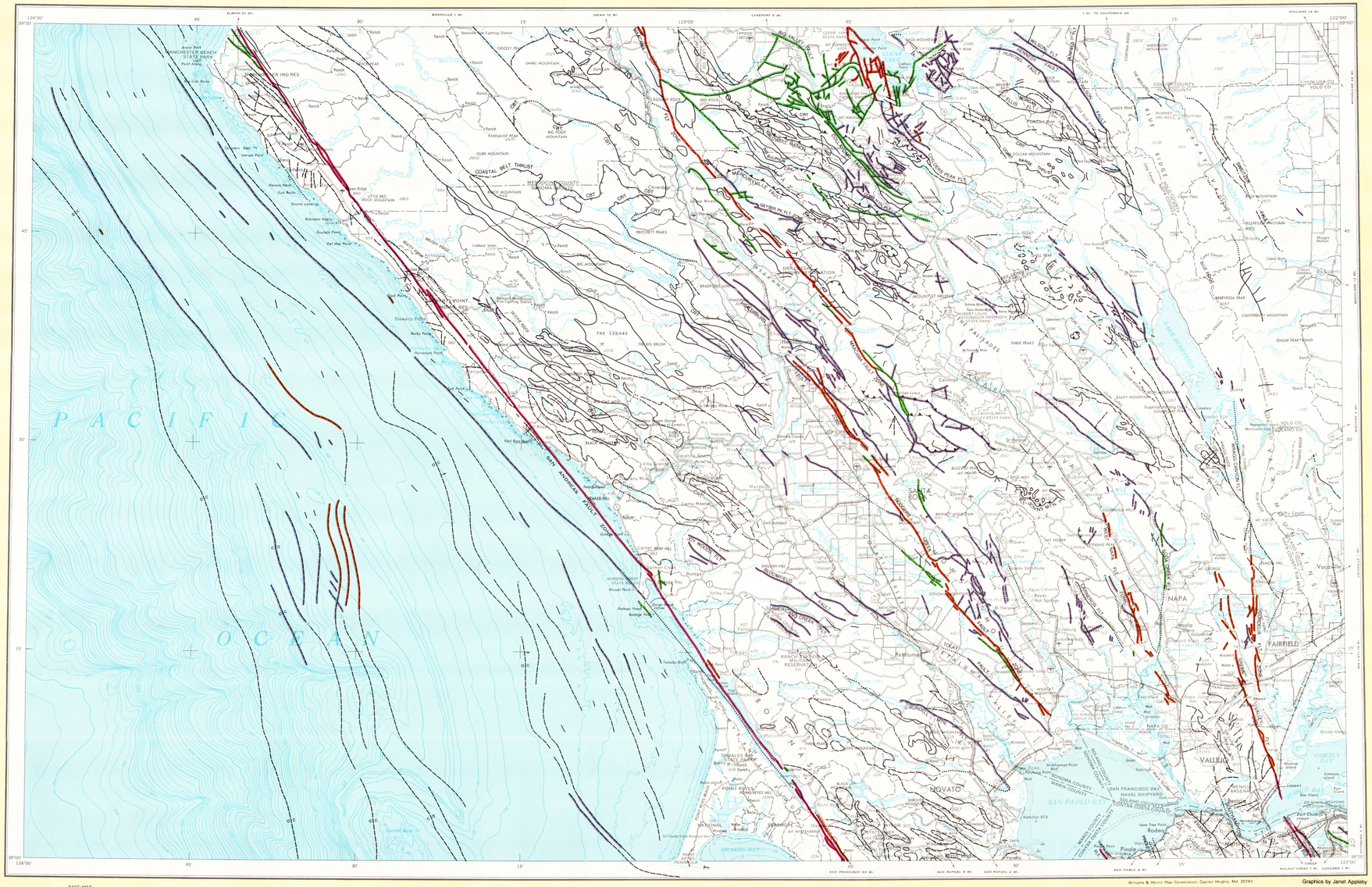


Graphics by Janet Appleby

BASE MAP

PRODUCED BY THE U. S. GEOLOGICAL SURVEY AND THE NATIONAL OCEAN SURVEY

Base map prepared by Defense Mapping Agency from 1:24,000, 1:25,000, and 1:50,000 scale maps dated 1942-1955. Field checked 1958. Revised by the U. S. Geological Survey 1970.

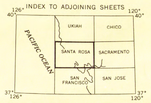
Bathymetry compiled by the National Ocean Survey from tide-coordinated hydrographic surveys. Bathymetric survey data comply with International Hydrographic Organization (IHO) Special Publication 44 accuracy standards and/or standards used at the date of the survey. This information is not intended for navigational purposes

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

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
BATHYMETRIC CONTOUR INTERVAL 10 METERS TO THE 200 METER DEPTH, 50 METERS TO MAXIMUM DEPTH
TRANSVERSE MERCATOR PROJECTION

INDEX TO ADJOINING SHEETS



Geologic Time Scale		Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION: ON LAND	DESCRIPTION: OFFSHORE[1]
Quaternary	Late Quaternary – Holocene: Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
Quaternary	Late Quaternary – Holocene	10,000			Displacement during Holocene time.[2]	Fault offsets seafloor sediments. Latest movement was probably Holocene.
Quaternary	Late Quaternary	700,000			Faults showing evidence of displacement during late Quaternary time.[3, 4]	Faults in this category not classified by McCulloch, Greene, Heston, and Rubin.
Quaternary	Early Quaternary – Pleistocene	2,000,000			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.	Fault cuts folded strata, overlying strata and reaches seafloor. Latest movement was late Miocene to Holocene. Or Fault cuts strata overlying folded strata but does not reach seafloor.
Pre-Quaternary	Pliocene	5,000,000			Fault showing evidence of no displacement during Quaternary time or faults without recognized Quaternary displacement.	Overlying strata are not faulted. Latest movement predates deposition of overlying strata. Or No overlying strata. Latest movement was late Miocene to Holocene.
Pre-Quaternary	Miocene					

