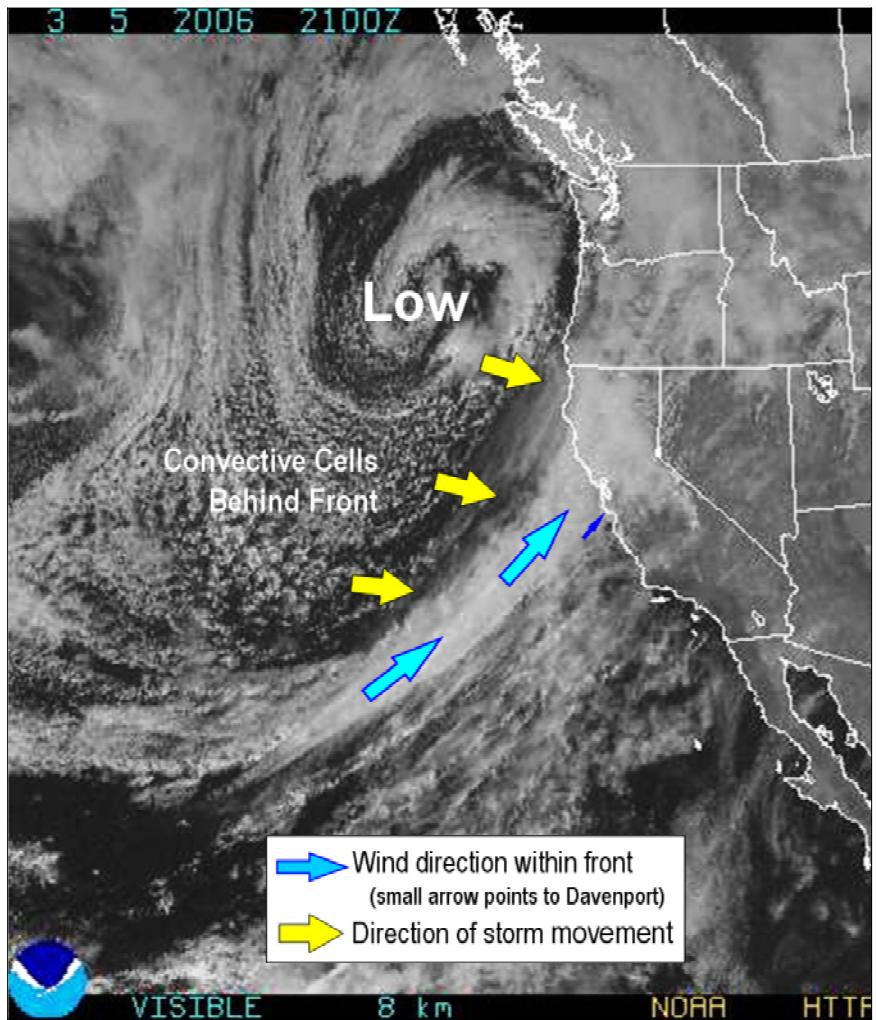
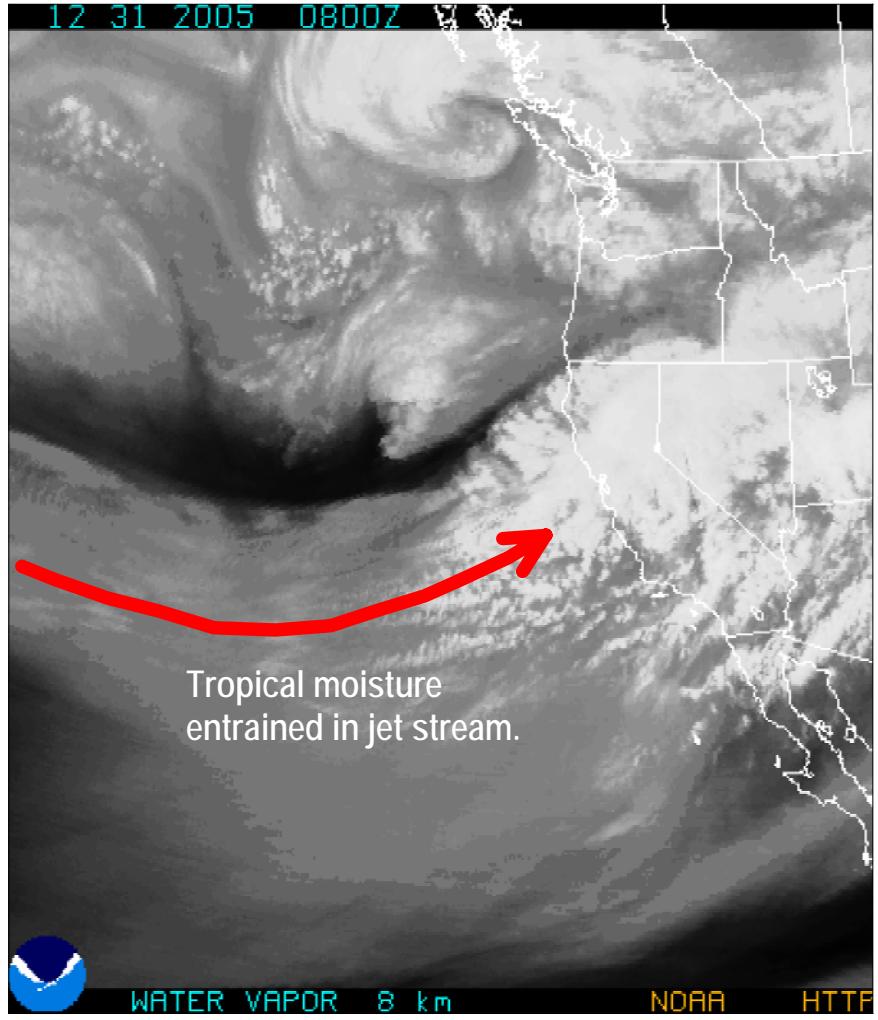


