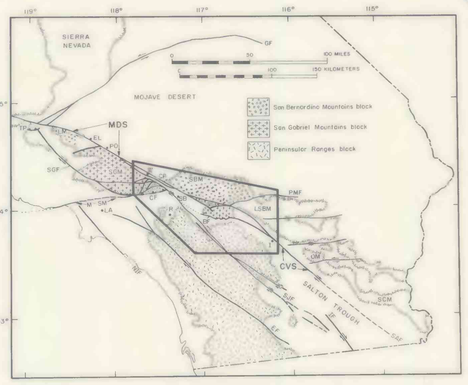
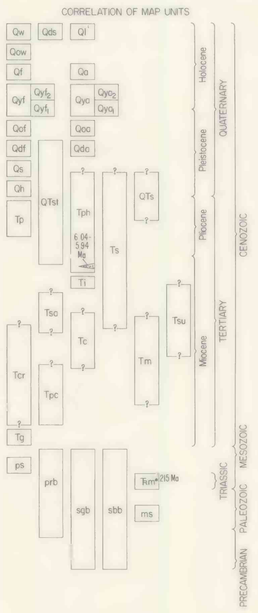
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN-FILE REPORT
92-354
SHEET 2 OF 2



Index map showing location of study area and distribution of major faults. The dashed trace of the Coachella Valley segment of the San Andreas fault in the southern Salton Trough indicates the fault's probable course during much of Pliocene and Pleistocene time. The modern trace of the fault, where recognizable, is shown on the map by a solid line. CF, Cucamonga fault; CP, Cajon Pass; CVS, Coachella Valley segment, San Andreas fault; EF, Elsinore fault; EL, Elizabeth Lake; GF, Garlock fault; LA, Los Angeles; LM, Liebre Mountain; LSBM, Little San Bernardino Mountains; MDS, Mojave Desert segment, San Andreas fault; M-SM, Malibu-Santa Monica fault zone; NIF, Newport-Inglewood fault; OM, Orocopia Mountains; PD, Palmdale; PMF, Pinto Mountain fault; R, Riverside; SAF, San Andreas fault; SB, San Bernardino; SBM, San Bernardino Mountains; SCM, southern Chocolate Mountains; SGF, San Gabriel fault; SGM, San Gabriel Mountains; SJF, San Jacinto fault; TP, Tejon Pass; W, Wrightwood.



EXPLANATION

CONTACT--Dashed where approximately located

FAULT--Dotted where concealed, dashed where approximate. Arrows show direction of relative movement; single arrow perpendicular to fault shows direction of dip. Bar and ball on downdropped block. Hachures indicate fault scarp, with hachures on downdropped block

THRUST FAULT--Dotted where concealed. Teeth on upper plate. Locally includes reverse faults

ANTICLINE--Position of crestline is approximate

LANDSLIDE DEPOSIT--Arrows show direction of movement

A-A'
B-B'
C-C'
D-D'
E-E'
ROCK UNITS OR PHYSIOGRAPHIC FEATURES DISPLACED BY THE MILL CREEK STRAND OF THE SAN ANDREAS FAULT

F-F'
G-G'
ROCK UNITS DISPLACED BY THE COACHELLA VALLEY SEGMENT OF THE BANNING FAULT

Base from U.S. Geological Survey
San Bernardino, 1958, revised 1969
Santa Ana, 1959, revised 1979

Scale 1:250,000

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

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
TRANSVERSE MERCATOR PROJECTION