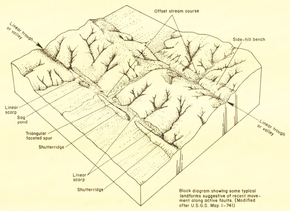
FOOTNOTES

[1] Offshore explanation from: McCulloch, D.S., Greene, H.G., Heston, K.S., and Rubin, D.M., 1980, A summary of the geology and geologic hazards in Proposed Lease Sale 53, Central California Outer Continental Shelf: U.S. Geological Survey Open-File Report OFR 80-1095, Plate 10.

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

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

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



FAULT MAP SYMBOLS

ON LAND

Solid where well located; dashed where approximately located or inferred; dotted where concealed by younger rocks, lakes or bays; queried where continuation or existence is uncertain. Barbs indicate thrust fault (barbs on upper plate). Arrows indicate relative or apparent direction of movement.

CRT

Coast Range thrust—the upper boundary of a long-inactive, late Mesozoic subduction zone (barbs on upper plate).

CBT

Coastal belt thrust—an inferred boundary between the Coastal belt Franciscan and older parts of the Franciscan Complex (barbs on upper plate).

OFFSHORE

U D

All dashed offshore faults are based on acoustic reflection profile records. Queried where connection is uncertain. U and D indicate relative or apparent upthrown or downthrown blocks. I→ indicates high angle fault with arrow pointing down dip.

RECENCY OF FAULTING

This map is a synthesis of data from a large body of literature, published and unpublished, regarding faulting in a part of the north-central Coast Ranges of California. The faults shown are identical to those on the accompanying Geologic Map of the Santa Rosa Quadrangle; however, the purpose of the fault map is to depict what is known about the recency of displacement along these faults. Future studies may find additional faults, require relocation of faults, or, in some cases, change the age classification as shown here.

The age classifications are determined by examining geologic evidence to determine the youngest faulted unit and the oldest unfaulted unit along each fault or fault segment. If Quaternary displacement is indicated, the fault is classified into one of the three categories within Quaternary time (Holocene, late Quaternary, Quaternary undifferentiated). Faults with reported surface rupture during historic time are further classified as historically active. Faults having evidence indicating no movement in Quaternary time are classified as pre-Quaternary. If the fault has insufficient evidence to allow classification, it is grouped with the pre-Quaternary faults.

The reliability of the age classifications on this map is dependent upon several factors. First, much of the data used to classify faults on this map were based on studies not directed to the determination of 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 after examining incomplete geologic evidence for recency of faulting. Fourth, the ages of the rock units used to classify the faults may not be known accurately.

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

Compilation References

Pampeyan, E.H., 1979, Preliminary map showing recency of faulting in coastal north-central California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1070, scale 1:250,000.

Helley, E.J., and Herd, D.G., 1977, Map showing faults with Quaternary displacement, northeastern San Francisco Bay region: U.S. Geological Survey Miscellaneous Field Studies Map MF-881, scale 1:125,000.

Wagner, D.L., 1980, Personal communication for faults east of area covered by Pampeyan (1979).

McLaughlin, R.J., 1980, Personal communication for faults in Hopland and Kelseyville 15-minute quadrangles.

McCulloch, D.S., Greene, H.G., Heston, K.S., and Rubin, D.M., 1980, A summary of the geology and geologic hazards in Proposed Lease Sale 53, Central California Outer Continental Shelf: U.S. Geological Survey Open-File Report OFR 80-1095, Plate 10 (offshore geology by D.M. Rubin), scale 1:250,000. *Area below 38° in vicinity of Point Reyes from:* Cooper, A, 1973, Structure of the continental shelf west of San Francisco, California: U.S. Geological Survey Open-File Report, Figures 3, 8, 11.

Other Fault References

Brown, R.D., Jr., and Wolfe, E.W., 1972, Map showing recently active breaks along the San Andreas fault between Point Delgada and Bolinas Bay, California: U.S. Geological Survey Miscellaneous Geologic Investigation Map I-692, scale 1:24,000.

Frizzell, V.A., Jr., and Brown, R.D., Jr., 1976, Map showing recently active breaks along the Green Valley fault, Napa and Solano counties, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-743, scale 1:24,000.

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Pampeyan, E.H., Harsh, P.W., and Coakley, J.M., 1980, Preliminary map showing recently active breaks along the Maacama fault zone between Laytonville and Hopland, Mendocino County, California: U.S. Geological Survey Open-File Report OFR 80-662, Map No. 10, scale 1:24,000.

Sharp, R.V., 1973, Map showing tectonic movement on the Concord fault, Contra Costa and Solano counties, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-505, scale 1:24,000.

Smith, T.C., 1980, The Hayward fault, Mare Island and Richmond quadrangles, California: California Division of Mines and Geology Fault Evaluation Report FER-101 (unpublished report on file in San Francisco District Office), scale 1:24,000.

Upp, R.R., 1980, Holocene activity of the Maacama fault system, Mendocino County, California: Stanford University Ph.D. dissertation in progress, scale 1:24,000.

U.S. Army Corps of Engineers, 1978, Maacama fault study, Sonoma and Mendocino counties, California: Department of the Army Report, Plate 7, scale 1:24,000.

MAP SHOWING RECENCY OF FAULTING, SANTA ROSA QUADRANGLE, 1:250,000

Compilation by
Edward J. Bortugno
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