Figure 3b (FER-229). Malibu Coast fault zone - late Quaternary faults and fault features on the **Point Dume 7.5' quadrangle**.

faults from Campbell and others (1970) (red); dotted where concealed

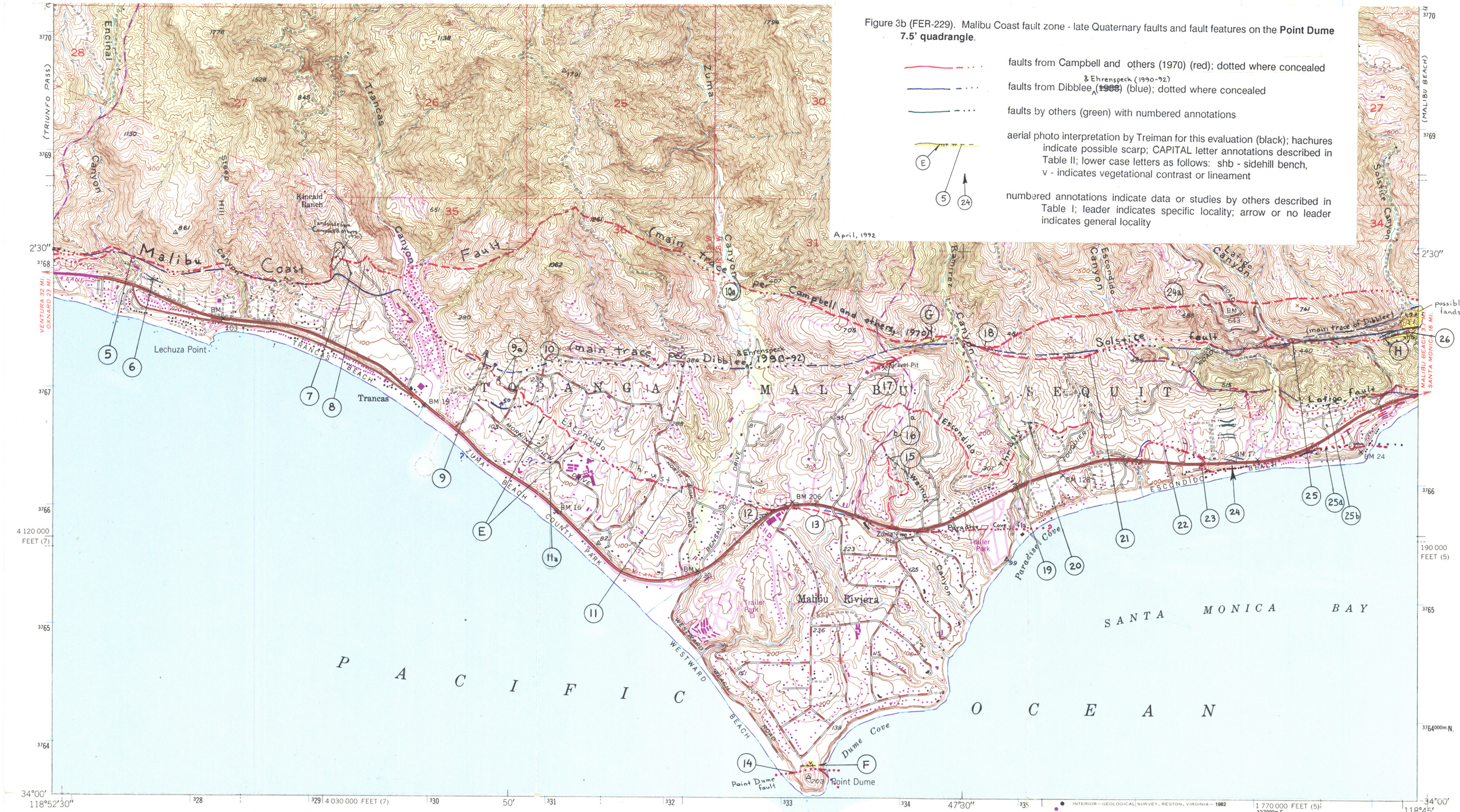
faults from Dibblee & Ehrenspeck (1990-92) (blue); dotted where concealed

faults by others (green) with numbered annotations

aerial photo interpretation by Treiman for this evaluation (black); hachures indicate possible scarp; CAPITAL letter annotations described in Table II; lower case letters as follows: shb - sidehill bench, v - indicates vegetational contrast or lineament

numbered annotations indicate data or studies by others described in Table I; leader indicates specific locality; arrow or no leader indicates general locality

April, 1992



Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Los Angeles County

Topography by photogrammetric methods from aerial photographs taken 1947. Field checked 1950

Polyconic projection. 10,000-foot grid ticks based on California coordinate system, zones 7 and 5. 1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue. 1927 North American Datum. To place on the predicted North American Datum 1983 move the projection lines 2 meters north and 86 meters east as shown by dashed corner ticks

Dotted land lines were established by private surveys

There may be private inholdings within the boundaries of the National or State reservations shown on this map

GN MN 1°01' 18 MILS 14½° 258 MILS

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 25 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER

THE MEAN RANGE OF TIDE IS APPROXIMATELY 4 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

CALIF

QUADRANGLE LOCATION

Revisions shown in purple and woodland compiled from aerial photographs taken 1978 and other sources. This information not field checked. Map edited 1981

ROAD CLASSIFICATION

Heavy-duty — Light-duty

Medium-duty — Unimproved dirt

State Route

POINT DUME, CALIF.