SLVWD Water Supply Master Plan  
NM Johnson

Figure 3-1. Isohyetal Map of San Lorenzo Valley



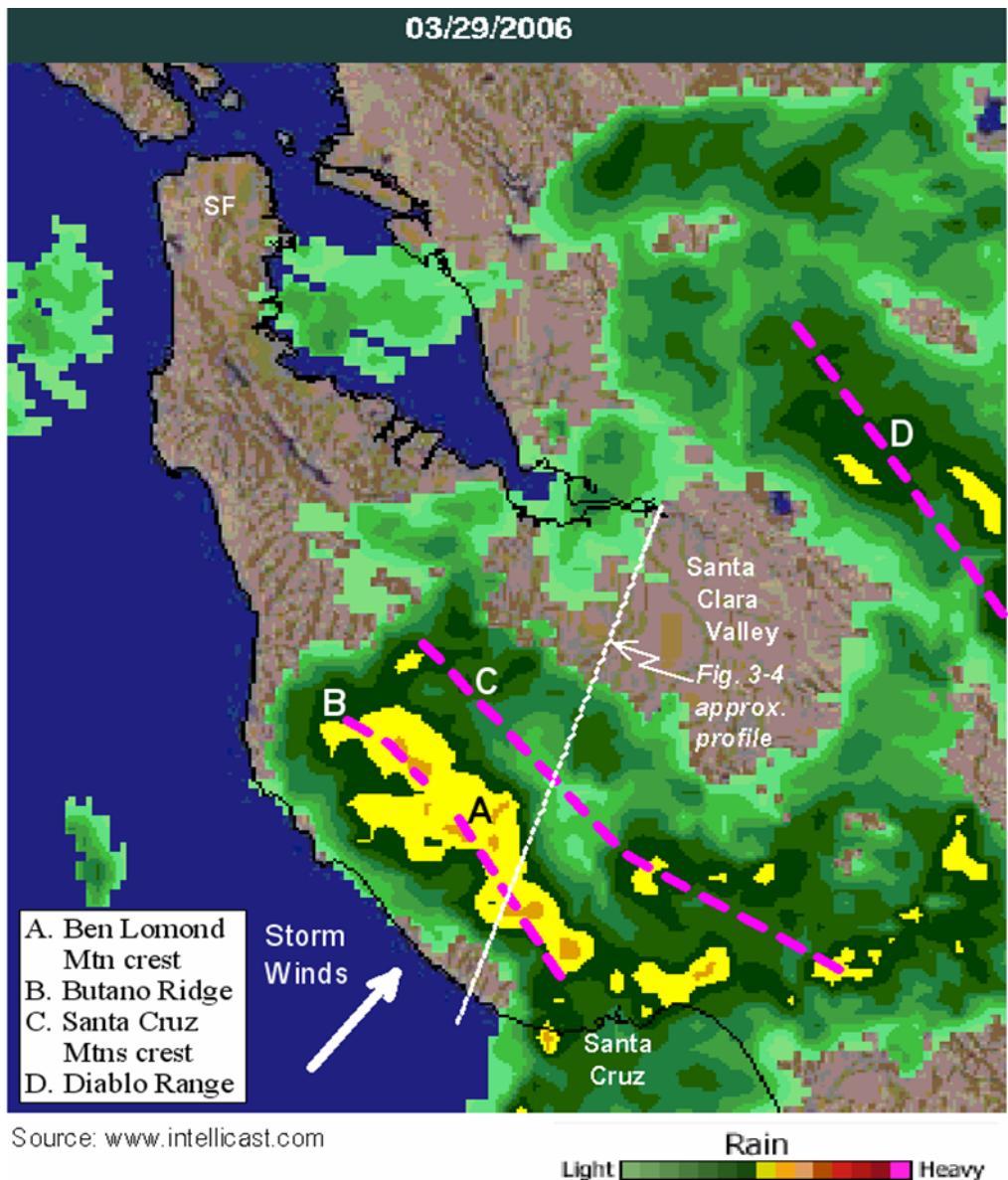
a. Cold Cyclonic Storm



b. Warm Advective Storm

**Figure 3-2**  
**Satellite Images of Typical Pacific Storms**

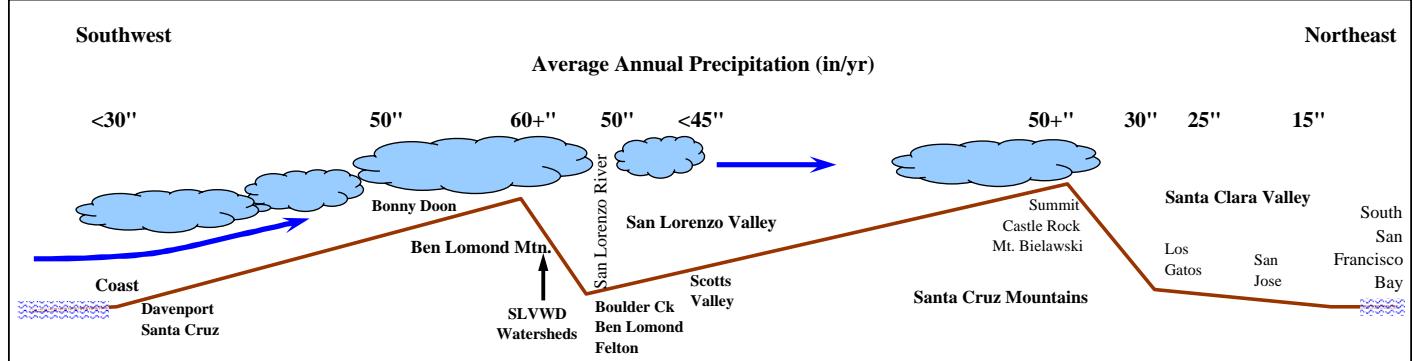
Imagery source: [www.goes.noaa.gov/](http://www.goes.noaa.gov/)



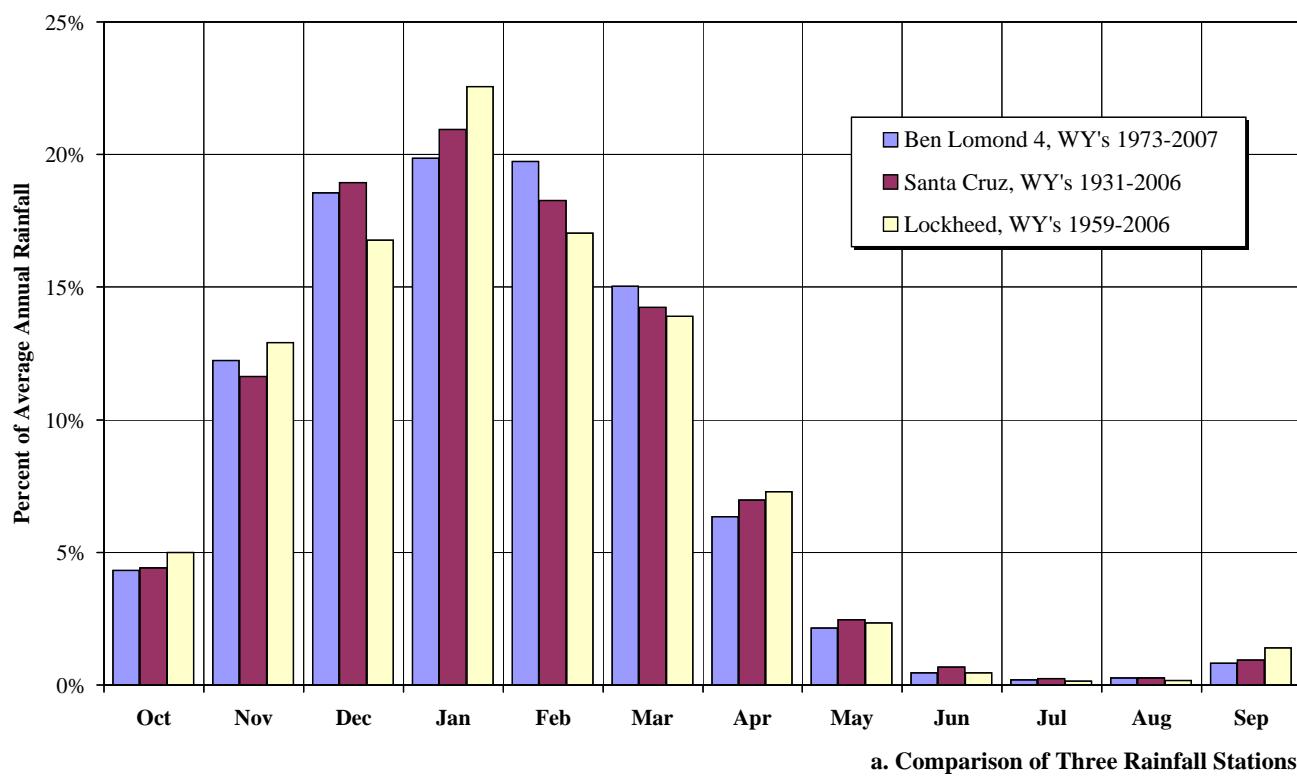
Source: www.intellicast.com

Rain

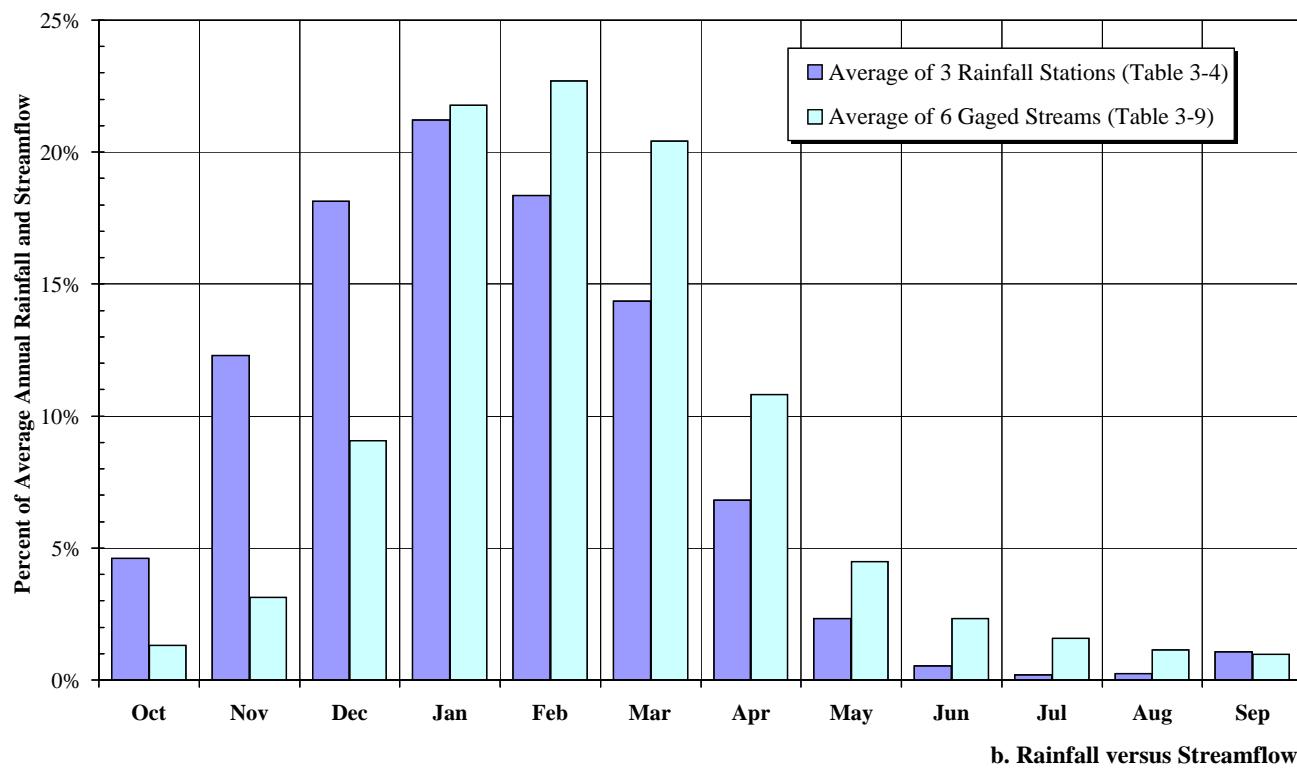
**Figure 3-3**  
**Radar Image Showing Influence of Ben Lomond Mountain on Rainfall Distribution**



