

CHAPTER 2. BASIC DATA

2.1 LOCATION AND TOPOGRAPHY

Solano County (County) is located within the southern portion of the Sacramento River Valley and is one of nine counties that constitute the San Francisco Bay region (Figure 2-1). Neighboring counties are Yolo to the north and northeast, Sacramento to the east, Contra Costa to the south, Sonoma to the southwest, and Napa to the west. Putah Creek, draining from Lake Berryessa to Yolo County, forms the northern border of the County, and the southern boundary extends from San Pablo Bay through Carquinez Strait and Suisun Bay to the Sacramento River.

The topography of Solano County is shown on Figure 2-1. Also shown on this figure are the names and locations of the 7.5-minute USGS quad maps that cover Solano County.

Prominent topographic features of Solano County are the Vaca Mountains and Montezuma Hills. The Vaca Mountains, part of the Coastal Range, form a strip of extremely steep slopes along the western border of the County. Located within this range, Mt. Vaca is the highest point in the County at elevation 2,819 feet. The Montezuma Hills are a series of moderately high formations located at the southeast corner of the County. The highest point in these hills is at elevation 233 feet, and the slopes are moderate, ranging from five to thirty percent.

Except for the Vaca Mountains and Montezuma Hills, Solano County is otherwise relatively flat. Over sixty percent of the County is below elevation 100 feet and has slopes ranging from zero to fifteen percent. The valley area covering the northeastern third of the County has slopes of less than five percent. The Suisun Marsh, located at the southern boundary of the County, constitutes the lowest areas, with most of the marsh at or near sea level. Suisun Marsh is the largest unfilled marsh in the San Francisco Bay region.

2.2 PRECIPITATION

Precipitation in Solano County is derived from frontal storms originating over the Pacific Ocean. The precipitation occurs generally as rain although some snow flurries occur over the Vaca Mountains. Rain occurs during the wet season which extends from October to April.

Rainfall distribution is affected significantly by topography. As shown on the isohyetal map of mean annual precipitation (Figure 2-2), most of the rainfall is concentrated along the western County border over the Vaca Mountain range. This results from the orographic effect of the mountains, which causes rain-bearing air (coming from the west) to rise and discharge a large portion of moisture over the mountains and immediately downwind.

The greatest amount of rainfall, averaging over 40 inches a year, occurs over the Vaca Mountains. The rainfall level decreases easterly away from the mountains and reaches the lowest value of 14 inches per year at the southeastern corner of the County. The overall mean annual precipitation (rainfall) for the County is approximately 20 inches.