N3400—W11845/7.5

1950

PHOTOREVISED 1981

DMA 2252 III SE—SERIES V895

229-1

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1982

Notable Historical Tsunamis: The following table provides very basic information about historical tsunami events; not all tsunamis are represented, especially minor or small tsunamis. Note that the largest, most damaging tsunamis in Los Angeles County history have come from large earthquakes in the Alaska-Aleutian Islands and Chile regions as distant tsunami sources and potential offshore faults or submarine landslide as local sources. Although the potential for local tsunamis exists, they are much less frequent than distant source tsunamis.

Notable Historical Tsunamis in Los Angeles County

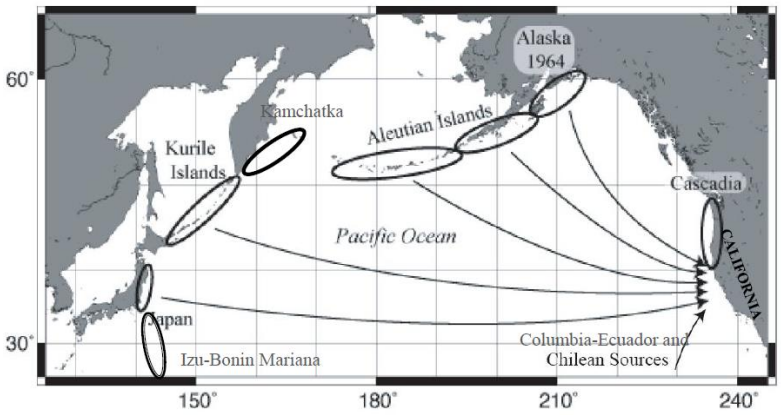
Run-up amplitude, in feet, above normal tide conditions

OBS = observed tsunami activity
NR = No damage or severe conditions reported

- Distant Source - Tsunamis without felt earthquakes

- Local Source - Earthquake and tsunami together

Date	Magnitude-Source area	Tsunami location	Run-Up/Amp	Remarks
7/10/1855	multiple local Eqs	Santa Monica	?	"...considerable commotion in the water, attended by a strong rushing sound..."
8/13/1868	M8.5 - Chile	LA/San Pedro	2 ft	"...the loading dock was submerged..."
5/10/1877	M8.3 - Chile	LA/San Pedro	6 ft	"...The current was frightfully swift to look at..."
8/10/1879	moderate local EQ	Santa Monica	?	Minor "tidal wave" followed EQ
4/13/1923	M7.2 - Kamchatka	LA/San Pedro	?	"...ships had difficulty holding their lines due to swirling tides..."
8/30/1930	meteotsunami?	Santa Monica	10 ft	One person killed due to high surf; conjecture on tsunami source; possible LS from local M5.2 EQ
4/1/1946	M8.8 – Aleutian Islands	LA/San Pedro	3 ft	Broke ships from moorings
		Long Beach	1 ft	NR
		Catalina	6 ft	Damage to docks
11/4/1952	M9.0 - Kamchatka	Santa Monica	2 ft	NR
		LA/San Pedro	1 ft	Docking ferry problematic
		Long Beach	1 ft	NR
3/9/1957	M8.6 - Aleutian Islands	Santa Monica	2 ft	NR
		LA/San Pedro	1 ft	NR
		Long Beach	1 ft	NR
5/22/1960	M9.5 - Chile	Santa Monica	5 ft	NR
		LA/San Pedro	3 ft	One death (swimmer); $1M in damages; 800 small craft unmoored, 200 damaged, 40 sunk
		Long Beach	3 ft	Dock damage
		Alamitos Bay	2 ft	NR
		Catalina	2 ft	NR
3/28/1964	M9.2 – Alaska	Santa Monica	3 ft	One boat sunk; $100k damage at Marina Del Rey
		LA/San Pedro	2 ft	One death to longshoreman by falling object; $250k in damages; 100 boats unmoored, 6 sunk
		Long Beach	?	$100k in damages
		Alamitos Bay	2 ft	NR
		Catalina	2 ft	NR
11/29/1975	M7.1 - Hawaii	Catalina	4 ft	Damage to dock and boats
9/29/2009	M8.0 – Samoa	LA/San Pedro	1 ft	NR
2/27/2010	M8.8 – Chile	Santa Monica	2 ft	Minor damage in Marina Del Rey
		LA/San Pedro	1 ft	Minor damage to docks and boats
		Long Beach	?	NR
		Catalina	3 ft	Minor damage to several docks
3/11/2011	M9.0 - Japan	Santa Monica	3 ft	Minor damage in Marina Del Rey
		Redondo B.	2 ft	One dock, five boats damaged; $15K in damage
		LA/San Pedro	2 ft	Minor damage to boats and docks
		Long Beach	?	Damage to dock and boats
		Catalina	?	Damage to several docks and boats

