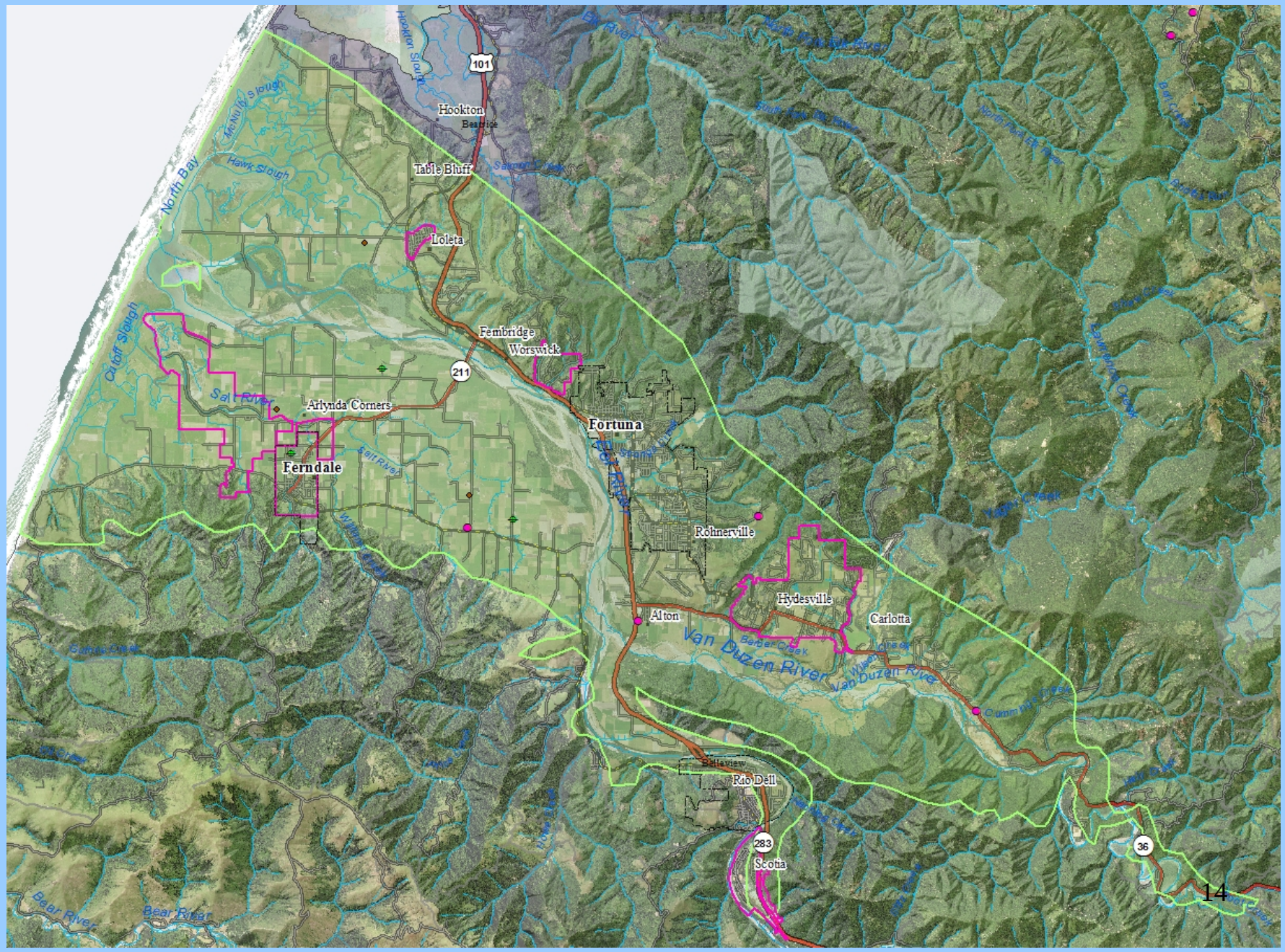
Groundwater basin/subbasin

Basin prioritization ranking

- High
- Medium
- Low
- Very low

Source:
DWR Bulletin 118

Eel River Valley Groundwater Basin



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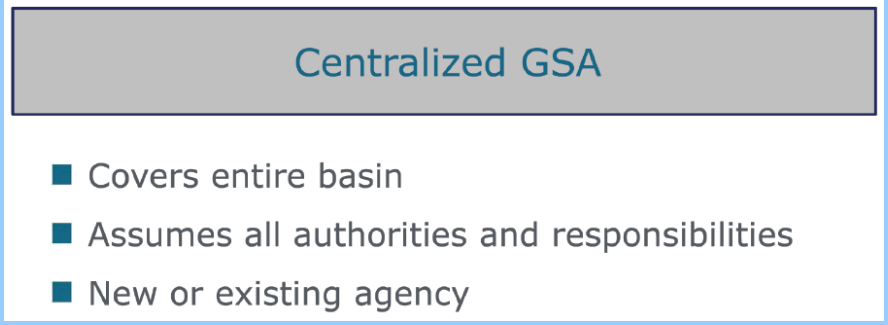
Option 1



Option 2

Source: WEF, 2015

Key Aspects of Sustainable Groundwater Management Act

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3. Requires formation of local groundwater sustainability agencies
4. Overall goal is to operate within sustainable yield: maximum quantity of water that can be withdrawn annually without causing an undesirable result
5. Undesirable results include:
    - Lowering of groundwater levels and depletion of supply
    - Reduction of groundwater storage
    - Seawater intrusion
    - Degraded water quality
    - Subsidence
    - Depletions of interconnected surface waters with adverse impacts on beneficial uses of the surface water

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   - Registration
   - Fees
   - Inspections
   - Measuring devices

   (not de minimis extractors)
   - Spacing
   - Control extractions (regulate/limit/suspend)
   - Reporting
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7. Groundwater sustainability plans require:
   - Advisory committee and maintenance of interested persons list
   - Description of the basin
   - Measurable objectives to achieve the sustainability goal
   - Implementation measures (monitoring and management components, as applicable)

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8. Groundwater plans will not establish or determine groundwater rights, but will govern how those rights are exercised

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   - Holders of overlying groundwater rights, including agricultural users and domestic well owners
   - Municipal well operators and public water systems
   - Local land use planning agencies
   - Environmental users of groundwater
   - Surface water users, if there is a hydrologic connection between surface and groundwater bodies
   - Federal and tribal lands
   - Economically disadvantaged communities

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10. State can intervene if local agency is not managing its groundwater sustainably or not complying with the Act

General Timeline for Sustainable Groundwater Management Act

	State	Local
Late 2015/ Early 2016	Funding program for local agencies to develop groundwater plans (from Prop. 1)	
2016	June 1: DWR to adopt regulations for implementing program	
2017	DWR to publish Bulletin 118 – Interim Update (boundaries, prioritization)	Jan. 1: Due date for "alternative submittals" June 30: Groundwater sustainability agencies established for all high- and medium-priority basins
2018		
2019		
2020		
2021		
2022		Jan 31: Groundwater sustainability plans adopted for high- and medium-priority basins not in critical overdraft
2042		Achieve sustainability goal

Legislation Summary

Legislation Summary

1. In Humboldt County, initially applies only to Eel River Valley
2. Long-term reliability, multiple benefits, best available science
3. Local control with state oversight and ability to intervene
4. Discretionary powers and authorities
5. Funding:
   - For Humboldt County, initial funding from County General Fund
   - Opportunity to apply for Prop. 1 grant funds in late 2015/early 2016
   - Legislative intent is for local management to be funded in part through fees
6. Timeline:
   - Determine groundwater sustainability agency by June 30, 2017
   - Adopt groundwater sustainability plan by January 31, 2022
   - Achieve sustainability goals by 2042

Initial Questions

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1. Who are the stakeholders? How should stakeholders be engaged?
2. What are the key issues and concerns? Are there existing or imminent problems?
3. What data exist? What are the important data gaps?
4. Who should serve as the groundwater sustainability agency?
5. To the extent that the County is involved, how will groundwater management integrate with existing department functions?

Initial Outreach

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1. Fall 2014-present: contacts, interviews, and presentations
2. Feb. 2015: report to Board of Supervisors
3. April 2015: workshop
4. Staff to summarize feedback from initial outreach to Board of Supervisors within next 1-2 months
5. Formation of a working group to meet quarterly and help formulate a groundwater program for the Eel River Valley

Initial topics

- Groundwater sustainability agency
- Community interests
- Potential management objectives
- Data and information
- Prop. 1 grant application
- Future funding mechanisms

GROUND WATER MEETING FOR THE EEL RIVER BASIN

April 27, 2015

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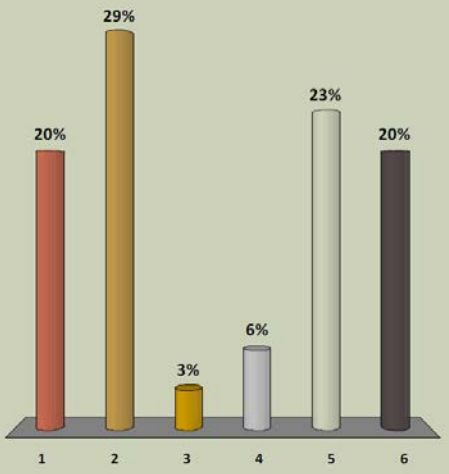
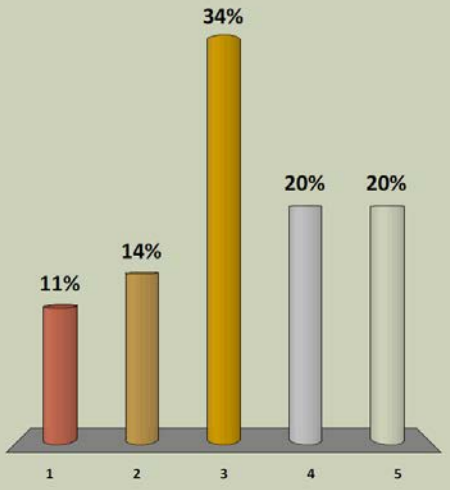
WHO IS REPRESENTED TODAY?

1. Municipal
2. Agricultural
3. Residential
4. Environmental
5. Scientific
6. Other



IN YOUR OPINION, THE STATE OF GROUND WATER FOR THE EEL RIVER BASIN IS?

1. An existing problem
2. An imminent problem
3. Future problem
4. Unlikely to be a future problem
5. Don't know

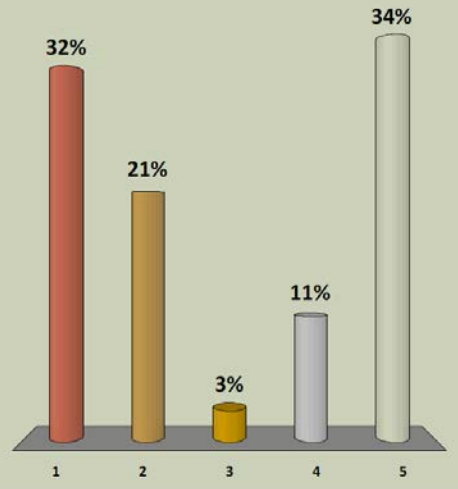


GROUND WATER MEETING FOR THE EEL RIVER BASIN

April 27, 2015

WHICH ISSUES ARE MOST IMPORTANT?

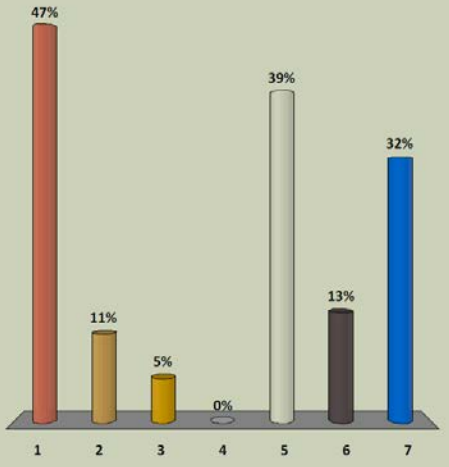
1. Loss of local control though state intervention
2. Pumping restrictions
3. Mandatory flow meters
4. High fees
5. Potential for changing hydrology from over usage



ARE YOU CONCERNED ABOUT?

(PICK TOP TWO ITEMS)

1. Lowering water tables/ reduced storage
2. Sea level intrusion
3. Degraded groundwater quality
4. Land subsidence
5. Reduced instream flows
6. All of the above
7. None likely to occur with current usage

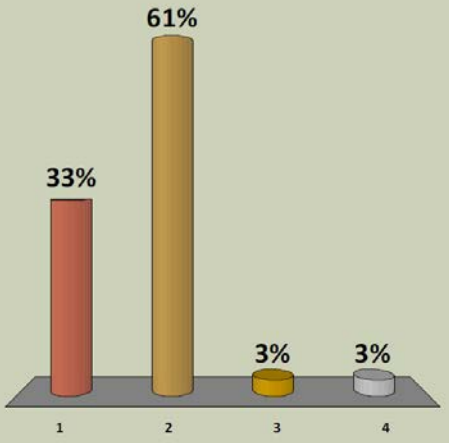


GROUND WATER MEETING FOR THE EEL RIVER BASIN

April 27, 2015

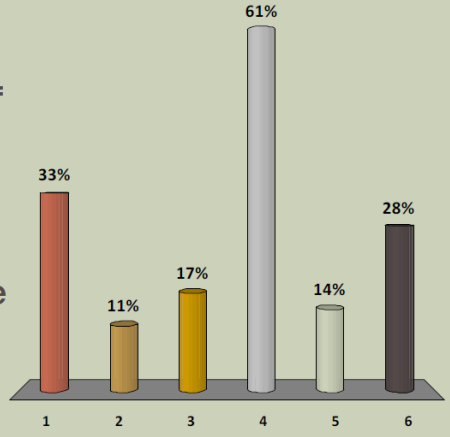
WHAT SHOULD GROUND WATER AGENCY GOVERNANCE BE?

1. County only
2. County in partnership with others (cities, water district, RCD, etc)
3. Other- creation of a new special district
4. None of the above: let the state control Eel River groundwater



WHAT SHOULD BE THE PRIORITIES FOR THE WORKING GROUP? (PICK TOP TWO)

1. Resolve governance structure
2. Funding plan
3. Determine the Co. of Humboldt's role
4. Gather existing groundwater data
5. Explore changing the basin's priority level
6. All of the above



