

SANTA CRUZ COUNTY WATER RESOURCES

By Mike Cloud – Retired Geologist , County Environmental Health Services

- 1. WHERE DOES OUR WATER COME FROM?**
- 2. THE WHO, WHAT, WHEN AND WHERE OF COUNTY WATER MANAGEMENT**
- 3. WHAT IS THE CONDITION OF OUR WATER RESOURCES?**
- 4. WHAT CAN BE DONE REGARDING GROUNDWATER RECHARGE**

\$

Financial

L

Legal

E

Environmental

R

Regulatory

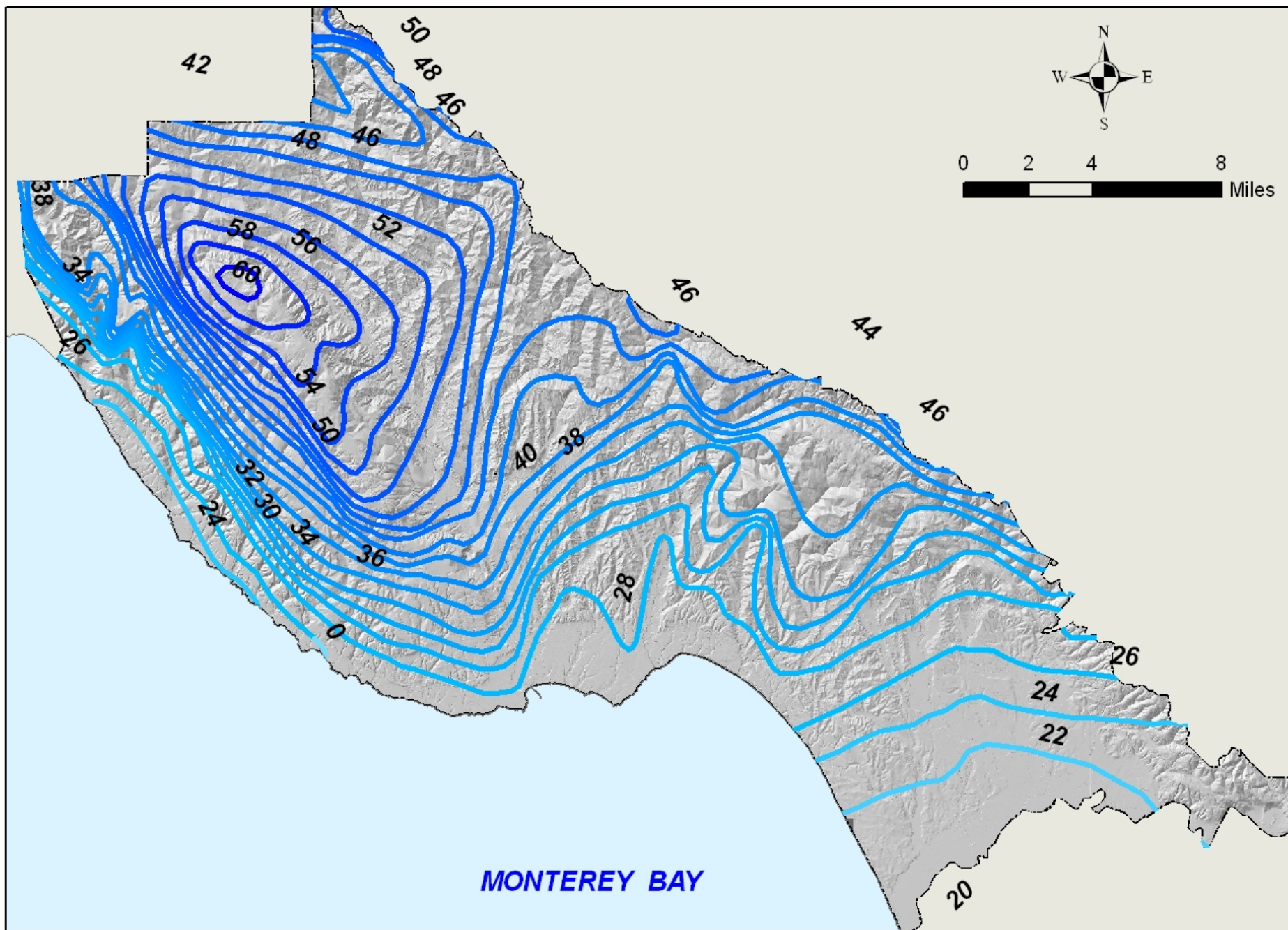
P

Political

T

Technical

WHERE DOES OUR WATER COME FROM?



SANTA CRUZ COUNTY AVERAGE RAINFALL

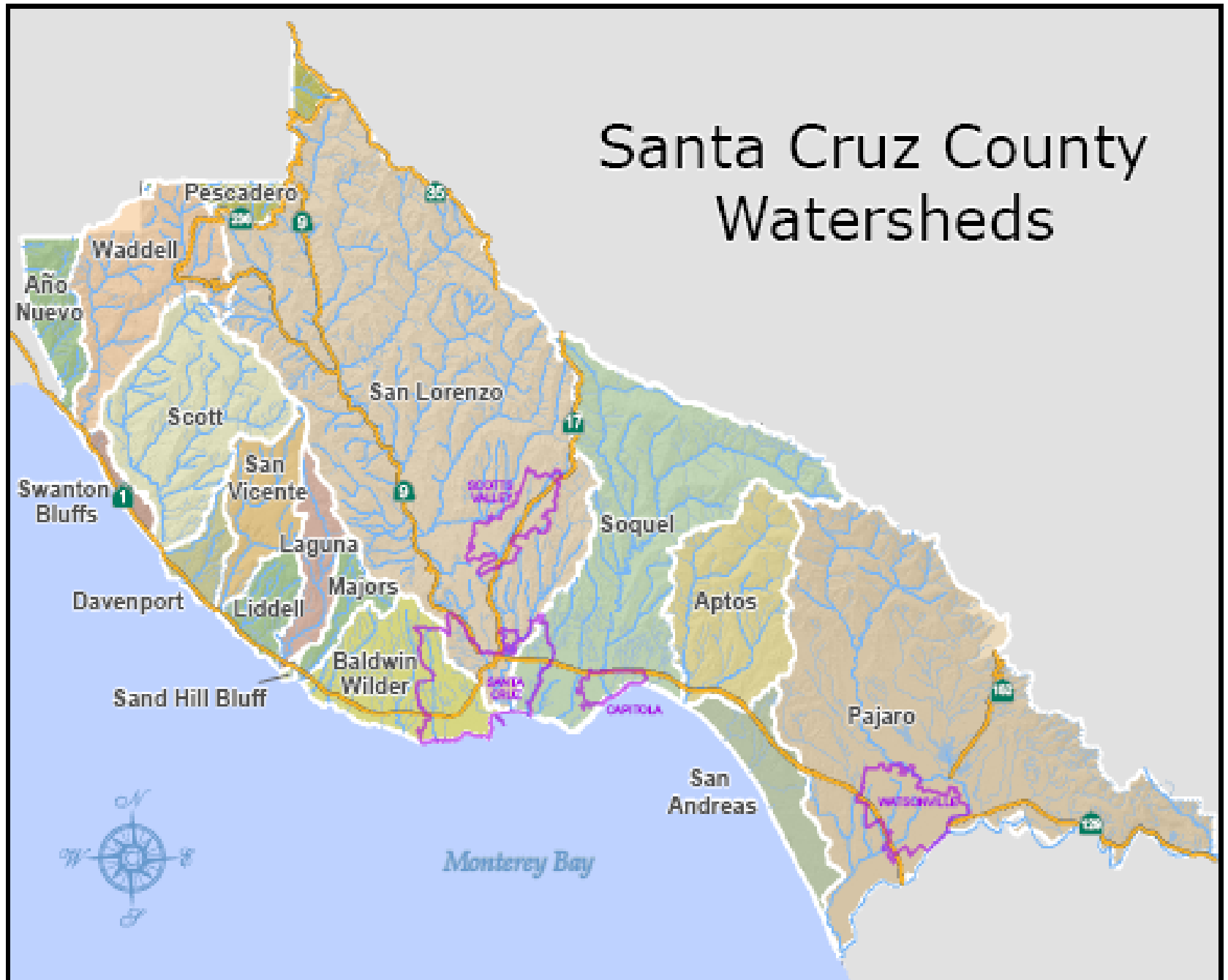
SANTA CRUZ COUNTY PRECIPITATION ESTIMATES

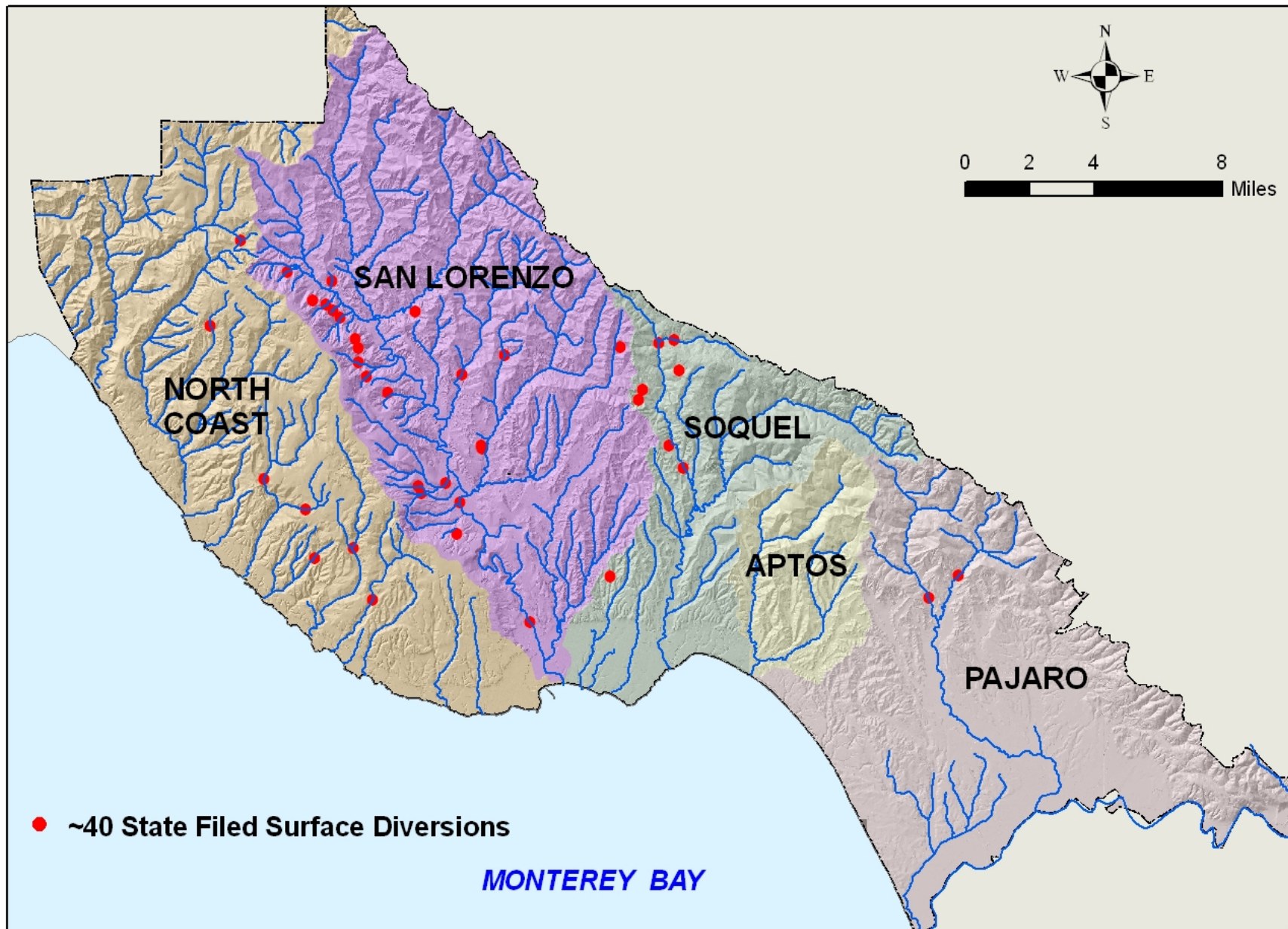
	AREA-SQ FT	AREA-ACRES	AVG PRECIP IN/YR	AVG TOTAL PRECIP-AFY	% OF TOTAL CO. PRECIP
NORTHERN WATERSHEDS	7,100,000,000	162,994	44	597,643	66%
MID-COUNTY WATERSHEDS	2,886,000,000	66,253	34	187,718	21%
SOUTHERN WATERSHEDS	2,448,000,000	56,198	26	121,763	13%
TOTAL	12,434,000,000	285,445	38	907,124	100%