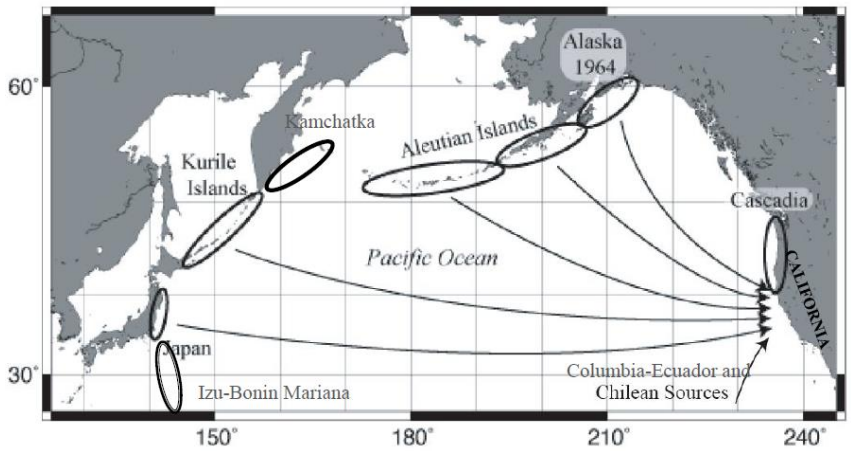


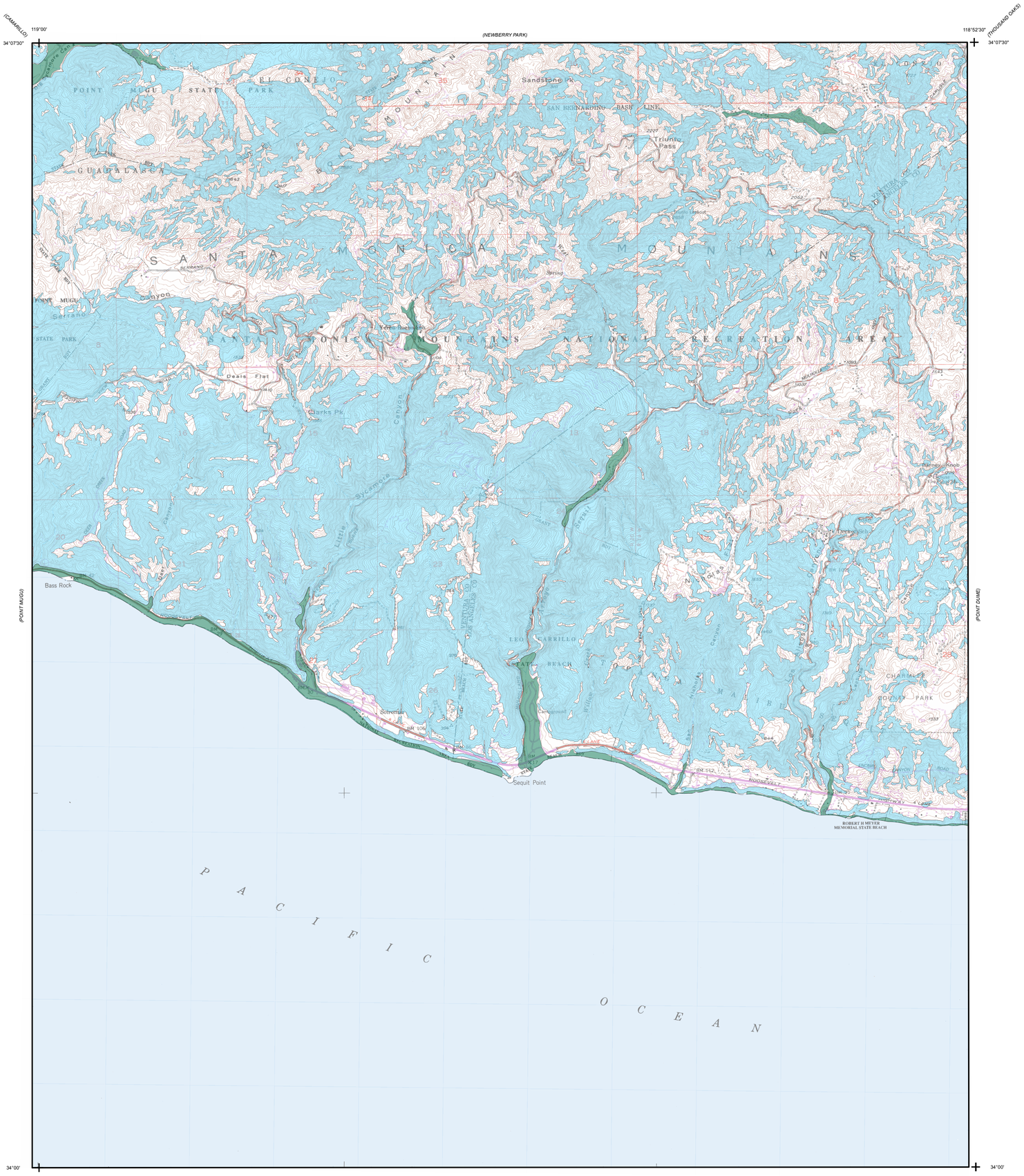
Modeled Tsunami Scenarios: Because very large tsunamis are infrequent and the likelihood that the largest potential tsunamis have not yet occurred in Los Angeles County, the state tsunami program developed a suite of maximum credible tsunami scenarios as part of their tsunami inundation mapping project for local evacuation planning. The general tsunami wave height for key locations from these scenarios are provided below. As identified in the historical tsunami table, the largest tsunamis could occur from large earthquakes in the Alaska-Aleutian Islands or Chile regions, or from a large offshore fault or submarine landslide.