Initial Data and Information Gathering for Eel River Valley Groundwater

Change in Groundwater Levels – Spring 2013 to Spring 2014

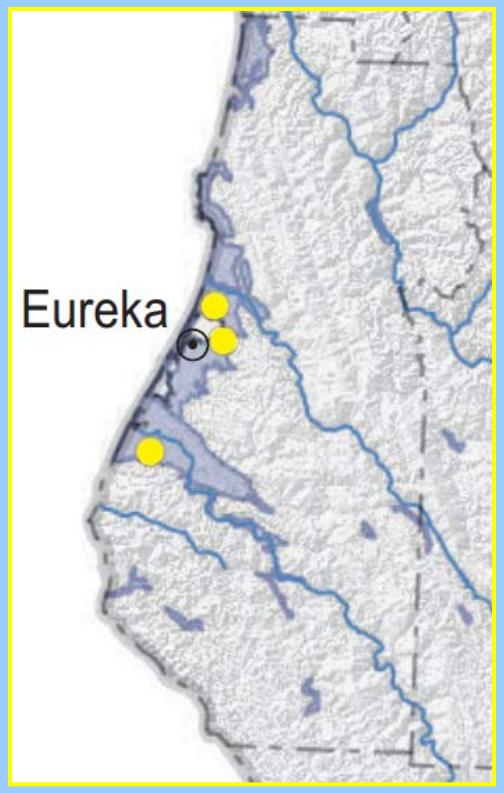
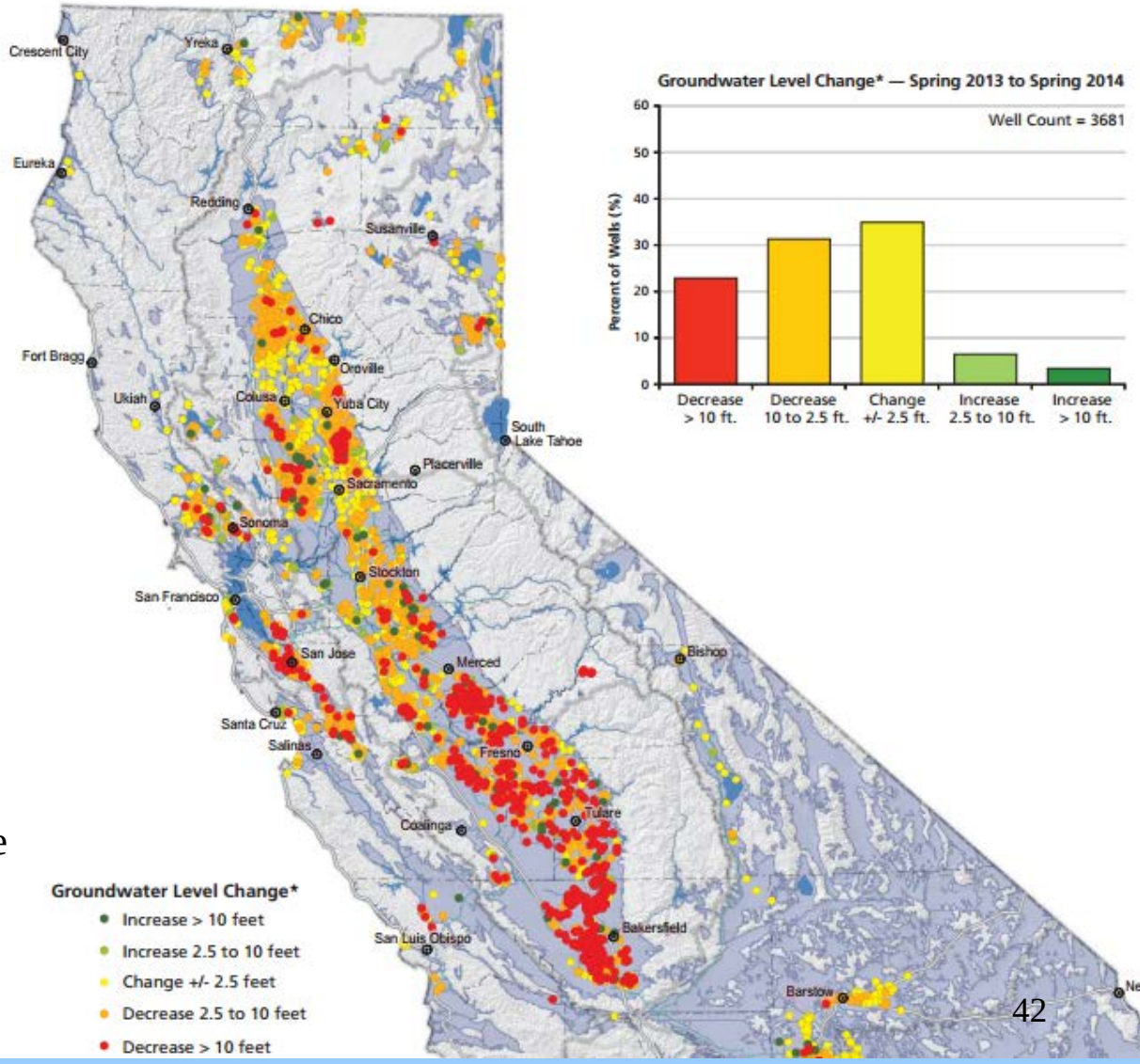
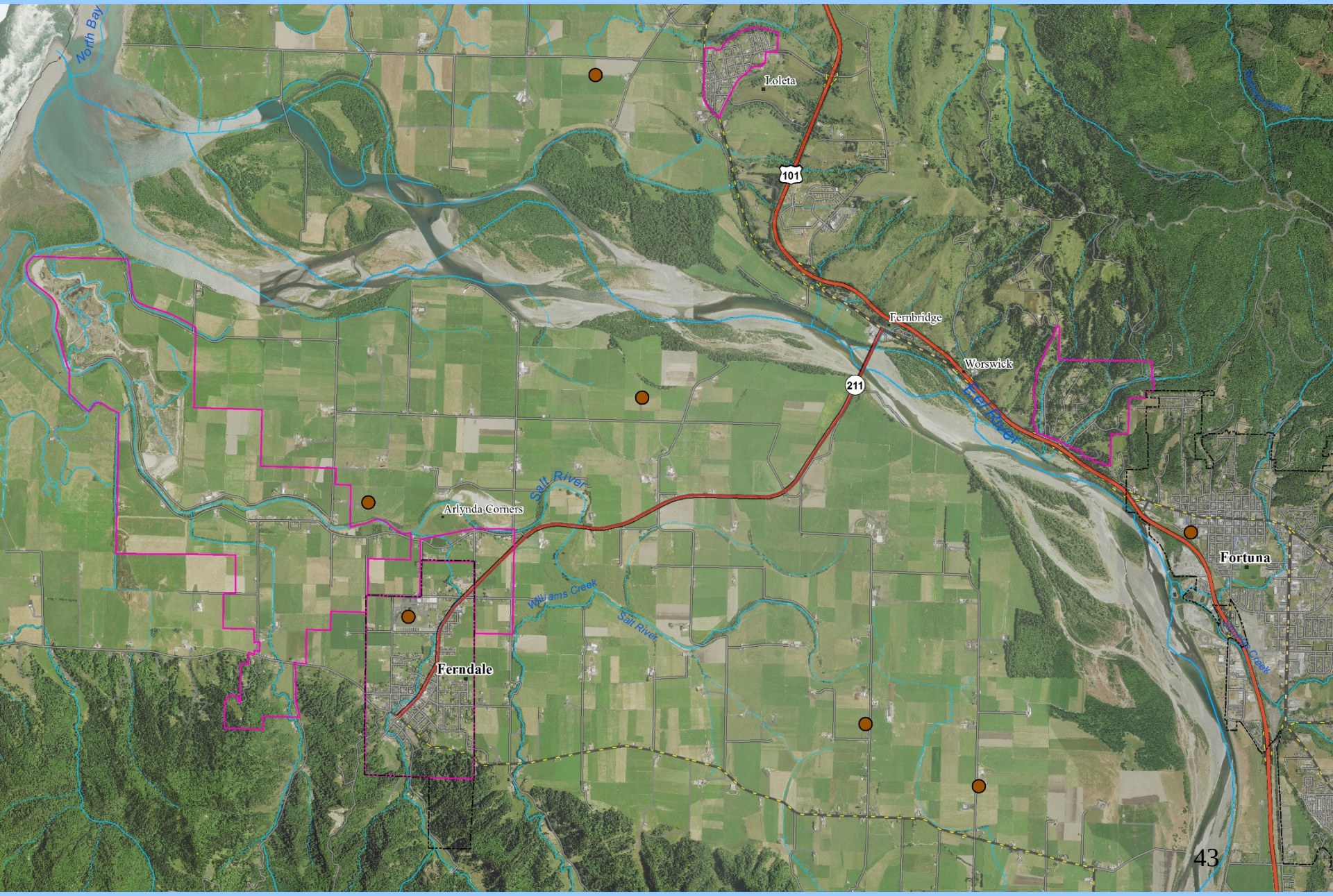


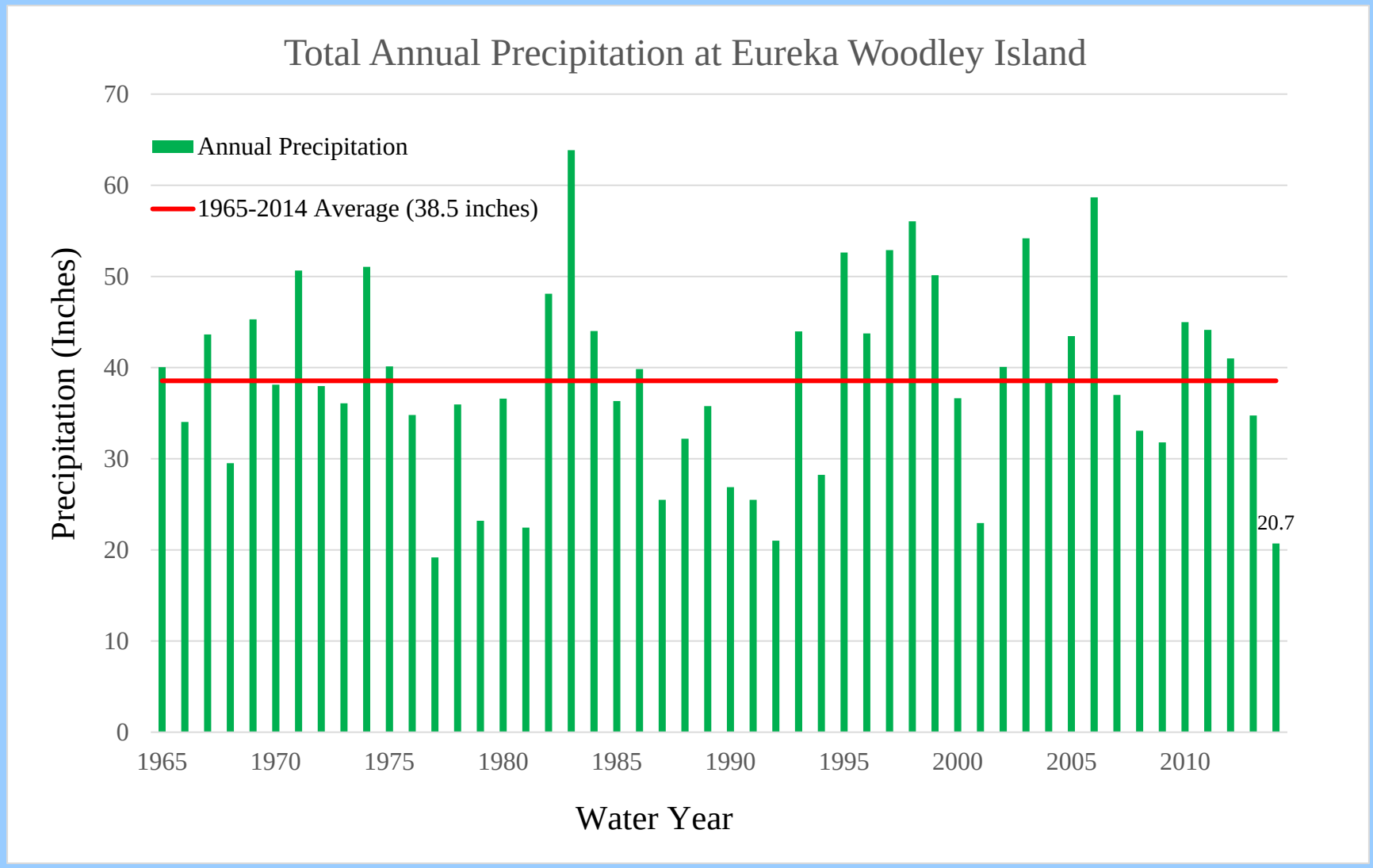
Figure 5: Change in Groundwater Levels in Wells - Spring 2013 to Spring 2014

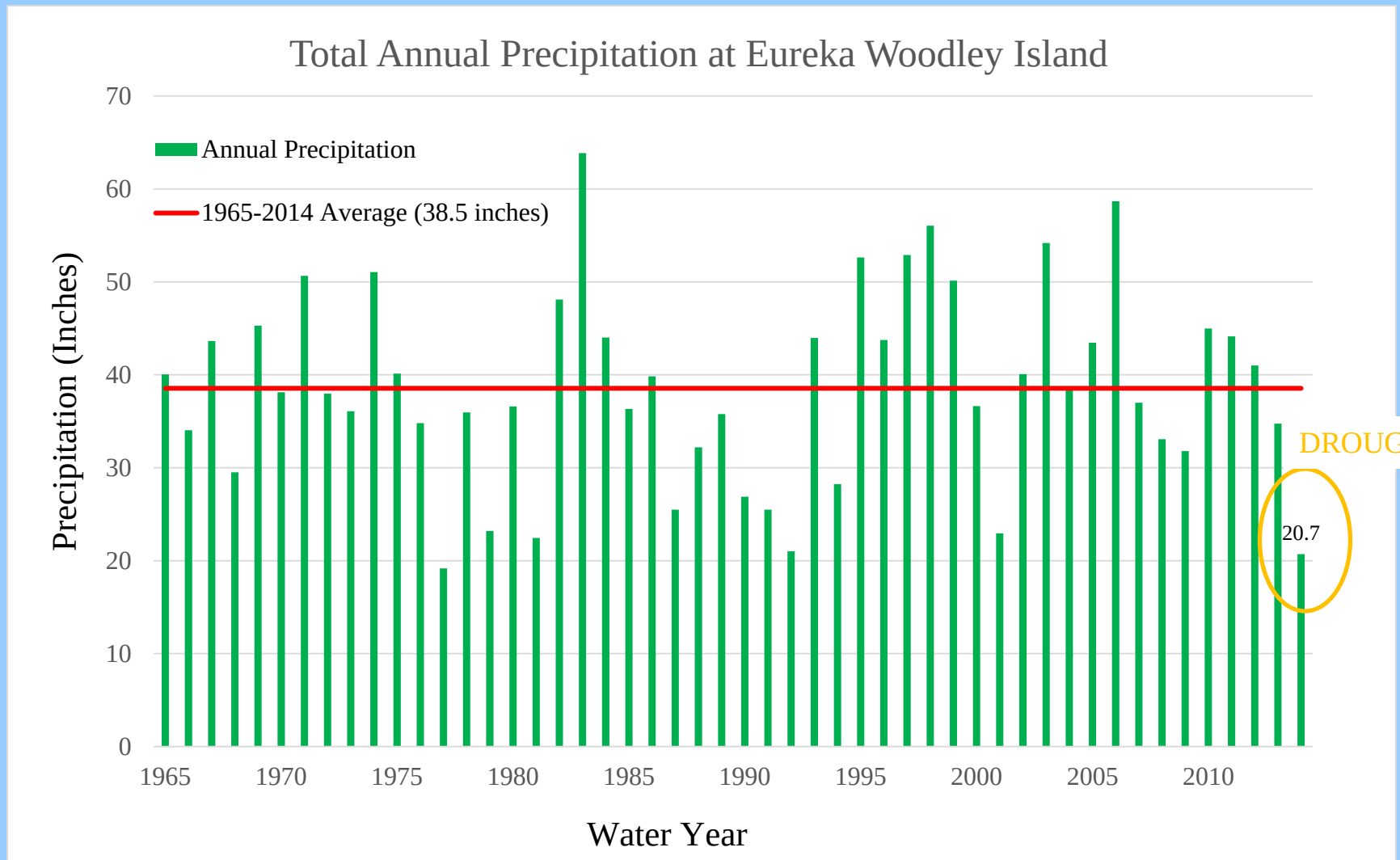


Source:
Public Update for Drought Response
(DWR, Nov. 2014)

DWR Monitoring Wells in Eel River Basin




Total Annual Precipitation at Eureka Woodley Island
Annual Precipitation
1965-2014 Average (38.5 inches)
Precipitation (Inches)
70
60
50
40
30
20
10
0
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
20.7
Water Year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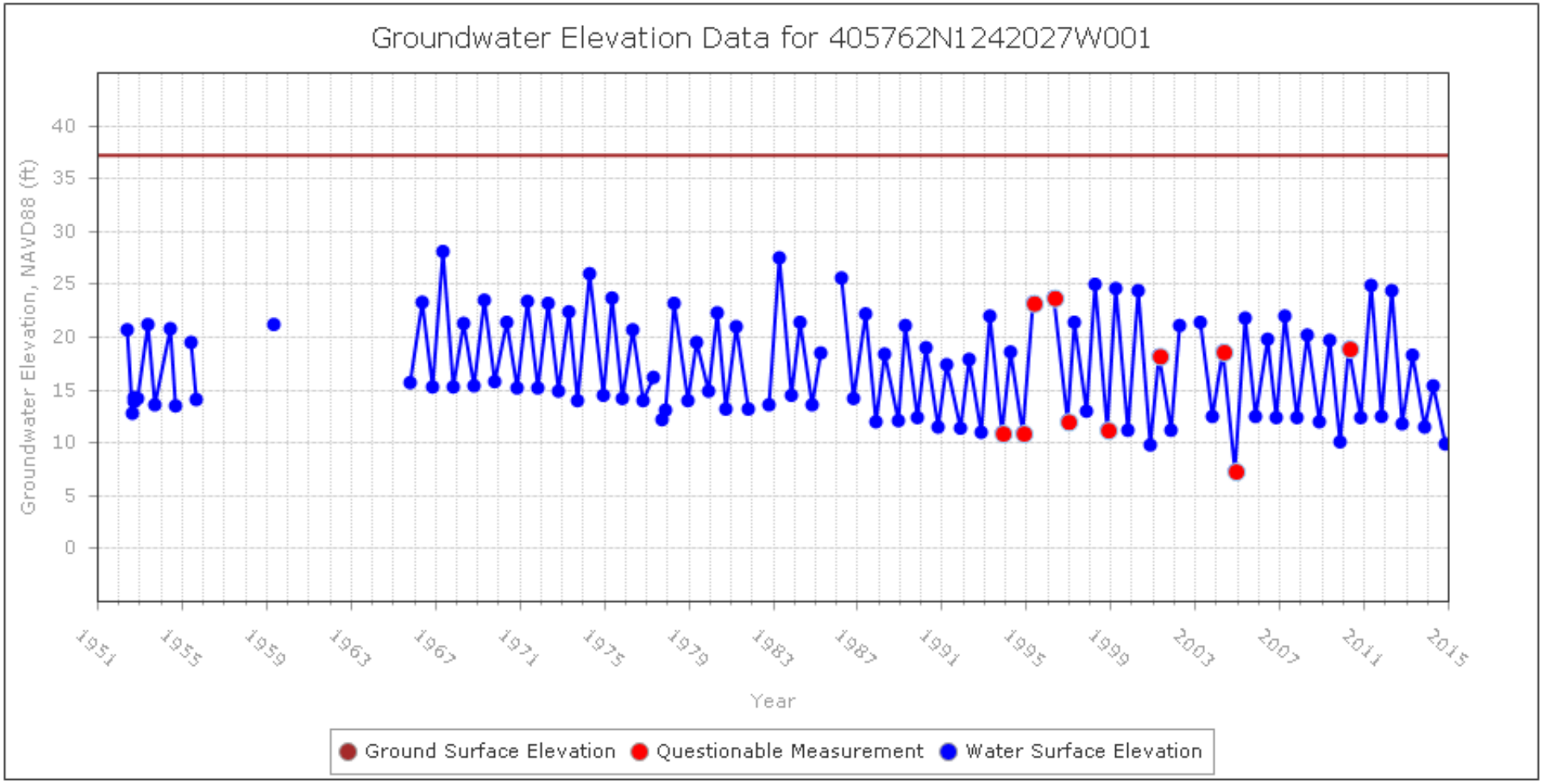
Well near Waddington Road, Eel River Valley



