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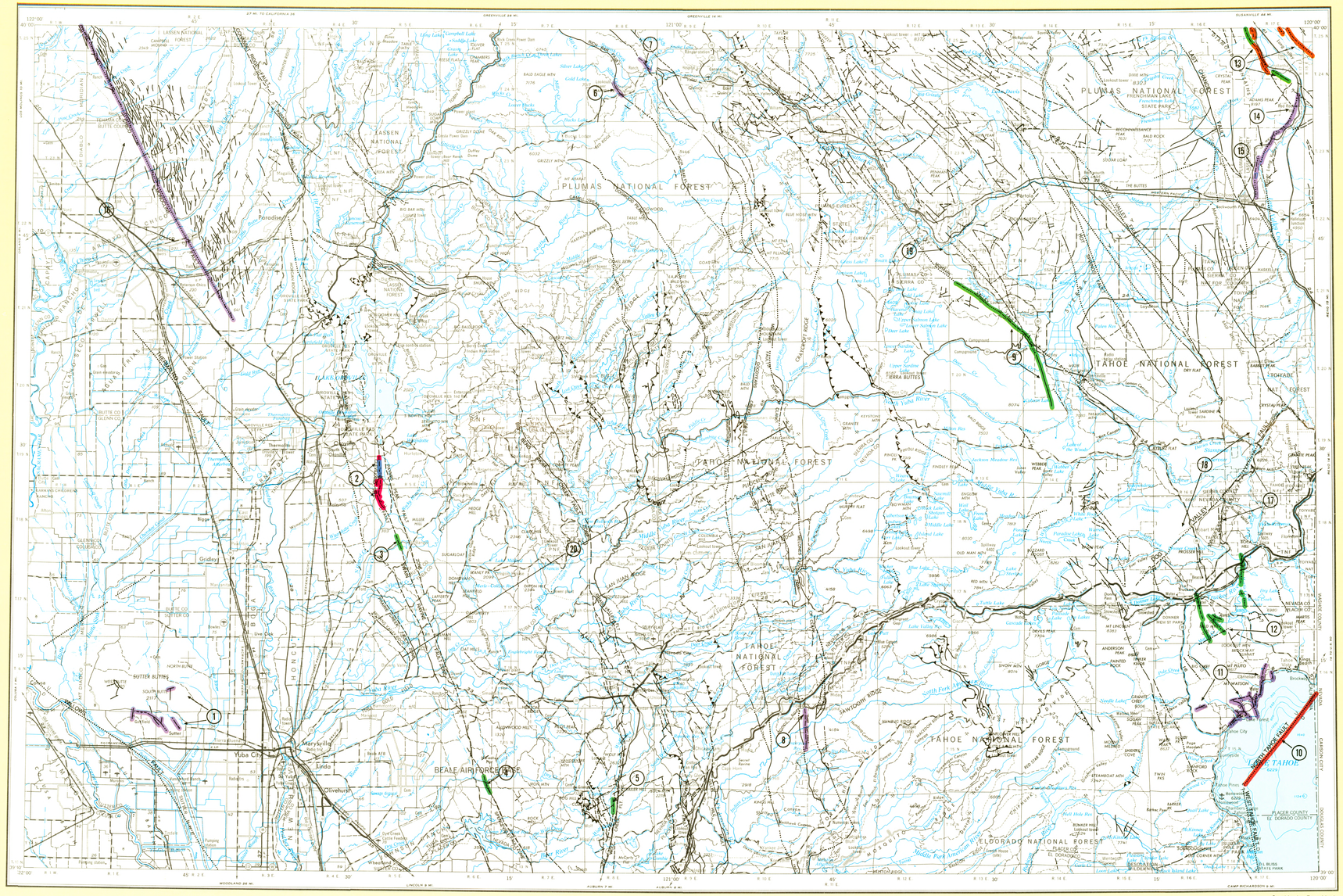
REGIONAL GEOLOGIC MAP SERIES
CHICO QUADRANGLE—MAP NO. 7A (GEOLOGY)
SHEET 5 OF 5



Graphics by Ross Martin

Geologic Time Scale		Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION
Quaternary	Late Quaternary, Holocene, Historic	200			Displacement during historic time (e.g. Cleveland Hill fault 1975).
		10,000			Displacement during Holocene time.[1]
					Faults showing evidence of displacement during late Quaternary time.[2,3]
	Early Quaternary, Pleistocene	700,000			Quaternary (undifferentiated) faults - most faults in this category show evidence of displacement during the last 2,000,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.[3]
Pre-Quaternary	Pliocene, Miocene	2,000,000 – 5,000,000			Faults showing evidence of no displacement during Quaternary time or faults without recognized Quaternary displacement.