Tsunami Source Scenario Model Results for Los Angeles County

Near shore tsunami heights (flow depths) for both local and distant source scenarios, in FEET above Mean Sea Level. NOTE: The projections do not include any adjustments for ambient conditions, such as storm surge and tidal fluctuations, and model error (it is very important to note this difference, as those numbers can increase the projected water height during an event).

	TSUNAMI SOURCES	Approximate Travel Time	Leo Corrillo State Beach	Malibu Beach/ Lagoon	Santa Monica Pier	Marina Del Rey	Manhattan Beach	Redondo Beach	Palos Verdes Hills	San Pedro-POLA	Long Beach Middle Harbor-POLB	Long Beach	Naples-Alamitos Bay
Local Sources	M7 Newport-Inglewood Fault	10-15min								2	3	3	3
	M7.5 Channel Isl. Thrust Fault	10-15min	4		3	2	3	3	3				
	M7.2 Anacapa Dume Thrust Fault	10-15min		8	6	3	6	6	5				
	Palos Verdes Landslide 1	10-15min			7	4	6	10	20	4	4	4	5
	Palos Verdes Landslide 2	10-15min								6	5	5	5
	M7.1 Santa Monica Thrust Fault	10-15min		4	5	3	3	4	3				
	M7.7 Catalina Fault	15-20min	4	6	6	5	6	6	6	5	7	7	7
Distant Sources	M9 Cascadia-full rupture	2hr			4	4	4	4	3	3	4	4	4
	M9.2 Alaska 1964 EQ	6hr	5	5	7	6	5	4	4	8	7	9	8
	M8.9 Central Aleutians I	6hr	3		5	5	4	4	4	4	5	5	4
	M8.9 Central Aleutians II	6hr			3	4	3	4	3	3	3	4	4
	M9.2 Central Aleutians III	6hr	6	7	10	10	7	6	5	13	10	11	13
	M9 Kamchatka 1952 EQ	9hr	3										
	M8.8 Kuril Islands II	10hr			3	2	3	2	2	2	3	3	3
	M8.8 Kuril Islands III	10hr			3	3	3	3	2	2	3	3	3
	M8.8 Kuril Islands IV	10hr			3	3	3	3	2	2	3	3	3
	M8.8 Japan II	11hr			3	3	3	3	2	2	3	3	3
	M9.5 Chile 1960 EQ	13hr			5	5	4	4	4	4	7	9	10
	M9.4 Chile North	13hr	5	5	5	6	5	5	5	4	10	9	11
	Maximum Runup - Local Source		**4**	**9**	**8**	**5**	**7**	**11**	**24**	**7**	**8**	**8**	**8**
	Maximum Runup - Distant Source		**7**	**9**	**11**	**11**	**8**	**7**	**5**	**15**	**12**	**13**	**15**





Earthquake Zones of Required Investigation
Triunfo Pass Quadrangle

California Geological Survey

This Map Shows Seismic Hazard Zones for Soil Liquefaction and Earthquake-Induced Landslides. Alquist-Priolo Earthquake Fault Zones Have Not Been Prepared for the Triunfo Pass Quadrangle.

This map shows the location of Seismic Hazard Zones referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps" GIS files are available at the GGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of earthquake-triggered ground failure as required by the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6) and the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California* and Special Publication 42, *Fault-Rupture Hazard Zones in California*.

For information regarding the scope and recommended methods to be used in conducting required site investigations refer to CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, and CGS Special Publication 42, Appendix C *Guidelines for Evaluating the Hazard of Surface Rupture*. For a general description of the Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning acts, the zonation programs, and related information, please refer to the website at www.conservation.ca.gov/cgs/.

