

1975

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CONSISTING OF BOLINAS, DOUBLE POINT, DRAKES BAY,
INVERNESS, NOVATO, PETALUMA, PETALUMA RIVER, POINT REYES
NE, SAN GERONIMO, SAN RAFAEL, SAN QUENTIN, AND TOMALES
7 1/2 MINUTE QUADRANGLES

SAN RAFAEL

References Cited

Blake, M. C., Jr., Bartow, J. A., Frizzell, V. A., Jr., Schlocker, J., Sorg, D., Wentworth, C. M., and Wright, R. H., 1974, Preliminary geologic map of Marin and San Francisco Counties and parts of Alameda, Contra Costa and Sonoma Counties, California: U.S. Geol. Survey Misc. Field Studies Map MF-74, scale 1:62,500.
Brabb, E. H., and Pampeyan, E. H., 1972, Preliminary map of landslide deposits in San Mateo County, California: U.S. Geol. Survey Misc. Field Studies Map MF-34, scale 1:62,500.
Nilsen, T. H., 1972, Preliminary photointerpretation map of landslide and other surficial deposits of the Mc Hamilton quadrangle and parts of the St. Bernard and San Jose quadrangles, Alameda and Santa Clara Counties, California: U.S. Geol. Survey Misc. Field Studies Map MF-39, scale 1:62,500.

This photo-reconnaissance map of landslide deposits in parts of Marin and Sonoma Counties was prepared as part of an ongoing USGS study in the San Francisco Bay Region to supply information about slope stability, an aspect of the physical environment that may be potentially hazardous to man or his works. When combined with other data, such as bedrock geology, slope steepness, and hydrology, the landslide information presented herein may facilitate land-use decisions where slope stability may be of concern.
The map was prepared exclusively through photointerpretive methods (in a fashion similar to Nilsen (1972) and Brabb and Pampeyan (1972)) and has not been systematically checked by examining the distribution of landslides observable in the field. Overlapping vertical aerial photographs with a scale of 1:80,000, 1:30,000 and 1:20,000 were used. Landslides were identified by the presence of specific topographic features including scarps, closed depressions, and downslope bulges that contrast with adjacent terrain lacking these features.
Blake and others (1974) includes numerous references to publications concerning the geology of the map area.



INDEX MAP

U. S. Geological Survey
OPEN FILE REPORT

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

MAP SYMBOLS

LANDSLIDES



Landslide
Identification confident to probable, except uncertain where queried; inferred movement style variable, including uncertain or indeterminate styles



Small Landslide Deposits
arrows indicate direction of inferred down-slope movement and are generally centered over location of deposits; deposits generally larger than 100 feet but smaller than 500 feet in maximum dimension; confident to probable; queried where uncertain



Block Slide
Identification confident to probable, except uncertain where queried; consists of those landslides inferred to have moved downslope as relatively intact blocks



Severe Creep
Identification confident to probable, with "wrenchlike" or similarly distorted soil surface; identifiable only on grassy or bare ground



possible landslide or block slide, arrow types as above



Flow
landslide inferred to have moved as a flow well beyond the toe of the failure slope



Glide
landslide involving relatively intact blocks that is inferred to have formed by nearly horizontal movement



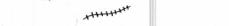
Active Landslide
containing evidence of recent movement

ANOMALOUS TOPOGRAPHIC FEATURES

Scarp of uncertain origin*
possibly landslide related (line at base of scarp)



Sea Cliffs
cliffs backing beaches or facing open water, may produce falling rock and debris (line at top of cliff)



Anomalous Bule, Trench, or Small Valley*
possibly landslide related



Closed Depression
"X" located at bottom, line along rim

ROCK AND SEDIMENT

a, a'

Young Sedimentary Deposits with Construction Topography
queried where identification uncertain; consists of alluvium, alluvial fans and some terrace deposits; east of and within the San Andreas Rift Zone includes colluvium and dune and beach sands that are distinguished west of that zone

c, c'

Colluvial Deposits
queried where identification uncertain

S, s'

Dune and Beach Sand
queried where identification uncertain

t, t'

Terrace Deposits
queried where identification uncertain; distinguished only locally

b, b'

Bedrock with Erosional Topography
queried where identification uncertain; ranges from semi-indurated sediment to hard rock, variably covered with soil, labeled only where identity not otherwise evident.

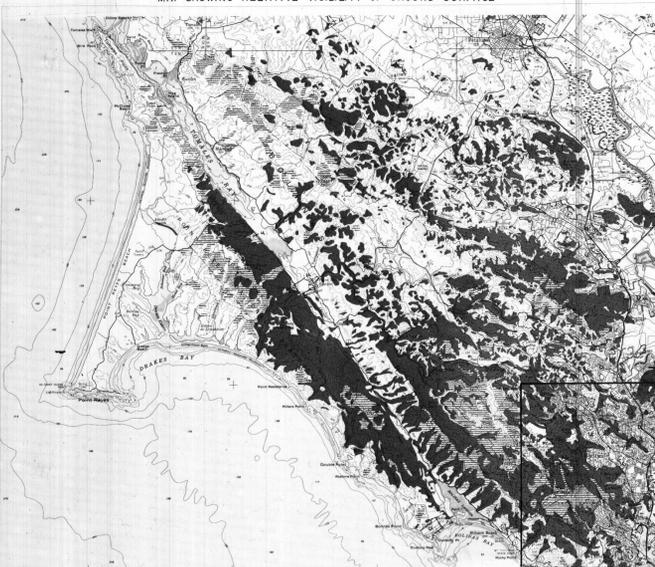
*symbol used exclusively east of the San Andreas Rift Zone

Q

Quarry

Limit of Landslide Mapping
landslides are not mapped outside scarp boundary

MAP SHOWING RELATIVE VISIBILITY OF GROUND SURFACE



EXPLANATION OF MAP SHOWING RELATIVE VISIBILITY OF GROUND SURFACE

Ground surface least visible, with the ground surface and outline of the ground surface commonly obscured by trees or combinations of trees and brush. Landslides most easily overlooked.

Ground surface usually obscured by brush, but outline of ground surface is observable. Also locally contains areas of trees or grass too small to be shown.

no pattern

Surface of the ground covered by grass and easily visible. Includes some areas of trees or brush too small to be shown. Landslides most obvious.



The following aerial photographs were used in the preparation of the San Rafael Quadrangles U.S. Department of Agriculture (ASCS) Series 288H taken in 1952 and 1953 including photographs numbered 10-4 to 8, 109 to 116 and 144 to 153, 2K-131 to 133 and 4K-163 to 169 (1:20,000 scale). In addition, photographs taken for the U.S. Geological Survey in 1970 were used supplementarily. These included Series GS-VCH 2-192 to 194 (1:80,000 scale).