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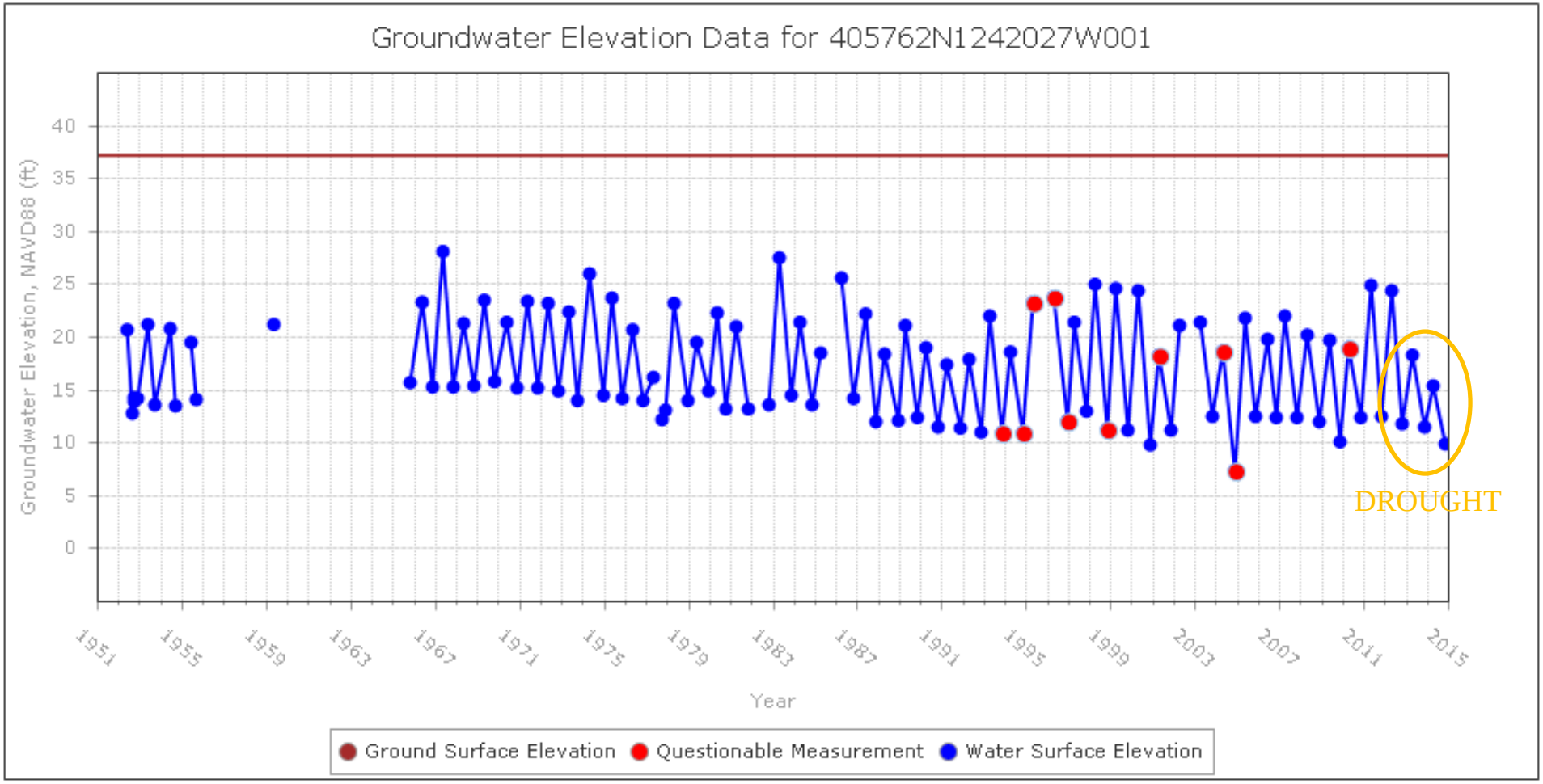

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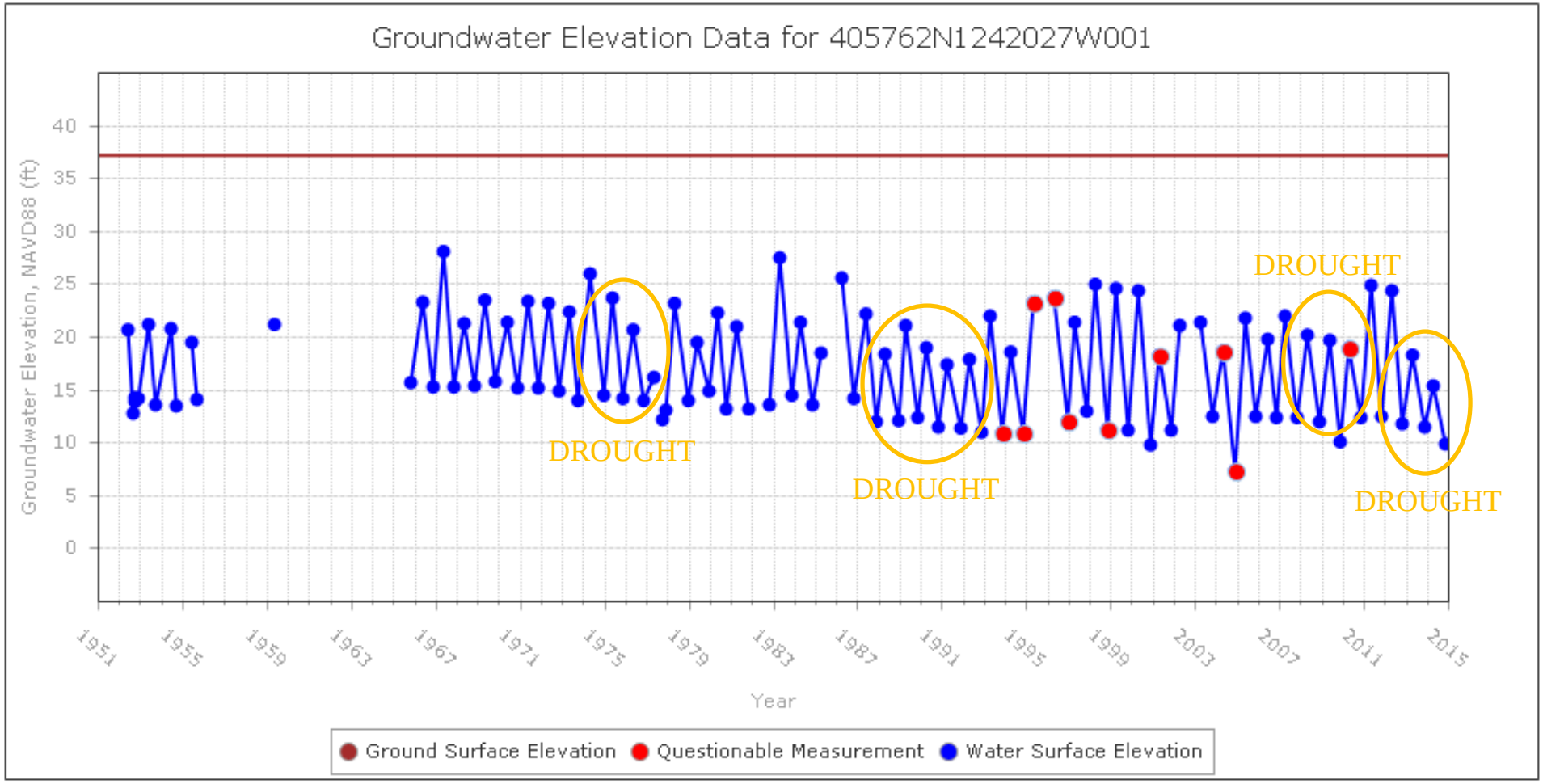
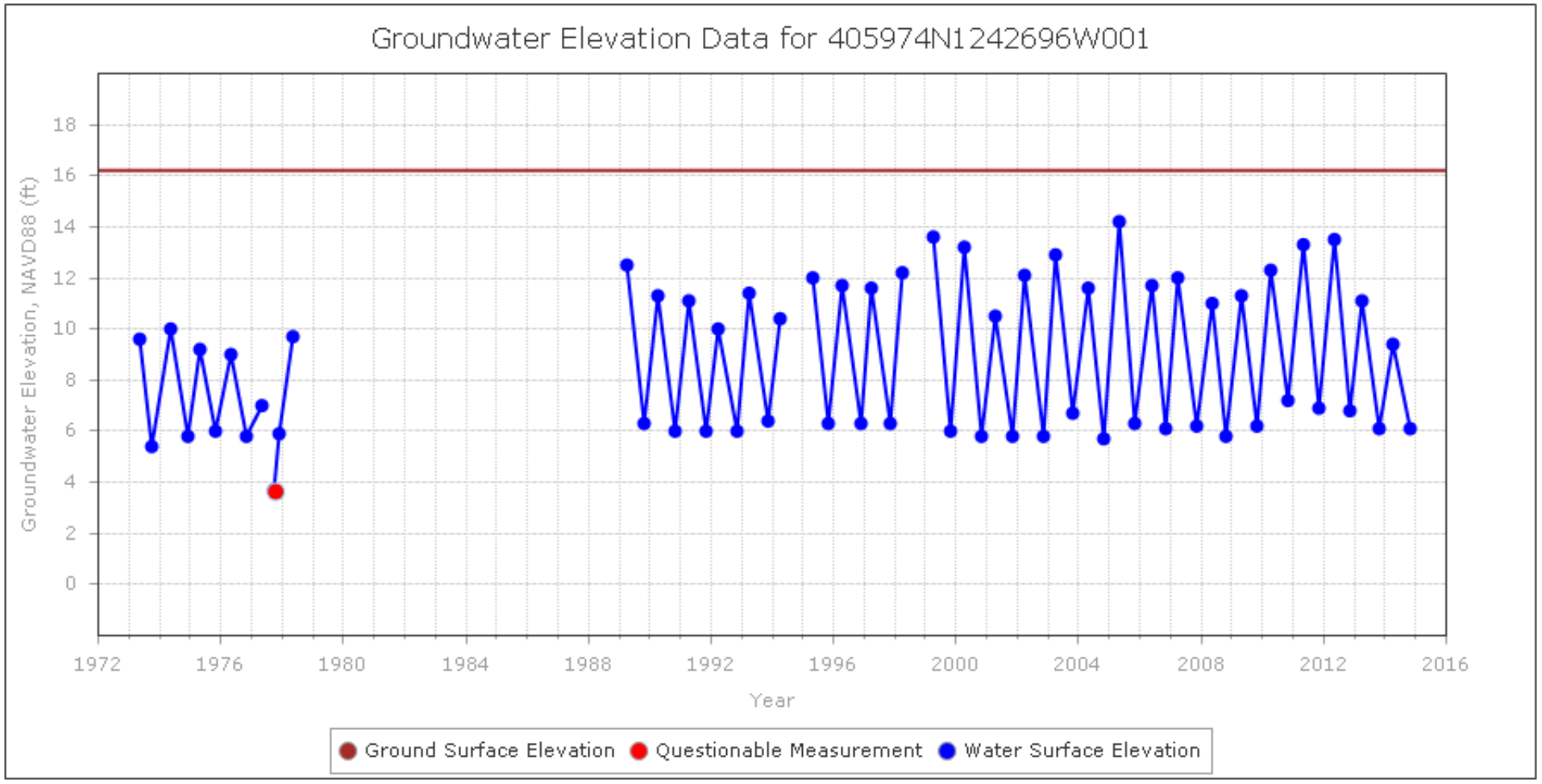
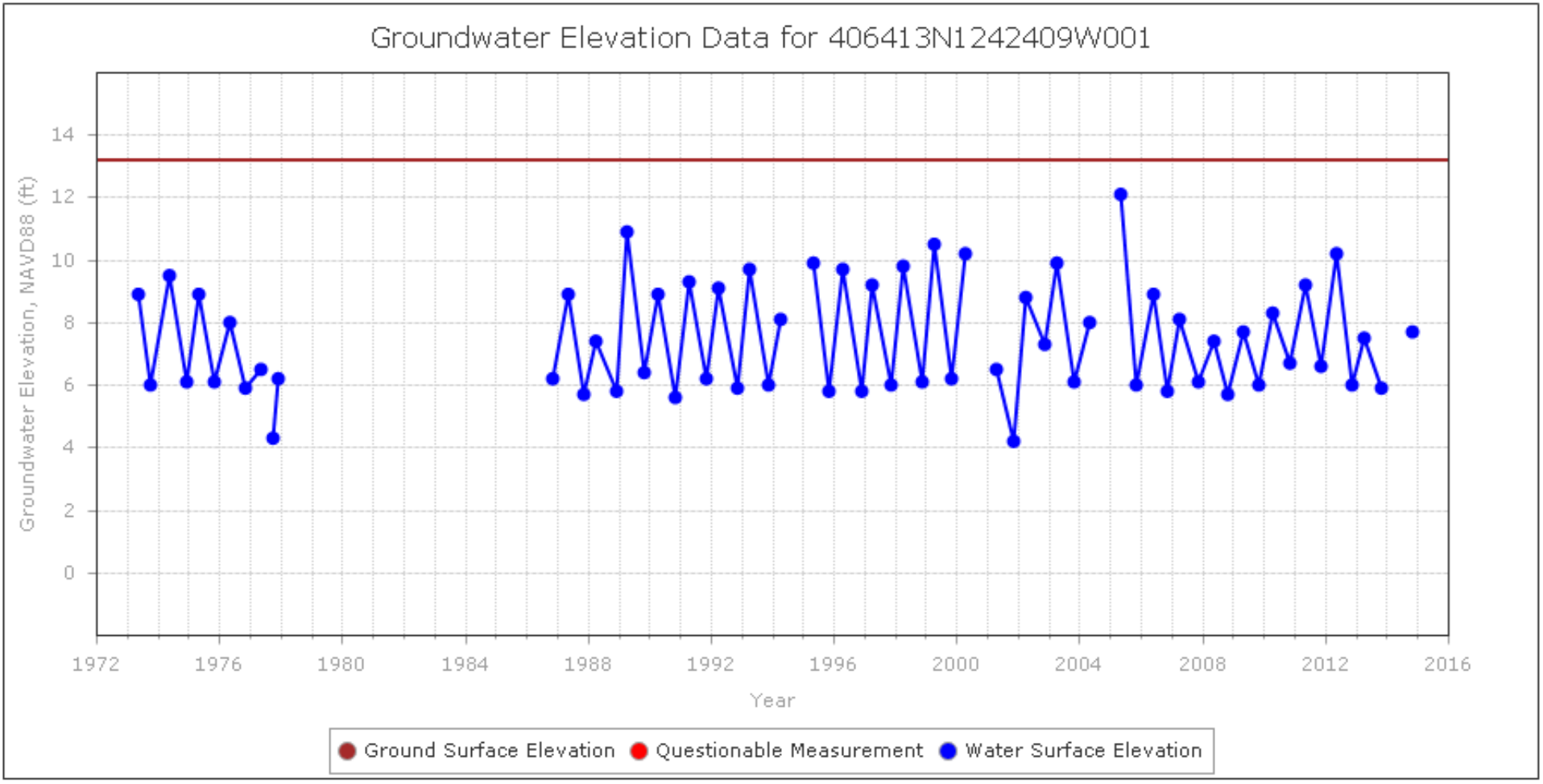