Sources of Geologic Mapping

Coachella Valley and Morongo Valley regions: Rogers (1965, 1967) and Dibblee (1967), modified by preliminary photogeologic mapping (Matti, unpubl.). ***San Gorgonio Pass region***: Allen (1957), Farley (1979), Matti and others (1983), Morton, Matti, and Cox, (unpubl. mapping, 1978-1992). ***Peninsular Ranges region***: Rogers (1965, 1967) modified by Morton (1978a,b,c) and by Morton and Matti (unpubl. mapping, 1972-1992). ***San Bernardino Valley region***: Morton and Miller (1975); Miller (1979); Matti and others (1992); Matti, Carson, Morton, and Cox, (unpubl. mapping, 1971-1992). ***San Gabriel Mountains region***: Rogers (1967) modified by Morton (1975a, 1976), Morton and others (1983), Morton and Matti (1987), and Morton and Matti (1990b). ***Cajon Pass region***: Rogers (1967) modified by Weldon and others (1981), Weldon (1985a,b), Meisling and Weldon (1989), and Morton and Matti (1990a). ***San Bernardino Mountains region***: Rogers (1967) modified by Weldon (1985b), Miller (1979), Morton and others (1980), Matti and others (1982a, 1983), and Matti, Morton, and Cox (unpubl. mapping, 1978-1992).

DESCRIPTION OF MAP UNITS

Qw ALLUVIUM OF ACTIVE CHANNELS AND WASHES (HOLOCENE)

Qds WIND-DEPOSITED DUNE SAND (HOLOCENE)

Ql LACUSTRINE DEPOSITS OF ANCIENT LAKE COAHUILA (HOLOCENE)

Qow RECENTLY ADANDONED ALLUVIUM OF ACTIVE CHANNELS AND WASHES (HOLOCENE)

Qf DEPOSITS OF MODERN ALLUVIAL FANS (HOLOCENE)--Surfaces undissected

Qa DEPOSITS OF MODERN FLUVIAL FLOOD PLAINS (HOLOCENE)--Surfaces undissected

Qyf DEPOSITS OF YOUNGER ALLUVIAL FANS (HOLOCENE AND PLEISTOCENE)--Surfaces slightly to moderately dissected. Includes:

- **Qyf_2** Alluvial-fan deposits with slightly dissected surfaces and soil profiles lacking argillic horizons (Holocene)
- **Qyf_1** Alluvial-fan deposits with slightly to moderately dissected surfaces and soil profiles with weak argillic horizons (Holocene and latest Pleistocene)

Qya DEPOSITS OF YOUNGER FLUVIAL FLOOD PLAINS (HOLOCENE AND PLEISTOCENE)--Surfaces slightly to moderately dissected. Includes:

- **Qya_2** Flood-plain deposits with slightly dissected surfaces and soil profiles lacking argillic horizons (Holocene)
- **Qya_1** Flood-plain deposits with slightly to moderately dissected surfaces and soil profiles with weak argillic horizons (Holocene and latest Pleistocene)

Qof DEPOSITS OF OLDER ALLUVIAL FANS (PLEISTOCENE)--Surfaces moderately to well dissected; soil profiles have moderate argillic horizons

Qoa DEPOSITS OF OLDER FLUVIAL FLOOD PLAINS (PLEISTOCENE)--Surfaces moderately to well dissected; soil profiles have moderate argillic horizons

Qdf DEPOSITS OF OLDER DISSECTED ALLUVIAL FANS (PLEISTOCENE)--Surfaces moderately to well dissected; soil profiles have well developed argillic horizons

Qda DEPOSITS OF OLDER DISSECTED FLUVIAL FLOOD PLAINS (PLEISTOCENE)--Surfaces moderately to well dissected; soil profiles have well developed argillic horizons

Qs SHOEMAKER GRAVEL OF NOBLE (1954a) AS USED BY MEISLING AND WELDON (1989) (PLEISTOCENE)

Qh HAROLD FORMATION OF NOBLE (1954a) AS USED BY MEISLING AND WELDON (1989) (PLEISTOCENE)

QTs UNDIFFERENTIATED SEDIMENTARY ROCKS (PLEISTOCENE AND PLIOCENE)

QTst DEPOSITS OF SAN TIMOTEO BADLANDS OF FRICK (1921) AS USED BY MATTI AND MORTON (1975) (PLEISTOCENE AND PLIOCENE)--Locally includes underlying lithic and arkosic deposits that are unnamed