EST. CO-WIDE AVG PRECIP IN INCHES: 38

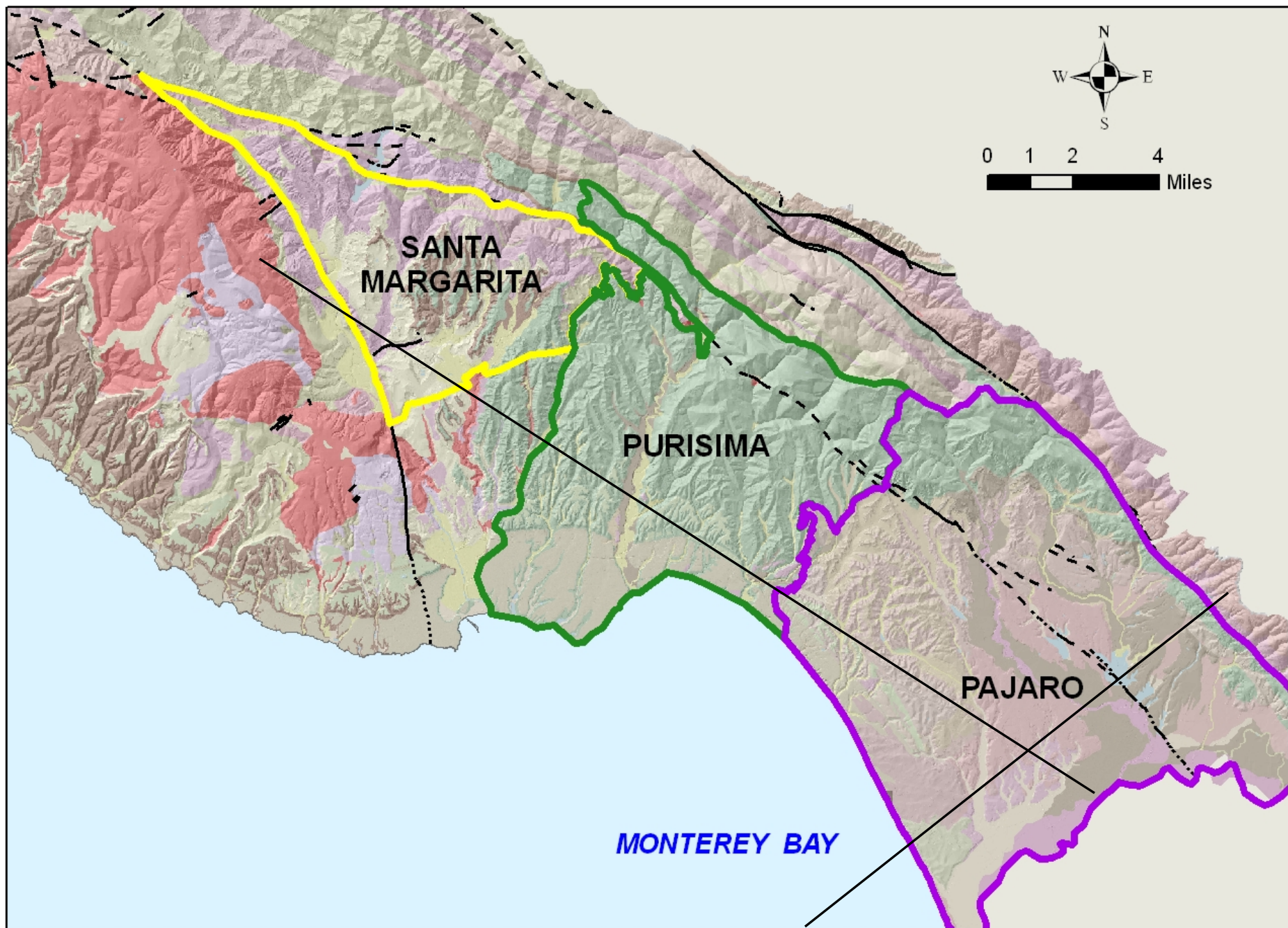
estimates from county watershed areas and isohyetal contours.