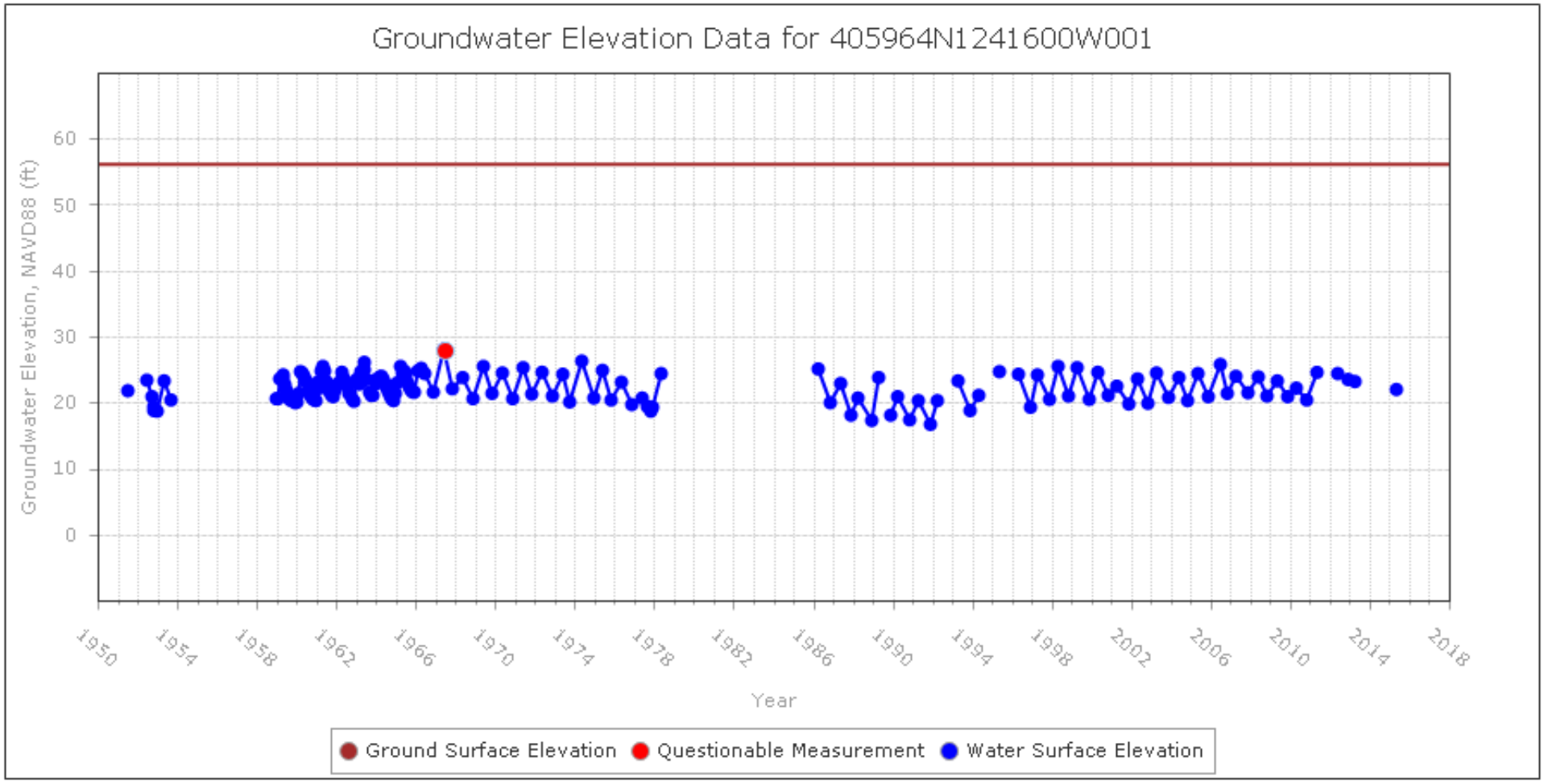
Well near Dillon Road, Eel River Valley



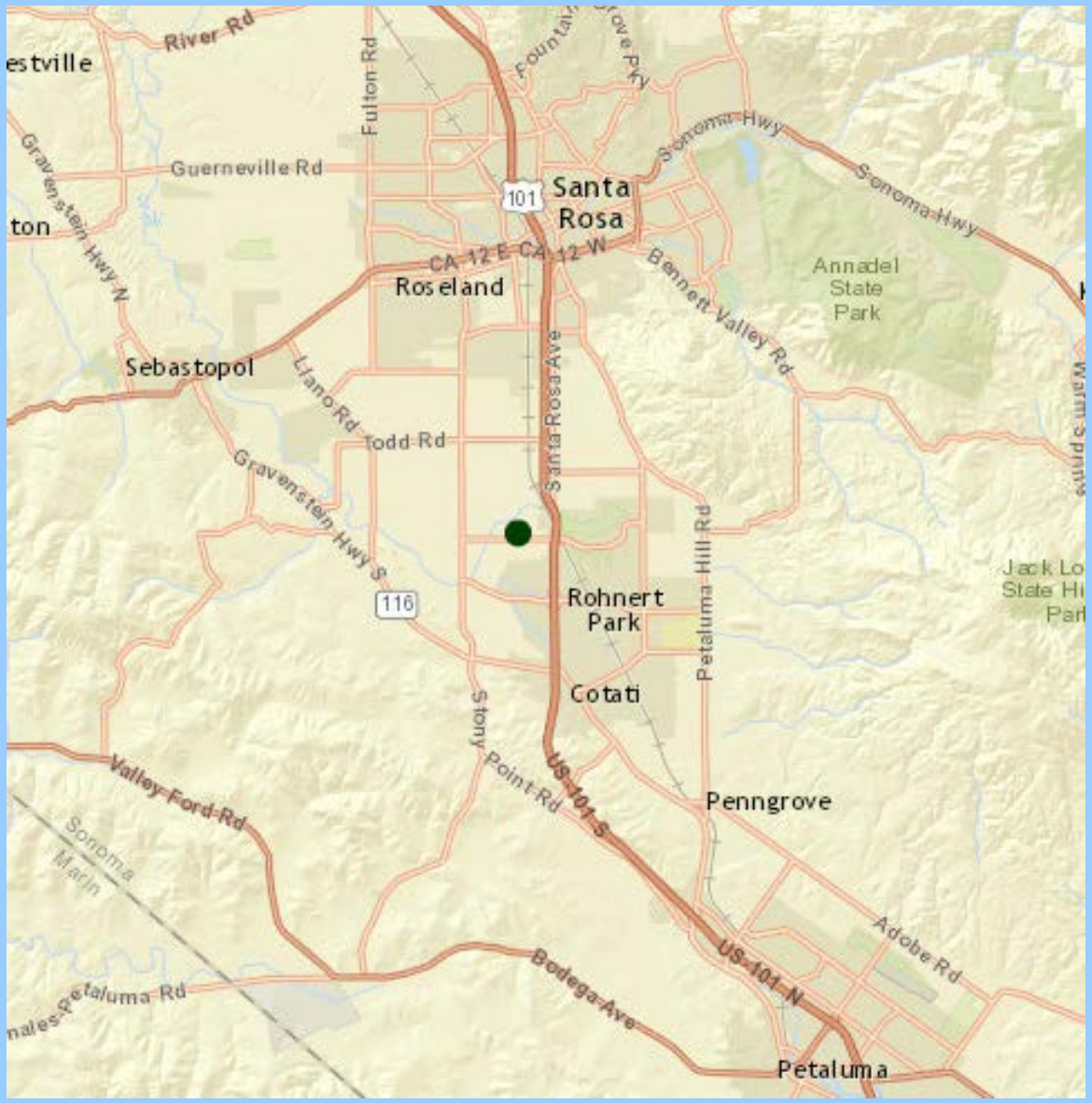
Well near Cannibal Island Road, Eel River Valley



Well near 7th and K Streets, Fortuna



Example of overdraft:
Well near Rohnert Park in Santa Rosa Plain Watershed



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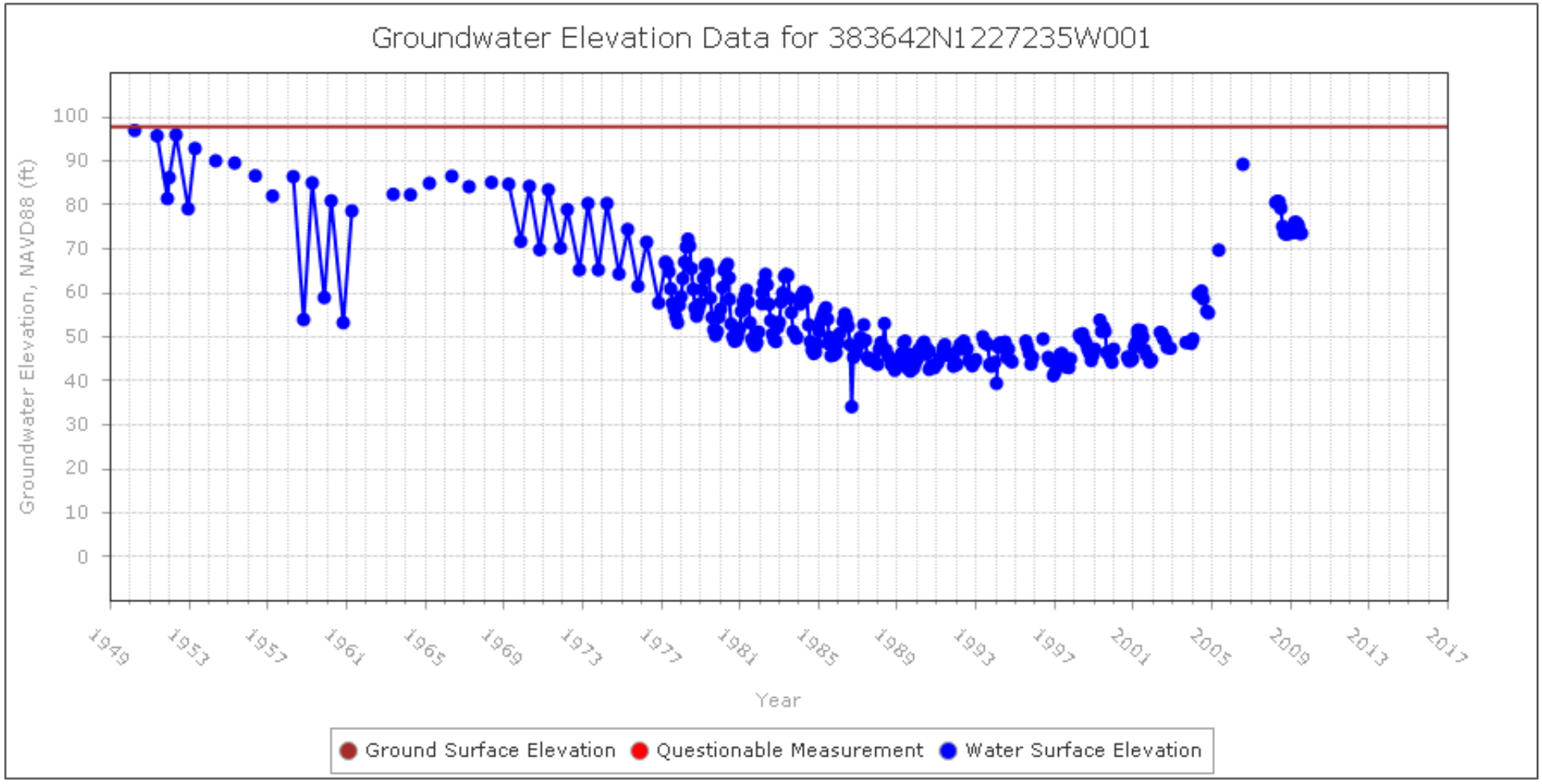

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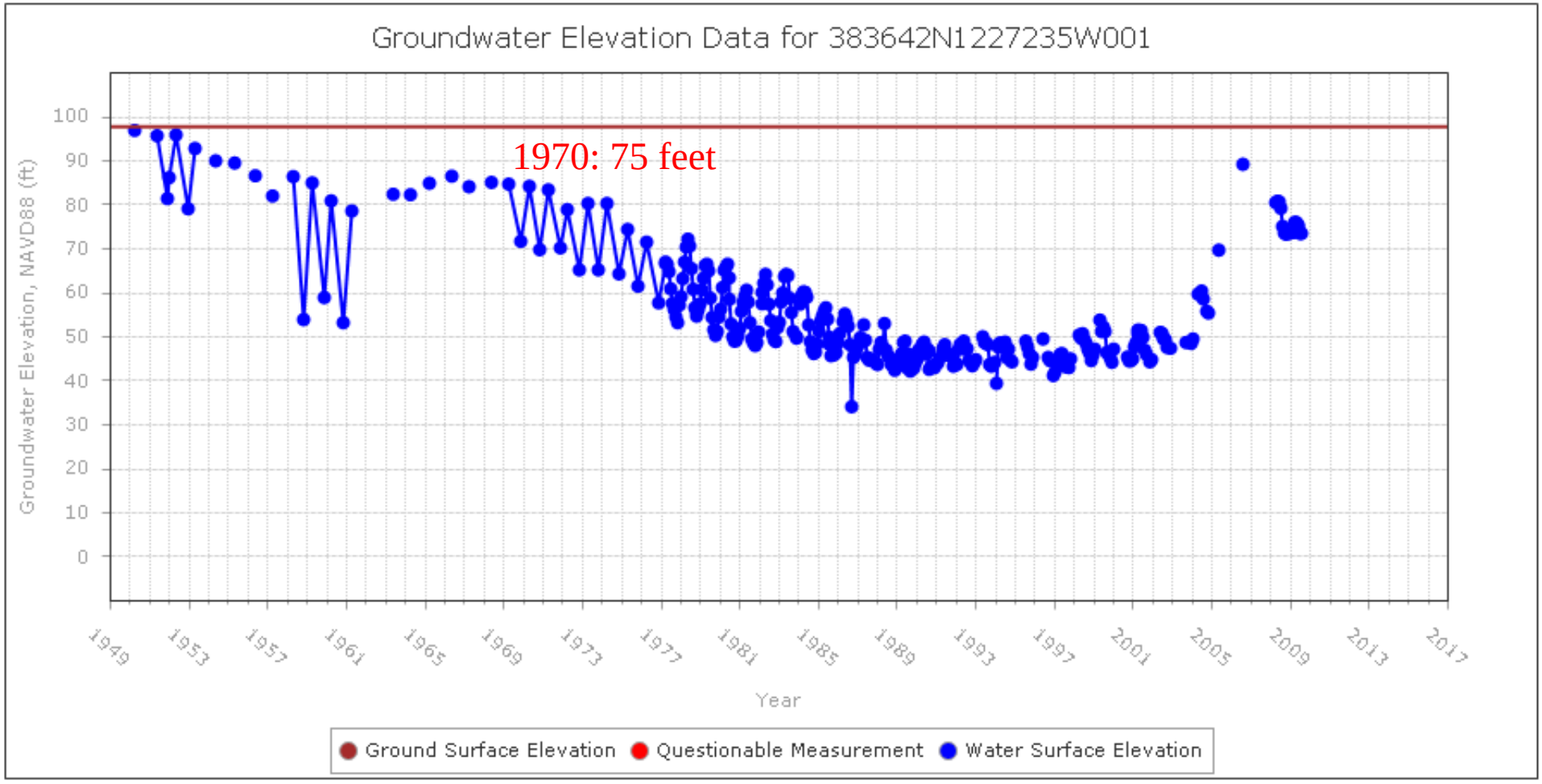

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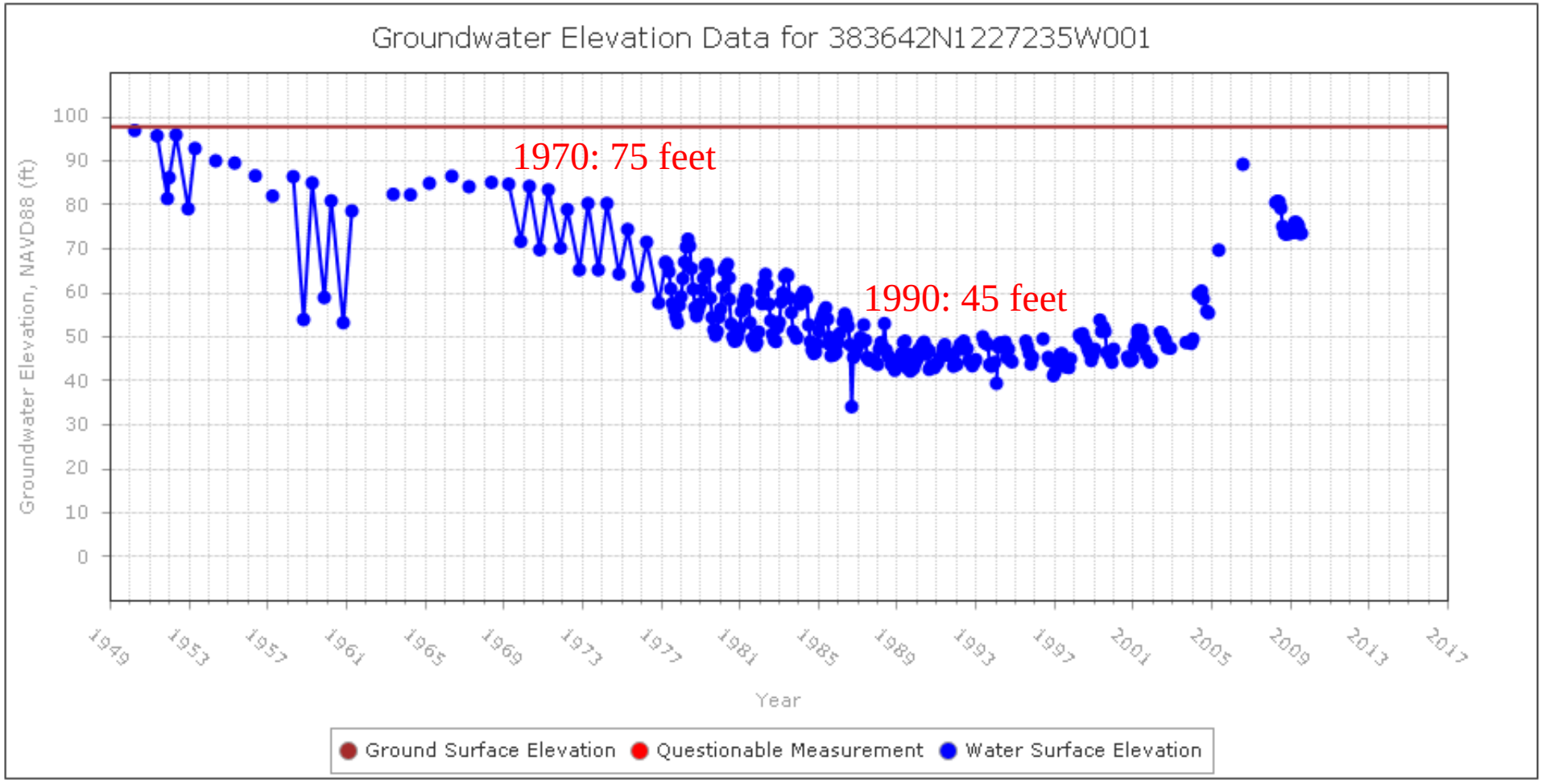

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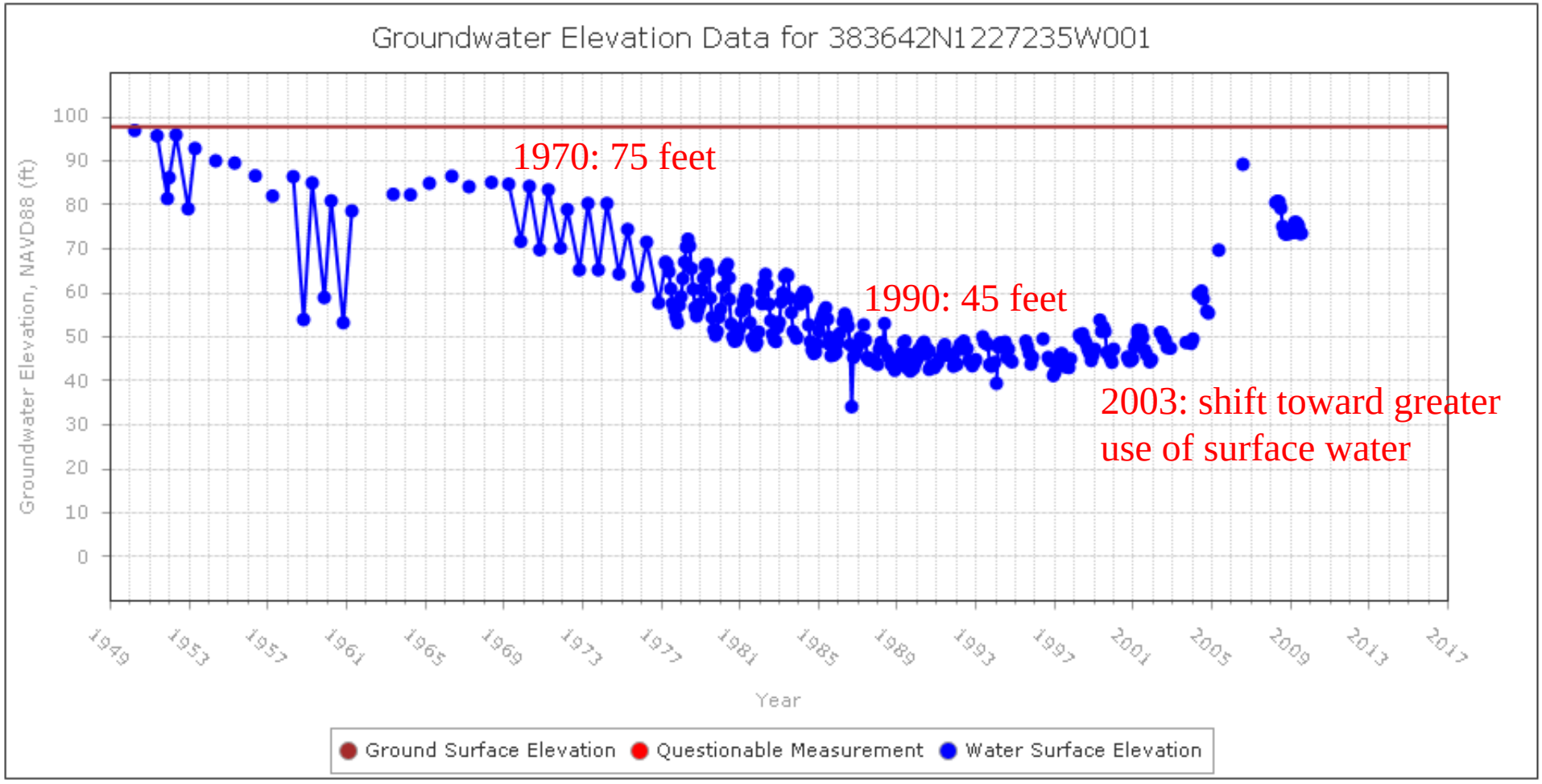
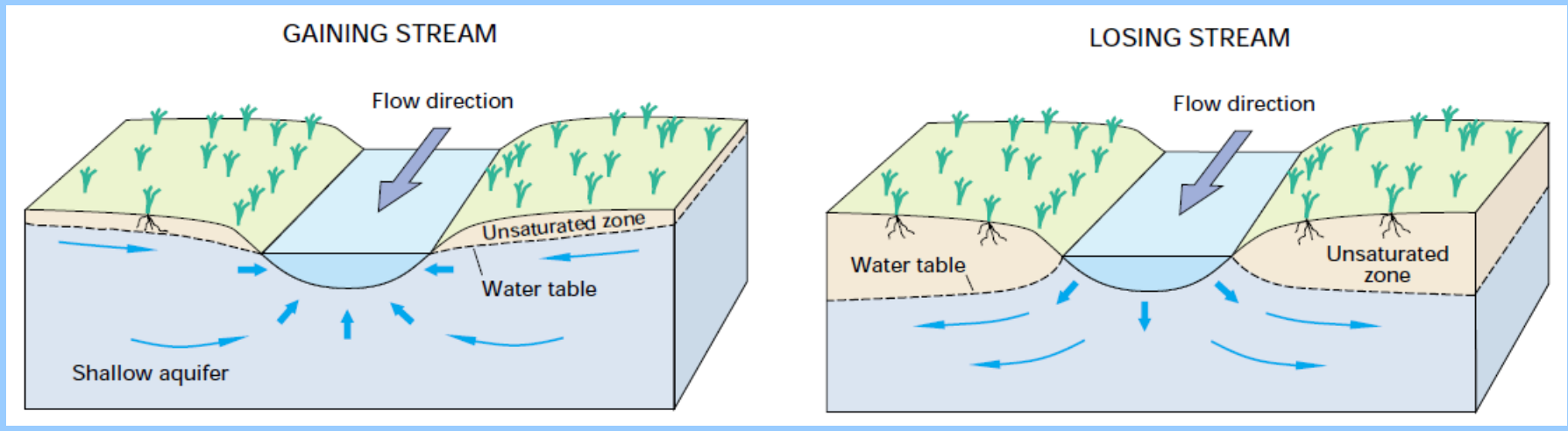