MAP EXPLANATION

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

ADDITIONAL INFORMATION

For additional information on the zones of required investigation presented on this map, the data and methodology used to prepare them, and additional references consulted, please refer to the following:

Seismic Hazard Zone Report for the Triunfo Pass 7.5-minute Quadrangle, Los Angeles and Ventura counties, California. California Geological Survey, Seismic Hazard Zone Report 059.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_059_Triunfo_Pass.pdf

For more information on the Seismic Hazards Mapping Act please refer to:
http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPpginfo.aspx

Click the link below to learn how to take greater advantage of the GeoPDF format of this map after downloading.
http://gmw.conservation.ca.gov/SHP/EZRIM/Docs/TerragoUserGuide.pdf

TRIUNFO PASS QUADRANGLE

SEISMIC HAZARD ZONES

Delineated in compliance with Chapter 7.8, Division 2 of the California Public Resources Code *(Seismic Hazards Mapping Act)*

OFFICIAL MAP

Released: February 7, 2002

STATE GEOLOGIST

IMPORTANT

PLEASE NOTE THE FOLLOWING FOR ZONES SHOWN ON THIS MAP

1) This map may not show all faults that have the potential for surface fault rupture, either within the Earthquake Fault Zones or outside their boundaries. Additionally, this map may not show all areas that have the potential for liquefaction, landsliding, strong earthquake ground shaking or other earthquake and geologic hazards. Also, a single earthquake capable of causing liquefaction or triggering landside failure will not uniformly affect the entire area zoned.

2) Faults shown are the basis for establishing the boundaries of the Earthquake Fault Zones.

3) The identification and location of these faults are based on the best available data. However, the quality of data used is varied. Traces have been depicted as accurately as possible at a map scale of 1:24,000.

4) Liquefaction zones may also contain areas susceptible to the effects of earthquake-induced landslides. This situation typically exists at or near the toes of existing landslides, downslope from rockfall or debris flow source areas, or adjacent to steep stream banks.

5) Landslide zones on this map were determined, in part, by adapting methods first developed by the U.S. Geological Survey (USGS). Landslide hazard maps prepared by the USGS typically use experimental approaches to assess earthquake-induced and other types of landslide hazards. Although aspects of these new methodologies may be incorporated in future CGS seismic hazard zone maps, USGS maps should not be used as substitutes for these Official SEISMIC HAZARD ZONES maps.

6) USGS base map standards provide that 90 percent of cultural features be located within 40 feet (horizontal accuracy) at the scale of this map. The identification and location of liquefaction and earthquake-induced landslide zones are based on available data. However, the quality of data used is varied. The zone boundaries depicted have been drawn as accurately as possible at this scale.

7) Information on this map is not sufficient to serve as a substitute for the geologic and geotechnical site investigations required under Chapters 7.5 and 7.8 of Division 2 of the California Public Resources Code.

8) Seismic Hazard Zones identified on this map may include developed land where delineated hazards have already been mitigated to city or county standards. Check with your local building/planning department for information regarding the location of such mitigated areas.

9) DISCLAIMER: The State of California and the Department of Conservation make no representations or warranties regarding the accuracy of the data from which these maps were derived. Neither the State nor the Department shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

Study area defined by USGS quadrangle boundaries using NAD 27, represented by the visible map extent. Data are maintained and distributed in California Albers (meters), NAD 83 [EPSG:3310], as shown by tics and coordinates.
Shaded topographic relief derived from USGS 10 meter NED (2013).
Topographic base map from USGS 1991.
Street data from US Census Bureau TIGER/Line, 2016.

Scale 1: 24000

1 0.5 0 1 2 Miles
1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000 Feet
1 0.5 0 1 2 Kilometers
1000 500 0 1000 2000 Meters