Santa Cruz County Watersheds

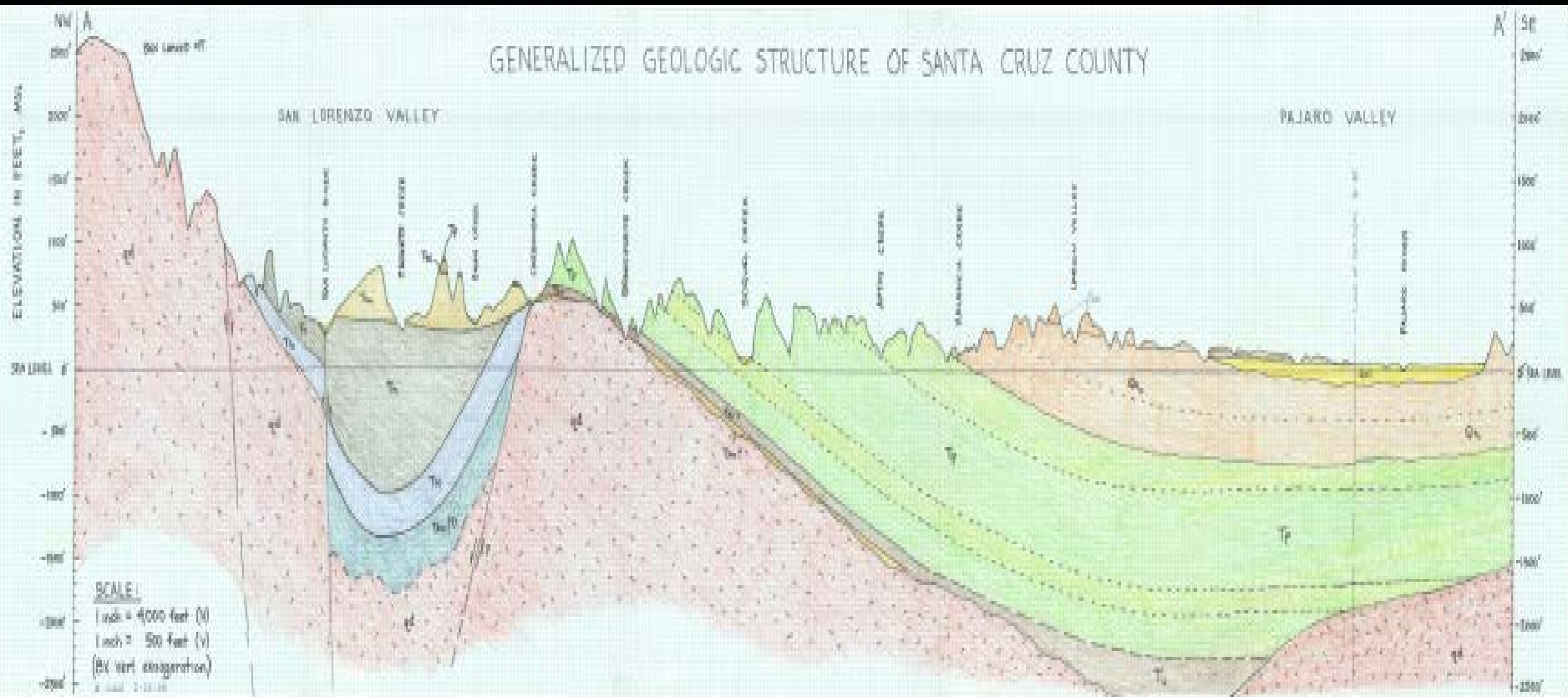


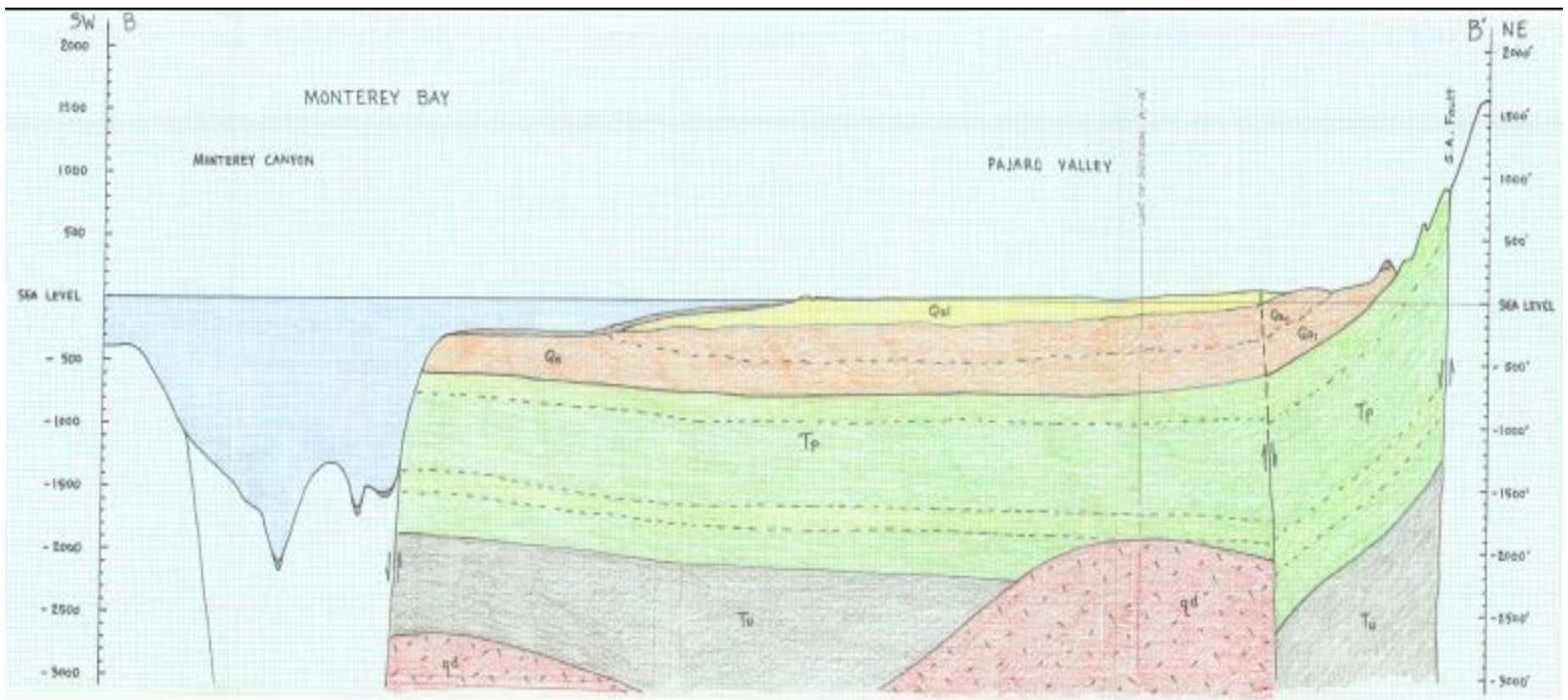


SANTA CRUZ COUNTY LEGAL STREAM DIVERSIONS



SANTA CRUZ COUNTY MAJOR GROUNDWATER BASINS

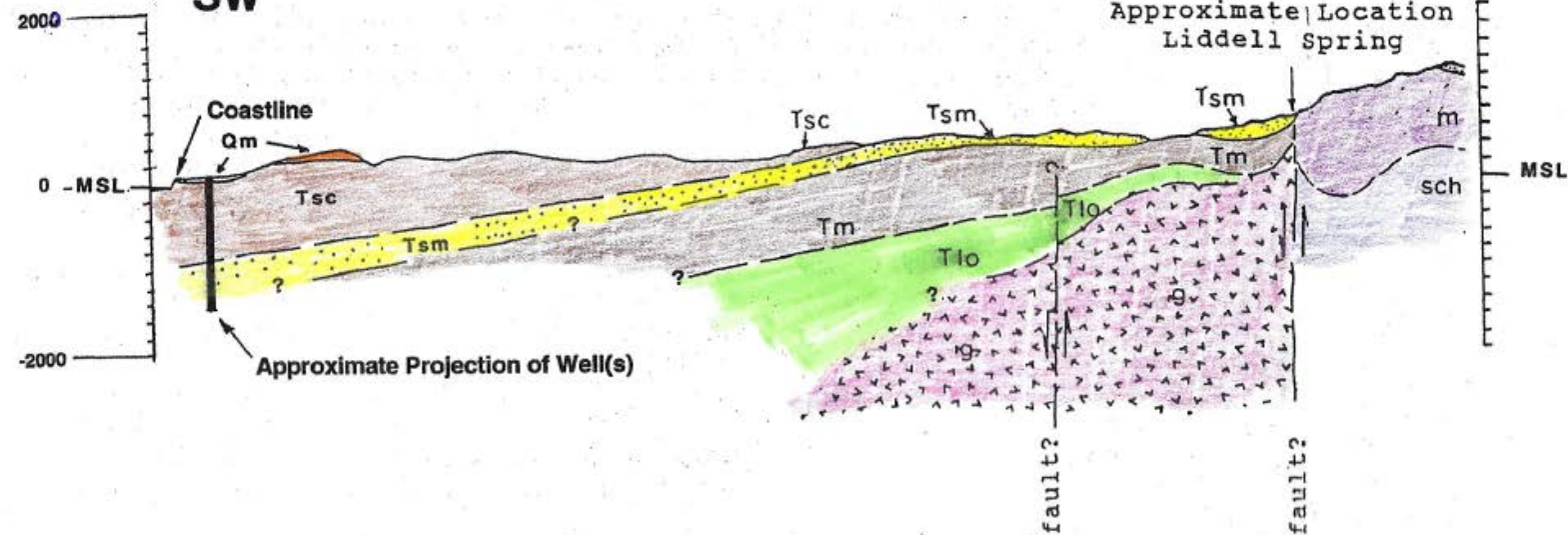




SW

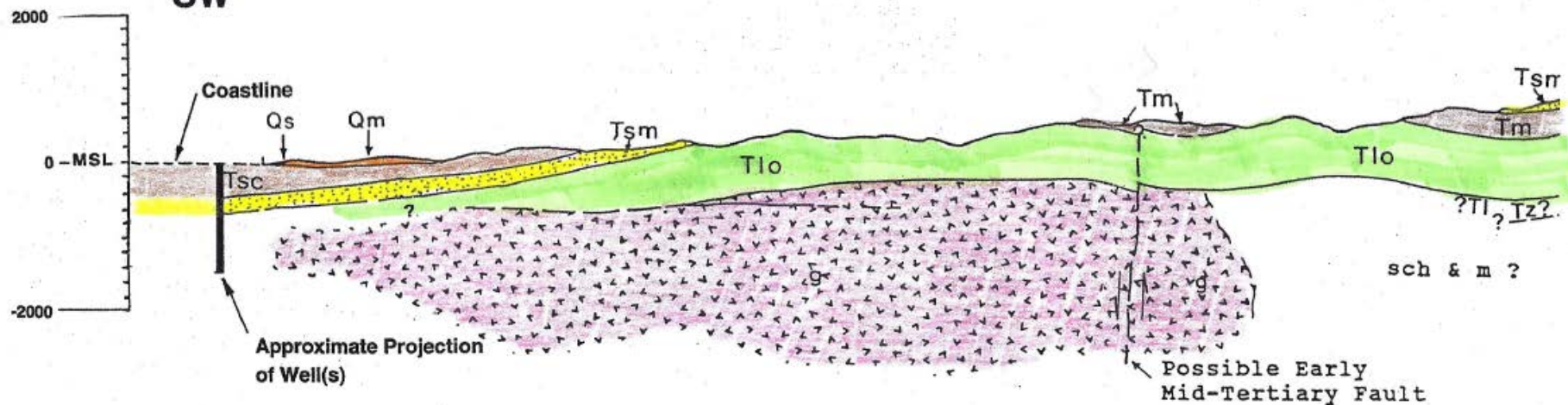
NE

Approximate Location
Liddell Spring



From:
Webber and
Associates
(1989)

SW



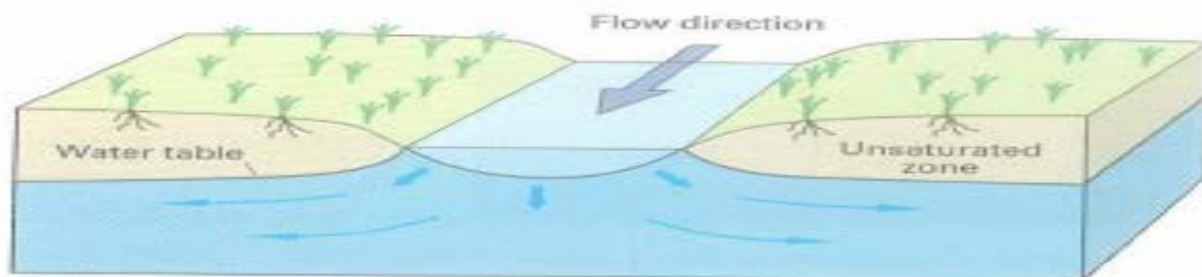
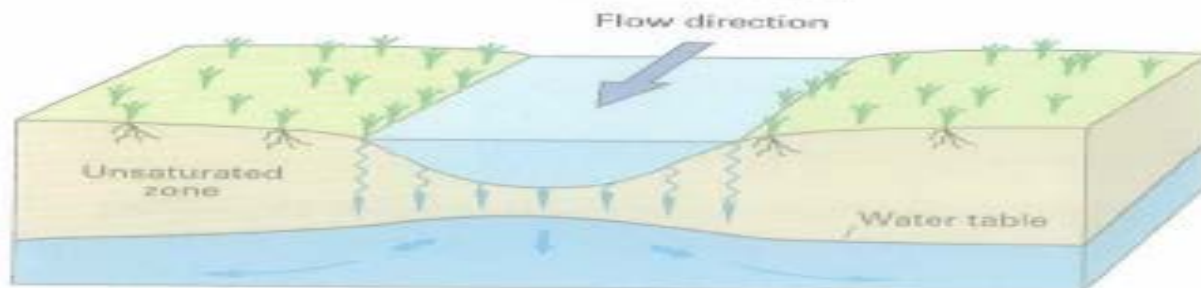
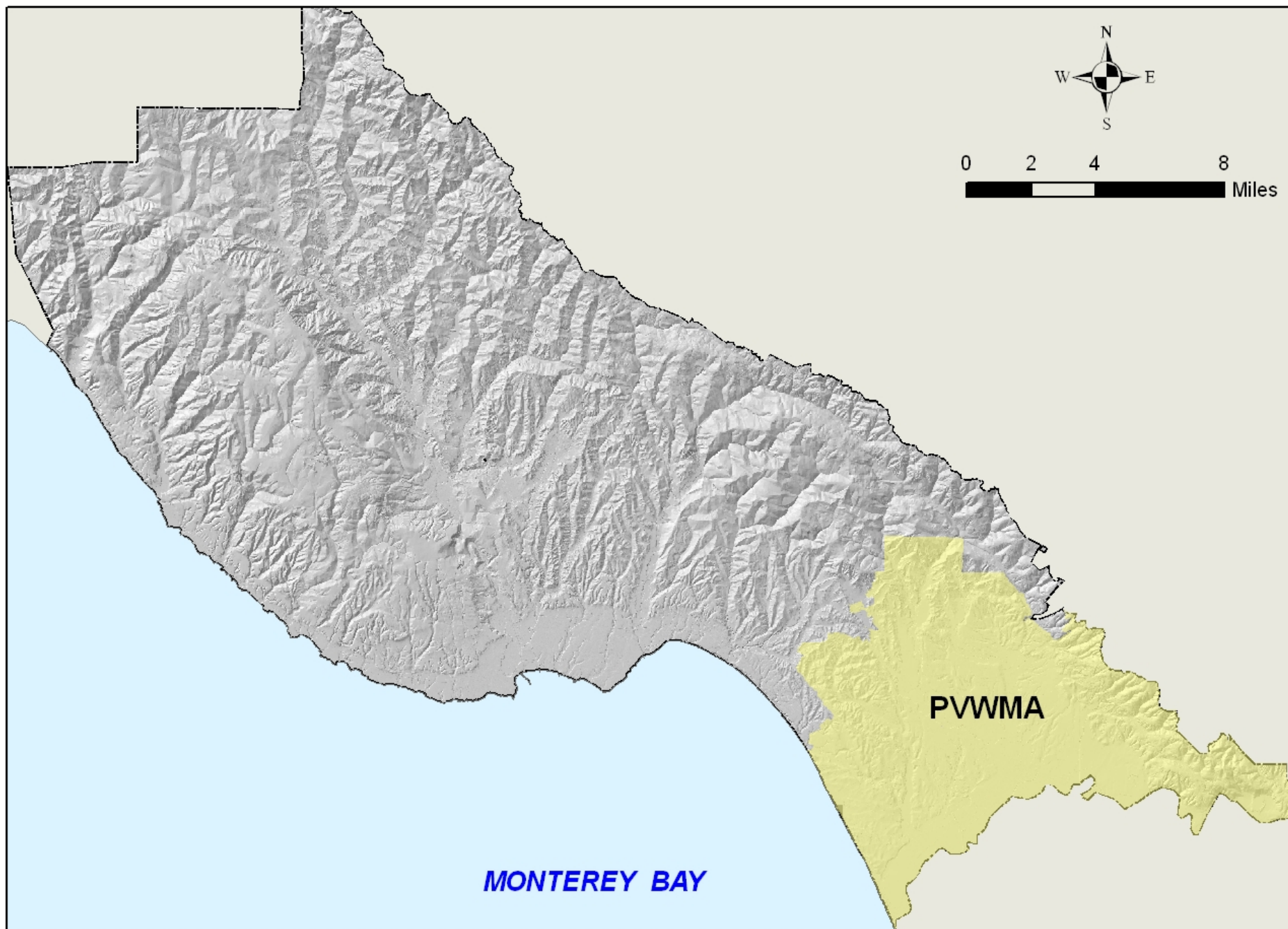
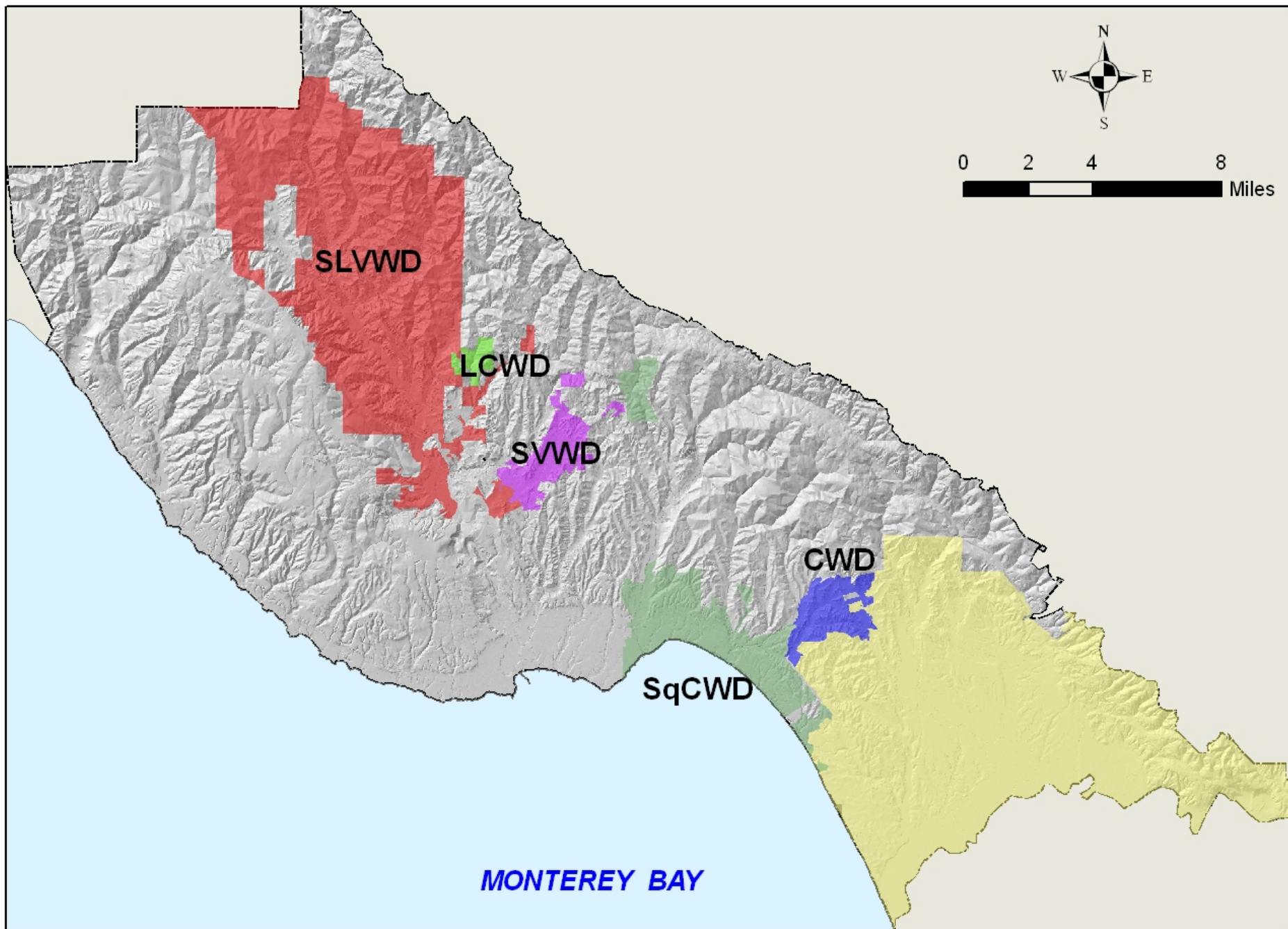
A**GAINING STREAM****B****LOSING STREAM****C****LOSING STREAM THAT IS DISCONNECTED FROM THE WATER TABLE**

Figure 12. Interaction of streams and ground water. (Modified from Winter and others, 1998.)