**Figure 3-4**  
**Schematic Coast-to-South Bay Profile Illustrating Orographic Influence on Rainfall Distribution**  
(adopted from Geomatrix, 1999; see Fig. 3-3 for approximate line of profile)

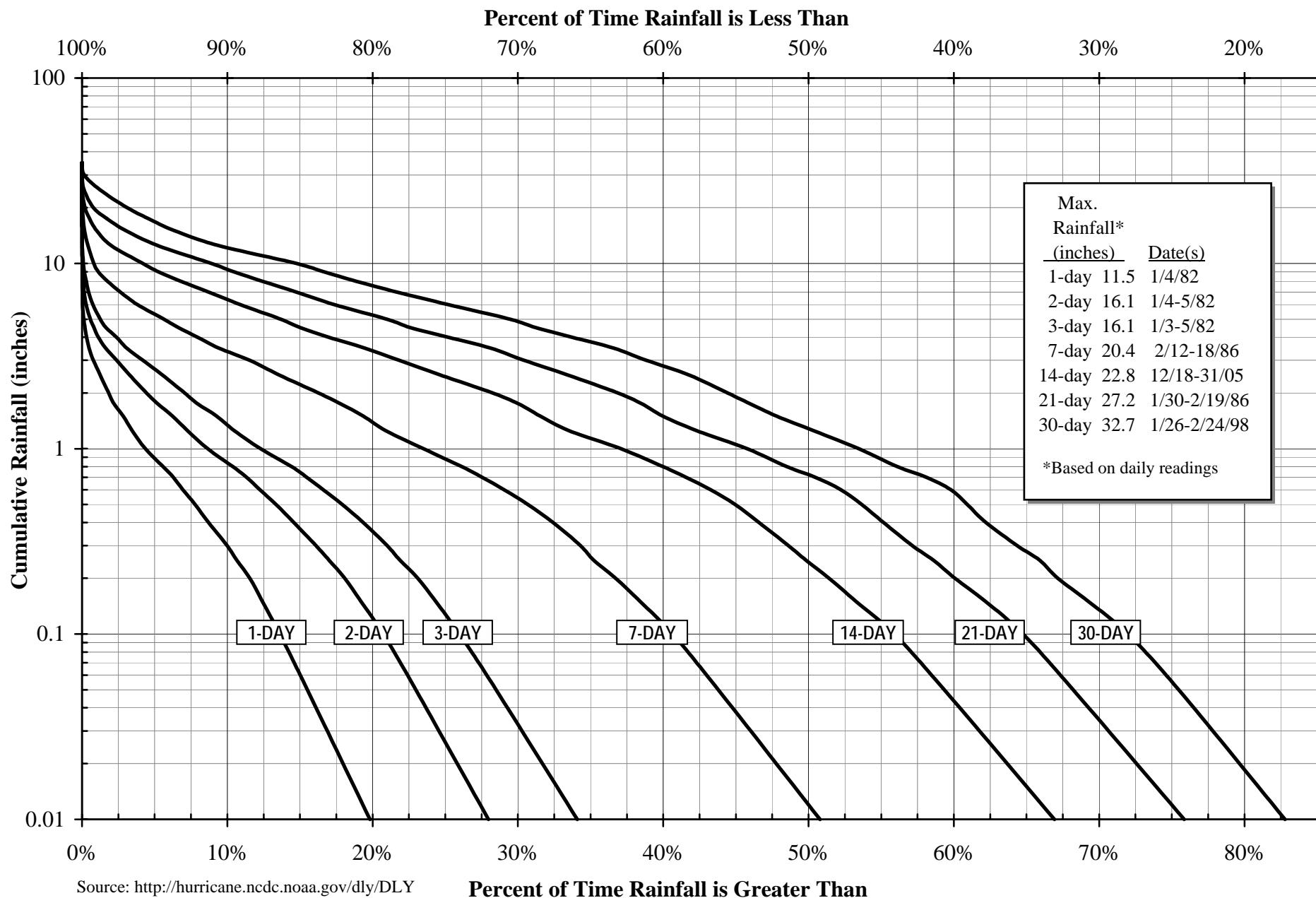


a. Comparison of Three Rainfall Stations

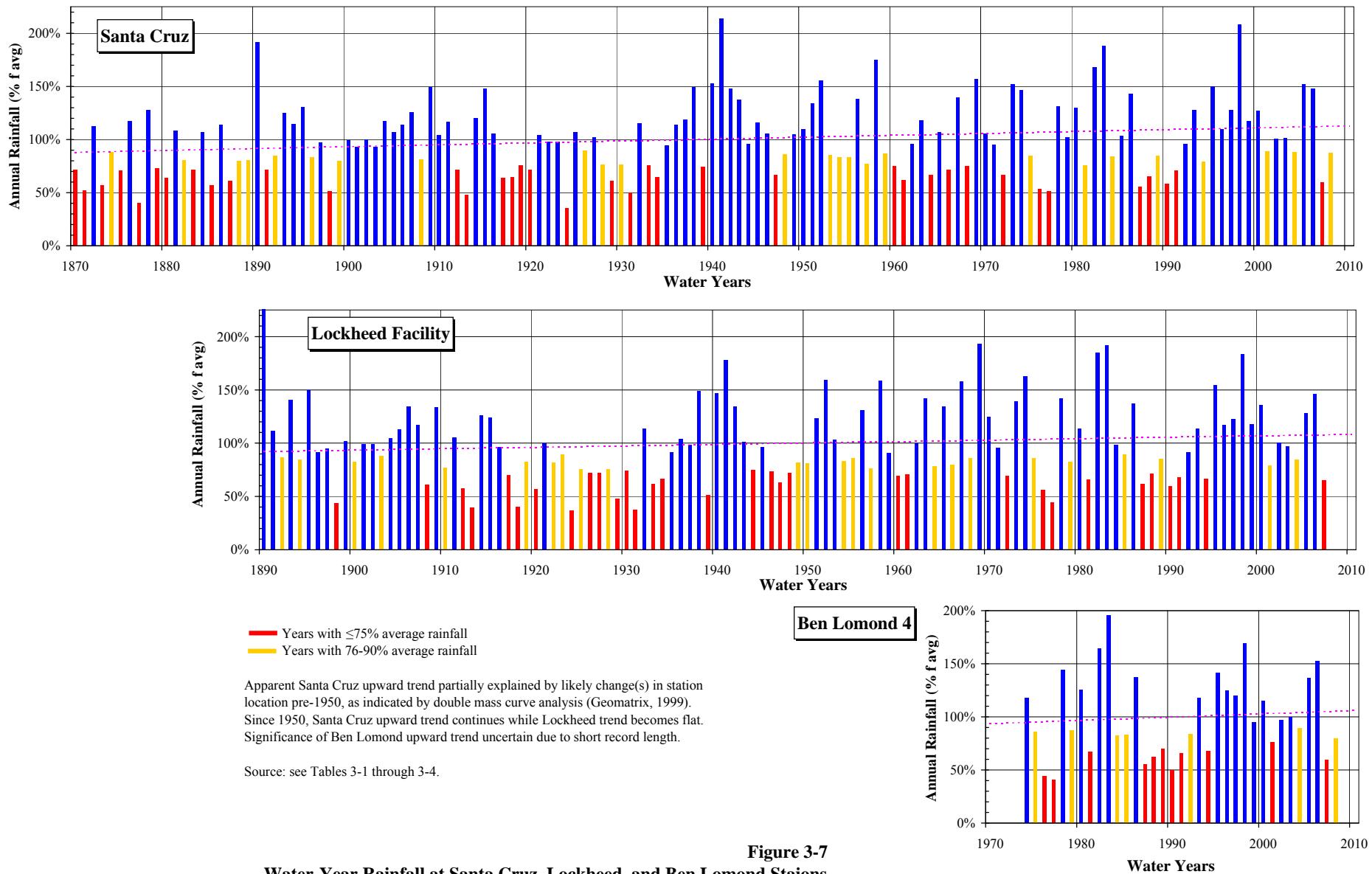


b. Rainfall versus Streamflow

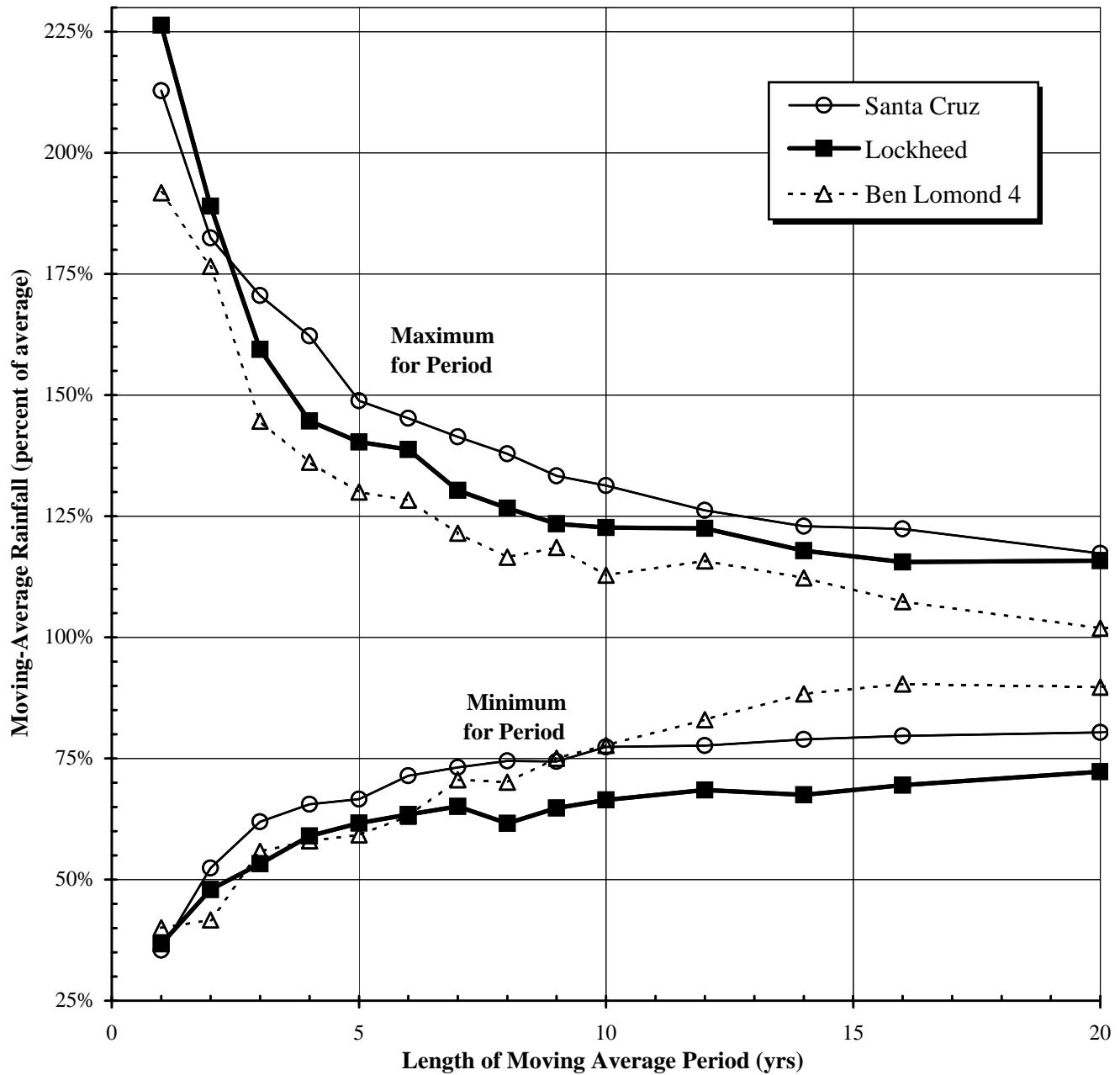
**Figure 3-5**  
Monthly Average Rainfall and Streamflow, Selected Stations



**Figure 3-6**  
**Frequency of Cumulative Daily to Monthly Rainfall at Ben Lomond, 1973-2006**



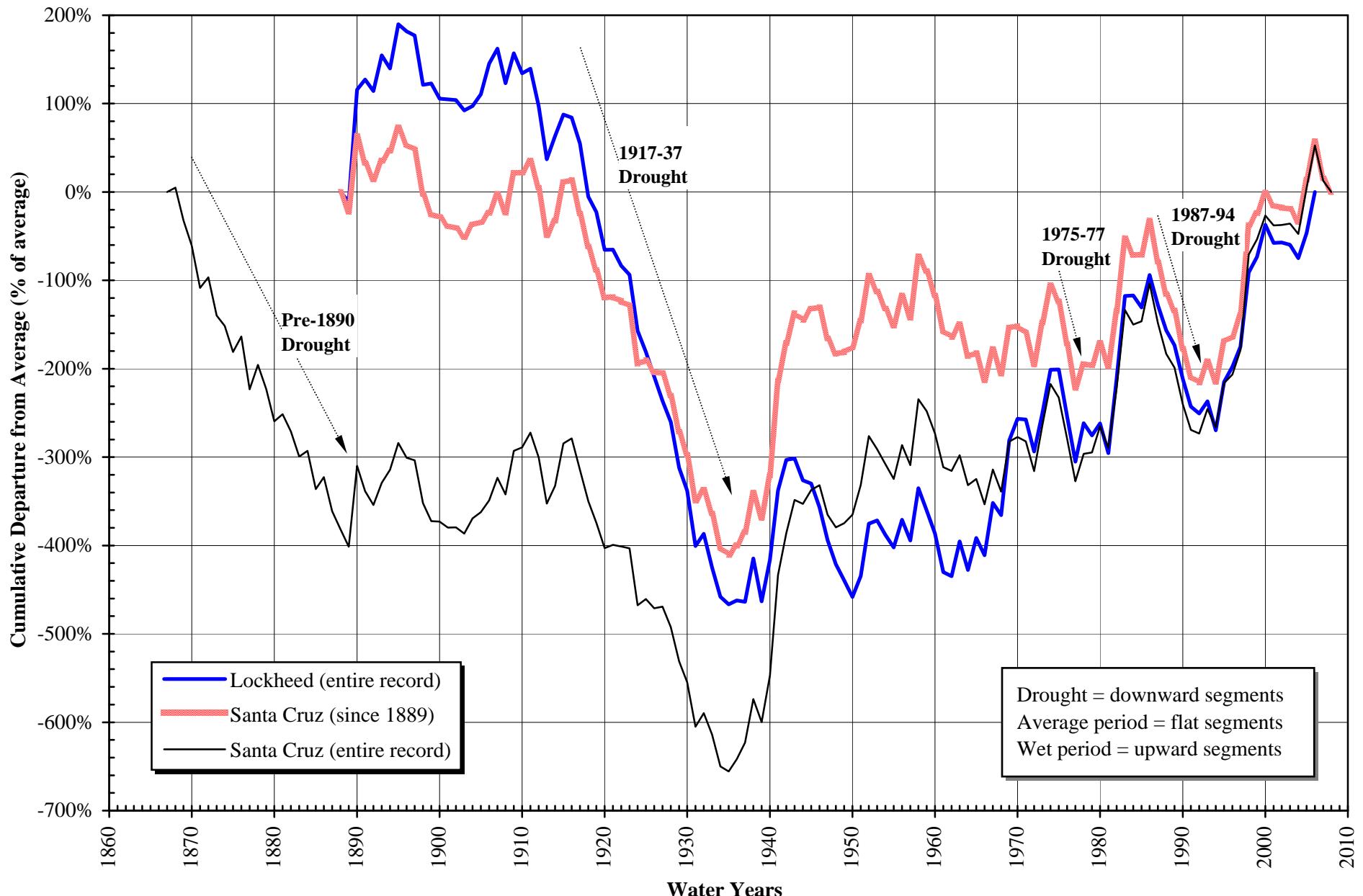
**Figure 3-7**  
**Water-Year Rainfall at Santa Cruz, Lockheed, and Ben Lomond Staions**



Yrs	Moving-Average Minimums*			Moving-Average Maximums*		
	Santa Cruz		Lockheed	Santa Cruz		Lockheed
1	35%	1924	37%	1924	213%	1941
2	52%	1976-77	48%	1976-77	182%	1940-41
3	62%	1869-71	53%	1929-31	171%	1940-42
4	66%	1928-31	59%	1928-31	162%	1940-43
5	67%	1987-91	62%	1927-31	149%	1940-44
6	71%	1987-92	63%	1926-31	145%	1938-43
7	73%	1869-75	65%	1924-30	141%	1937-43
8	74%	1924-31	62%	1924-31	138%	1936-43
9	74%	1869-77	65%	1923-31	133%	1937-45
10	77%	1868-77	66%	1922-31	131%	1936-45
12	78%	1869-80	69%	1921-31	126%	1995-06
14	79%	1918-31	67%	1920-31	123%	1993-06
16	80%	1916-31	69%	1919-21	122%	1937-52
20	80%	1869-88	72%	1916-35	117%	1937-56
					116%	1969-84
					116%	1967-86

\*Color-coded by  
common  
overlapping periods.