FOOTNOTES

[1]Geomorphic evidence for Holocene faulting includes: sag ponds, or the following features in Holocene deposits: offset stream courses linear scarps, and triangular faceted spurs.

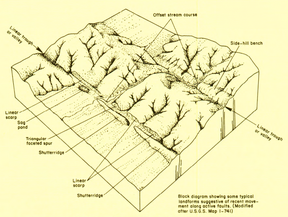
[2]Geomorphic evidence for late Quaternary faulting includes such features as offset stream courses, linear scarps, shutterridges, and triangular faceted spurs.

[3]Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

FAULT MAP SYMBOLS

U D — Fault

Solid where well located; dashed where approximately located or inferred; dotted where concealed by younger rocks or water; queried where continuation or existence is uncertain. U, up- thrown side; D, downthrown side (relative or apparent). Barbs indicate thrust fault (barbs on upper plate).



RECENCY OF FAULTING

This map and accompanying table depicts the recency of fault activity within the Chico 1°X 2° quadrangle. It represents a synthesis of data from a large body of literature, published and unpublished, regarding faulting in the east-central Sacramento Valley, northern Sierra foothills and northern Sierra Nevada of California. The faults shown are identical to those on the accompanying Geologic Map of the Chico Quadrangle. The purpose of this compilation is to depict what is currently known about the recency of displacement along these structures. Future studies in this region may discover additional faults, require more accurate location of faults as they are presently mapped, or, in some cases, change the age designations as shown here.

Age designations are assigned by examining the geologic evidence along faults or fault segments to determine the youngest faulted unit, the oldest unfaulted unit or the relative age of geomorphic features produced from fault rupture. If Quaternary displacement is indicated, the fault is classified into one of three categories (Holocene, late Quaternary, or Quaternary undifferentiated). Faults with reported surface rupture within the past 200 years are further classified as historically active. Faults showing no evidence of displacement in Quaternary time are classified as pre-Quaternary. Faults with insufficient evidence for classification, or those that may not have been fully evaluated for recency of displacement, are grouped with the pre-Quaternary faults.

The reliability of the age designations on this map are dependent upon several factors. First, some of the data used to classify faults on this map were based on studies not directed toward determining the recency of fault movement. Second, important fault-related, geomorphic features may have been destroyed by natural or human activities. Third, geologists may differ in their interpretations of the geologic evidence for recency of faulting. Fourth, the ages of the lithologic units used to classify the faults may not be accurately known.

The age designations on this fault map are based largely on information in the geologic literature (see compilation references below). The numbers shown on the map refer to the accompanying table and are used primarily to indicate the appropriate reference or references used for classification of that locality. Faults numbered but uncolored were not specifically classified but were considered to be worth noting.

This is a small scale (1:250,000) regional map, and should be used only as a first approximation of the potential fault hazards of an area. A detailed geologic investigation should be the core of any site-specific study for planning or development purposes.