Contour Interval 25 Feet

12° TRUE NORTH MAGNETIC NORTH
Approximate Declination, 2016

N

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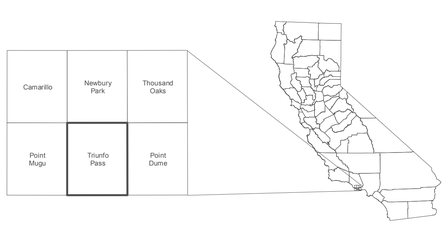
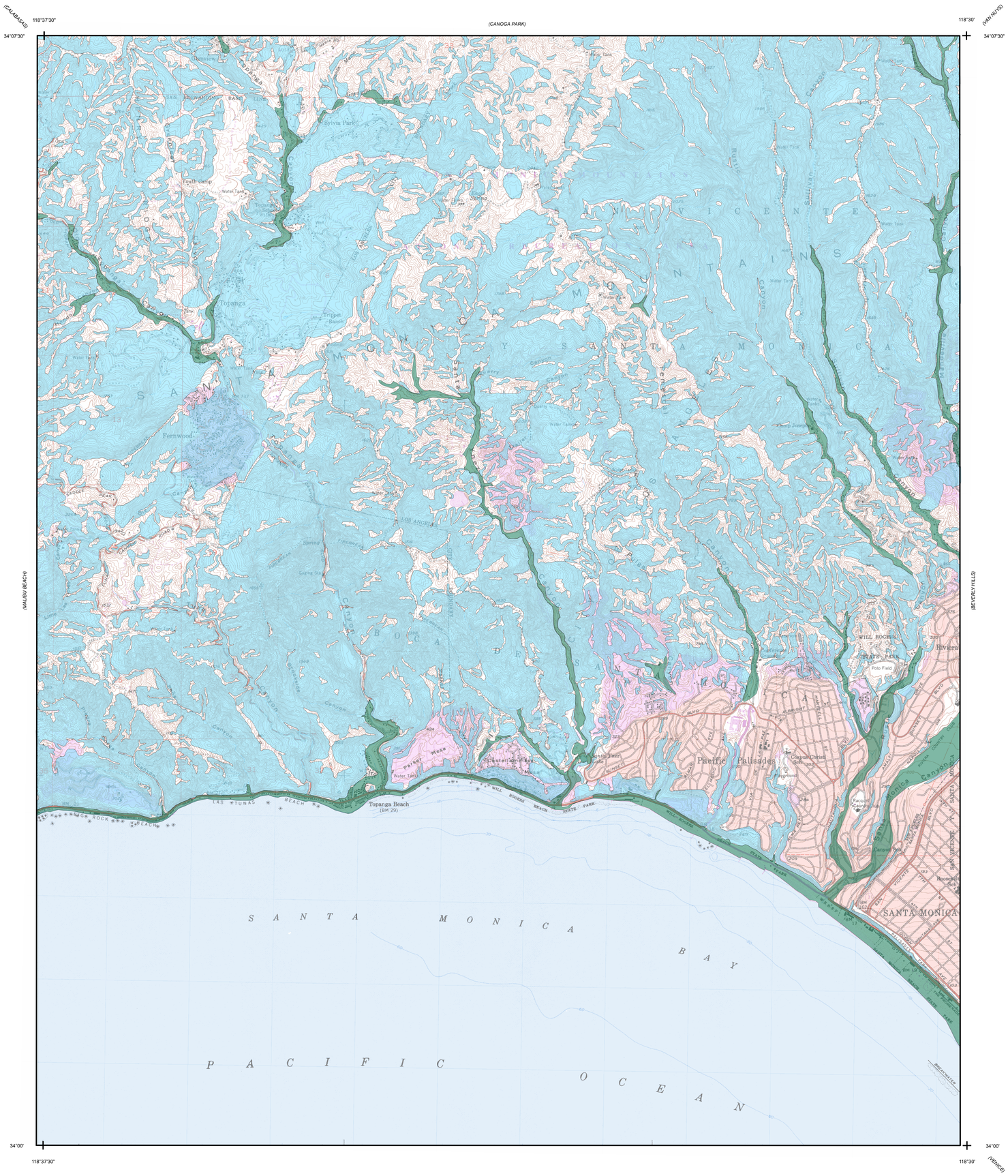
www.conservation.ca.gov/cgs





Earthquake Zones of Required Investigation Topanga Quadrangle

California Geological Survey

This Map Shows Seismic Hazard Zones for Soil Liquefaction and Earthquake-Induced Landslides. Alquist-Priolo Earthquake Fault Zones Have Not Been Prepared for the Topanga Quadrangle.

This map shows the location of Seismic Hazard Zones referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps" GIS files are available at the GGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of earthquake-triggered ground failure as required by the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6) and the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California* and Special Publication 42, *Fault-Rupture Hazard Zones in California.*

For information regarding the scope and recommended methods to be used in conducting required site investigations refer to CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, and CGS Special Publication 42, Appendix C *Guidelines for Evaluating the Hazard of Surface Rupture.* For a general description of the Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning acts, the zonation programs, and related information, please refer to the website at www.conservation.ca.gov/cgs/.

MAP EXPLANATION

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

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Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

ADDITIONAL INFORMATION

For additional information on the zones of required investigation presented on this map, the data and methodology used to prepare them, and additional references consulted, please refer to the following:

Seismic Hazard Zone Report for the Topanga 7.5-Minute Quadrangle, Los Angeles County, California. California Geological Survey, Seismic Hazard Zone Report 01.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_001_Topanga.pdf

For more information on the Seismic Hazards Mapping Act please refer to:
http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPpginfo.aspx

Click the link below to learn how to take greater advantage of the GeoPDF format of this map after downloading.
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TOPANGA QUADRANGLE

SEISMIC HAZARD ZONES

Delineated in compliance with Chapter 7.8 Division 2 of the California Public Resources Code *(Seismic Hazards Mapping Act)*

OFFICIAL MAP

Released: April 7, 1997

STATE GEOLOGIST

Study area defined by USGS quadrangle boundaries using NAD 27, represented by the visible map extent. Data are maintained and distributed in California Albers (meters), NAD 83 [EPSG:3310], as shown by tics and coordinates.
Shaded topographic relief derived from USGS 10 meter NED (2013).
Topographic base map from USGS 1952, photorevised 1981.
Street data from US Census Bureau TIGER/Line, 2016.