**Figure 3-8**  
**Minimum and Maximum Moving**  
**Average Rainfall**



**Figure 3-9**  
**Water-Year Rainfall Cumulative Departure from Average**



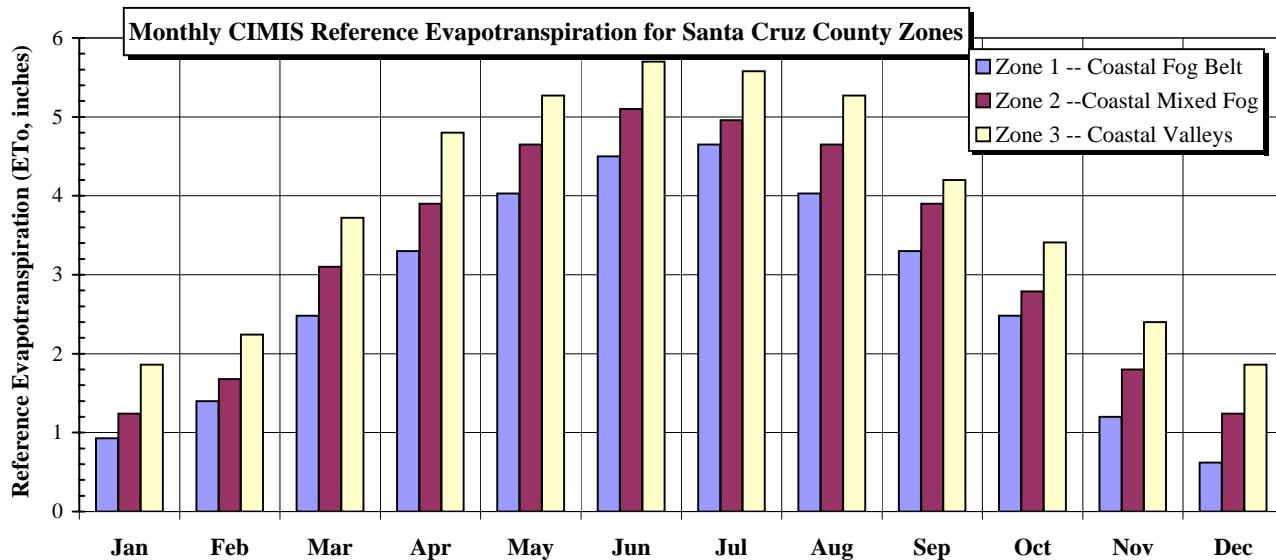
## Reference EvapoTranspiration (ETo) Zones

- 1 COASTAL PLAINS HEAVY FOG BELT**  
Lowest ETo in California. Characterized by dense fog
- 2 COASTAL MIXED FOG AREA**  
Less fog and higher ETo than zone 1
- 3 COASTAL VALLEYS AND PLAINS AND NORTH COAST MOUNTAINS**  
More sunlight than zone 2
- 6 UPLAND CENTRAL COAST AND LOS ANGELES BASIN**  
Higher elevation coastal areas
- 8 INLAND SAN FRANCISCO BAY AREA**  
Inland area near San Francisco with some marine influence

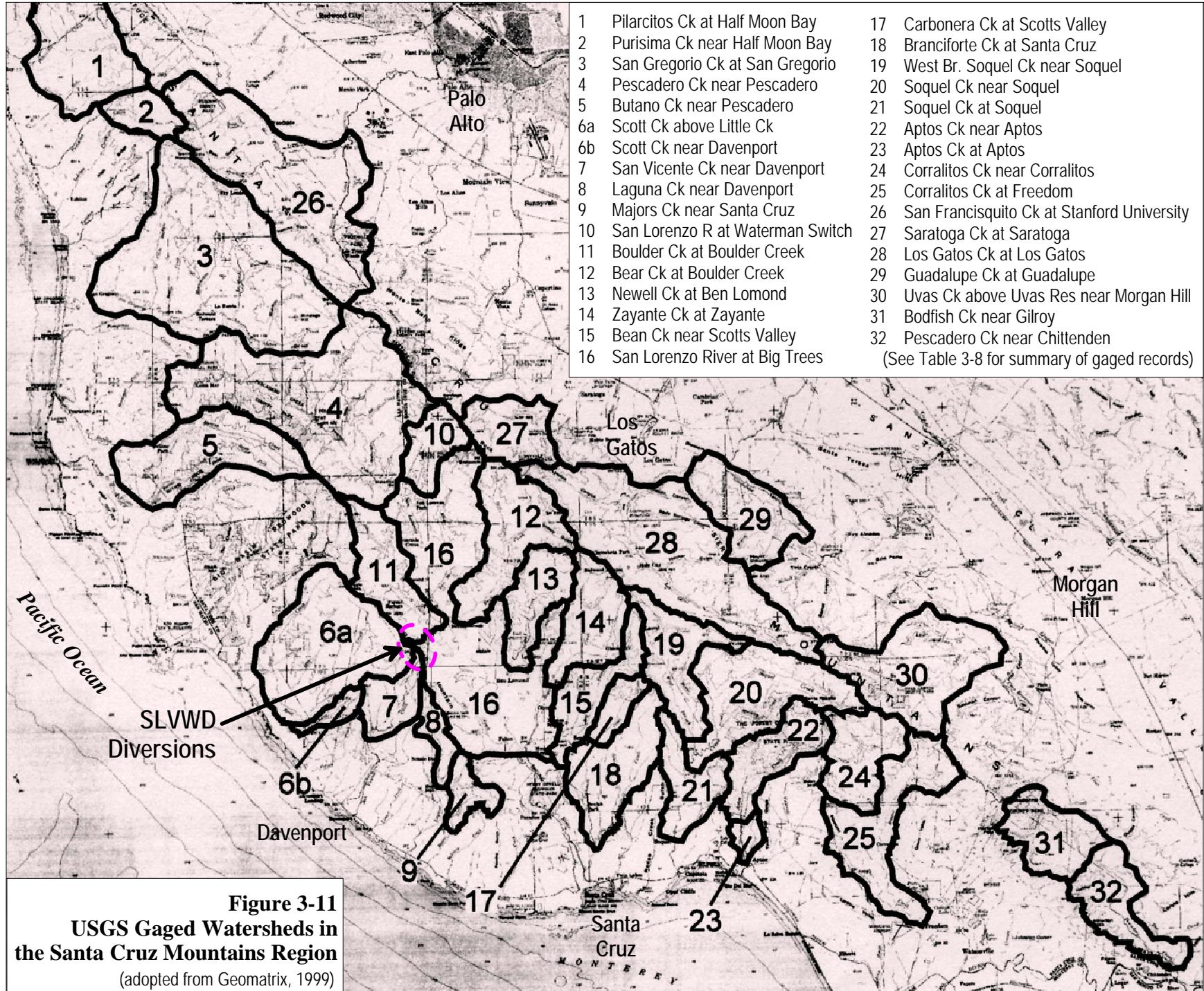
Source: <http://wwwcimis.water.ca.gov/cimis/info.jsp>

Monthly Average Reference Evapotranspiration by ETo Zone (inches/month)

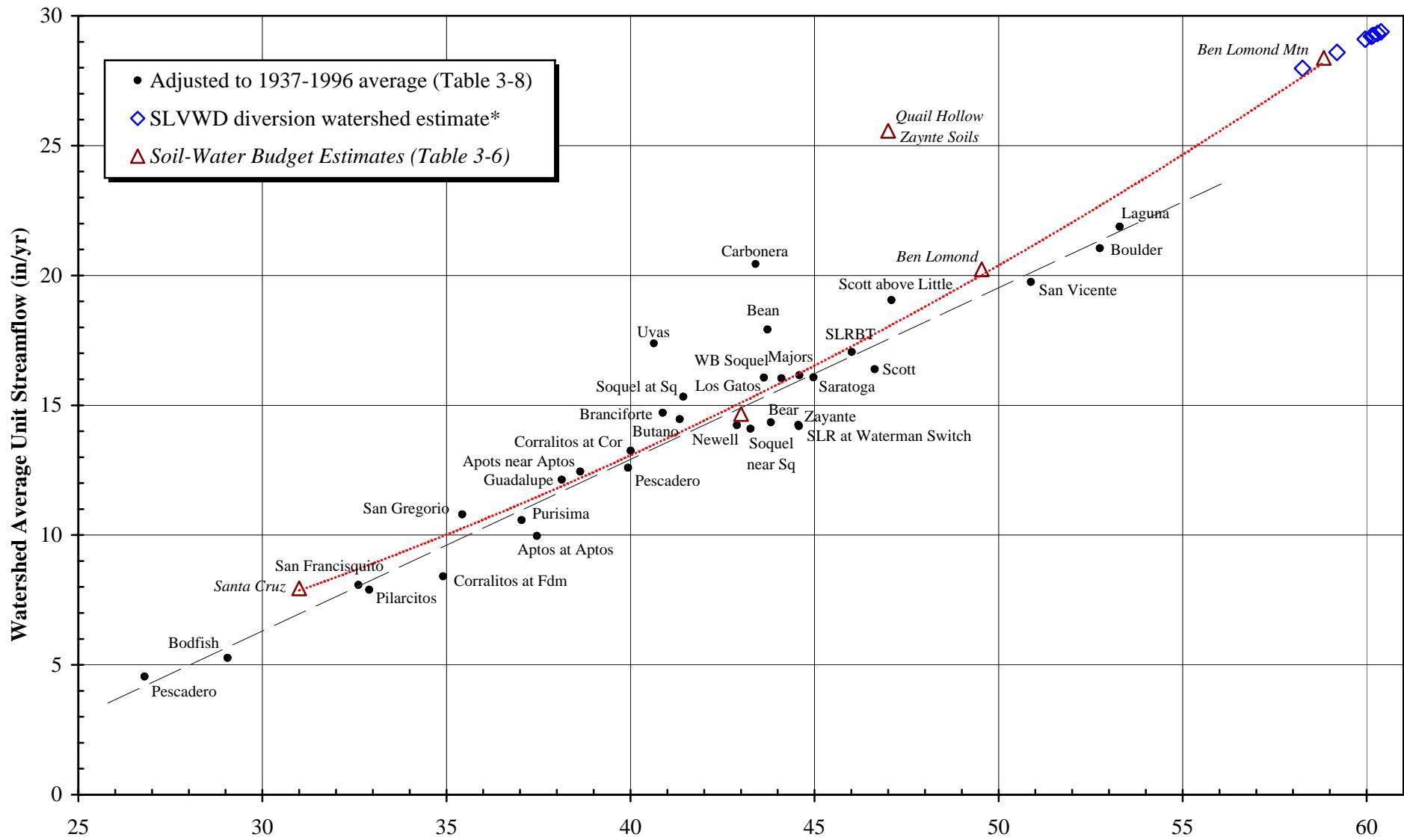
Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	0.93	1.40	2.48	3.30	4.03	4.50	4.65	4.03	3.30	2.48	1.20	0.62	33.0
2	1.24	1.68	3.10	3.90	4.65	5.10	4.96	4.65	3.90	2.79	1.80	1.24	39.0
3	1.86	2.24	3.72	4.80	5.27	5.70	5.58	5.27	4.20	3.41	2.40	1.86	46.3
6	1.86	2.24	3.41	4.80	5.58	6.30	6.51	6.20	4.80	3.72	2.40	1.86	49.7
8	1.24	1.68	3.41	4.80	6.20	6.90	7.44	6.51	5.10	3.41	1.80	0.93	49.4