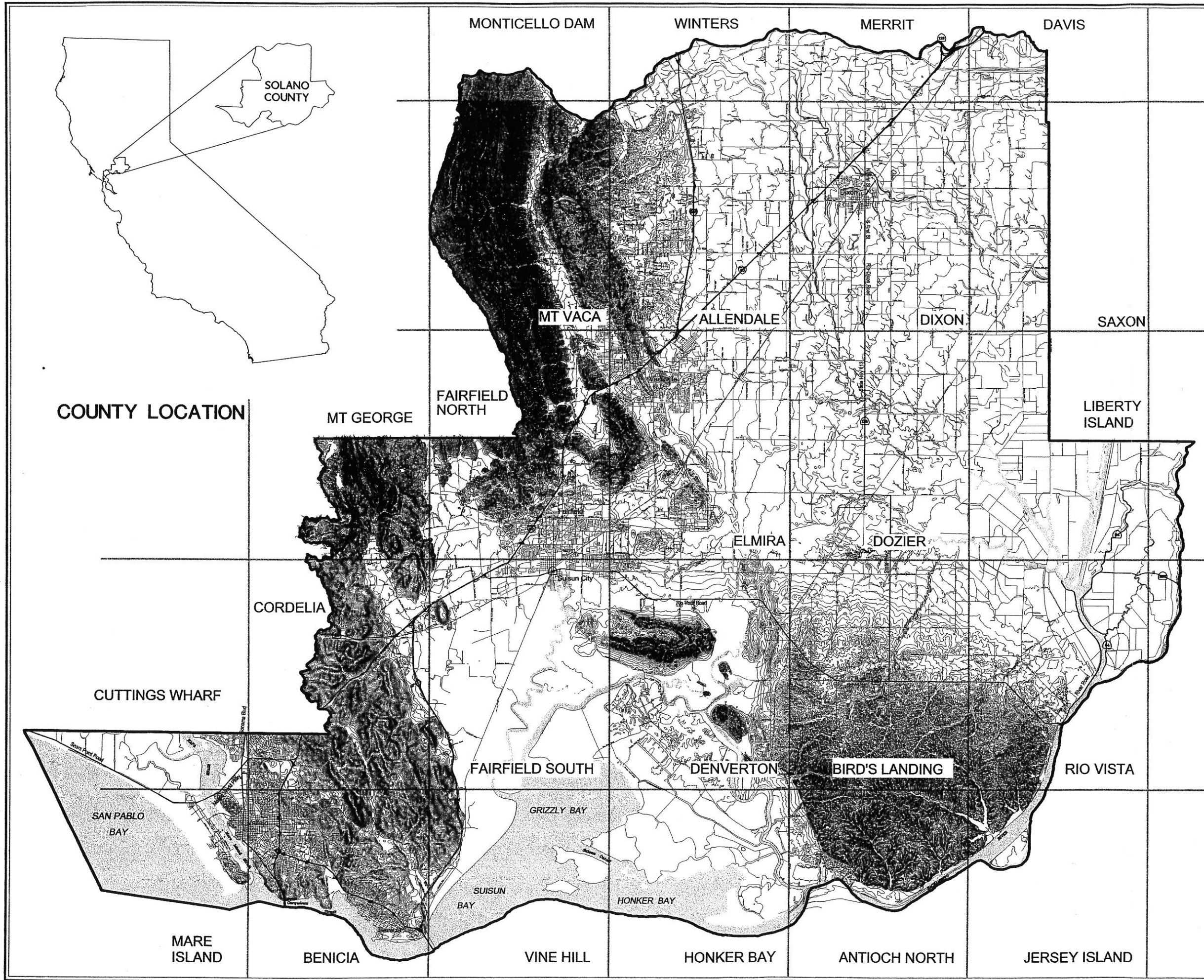
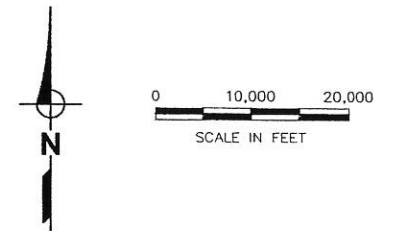


Figure 2-1

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TOPOGRAPHIC MAP OF
SOLANO COUNTY



NOTES:

1. SOURCE OF UNDERLYING MAPPING SHOWN HEREON IS DIGITIZED USGS QUAD MAPS AS SUPPLIED BY AMERICAN DIGITAL CARTOGRAPHY.
2. BOUNDARIES ARE APPROXIMATE AND HAVE BEEN ADJUSTED TO FIT USGS QUAD MAPS.
3. BASED ON OR CORRECTED TO THE 1951 TO 1980 BASE PERIOD.

LEGEND:

- ROADS & MINOR HIGHWAYS
- MAJOR HIGHWAYS
- CONTOUR LINES
- USGS QUADRANGLE MAP BOUNDARY
- ALLELENDALE USGS QUADRANGLE MAP NAME