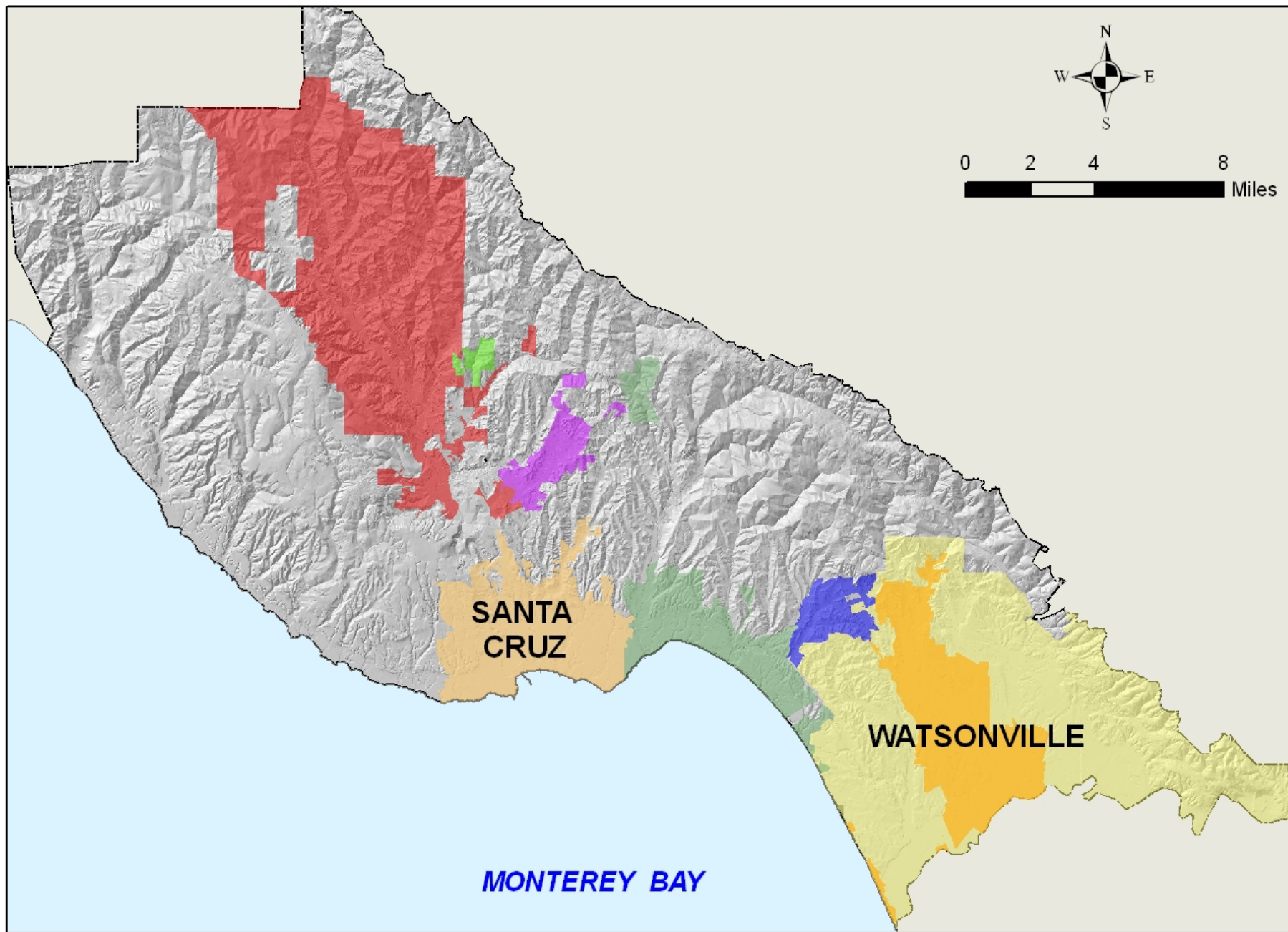
THE WHO, WHAT, WHEN AND WHERE OF COUNTY WATER MANAGEMENT



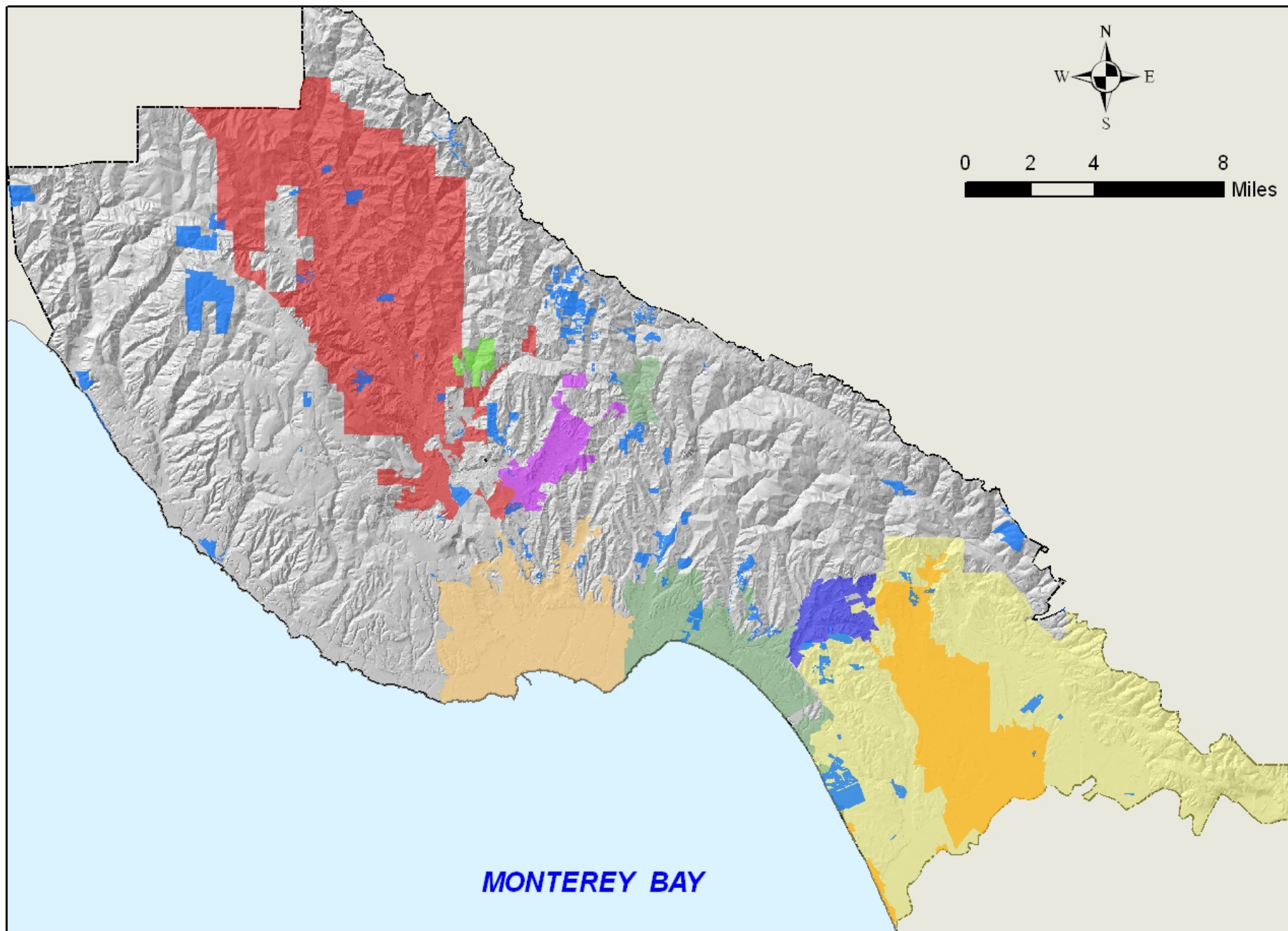
SANTA CRUZ COUNTY WATER MANAGEMENT



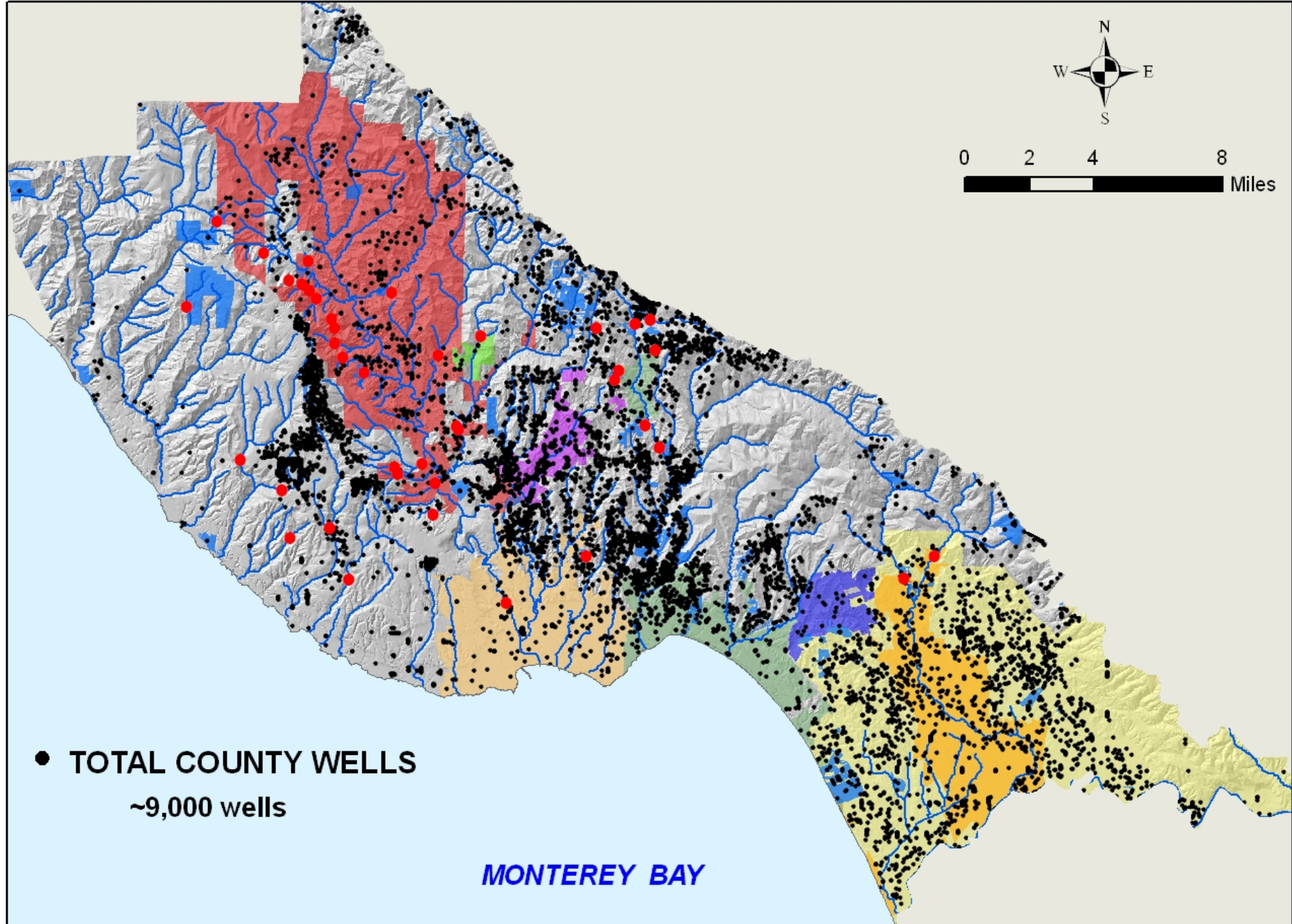
SANTA CRUZ COUNTY WATER MANAGEMENT



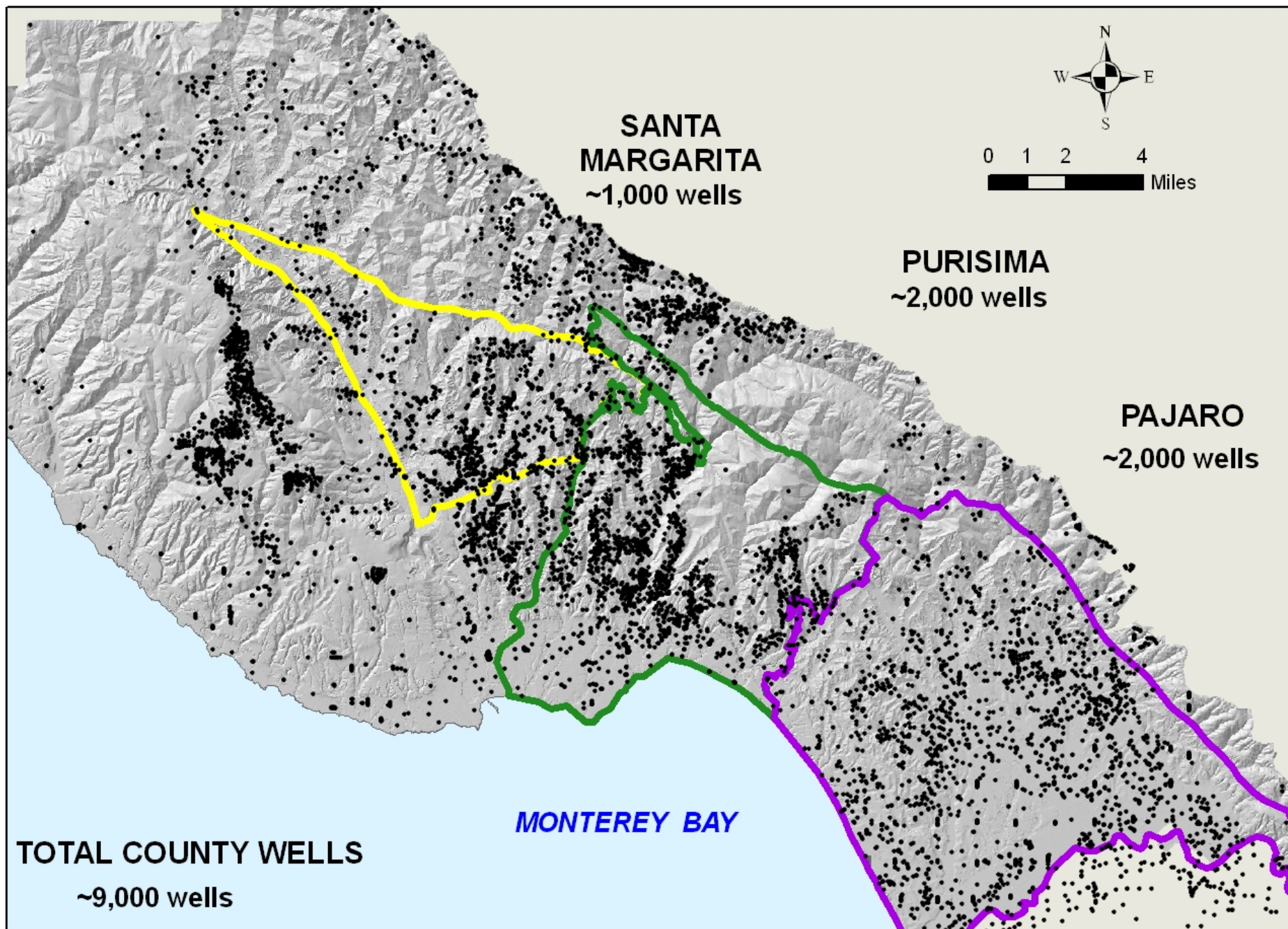
SANTA CRUZ COUNTY WATER MANAGEMENT



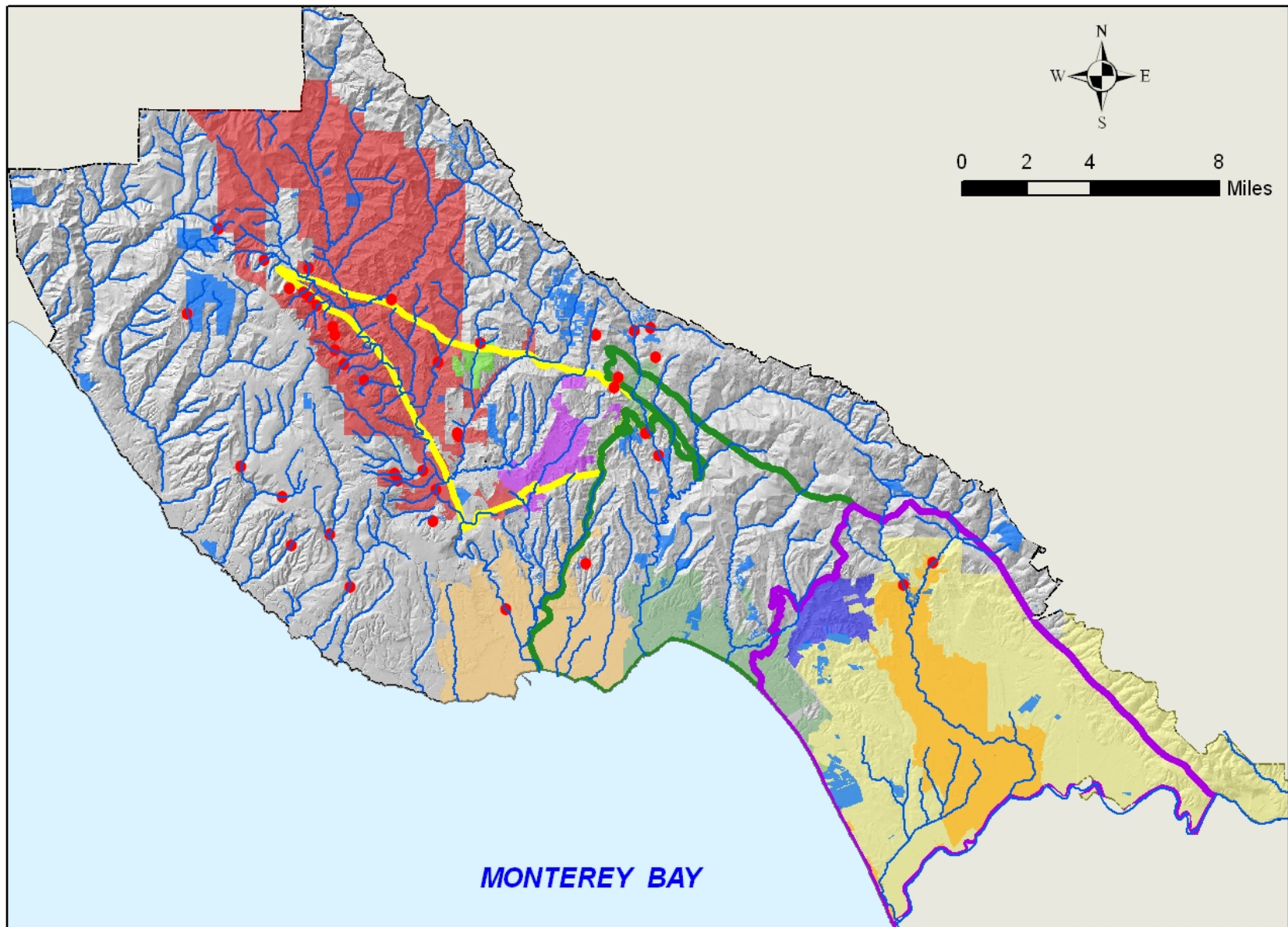