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FAULT CLASSIFICATION TABLE

NO.	FAULT NAME	AGE	COMMENT	REFERENCE
1	Unnamed faults at Sutter Buttes	Quaternary (undifferentiated)	Classification based on apparent offset of Plio-Pleistocene volcanic rocks.	See compilation source on Sheet 3
2	Cleveland Hill fault	Historic, 1975-1976	Ground rupture associated with 1975, Oroville earthquake.	Akers and McQuilkin, 1975 Clark, and others, 1976 Hart, 1976 Hart and Rapp, 1975
3	Swain Ravine fault zone (Orange Road site)	Late Quaternary (active within last 100,000 years)	Paleo-B soil horizon truncated by east-dipping normal fault.	Schwartz, and others, 1977; p. 54-57 Bryant. 1983a
4	Spenceville fault zone (Spenceville exploration site)	Late Quaternary (possibly Holocene, active between 9,000-130,000 y.b.p.)	Continuity of a paleo-B soil horizon is disrupted by west-dipping fault zone.	Schwartz, and others, 1977; p. 57-61 Borchardt, and others, 1980 Bryant, 1983a
5	Highway 49 fault zone (Smith Property)	Late Quaternary (active within last 130,000 years)	Paleo-B soil horizon apparently offset by west-dipping reverse fault.	Alt, and others, 1977; Appendix B Borchardt, and others, 1980 Bryant,1983b Schwartz, and others, 1977; p. 61
6	Rich Bar fault at Meadow Valley (Bottle Springs Fault)	Quaternary (undifferentiated)	Fault displaces Quaternary (?) lake deposits.	Alt, and others, 1977; p. 47-49
7	Melones fault zone (Meadow Valley fault)	Quaternary (undifferentiated)	Zone of faulting displaces Quaternary (?) lake deposits.	Alt, and others, 1977; p. 42-43
8	Giant Gap fault (west of Cosa Loma)	Quaternary (undifferentiated)	Zone of faulting displaces Miocene deposits and overlying Pleistocene(?) colluvium.	Alt, and others, 1977; p. 59-61
9	Mohawk Valley fault (and southwestern branch)	Late Quaternary	Geomorphic evidence suggestive of late Quaternary displacement.	Hawkins, and others, 1986; p. 60-63 Page, 1990
10	North Tahoe fault	Holocene	Holocene lake deposits displaced by faulting.	Hyne, and others, 1972; p. 1440 Hawkins, and others, 1986; p. 56
11	Unnamed faults north of Lake Tahoe	Quaternary (undifferentiated)	Classification based on apparent offset of Quaternary volcanic rocks.	See compilation source on Sheet 3
12	Unnames faults north of Lake `ahoe	Late Quaternary	Faults displace volcanic rocks or affect sediments determined to be less than 700,000 years old.	Latham, 1985
13	Unnames faults bordering Long Valley also southern continuation ofHoney Lake fault zone	Late Quaternary; Holocene	Classification based on photo interpretation.	Wills, 1990 Smith, 1977
14	DiamondMountains fault	Quaternary (undifferentiated)	Classification based on geomorphic evidence - "youthful scarp".	Mergner, 1978; p. 36-38 dePolo, 1988
15	Unnames fault (west sub of Upper Long Valley north of Beckworth Pass)	Quaternary (undifferentiated)	Fault displaces Pleistocene lake deposits.	Fraser and Nasirian, 1981
16	Chico-monocline fault	Quaternary (undifferentiated)	Major tectonic boundary with late Cenozoic displacement responsible for the formation of the Chico monocline. North of the map area, fractures related to monocline formation, displace a Pleistocene basalt flow. Also, two anomalous abrstshocks, associated with the 1975 Oroville earthquake, may have occurred on this fault.	Harwood and Helley, 1987; p. 19-23
17	Unnamec	(see comment)	Zone of isolated ground failures associated with the 1966, Truckee earthquake.	Kachadoorian, and others, 1967 Hawkins, and others, 1986, p. 65
18	Dog Valley fault	(see comment)	Zone of northeast-trending lineaments considered seismically active.	Hawkins, and others, 1986; p. 65-79
19	Unnames faults in Mohawk Valley area	(see comment)	Historic ground rupture associated with the 1875 earthquake is questionable.	Smith, 1983 Hawkins, and others, 1986; p. 60-63
20	Foothills\ault system	(see comment)	The 1975 Oroville earthquake and its associated ground rupture raised questions concerning the potential for activity along this system of faults. Subsequent studies indicate late Cenozoic faulting has been distributive within the Foothills system along short, discontinous fault strands.	Alt, and others, 1977 Bryant, 1983a Hart, and others, 1984 Harwood and Helley, 1987

Base Map

Prepared by the U.S. Army Topographic Command (KCSX), Washington, D.C. Compiled in 1957 from United States quadrangles, 1:24,000, 1:25,000, 1:48,000, 1:50,000, and 1:62,500, 1937-57. Planimetry revised in part from aerial photographs taken 1952 and 1957. Map field checked 1958. Revised in 1970 by the U.S. Geological Survey from aerial photographs taken 1967-69.

Area covered by dashed light-blue pattern is subject to controlled inundation.

Minorcorrections and additions to culture by California Division of Mines and Geology 1989.

Depthcontours in Lake Tahoe in feet - compiled from soundings shown on U.S. Coast and Geodetic Survey Chart 5001.

LOCATION DIAGRAM

Scale 1:250,000

5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometers
5 0 5 10 15 Nautical Miles

TRANSVERSE MERCATOR PROJECTION

BLACK NUMBERED LINES INDICATE THE 10,000 METER UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 10

1970 MAGNETIC DECLINATION FROM TRUE NORTH VARIES FROM 18° 33'0 MILS) EASTERLY FOR THE CENTER OF THE WEST EDGE TO 17° 12' (310 MILS) EASTERLY FOR THE CENTER OF THE EAST EDGE

MAP SHOWING RECENCY OF FAULTING, CHICO QUADRANGLE, CALIFORNIA, 1:250,000

Compilation by George J. Saucedo
Published 1992