Scale 1: 24000

1 0.5 0 1 2 Miles
1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000 Feet
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12° TRUE NORTH MAGNETIC NORTH
Approximate Declination, 2016

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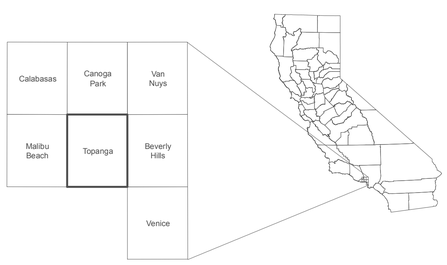

IMPORTANT

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4) Liquefaction zones may also contain areas susceptible to the effects of earthquake-induced landslides. This situation typically exists at or near the toes of existing landslides, downslope from rockfall or debris flow source areas, or adjacent to steep stream banks.

5) Landslide zones on this map were determined, in part, by adapting methods first developed by the U.S. Geological Survey (USGS). Landslide hazard maps prepared by the USGS typically use experimental approaches to assess earthquake-induced and other types of landslide hazards. Although aspects of these new methodologies may be incorporated in future CGS seismic hazard zone maps, USGS maps should not be used as substitutes for these Official SEISMIC HAZARD ZONES maps.

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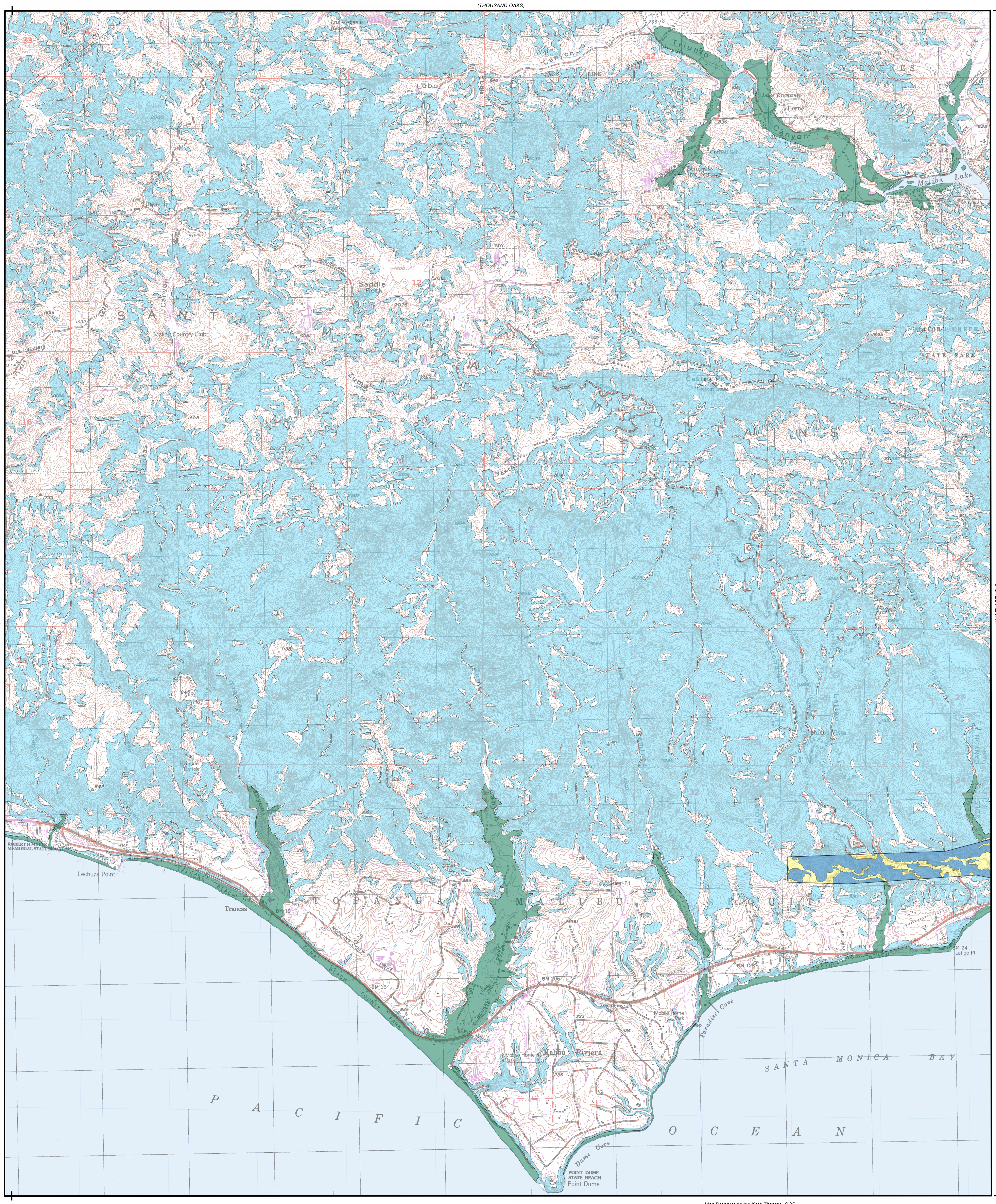
(NEWBURY PARK) (THOUSAND OAKS) (CALABASAS) (TRIUNFO PASS) (MALIBU BEACH)

118°52'30" 34°07'30" 118°45' 34°07'30"



34°00' 118°52'30" 34°00' 118°45'

Map Preparation by: Kate Thomas, CGS

Study area defined by USGS quadrangle boundaries using NAD 27, represented by the visible map extent. Data are maintained and distributed in California Albers (meters), NAD 83, [EPSG:3310] as shown by tics and coordinates.
Shaded topographic relief derived from USGS 10 meter NED, 2013.
Topographic base map from USGS 1950, photorevised, 1981.
Street data from US Census Bureau TIGER/Line, 2016.