**Figure 3-10**  
**CIMIS Reference Evapotranspiration for Central Coast Region**



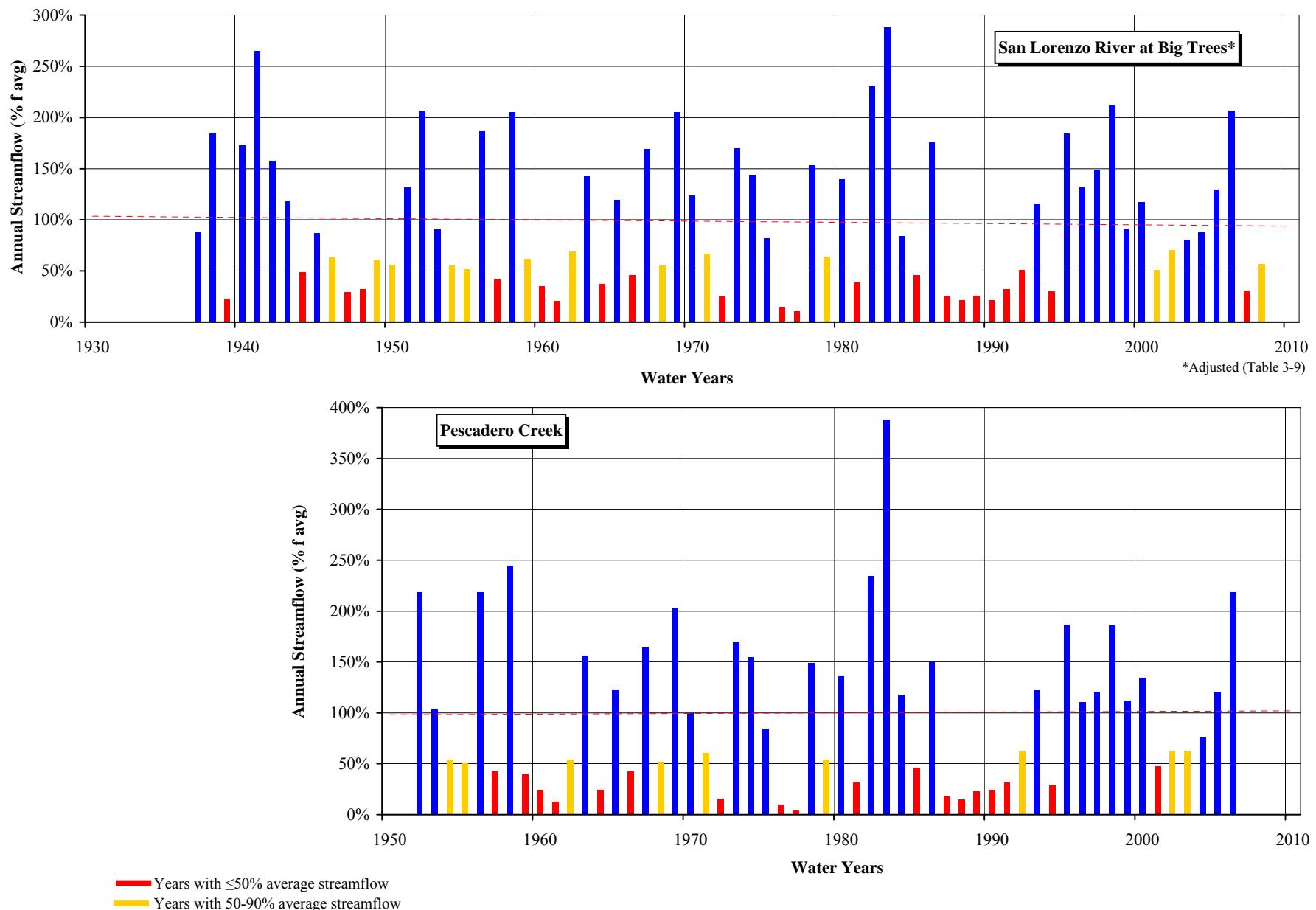
**Figure 3-11**  
**USGS Gaged Watersheds in**  
**the Santa Cruz Mountains Region**  
 (adopted from Geomatrix, 1999)



\*Adopted from Geomatrix, 1999.

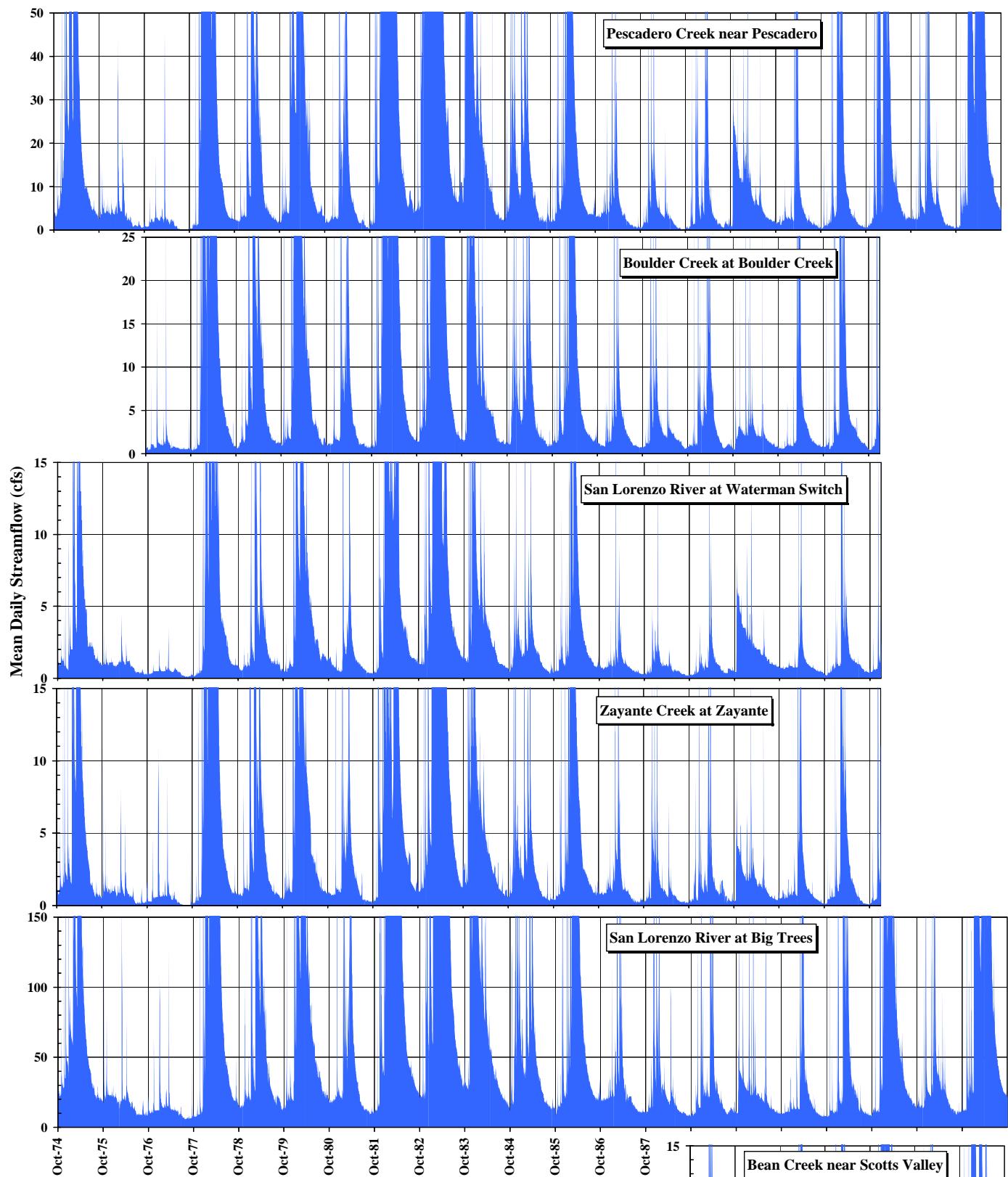
See Figure 3-11 for map of gaged watersheds.