Absence of surface flow in lower Eel River (September 2014)

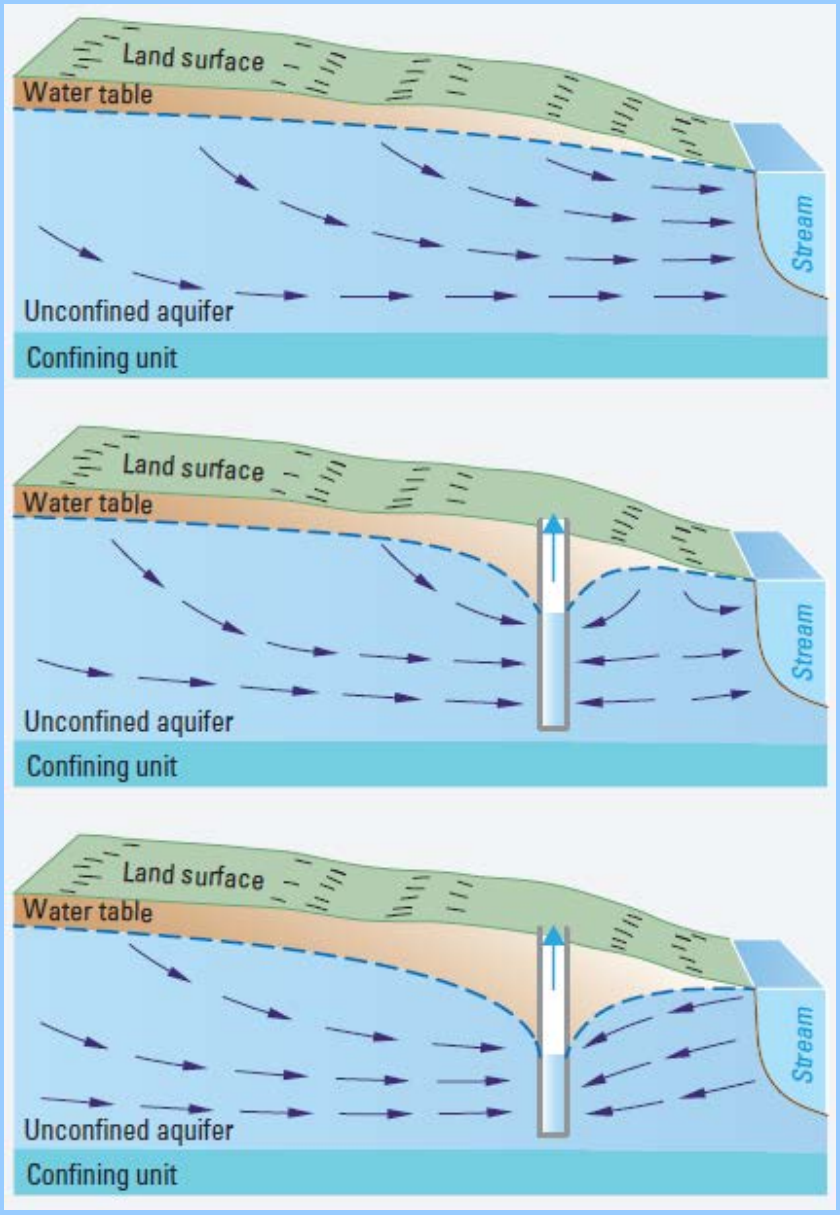
Source: The Press Democrat (9-14-2014)

Groundwater and stream interactions



Source: USGS Circular 1139

Pumping effects on groundwater and streams



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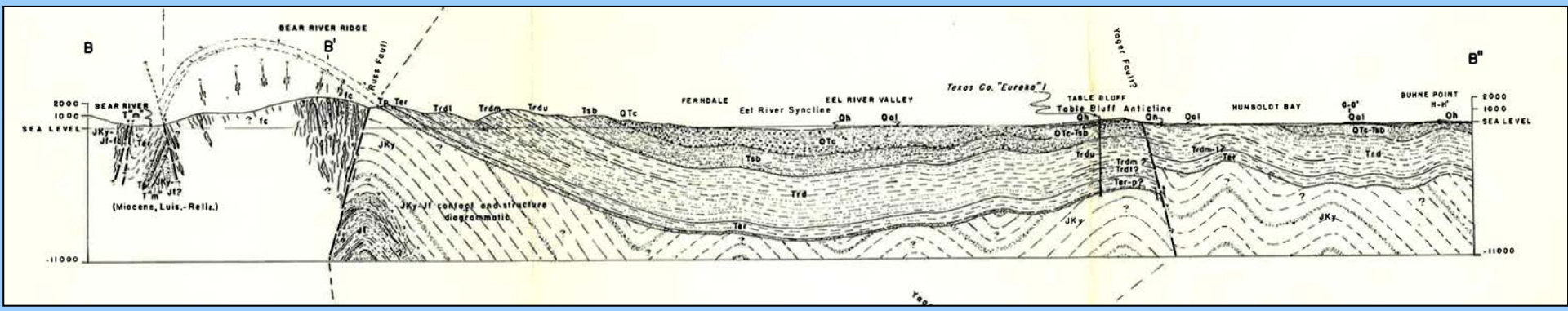
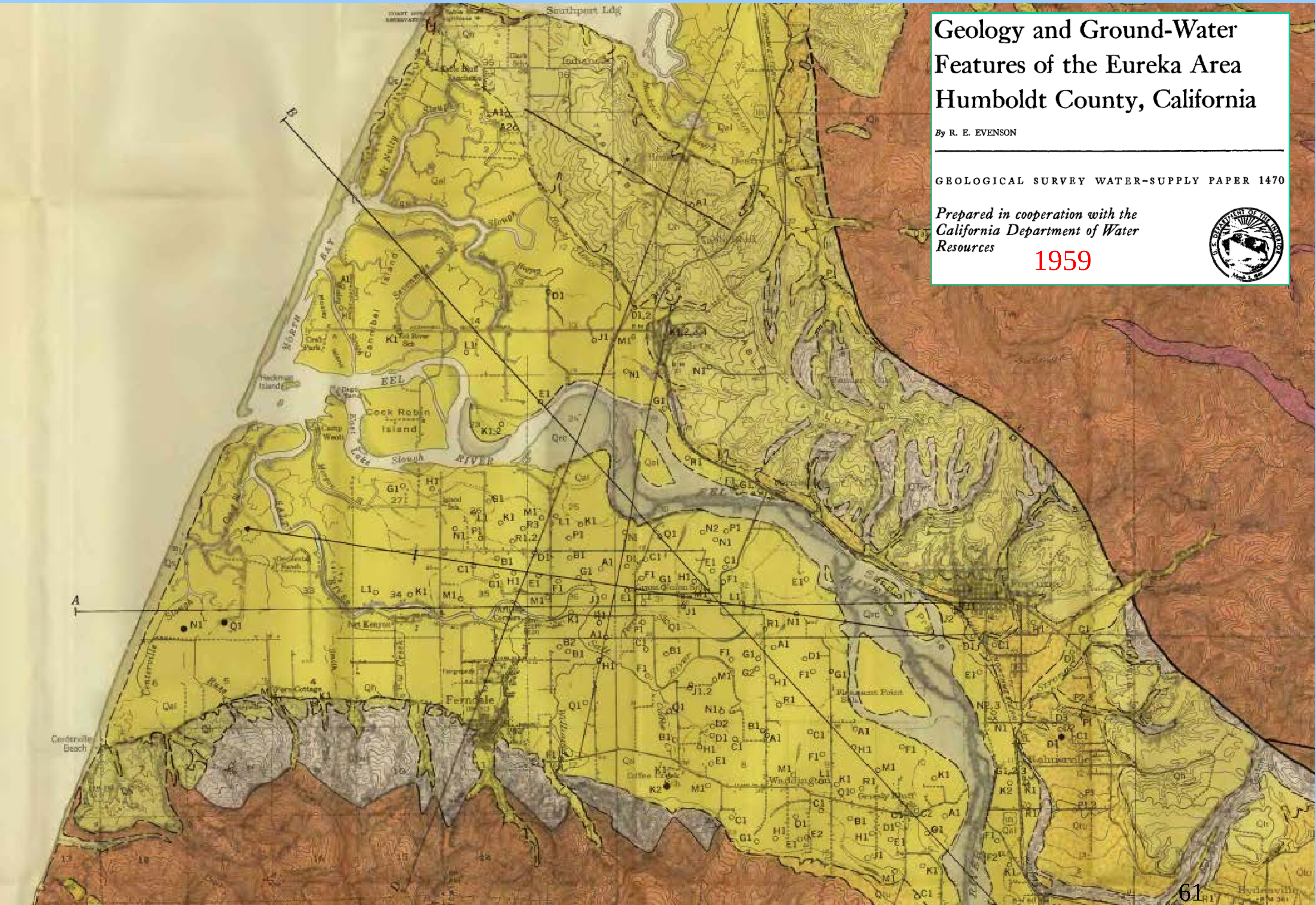
Eel River Valley Geology/Hydrogeology



Source: Geology of the Eel River valley area, Humboldt County, Calif. (Ogle, 1953)



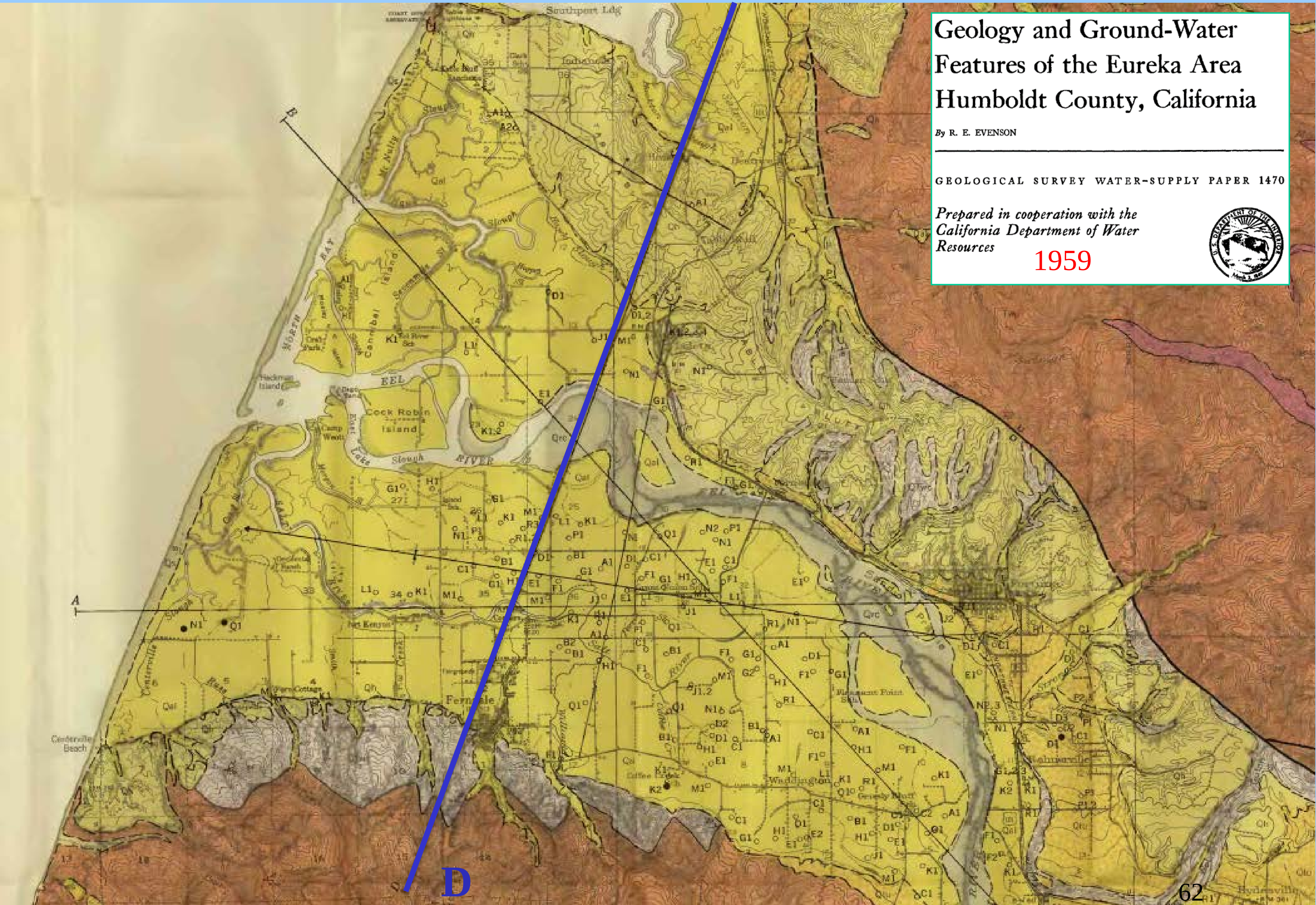
Geology and Ground-Water Features of the Eureka Area Humboldt County, California