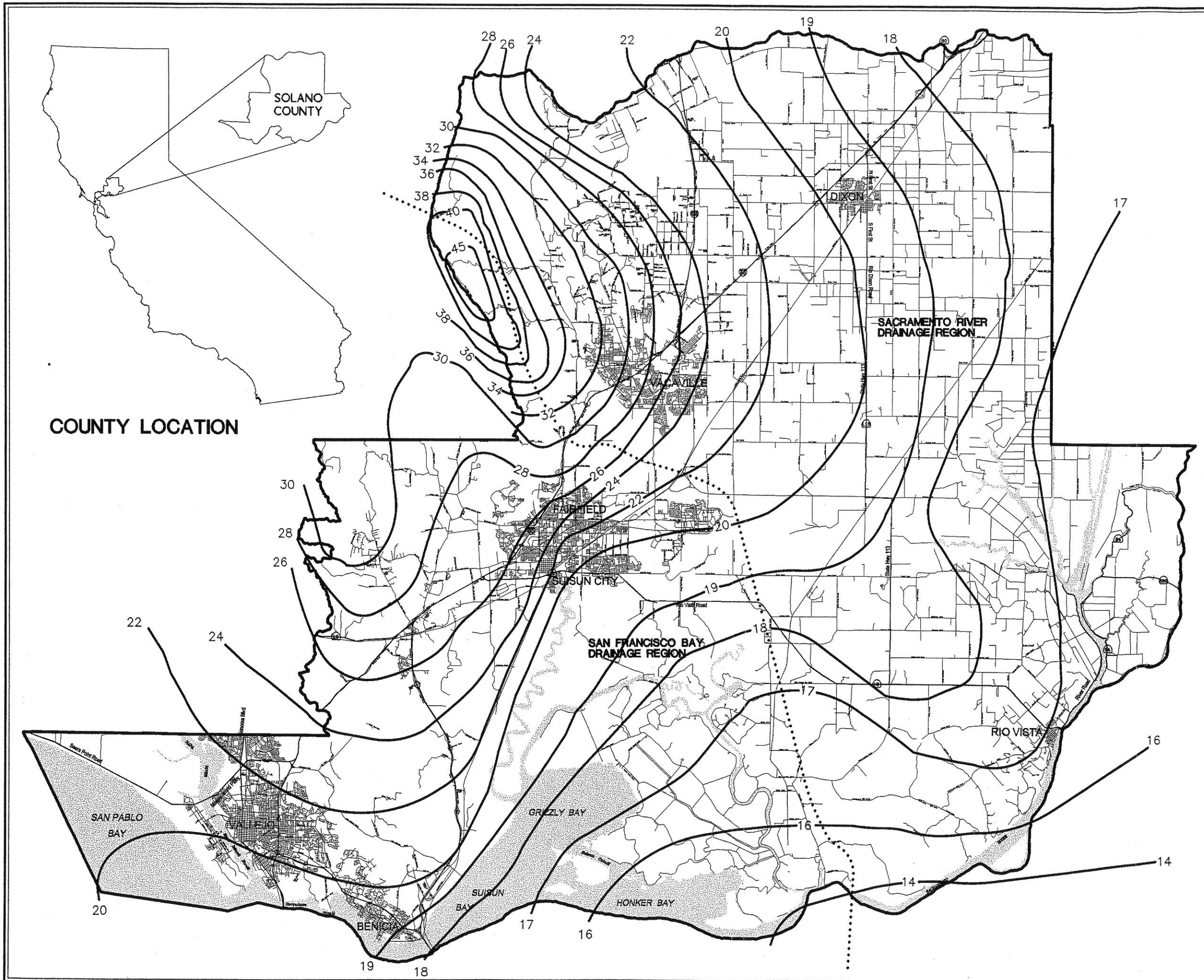
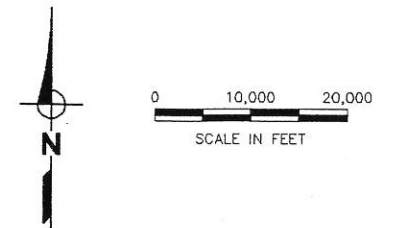


Figure 2-2

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**ISOHYETAL MAP OF
SOLANO COUNTY
MEAN ANNUAL PRECIPITATION**



NOTES:

1. SOURCE OF UNDERLYING MAPPING SHOWN HEREON IS DIGITIZED USGS QUAD MAPS AS SUPPLIED BY AMERICAN DIGITAL CARTOGRAPHY.
2. BOUNDARIES ARE APPROXIMATE AND HAVE BEEN ADJUSTED TO FIT USGS QUAD MAPS.
3. BASED ON OR CORRECTED TO THE 1951 TO 1980 BASE PERIOD.
4. ISOHYETAL LINES ARE FROM DESIGN RAINFALL FOR SOLANO COUNTY. PREPARED BY JAMES D. GOODRIDGE, SEPTEMBER 5, 1998.