**Figure 3-12**  
**Correlation Between Estimated Mean Annual Rainfall and Unit Streamflow for USGS Gaged Streams in the Santa Cruz Mountains Region**



**Figure 3-13**  
**Water-Year Streamflow of San Lorenzo River and Pescadero Creek**

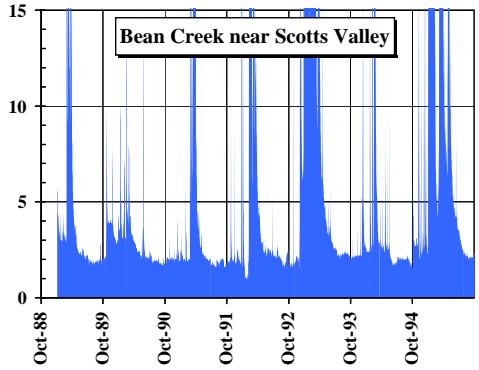
Source: see Table 3-10.

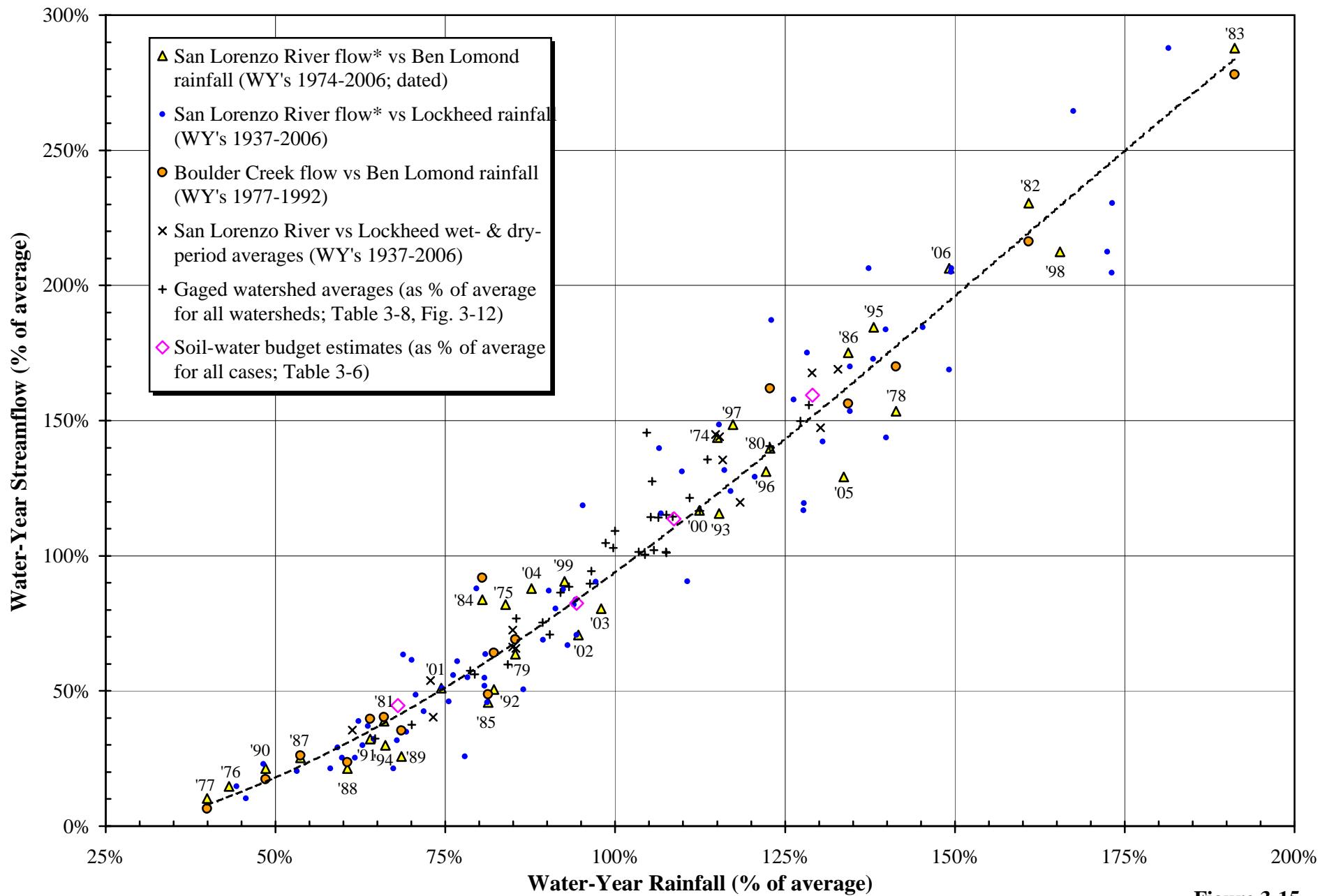


Plots show 1975-77 and 1987-94 droughts.  
Note effect of October 1989 Loma Prieta earthquake.

Source: <http://nwis.waterdata.usgs.gov/ca/nwis/sw>

**Figure 3-14**  
**Mean Daily Streamflow, Selected Streams, WY's 1975-1995**



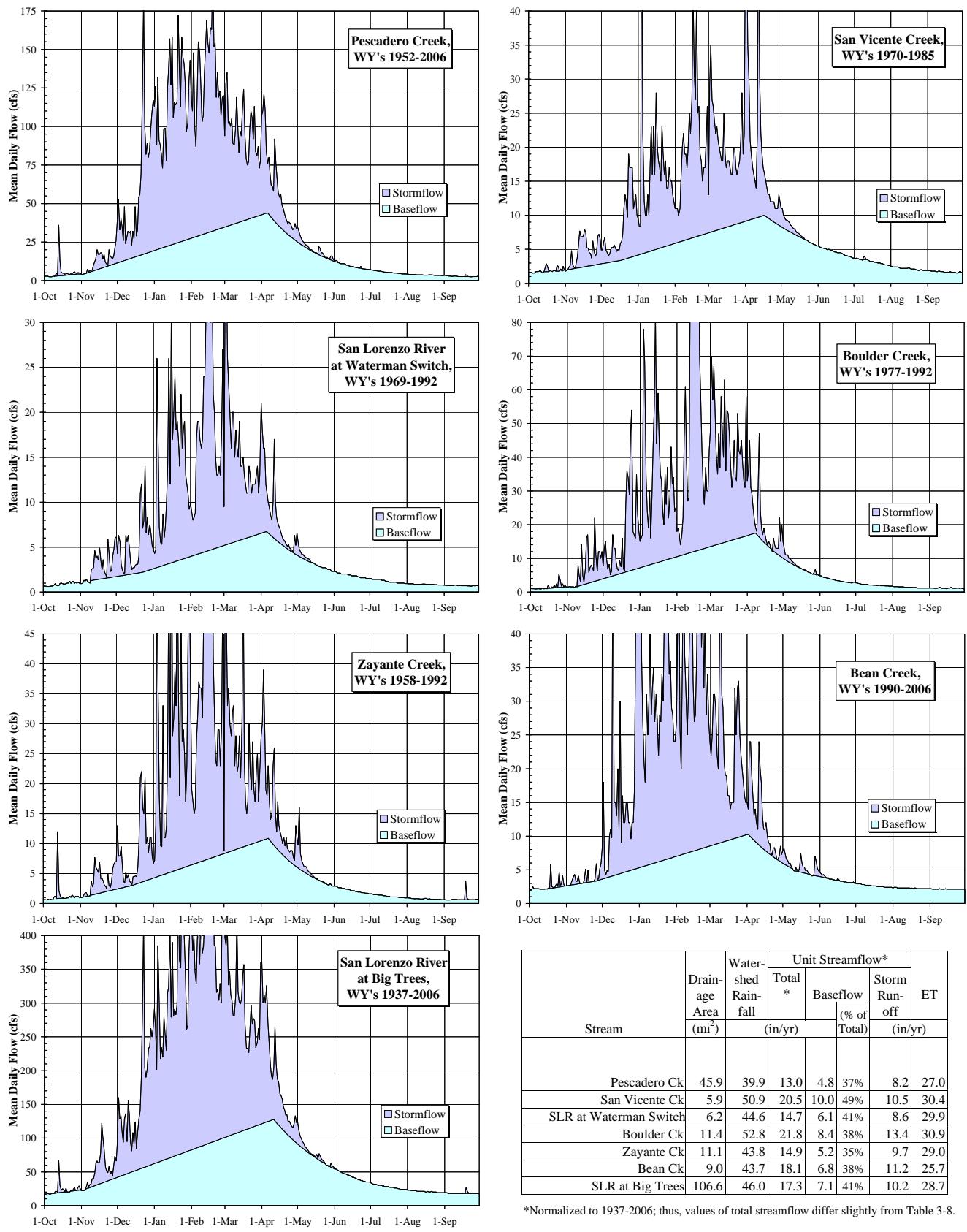


**Figure 3-15**

**Correlation Between Annual Rainfall and Unit Streamflow  
Selected Periods of Gaged Record**

\*At Big Trees gage; approx. adjustment for major diversions.