By R. E. EVENSON

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1470

Prepared in cooperation with the California Department of Water Resources

1959



Geology and Ground-Water Features of the Eureka Area Humboldt County, California

By R. E. EVENSON

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1470

Prepared in cooperation with the California Department of Water Resources

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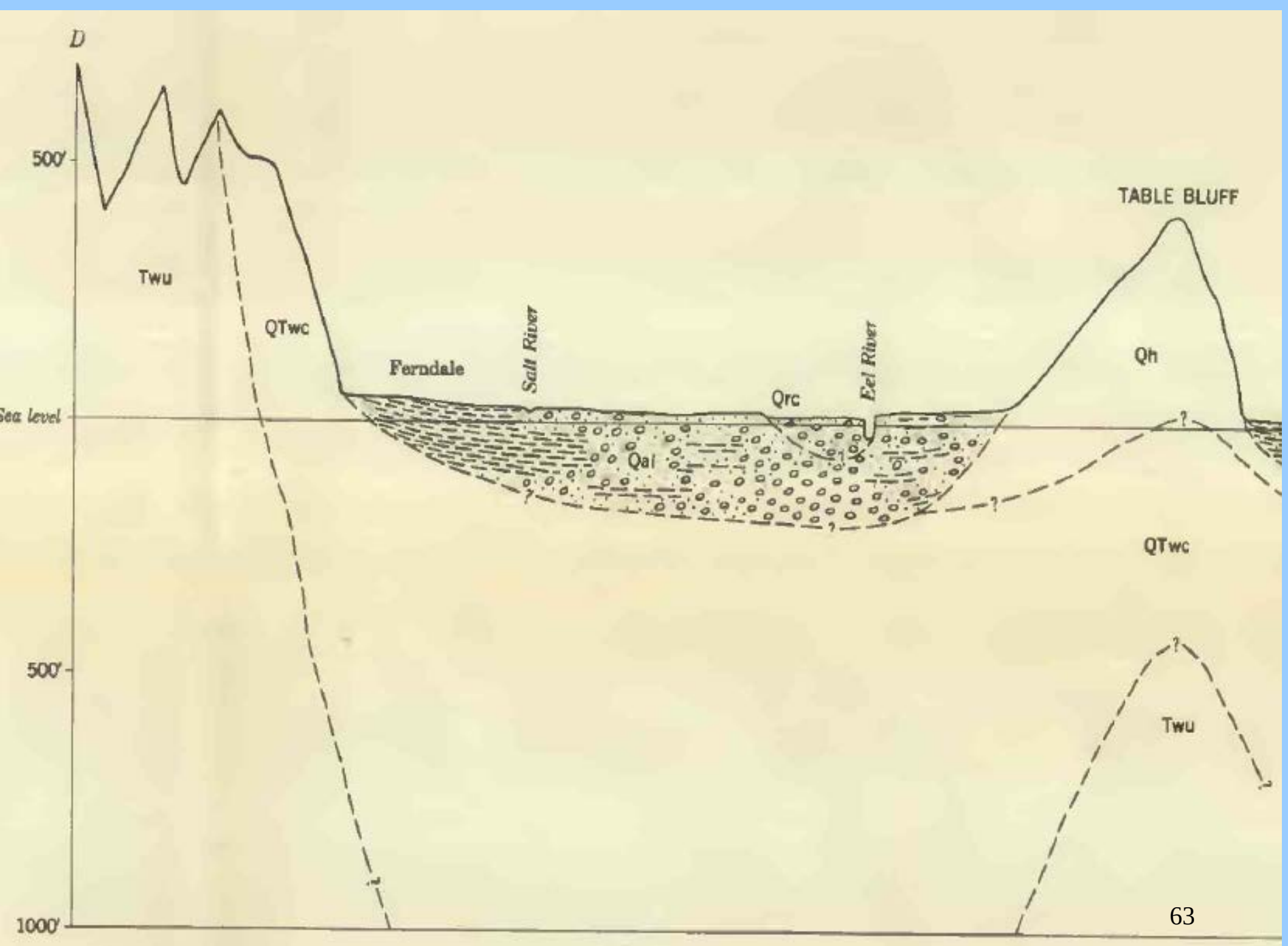
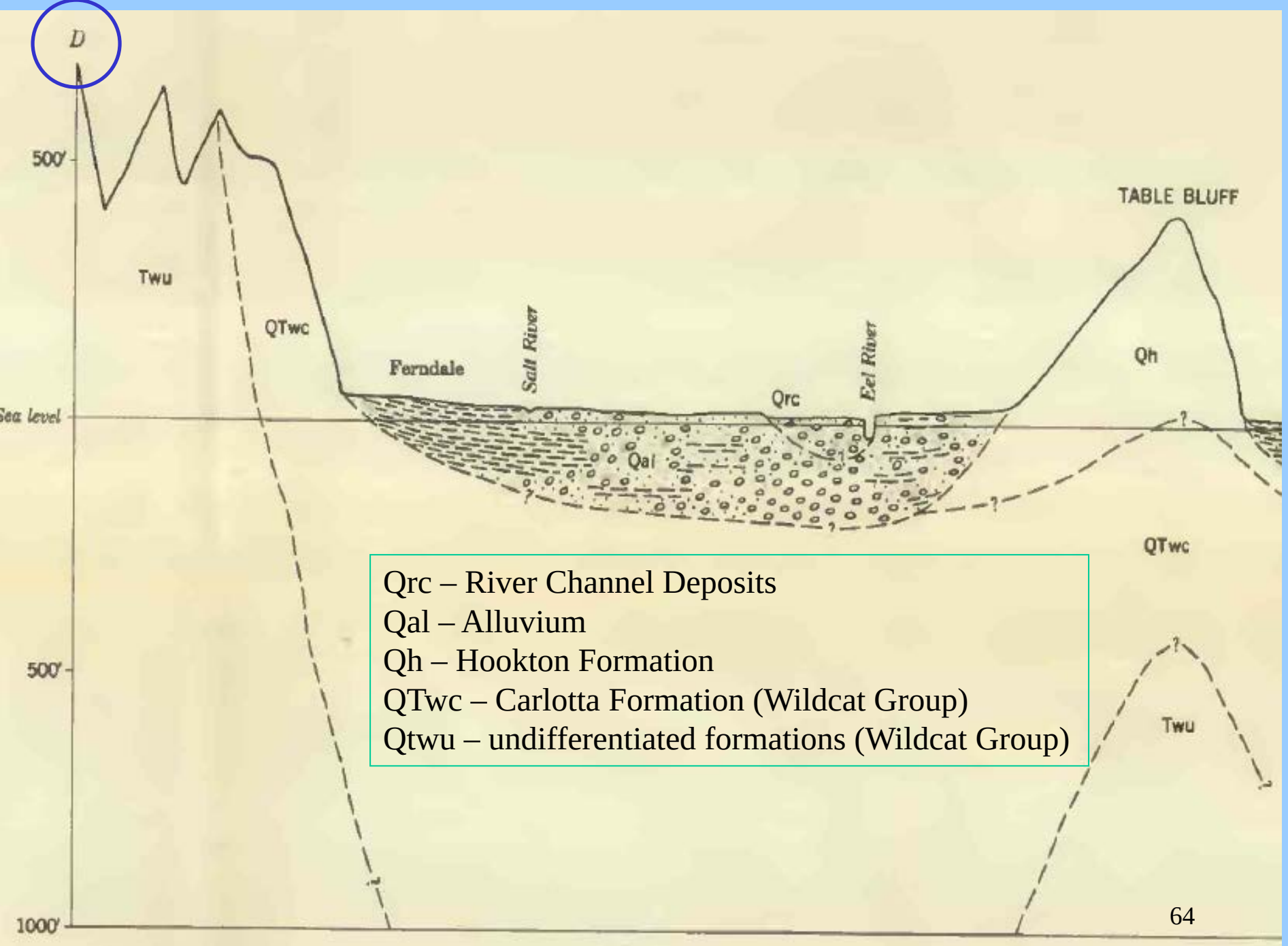


Source: Geology and Ground-Water Features of the Eureka Area, Humboldt County, California (Evenson, 1959)



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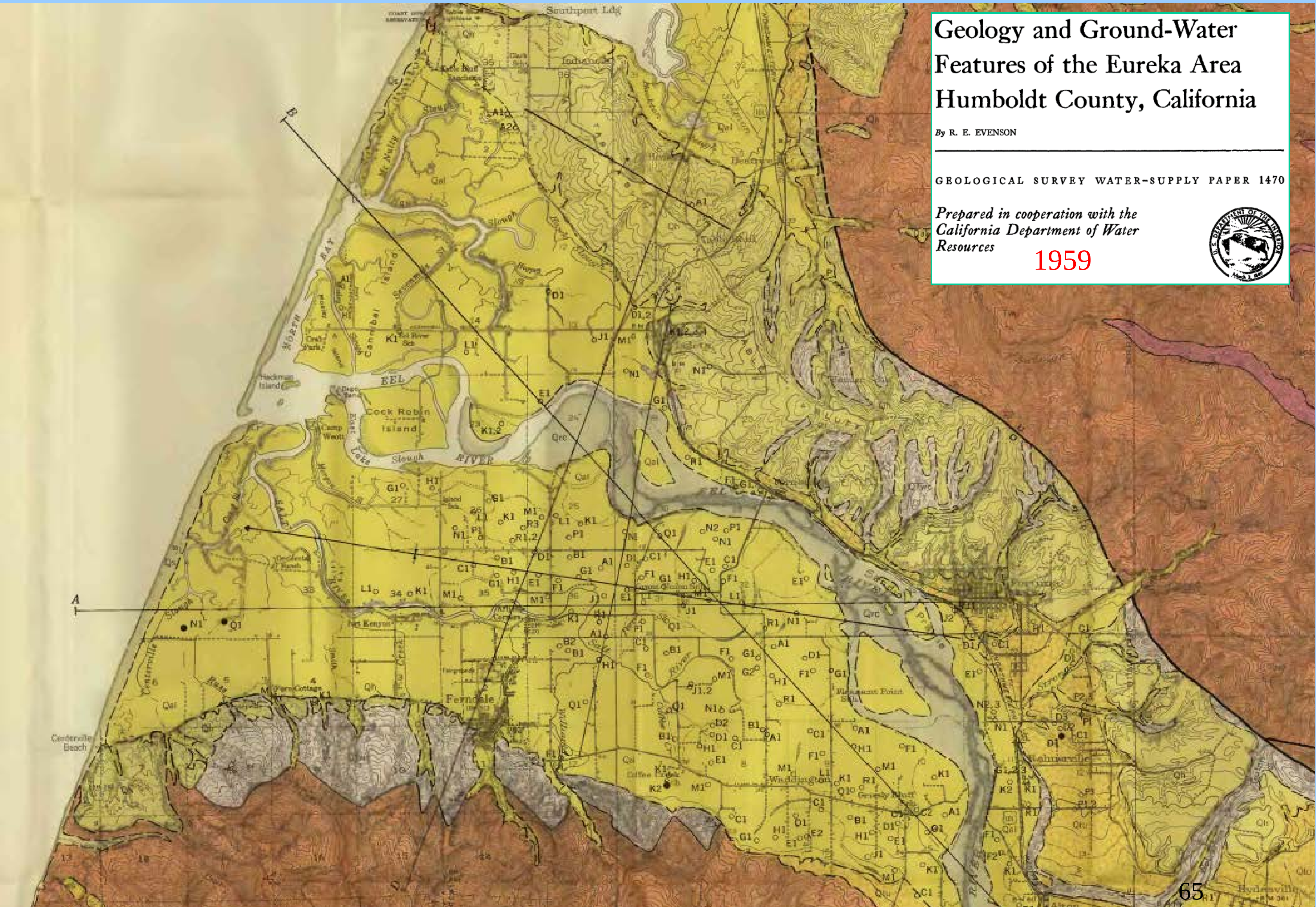

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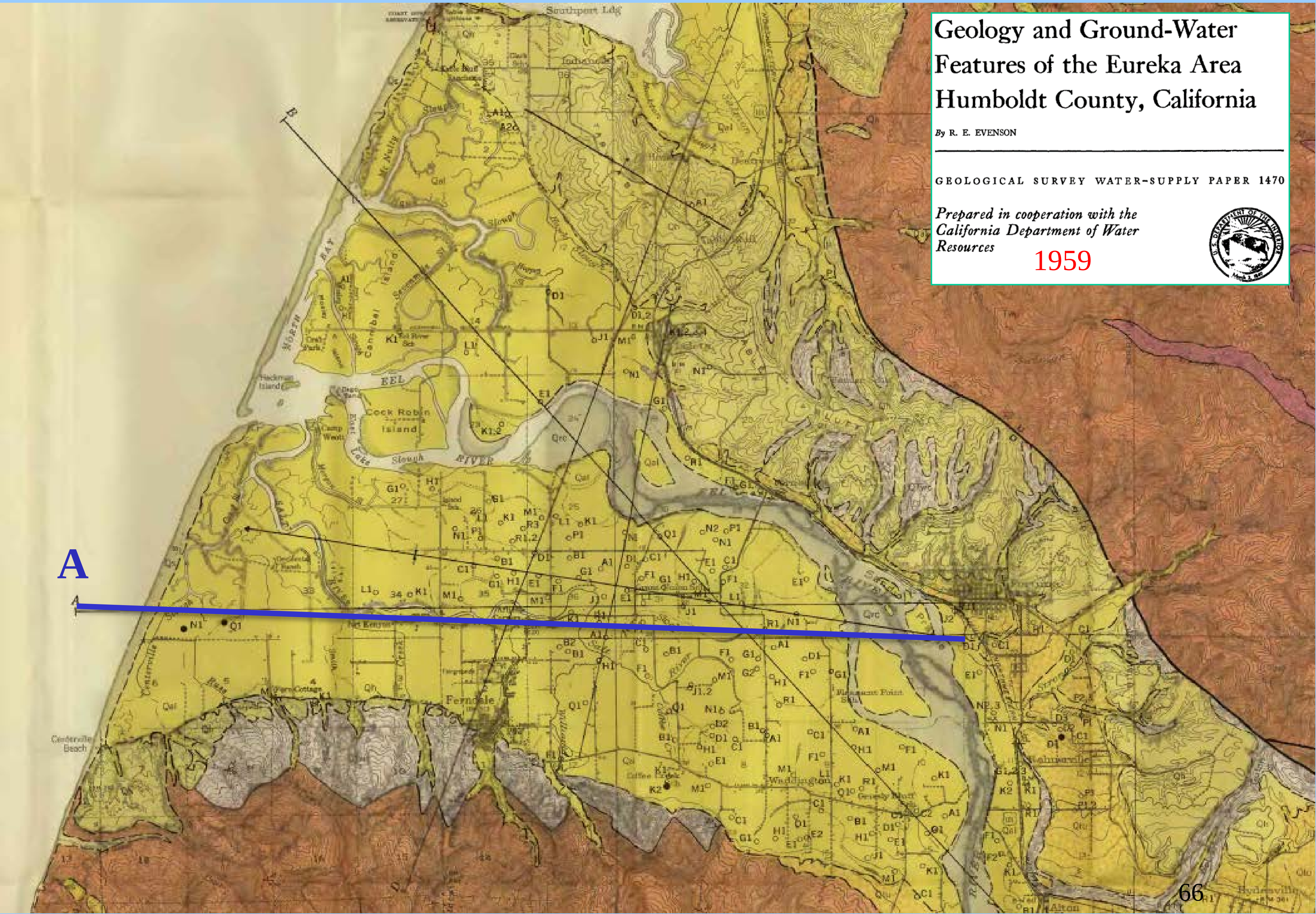

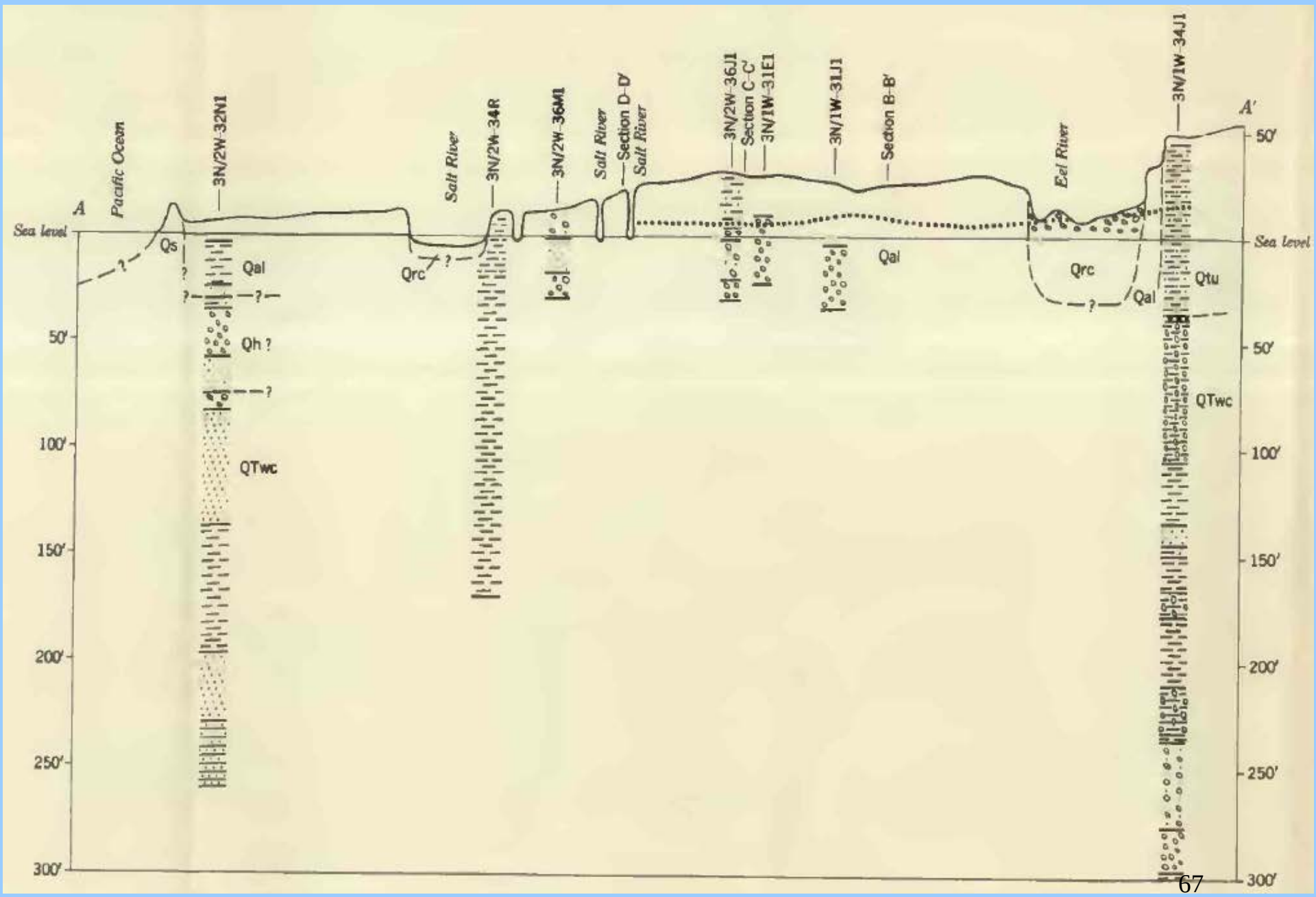

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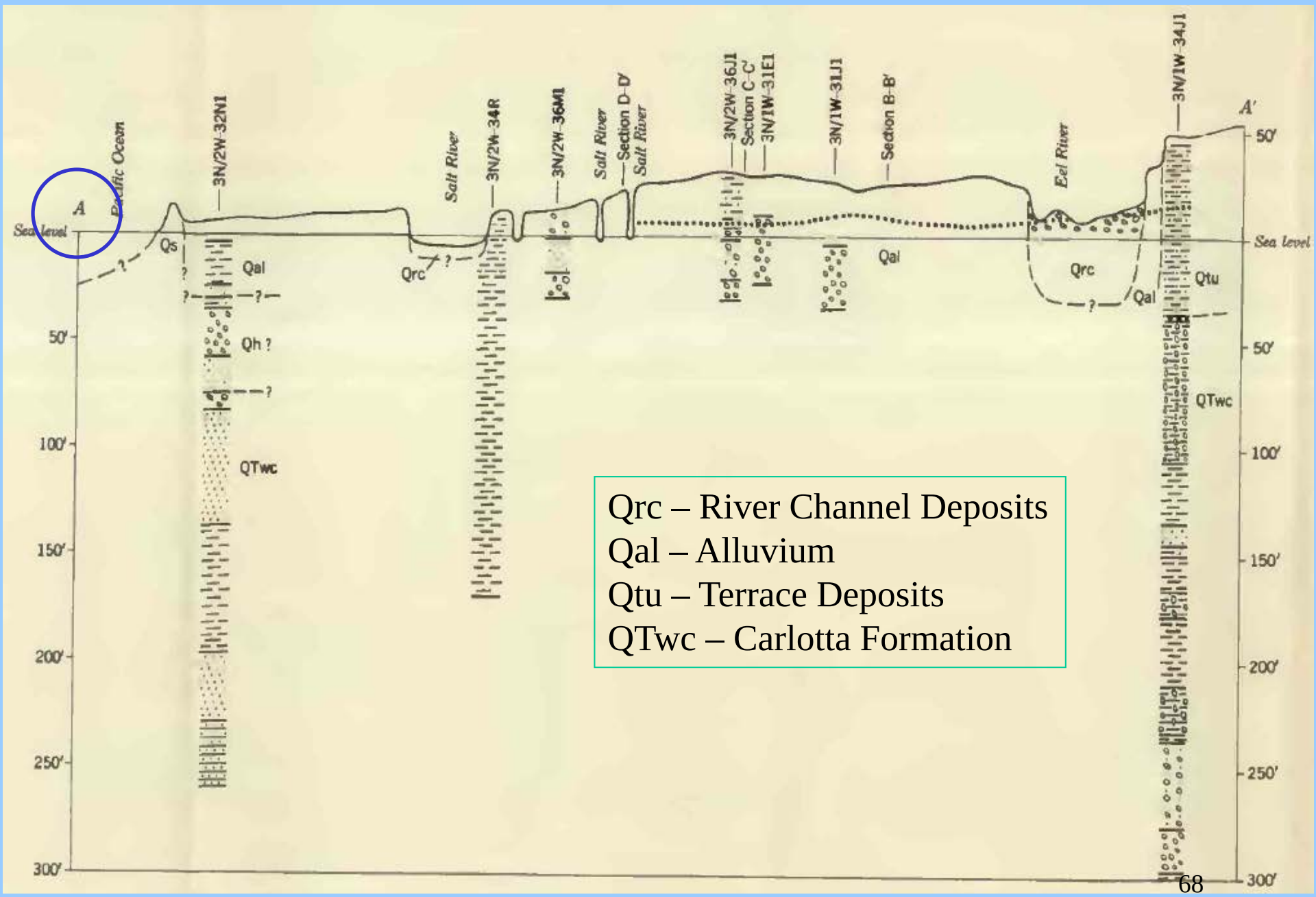