SANTA CRUZ COUNTY WATER MANAGEMENT



SANTA CRUZ COUNTY WATER MANAGEMENT



SANTA CRUZ COUNTY WELL DISTRIBUTION



SANTA CRUZ COUNTY WATERSHED/BASIN MANAGEMENT

AVERAGE COUNTY WIDE WATER USE, 2005-2010

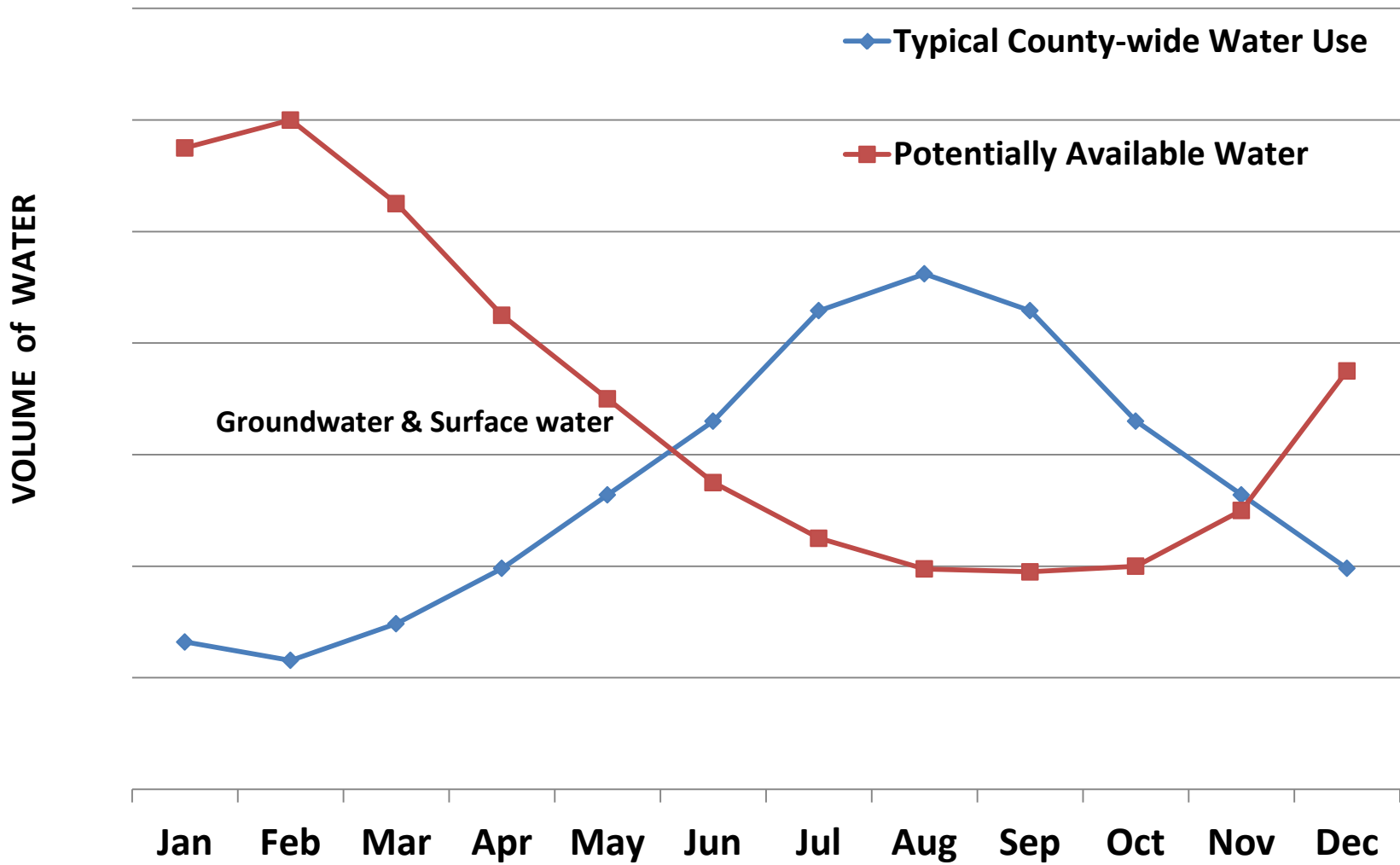
	AF	% TOTAL
ANNUAL GW	~51,870	78%
ANNUAL SW	~13,530	20%
ANNUAL TTWW	~1,000	2%
ALL SOURCES	~66,400	100%