See Tables 3-8 & -10 for sources.



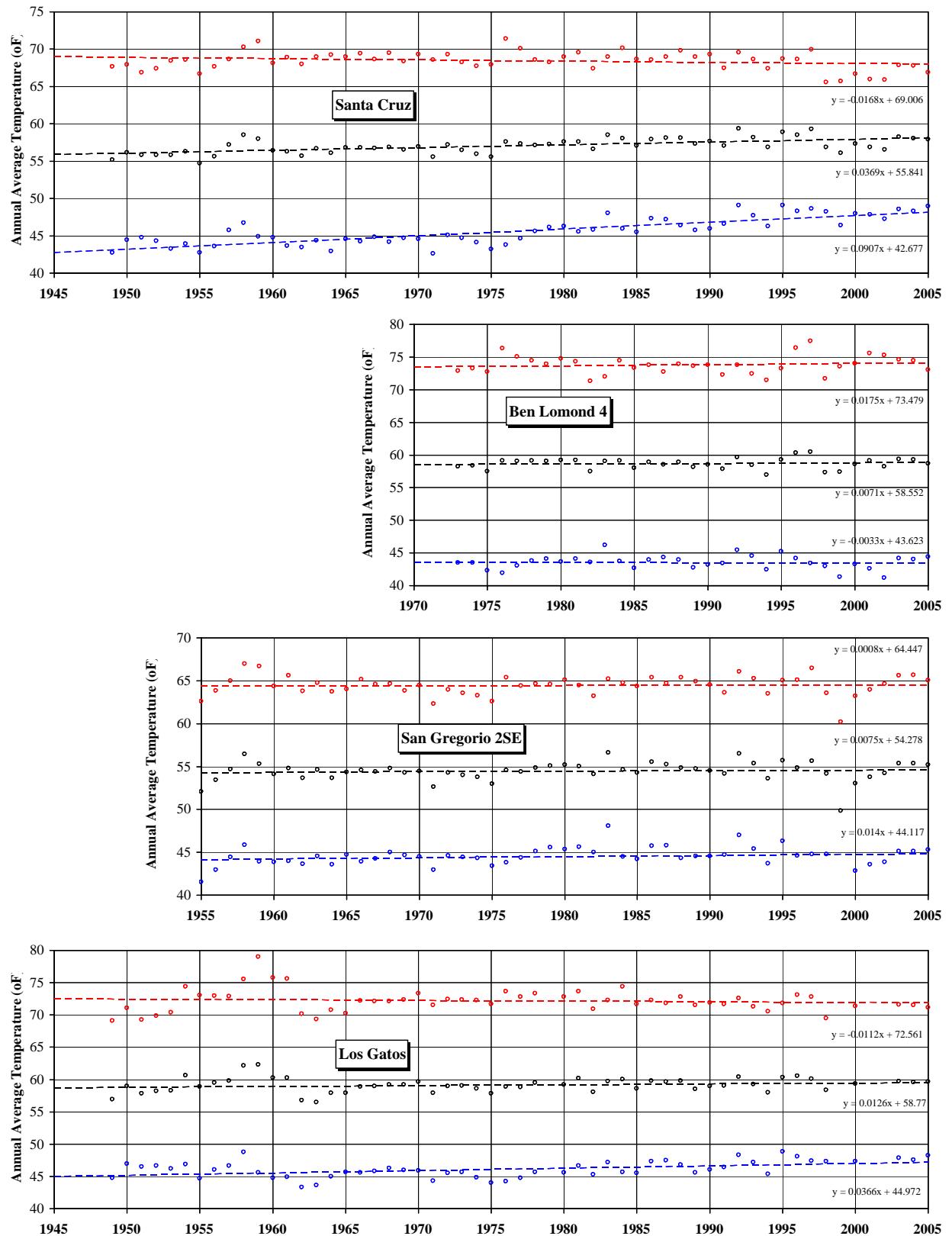
Stream	Drainage Area (mi <sup>2</sup> )	Watershed Rainfall (in/yr)	Unit Streamflow*			ET (in/yr)
			Total	Baseflow (% of Total)	Storm Run-off	
Pescadero Ck	45.9	39.9	13.0	4.8	37%	8.2
San Vicente Ck	5.9	50.9	20.5	10.0	49%	10.5
SLR at Waterman Switch	6.2	44.6	14.7	6.1	41%	8.6
Boulder Ck	11.4	52.8	21.8	8.4	38%	13.4
Zayante Ck	11.1	43.8	14.9	5.2	35%	9.7
Bean Ck	9.0	43.7	18.1	6.8	38%	11.2
SLR at Big Trees	106.6	46.0	17.3	7.1	41%	10.2

\*Normalized to 1937-2006; thus, values of total streamflow differ slightly from Table 3-8.

Hydrographs are of average mean daily flow for indicated periods of record.

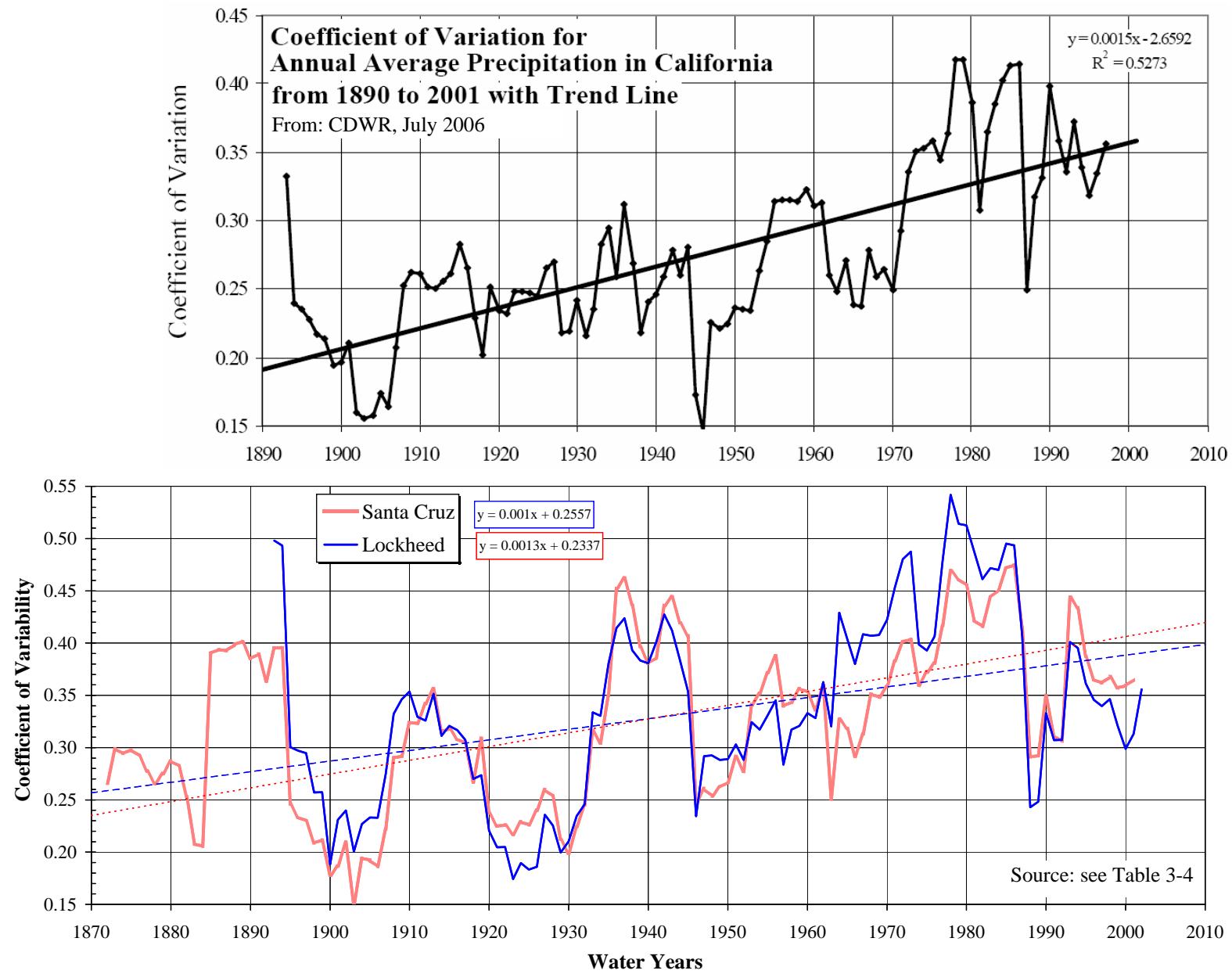
Source: <http://nwis.waterdata.usgs.gov/ca/nwis/sw>

**Figure 3-16**  
**Estimated Average Stormflow-Baseflow Hydrograph Separation, Selected Gaged Streams**



Source: [www.wrcc.dri.edu/summary/climsmnca.html](http://www.wrcc.dri.edu/summary/climsmnca.html)

**Figure 3-17**  
**Annual Mean Temperature, Selected Stations, 1945-2005**



**Figure 3-18**  
**Coefficient of Variation for Moving 10-Year Periods of Annual Precipitation, Study Area and Statewide, 1880's to Present**