Qrc – River Channel Deposits
Qal – Alluvium
Qtu – Terrace Deposits
QTwc – Carlotta Formation

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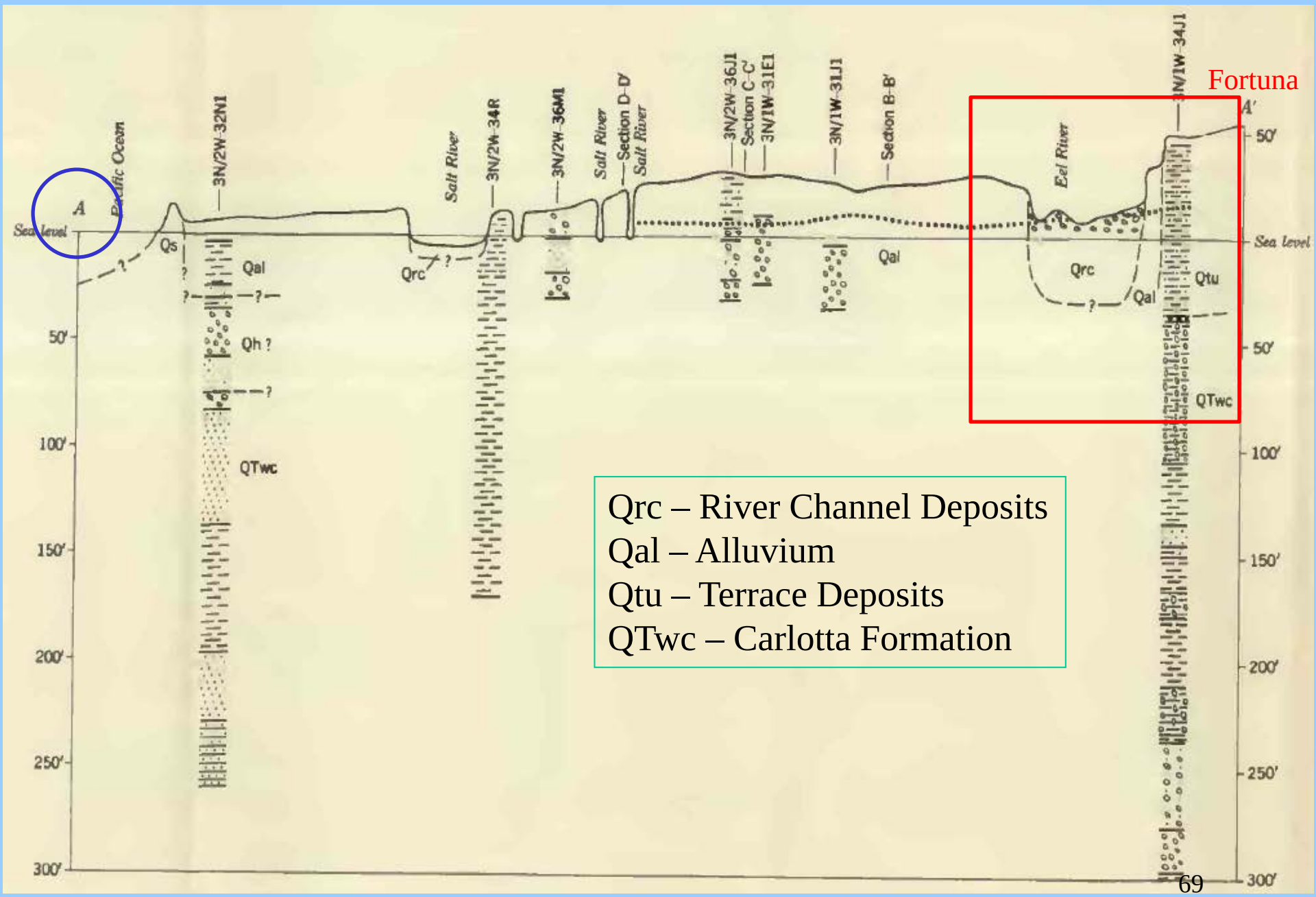

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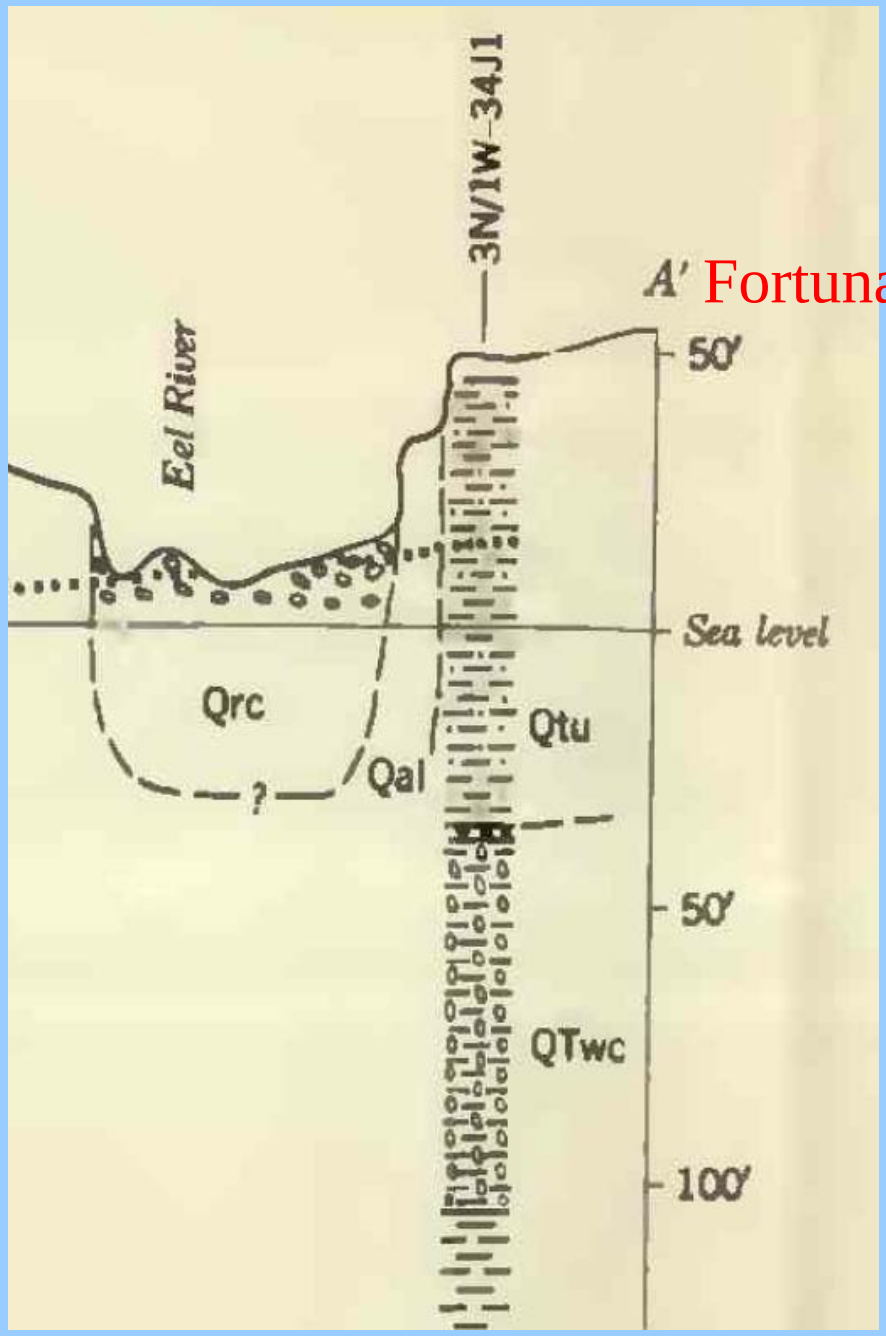

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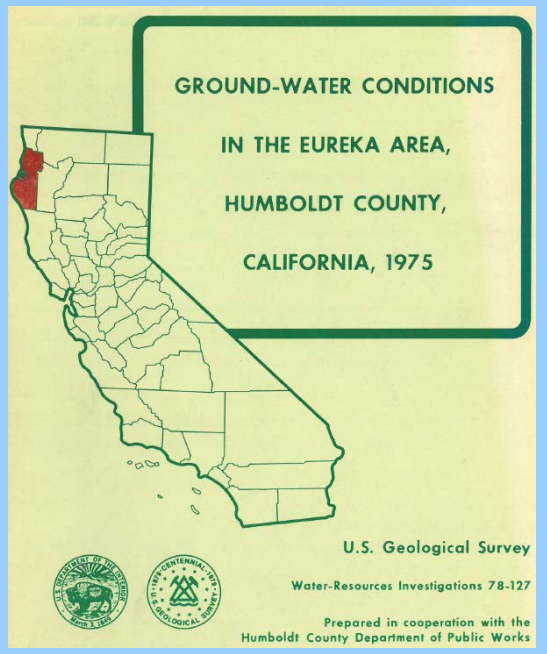
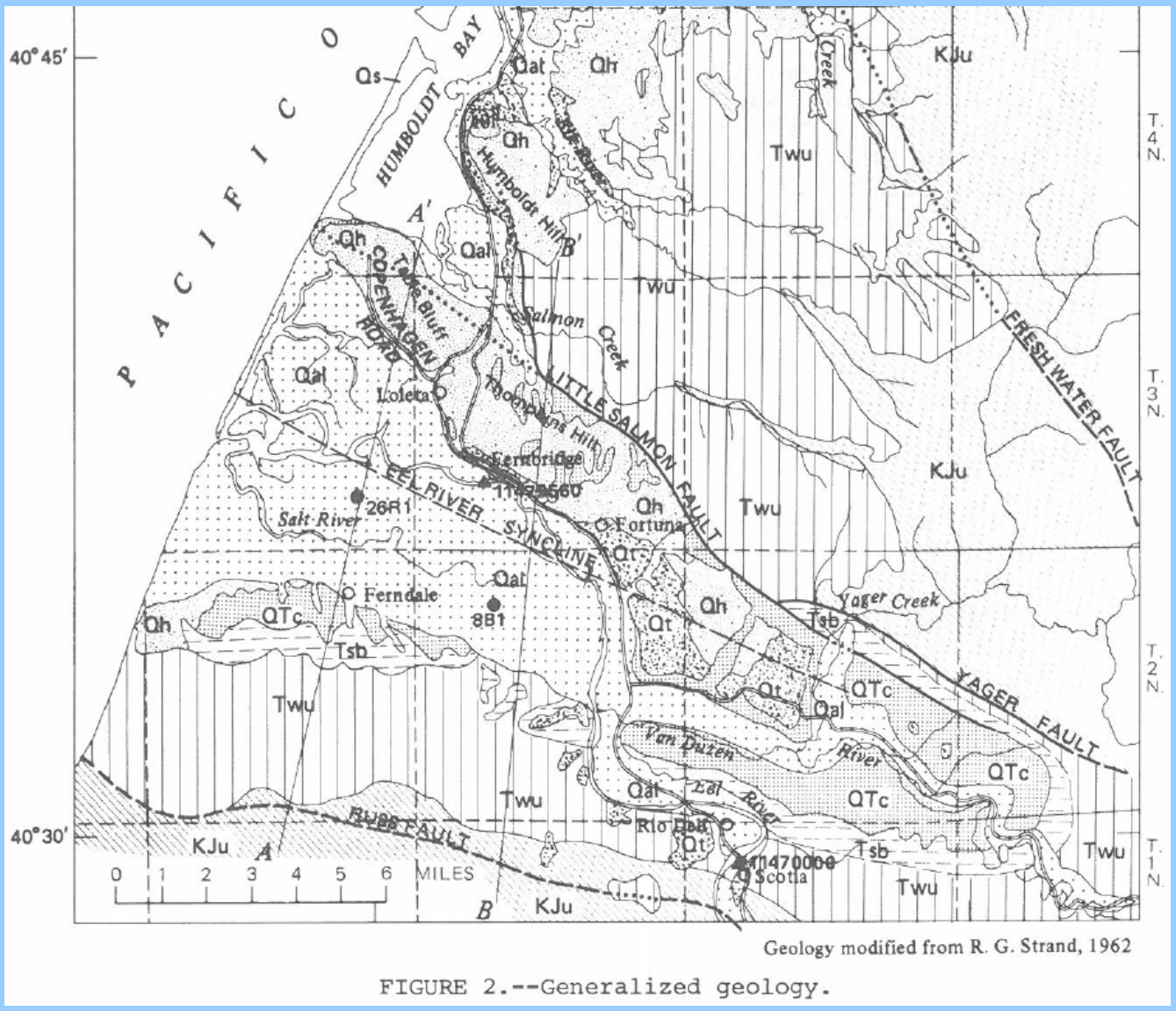
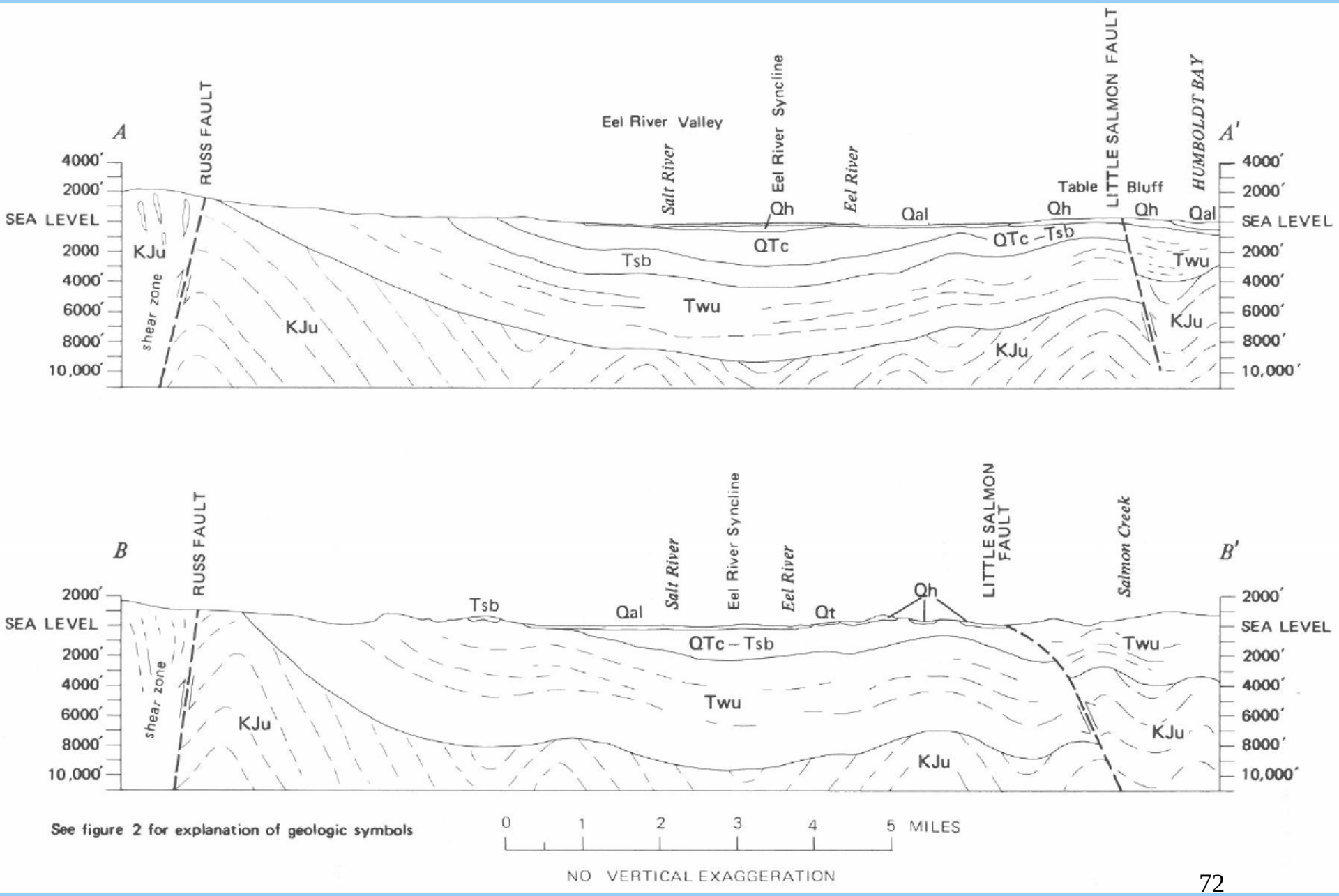




Geology modified from R. G. Strand, 1962

FIGURE 2.--Generalized geology.