AVERAGE COUNTY WIDE WATER USE 2005-2010, ALL USERS

	AF	% TOTAL
ANNUAL GROUNDWATER (GW)	51,870	78%
ANNUAL SURFACE WATER (SW)	13,530	20%
ANNUAL TREATED WASTEWATER (TTWW)	1,000	2%
ALL SOURCES	66,400	100%

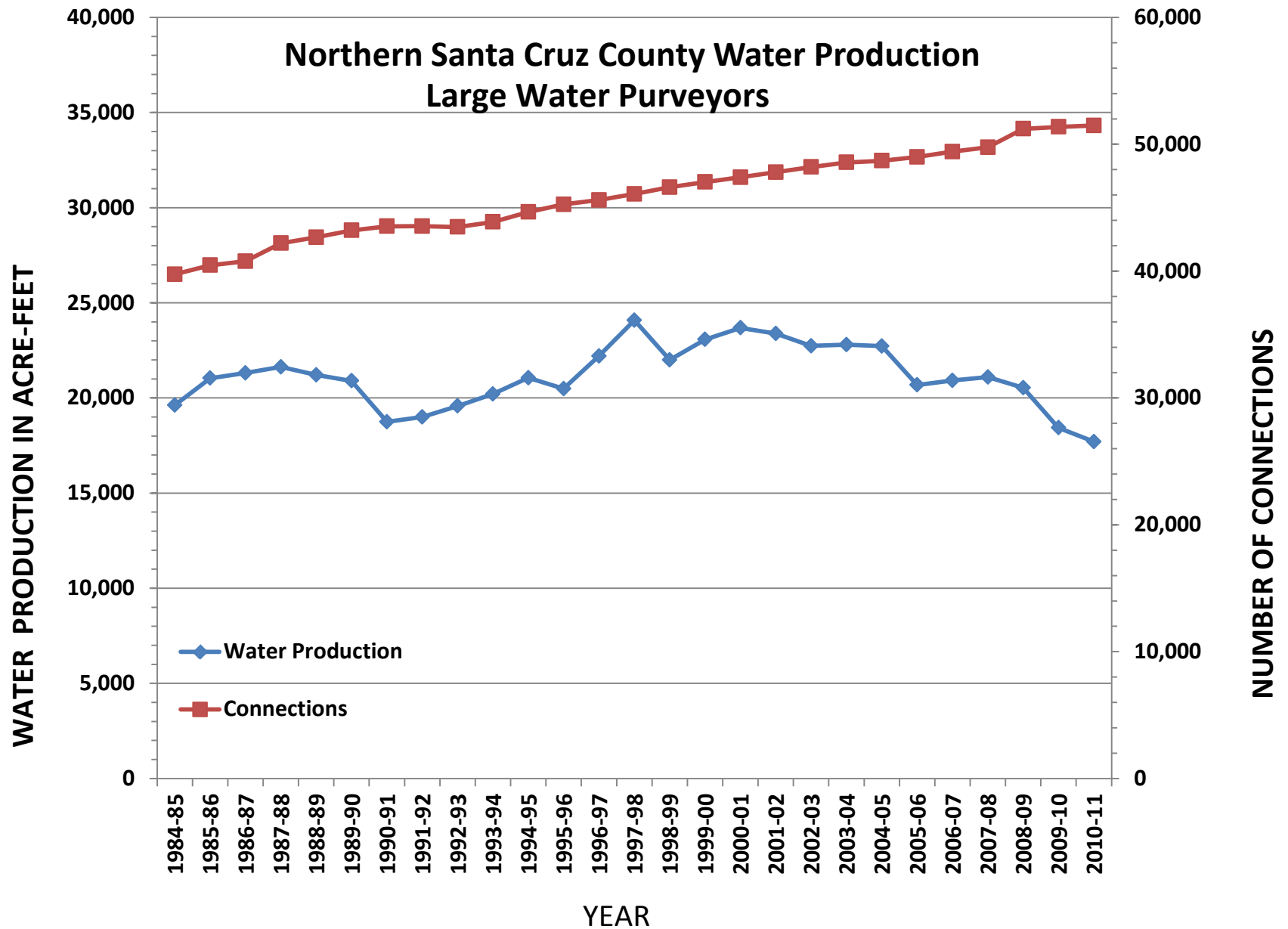
	TYPE VOL-AF	TYPE %	SEASONAL TOTAL %
WINTER GW	5,481	8%	12%
WINTER SW	2,610	4%	
WINTER TTWW	100	0%	
SPRING GW	12,498	19%	24%
SPRING SW	3,423	5%	
SPRING TTWW	220	0%	
SUMMER GW	22,241	33%	40%
SUMMER SW	4,062	6%	
SUMMER TTWW	450	1%	
FALL GW	11,650	18%	23%
FALL SW	3,436	5%	
FALL TTWW	230	0%	
TOTALS	66,400	100%	100%

SCHEMATIC OF MONTHLY COUNTY-WIDE WATER USE VERSUS WATER RESOURCE AVAILALBILITY



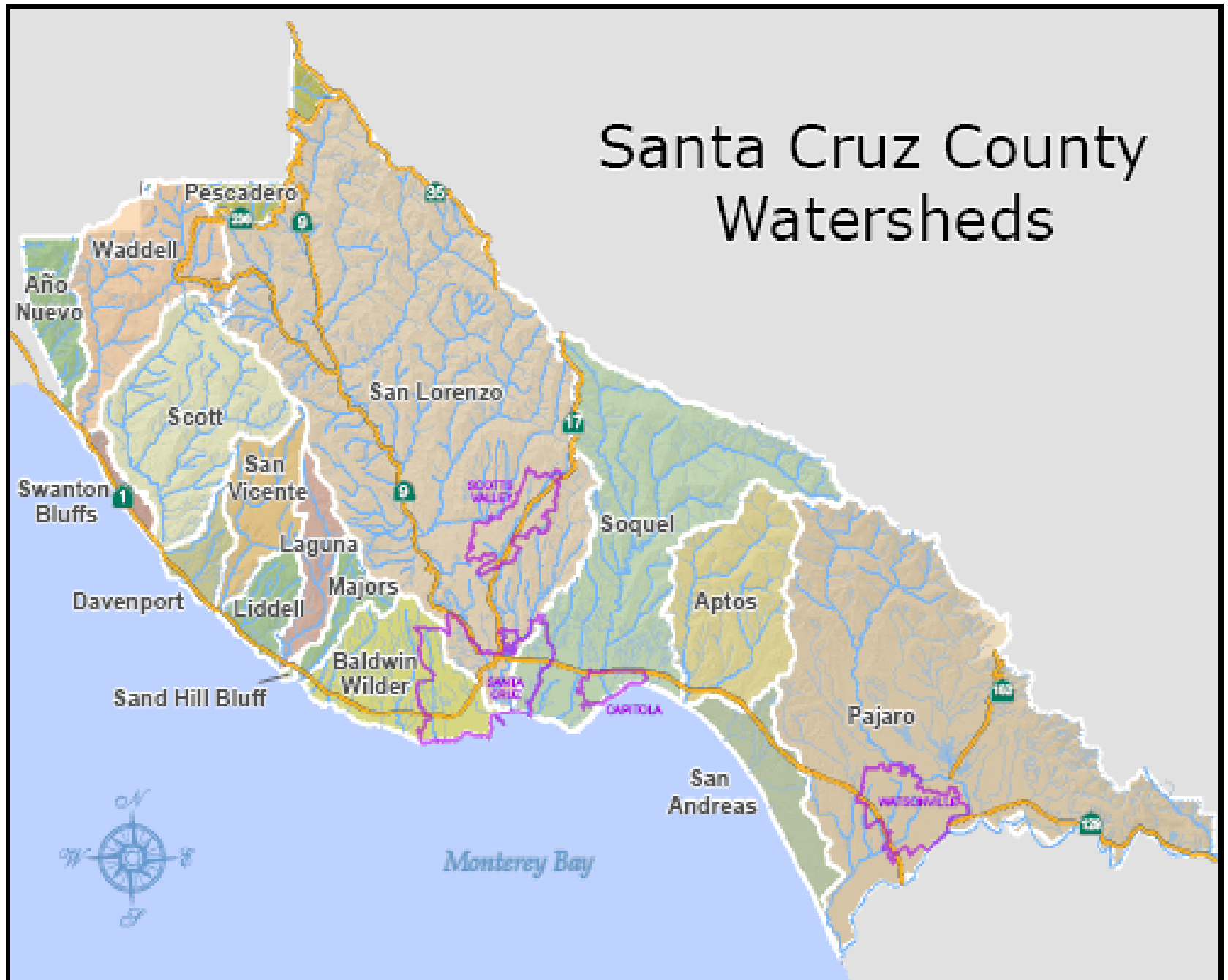
SANTA CRUZ AVERAGE ANNUAL RAINFALL VERSUS WATER USAGE

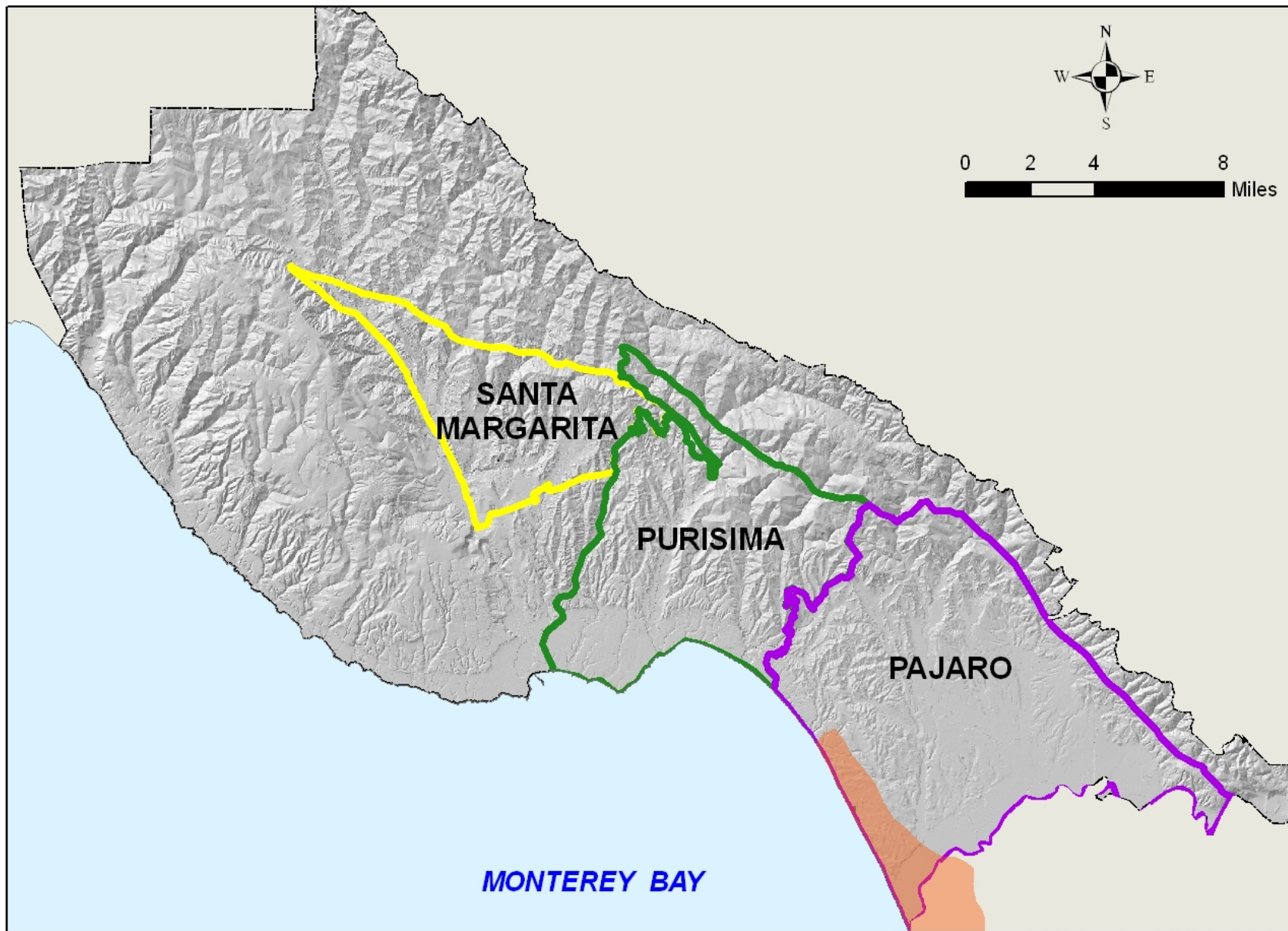
	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	Total
Rain in inches	6.7	5.3	4.4	2.2	0.7	0.2	0.1	0.1	0.3	1.2	3.9	5.3	30.4
% of Annual	22.0%	17.4%	14.5%	7.2%	2.3%	0.7%	0.3%	0.3%	1.0%	3.9%	12.8%	17.4%	100%
	53.9%			10.2%			1.6%			34.2%			
	winter			spring			summer			fall			
Water Usage	12.3%			24.2%			40.3%			23.1%			
2005-10 avg	winter			spring			summer			fall			
GW in AF	5,500			12,500			22,250			11,650			51,900
SW in AF	2,600			3,400			4,050			3,450			13,500
WW in AF	100			200			450			250			1,000
													66,400