Tp PHELAN PEAK DEPOSITS OF WELDON (1985a,b) AS USED BY MEISLING AND WELDON (1989)

Tph PAINTED HILL FORMATION OF ALLEN (1957) (PLIOCENE AND MIOCENE)--Late Miocene age for basal part of the Painted Hill Formation north of the Banning fault is indicated by K/Ar age determinations of about 6 Ma (see Table 2 of text)

Ti IMPERIAL FORMATION (MIOCENE)--Late Miocene age for the Imperial Formation is indicated by K/Ar age determinations of about 6 Ma from the basal part of the overlying Painted Hill Formation north of the Banning fault (see Table 2 of text)

Ts UNDIFERENTIATED SEDIMENTARY ROCKS (PLIOCENE AND MIOCENE)--Includes: ***San Gorgonio Pass region***: Painted Hill Formation, Imperial Formation, and Hathaway Formation (of Allen, 1957) (Pliocene and Miocene); ***southeastern San Gabriel Mountains***: unnamed conglomerate (unit Tc of Morton and Matti, 1987) (Miocene)

Tc COACHELLA FANGLOMERATE AS MAPPED BY ALLEN (1957) AND PETERSON (1975)

Tsa SANTA ANA SANDSTONE OF VAUGHAN (1922) AS MAPPED BY SADLER (1982a,b) AND SADLER AND DEMIRER (1986)

Tsu UNNAMED NONMARINE SANDSTONE AND CONGLOMERATE OF MORTON AND MILLER (1975) (MIOCENE)--Mapped as Formation of Warm Springs Canyon by Matti and others (1992)

Tm MILL CREEK FORMATION OF GIBSON (1971) AS USED BY MATTI AND OTHERS (1992) (MIOCENE)

Tcr CROWDER FORMATION OF WELDON (1985b) AS USED BY WELDON AND OTHERS (1984) AND MEISLING AND WELDON (1989) (MIOCENE)

Tpc PUNCHBOWL FORMATION OF CAJON PASS REGION AS MAPPED BY WOODBURNE AND GOLZ (1972) (MIOCENE)

Tg GRANODIORITE IN SOUTHEASTERN SAN GABRIEL MOUNTAINS (MORTON, 1975b; MILLER AND MORTON, 1977; MORTON AND MATTI, 1987, UNIT Tgd) (MIOCENE)

ps PELONA SCHIST (MESOZOIC)

prb PENINSULAR RANGES BLOCK (MESOZOIC, PALEOZOIC, AND PRECAMBRIAN?)--Granitoid rocks and prebatholithic metasedimentary rocks

sgb SAN GABRIEL MOUNTAINS BLOCK (MESOZOIC, PALEOZOIC, AND PRECAMBRIAN)--Granitoid rocks and prebatholithic metaplutonic and metasedimentary rocks

sbb SAN BERNARDINO MOUNTAINS BLOCK (MESOZOIC, PALEOZOIC, AND PRECAMBRIAN)--Granitoid rocks and prebatholithic sedimentary, metasedimentary, and metaplutonic rocks. Includes:

- **Trm** Megaporhyrytic hornblende-biotite monzogranite of Matti and others (1986) and Frizzell and others (1986) that has large euhedral K-feldspar phenocrysts (Triassic). Frizzell and others (1986) obtained an age of 215 Ma on zircon using the U/Pb method

ms Metaquartzite, marble, and pelitic gneiss and schist (Paleozoic and Precambrian)

DISTRIBUTION AND GEOLOGIC RELATIONS OF FAULT SYSTEMS IN THE VICINITY OF THE CENTRAL TRANSVERSE RANGES, SOUTHERN CALIFORNIA

By

JONATHAN C. MATTI, DOUGLAS M. MORTON, AND BRETT F. COX

1992

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.