Source: Ground-water Conditions of the Eureka Area, Humboldt County, California, 1975 (USGS)

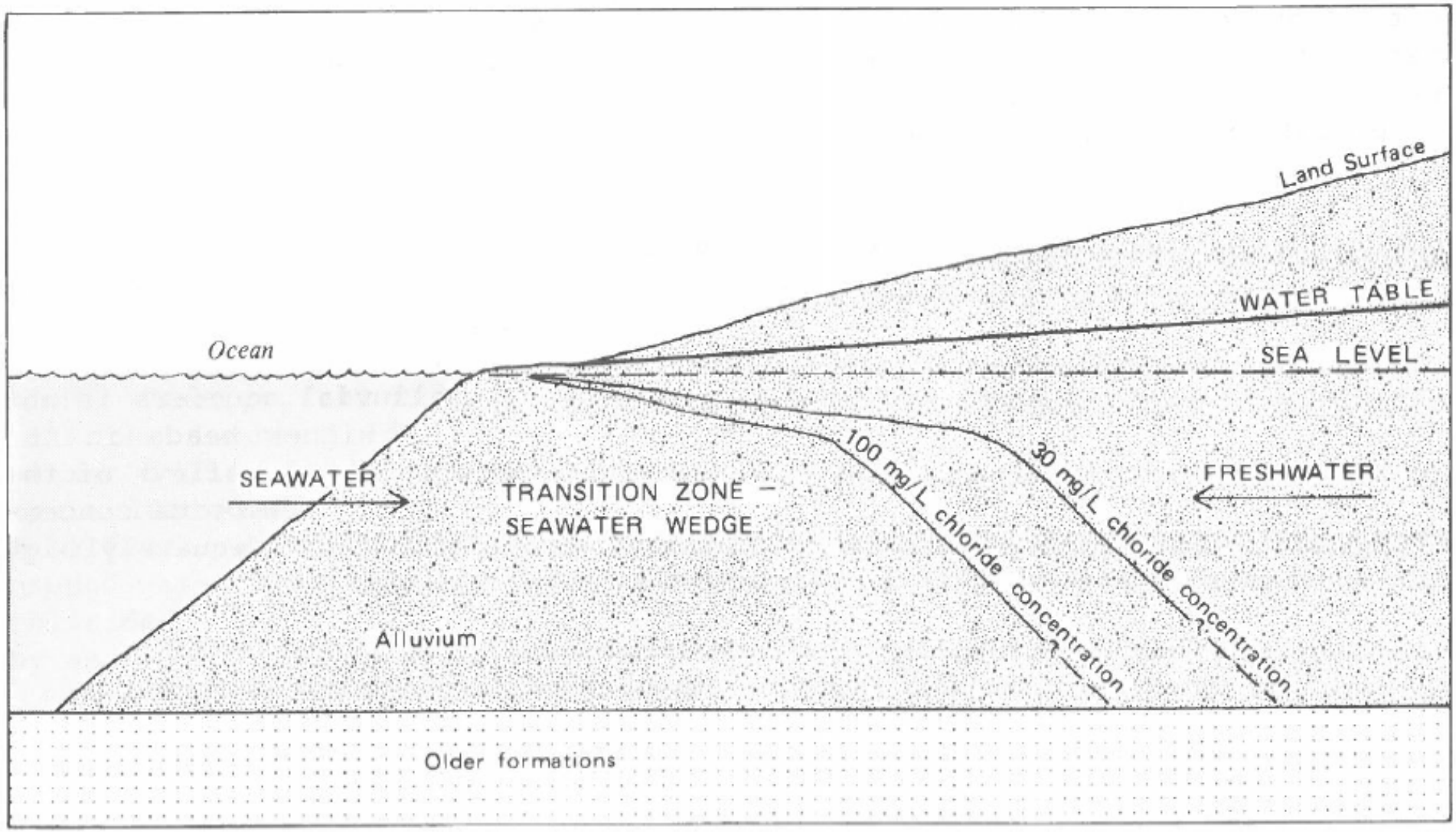


FIGURE 9.--Schematic section showing transition wedge in shallow aquifer.

Source: Ground-water Conditions of the Eureka Area, Humboldt County, California, 1975 (USGS)

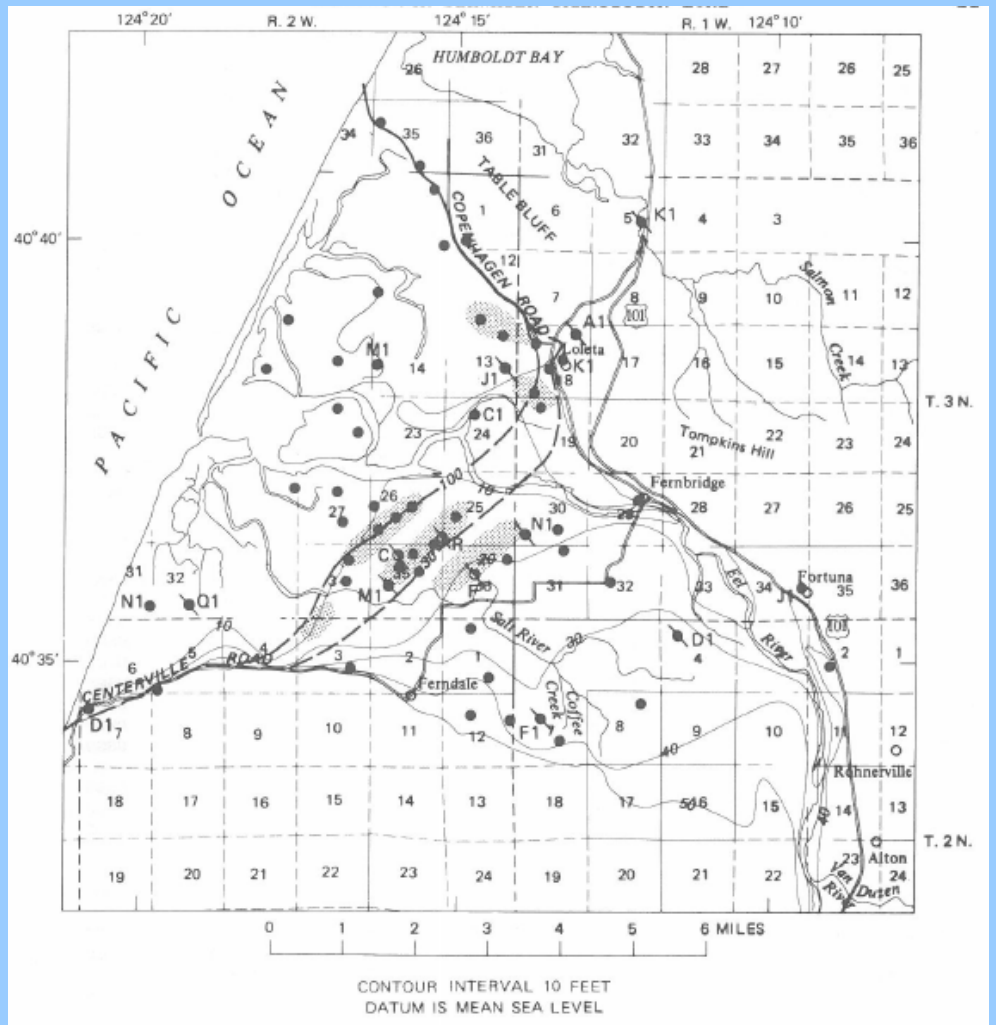


FIGURE 8.--Freshwater-seawater transition zone in the alluvial aquifer, Eel River valley, 1975.

Source: Ground-water Conditions of the Eureka Area, Humboldt County, California, 1975 (USGS)

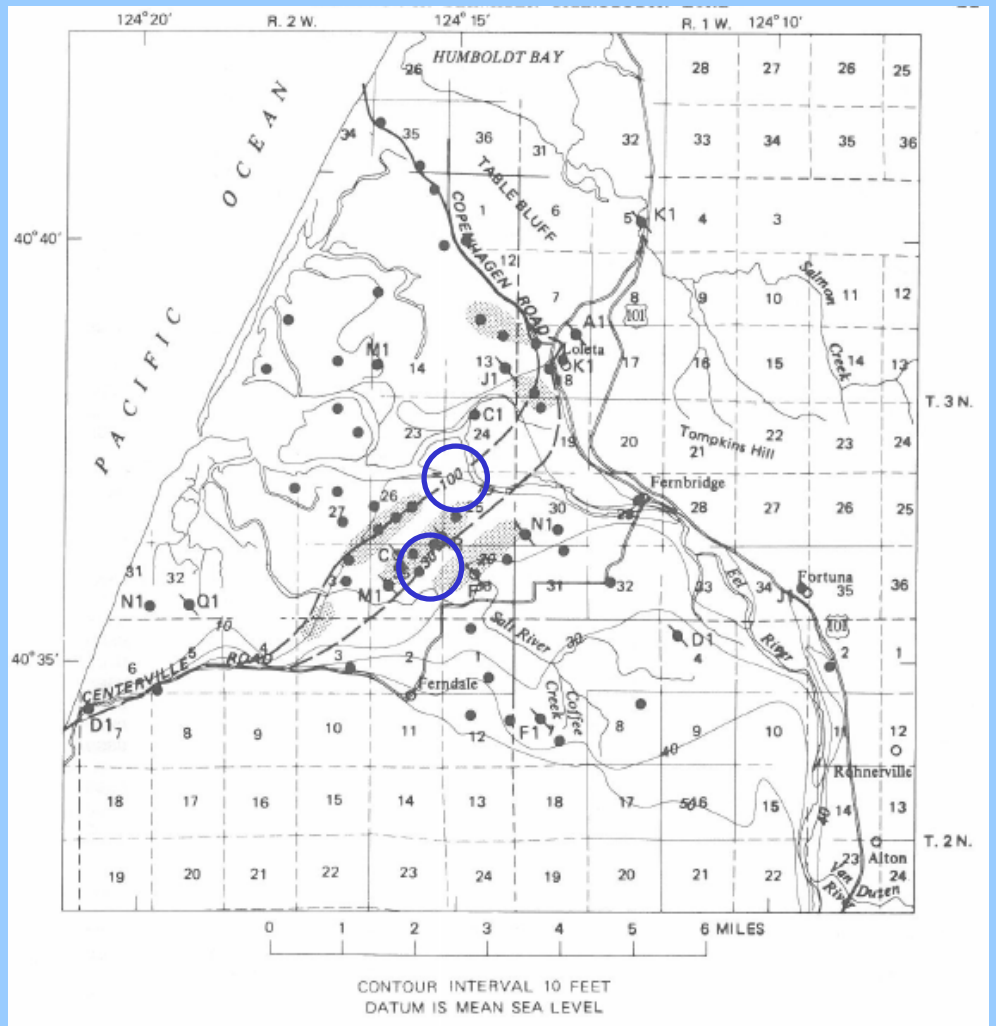


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TABLE 3.--*Irrigation pumpage*

[Pumpage given in acre-feet]

Area	Land-use method						Energy-lift method
	1952[1]		1958[2]		1968[3]		1975
	Acres	Pumpage	Acres	Pumpage	Acres	Pumpage	Pumpage
Eel and Van Duzen River valleys upstream from confluence	1,200	1,200	1,900	3,200	1,900	3,000	2,900
Eel River flood plain	8,400	8,400	9,000	14,800	9,800	15,800	14,400
Mad River flood plain	1,600	1,600	1,900	3,200	2,400	4,100	4,100
Other areas[4]	800	800	1,000	1,700	1,400	2,300	2,500
Total	12,000	12,000	13,800	22,900	15,500	25,200	23,900

[1]Evenson, 1959. Based on 1 acre-foot/acre (12 inches per unit area).
[2]Based on California Department of Water Resources, 1965a and 1965b.
[3]Based on file data, California Department of Water Resources, Red Bluff, Calif.
[4]Principally the Table Bluff-Eureka Plain area, Dows Praire-McKinleyville area, and Blue Lake area.

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Last update 2/27/04

North Coast Hydrologic Region
Eel River Valley Groundwater Basin

California's Groundwater
Bulletin 118

Groundwater Budget (Type B)

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources in 1996. The survey included landuse and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 49,000 and 1,400 acre-feet respectively. Deep percolation from applied water is estimated to be 9,500 acre-feet.

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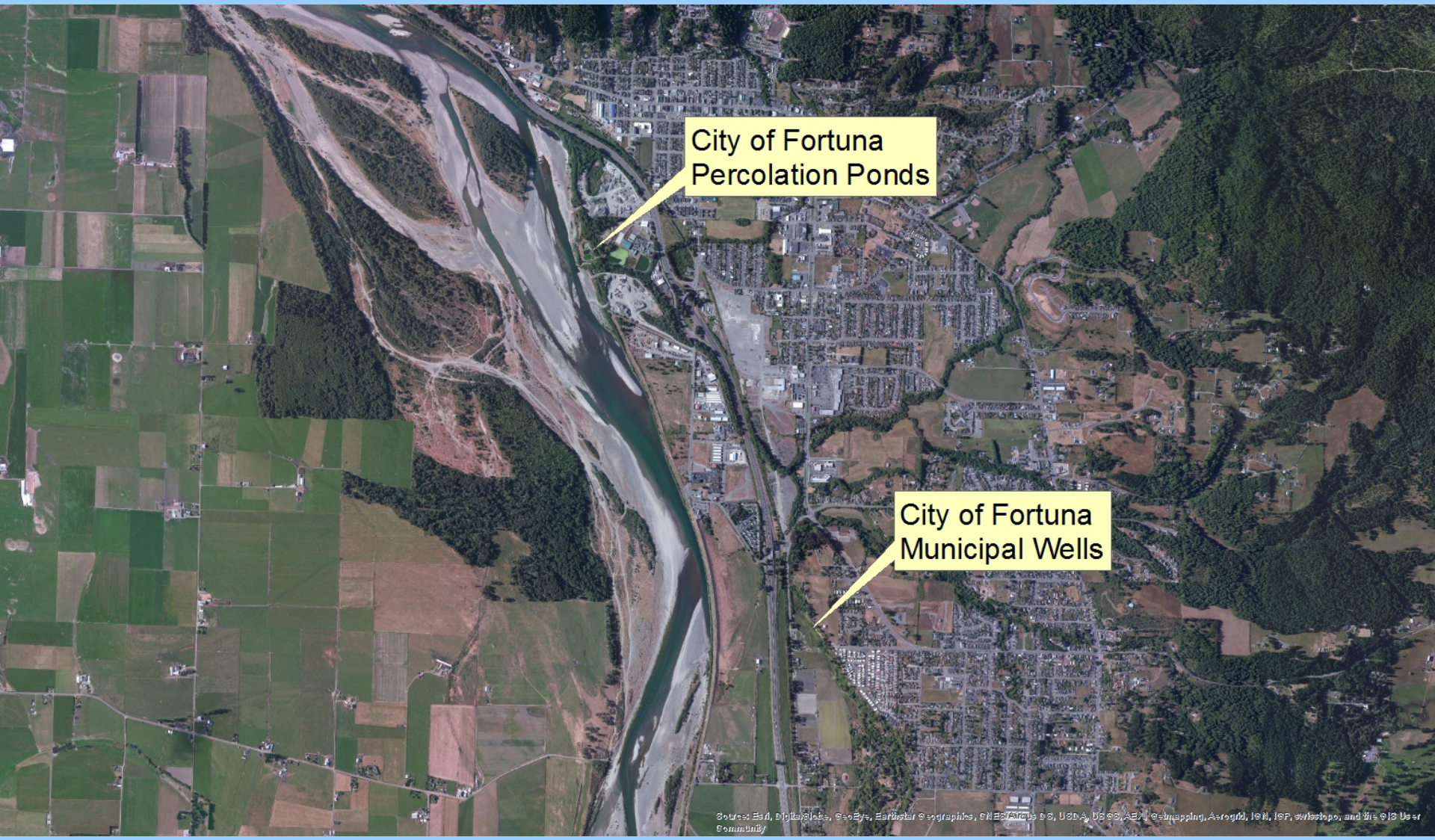

Imagery: Bing Maps

City of Fortuna

- Population 11,840 (2013)
- 4,300 water connections (2011)
- Economically disadvantaged community - 69% of state MHI (2013)

Some Key Questions

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1. Data Collection

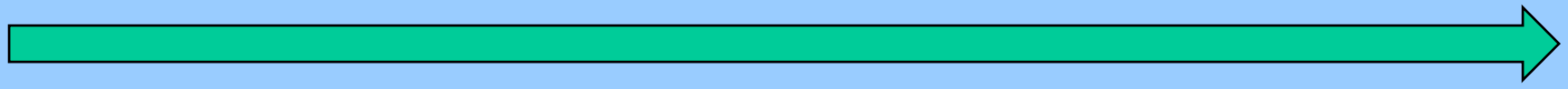
- **Stratigraphy/lithology**
- **Aquifer properties**
- **Water levels, gradients, flow directions**
- **Wells, intake location, pumpage, drawdown, cone of depression**
- **Irrigation return flows**
- **Sub-surface flow during dry season**

2. Conceptual Model

- **Groundwater/surface water interactions at appropriate scale**
- **Recharge areas**
- **Water balance**
- **Driving factors at watershed scale (climate cycles, upstream withdrawals)**

3. Numerical Model

- **Test hypotheses**
- **Evaluate scenarios**



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3. What defines a significant and unreasonable adverse impact on beneficial uses of surface water?
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Let's Discuss