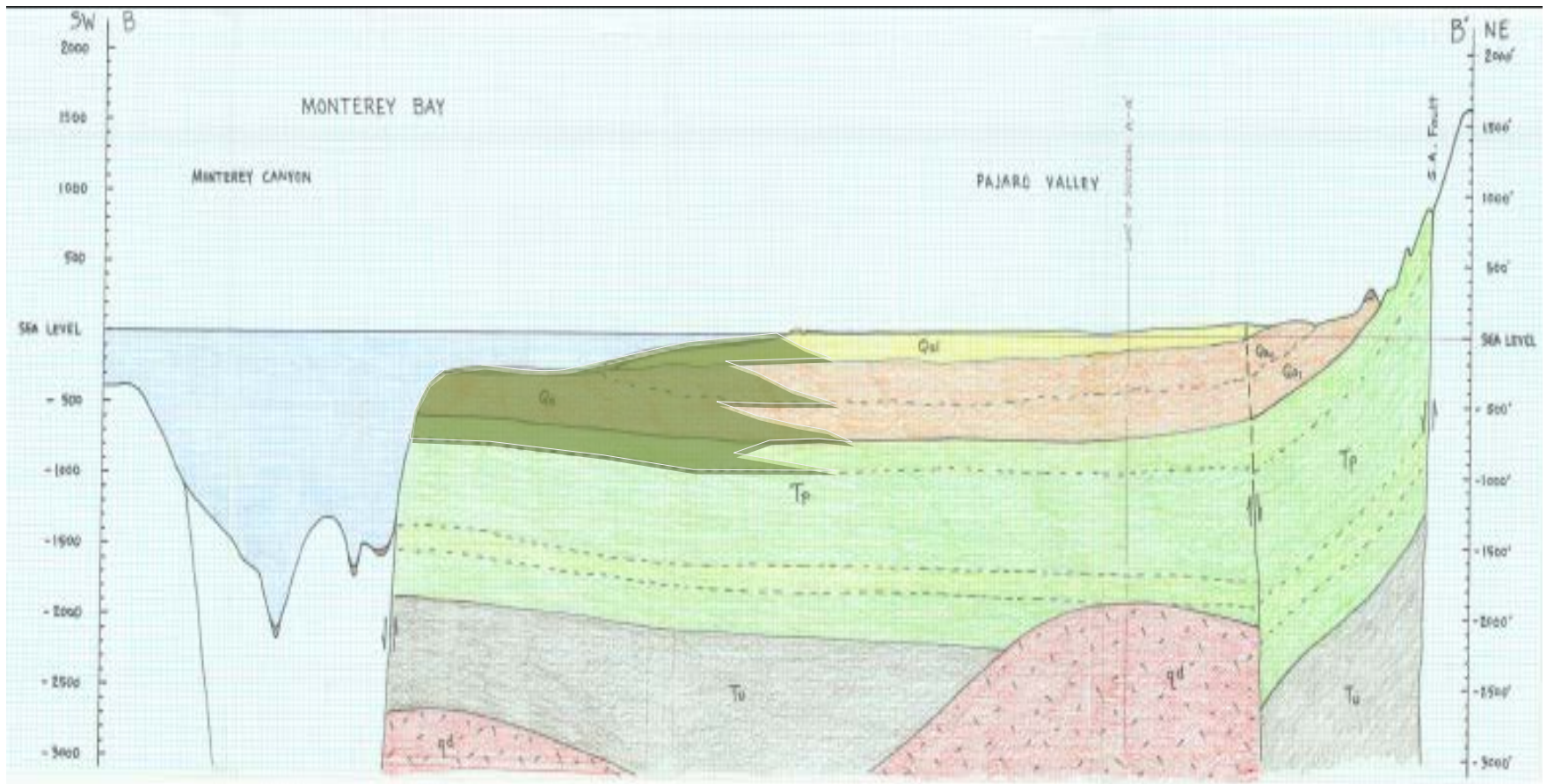
**WHAT IS THE CONDITION OF OUR WATER
RESOURCES?**

Santa Cruz County Watersheds





SANTA CRUZ COUNTY GROUNDWATER BASIN CONDITIONS



Schematic of Seawater Intrusion along Coast of Pajaro Valley

Representative Groundwater Elevations for Different Aquifers

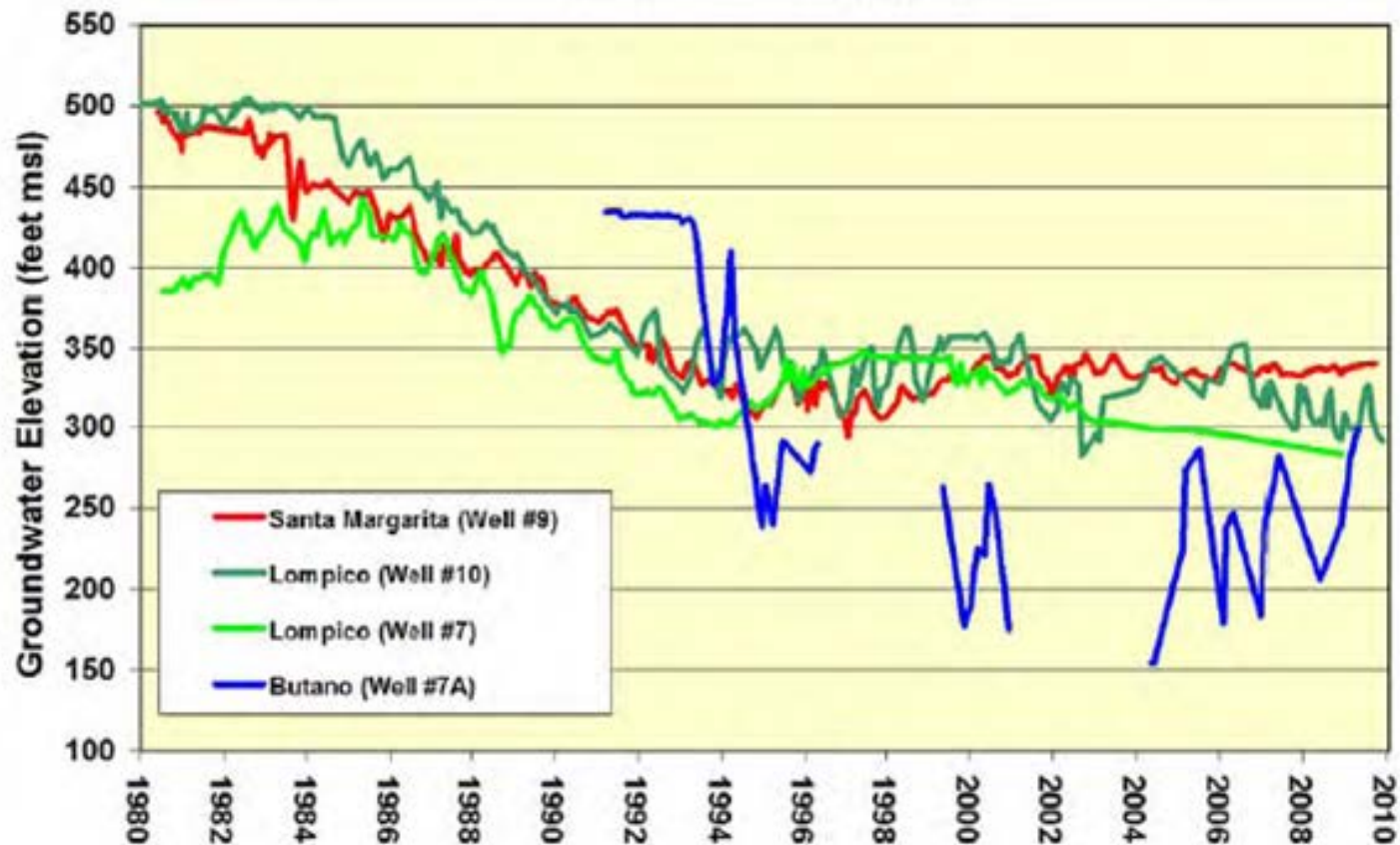
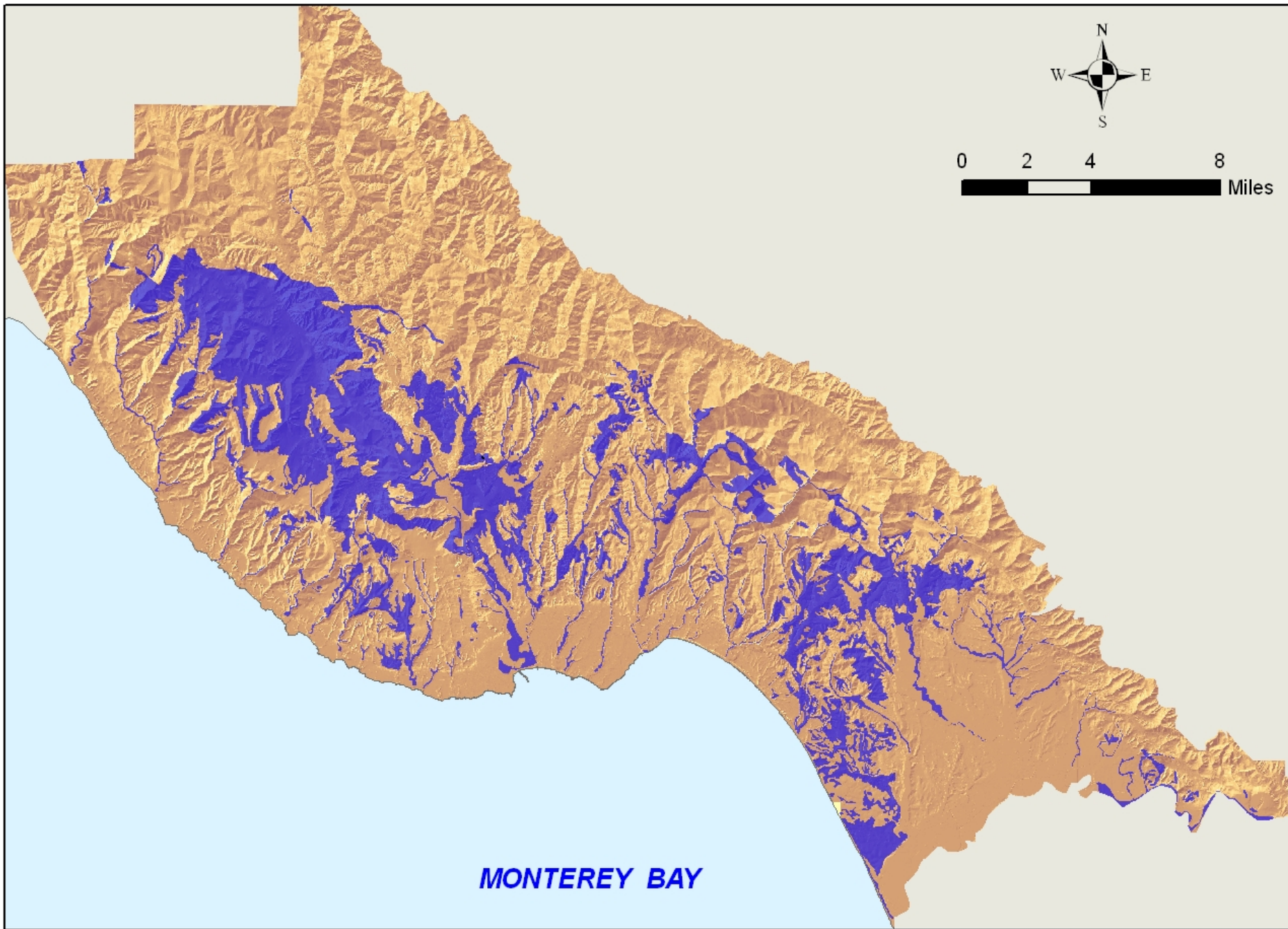


Figure 14: Historical Groundwater Levels from Different Aquifers -
Hydrograph comparing representative groundwater elevations from the Santa Margarita, Lompico and Butano.