LEGEND:

- ROADS & MINOR HIGHWAYS
- MAJOR HIGHWAYS
- ISOHYETAL LINES
- 22
- DRAINAGE REGION BOUNDARY

This rainfall pattern results in the County having somewhat different rainfall distributions in the southwest and northeast areas of the county. In this Hydrology Manual, Solano County has been divided into two drainage regions corresponding to the State of California, Department of Water Resources (DWR) Drainage Provinces. As shown on Figure 2-2, the San Francisco Bay Region includes the southwest area of the county (Fairfield, Suisun City, Vallejo and Benicia), and corresponds to the DWR San Francisco Bay Province. The Sacramento River Region includes the northeast area of the County (Vacaville, Dixon and Rio Vista), and corresponds to the DWR Sacramento River Province and a small amount of the DWR San Joaquin River Province.

An important parameter in the design of drainage facilities is the rainfall depth-duration-frequency (DDF) relationship. The frequency is expressed as a return period in years. The return period or recurrence interval is defined as the average number of years within which a given event is equaled or exceeded. A copy of a report describing the DDF relationships for Solano County is included in Appendix A.

2.3 SOILS

The United States Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) has mapped all of the soils in Solano County in the report *Soil Survey of Solano County, California* (issued May 1977). The NRCS categorized all soils into one of 4 hydrologic soil groups, which range from Group A, characterized by high infiltration and low runoff, to Group D, which has slow infiltration and high runoff (see Table 2-1).

Table 2-1. Hydrologic Soil Groups

Hydrologic Soil Group	Characteristics
A	Low runoff potential, high infiltration rate. Well to excessively drained sands and gravels.
B	Moderate infiltration rates. Moderately deep to deep. Moderately well to well drained soils. Loams and similar soils. No clay pans.
C	Slow infiltration rates. Soils with layer that impedes water transmission. Moderately fine to fine texture.
D	High runoff potential, very slow infiltration rate. Heavy clay soils or clay pan at or near the surface. Shallow soils over nearly impervious material.

The hydrologic soil group designation is used in selecting appropriate runoff coefficients in drainage design for pervious areas such as agricultural or open space. The procedure is described in greater detail in Section 3.4.

2.4 LAND USE

Present land use in Solano County is predominantly agricultural or rural open space. The most extensively developed areas are located along the I-80 corridor and include Vallejo/Benicia, Cordelia, Fairfield/Suisun (including Travis Air Force Base), Vacaville, and Dixon. The only other town in the County is Rio Vista, which is located near the southeast corner of the County. These communities are largely residential with commercial and industrial sections.

Much of the northeastern third of the County within the valley lowlands is intensively farmed with a predominance of irrigated row crops and orchards. The rest of the County (except for the urban centers) is open space, including the Suisun Marsh area, the Montezuma Hills to the south, and the Vaca Mountains along the western border. The natural vegetative cover is generally grass at the lower elevations, transitioning to brush and trees (mainly oak) at higher elevations.

2.5 TIDAL CONDITIONS

A large portion of southern Solano County is under tidal influence. Tidal effects extend from Suisun Bay and the Sacramento River as far up as Cordelia, Suisun City, and portions of Fairfield. Tidal conditions also occur in Vallejo, Benicia, Collinsville, Denverton, and Rio Vista. It is important that hydraulic analysis and design account for the backwater caused by tidal intrusion in these areas of tidal influence.