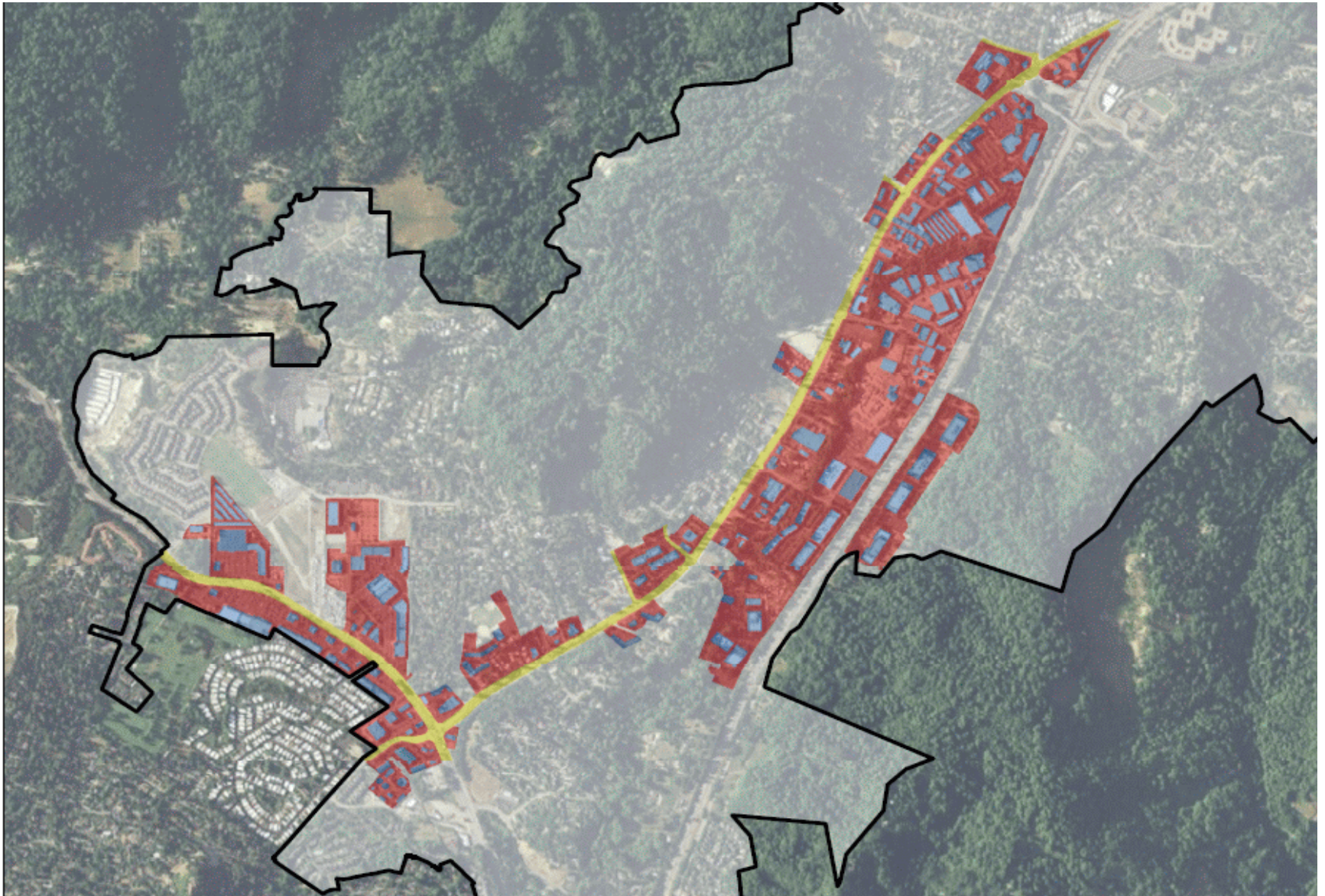
**WHAT IS BEING DONE AT THE COUNTY
LEVEL REGARDING RECHARGE ?**



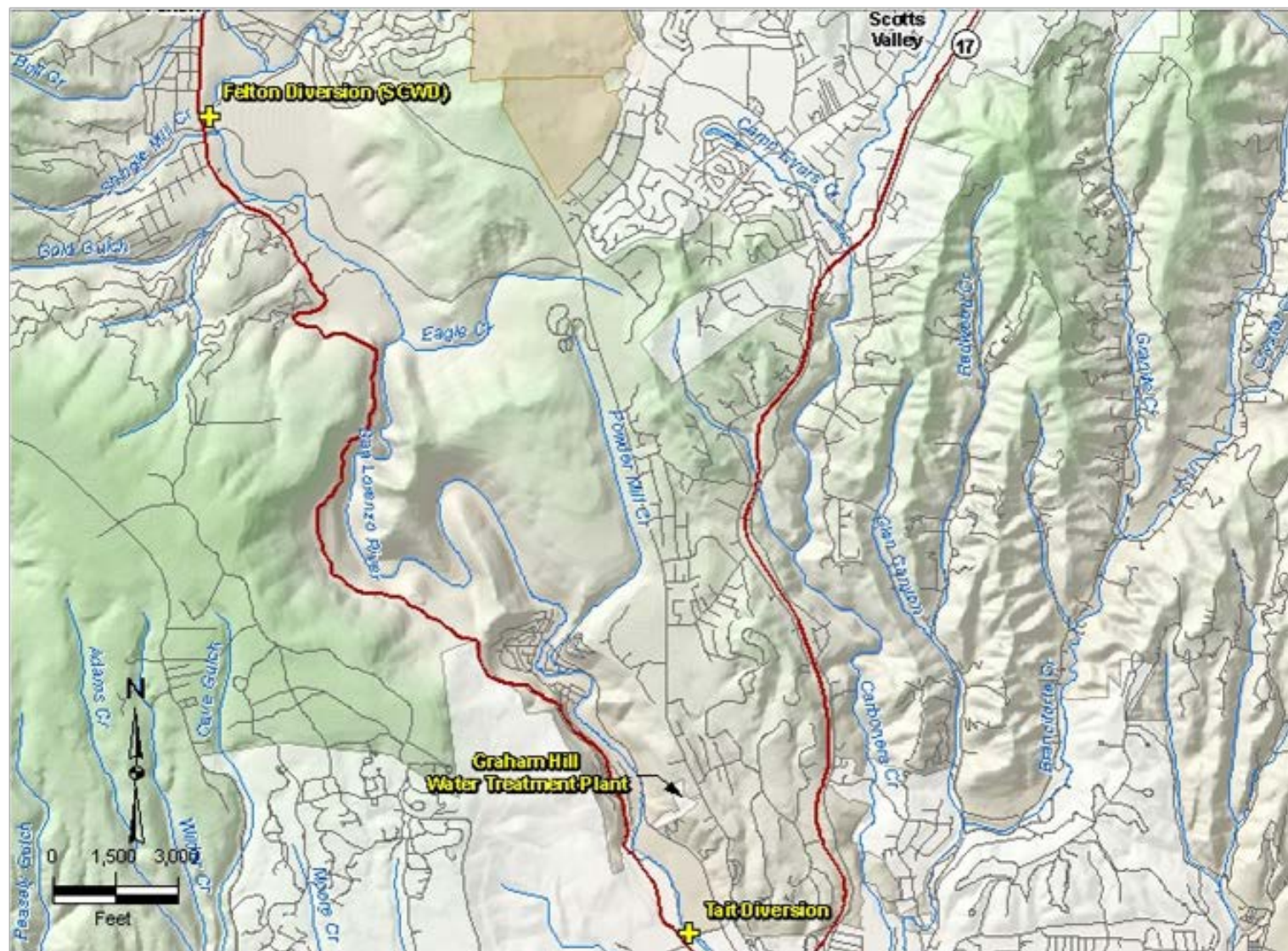
MONTEREY BAY

SANTA CRUZ COUNTY PRIMARY GROUNDWATER RECHARGE

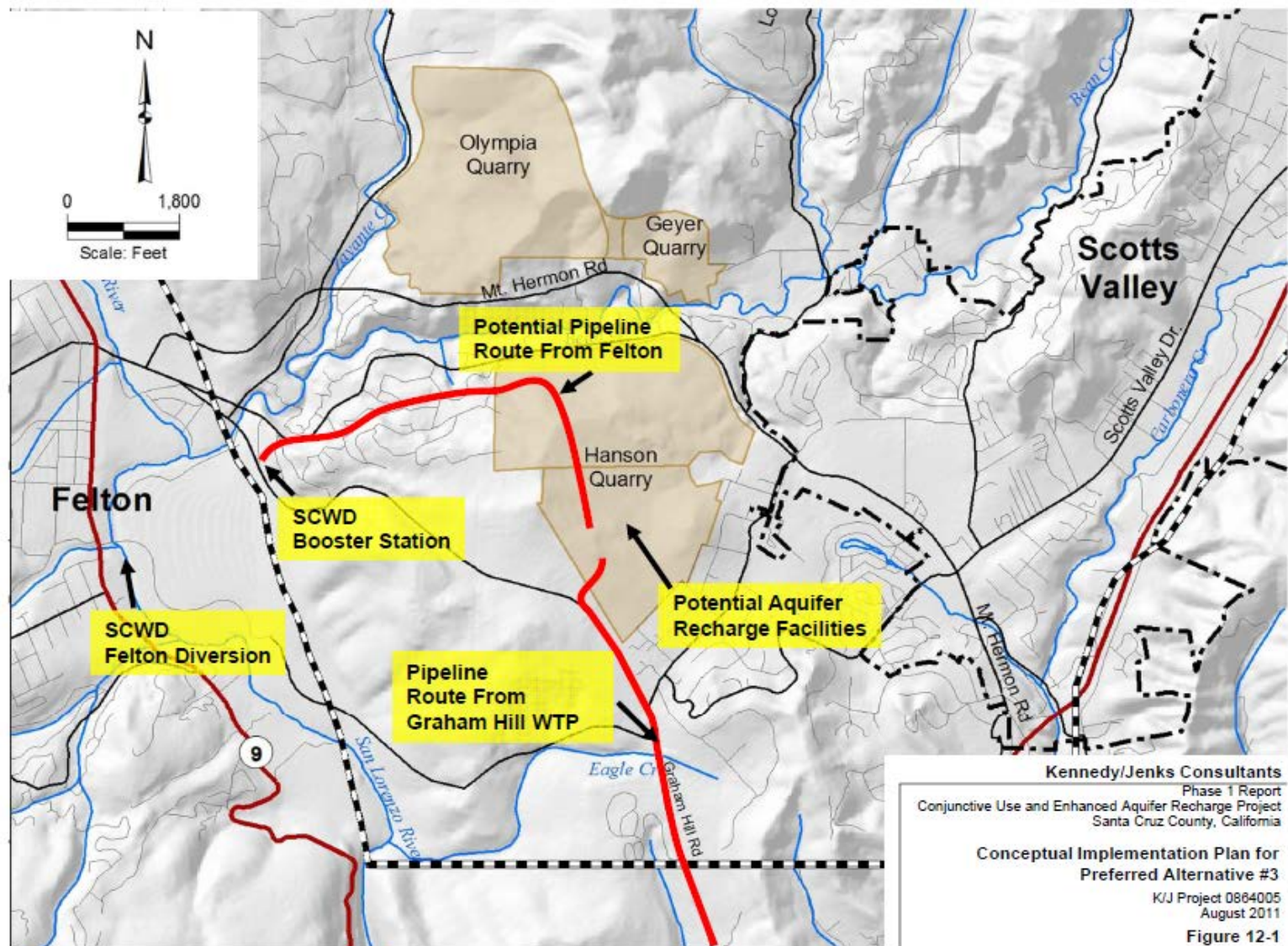
Conjunctive Use Alternative 1 – Potential Areas for Implementation (shown in red)



Conjunctive Use Alternative 2 Potential Areas for Implementation



Conjunctive Use Alternative 3 – Potential Areas for Implementation



1-001

at least 100 feet from the water or the water's edge.

Water Boards

with the State











SUMMARY

Water resource management in this county is complex.

Past and current practices have caused overdraft in our main water supply aquifers.

All water purveyors and the county are changing how they manage water so that those resources are used in a more sustainable and environmentally friendly manner.

And, improving groundwater recharge is one of those management tools.