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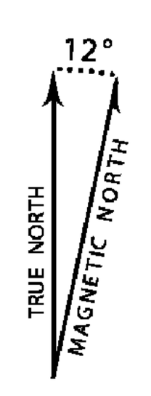

Approximate Declination, 2016

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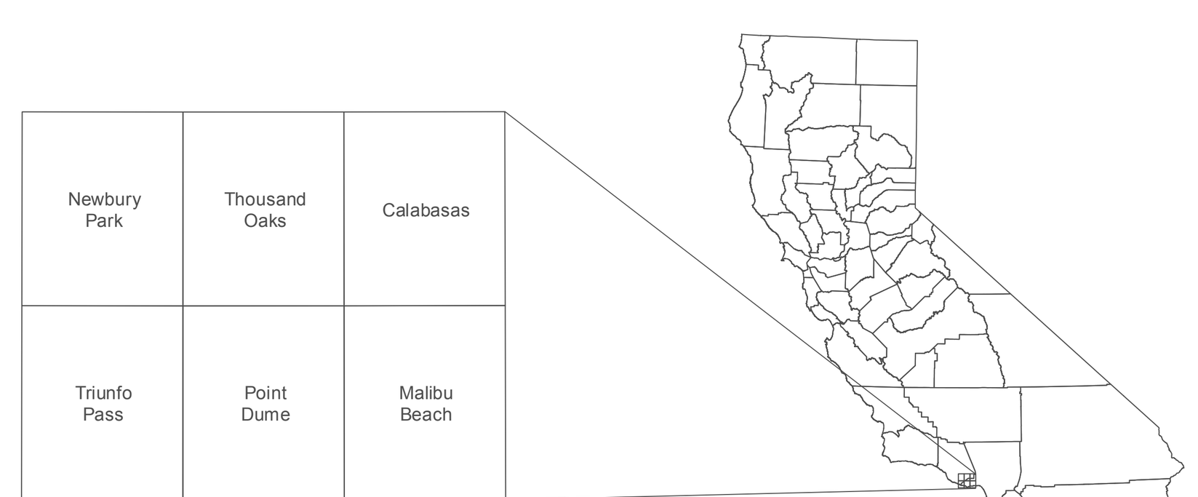


Earthquake Zones of Required Investigation Point Dume Quadrangle

California Geological Survey

This Map Shows Both Alquist-Priolo Earthquake Fault Zones and Seismic Hazard Zones Issued for the Point Dume Quadrangle

This map shows the location of Alquist-Priolo (AP) Earthquake Fault Zones and Seismic Hazard Zones, collectively referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps." GIS files are available at the CGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of surface fault rupture and earthquake-triggered ground failure as required by the AP Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630) and the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 42, *Fault-Rupture Hazard Zones in California*, and CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*.

For information regarding the scope and recommended methods to be used in conducting required site investigations refer to CGS Special Publication 42, Appendix C *Guidelines for Evaluating the Hazard of Surface Rupture*, and CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. For a general description of the AP and Seismic Hazards Mapping acts, the zonation programs, and related information, please refer to the website at www.conservation.ca.gov/cgs/.

MAP EXPLANATION

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
1906 C ? ?
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

OVERLAPPING ALQUIST-PRIOLO AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

Note: Mitigation methods differ for each zone – AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.

ADDITIONAL INFORMATION

For additional information on the zones of required investigation presented on this map, the data and methodology used to prepare them, and additional references consulted, please refer to the following:

The Malibu Coast Fault, in the Triunfo Pass, Point Dume, and Malibu Beach Quadrangles, Los Angeles County, California. California Geological Survey, Fault Evaluation Report FER-229.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/FER/229/

For more information on the Alquist-Priolo Earthquake Fault Zoning Act please refer to:
http://www.conservation.ca.gov/cgs/rghm/ap/Pages/main.aspx

Seismic Hazard Zone Report for the Point Dume 7.5-minute Quadrangle, Los Angeles and Ventura Counties, California. California Geological Survey, Seismic Hazard Zone Report 056.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_056_Point_Dume.pdf

For more information on the Seismic Hazards Mapping Act please refer to:
http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPpgminfo.aspx

Click the link below to learn how to take greater advantage of the GeoPDF format of this map after downloading.
http://gmw.conservation.ca.gov/SHP/EZRIM/Docs/TerragoUserGuide.pdf

POINT DUME QUADRANGLE

EARTHQUAKE FAULT ZONES

Delineated in compliance with Chapter 7.5 Division 2 of the California Public Resources Code *(Alquist-Priolo Earthquake Fault Zoning Act)*

OFFICIAL MAP

Released: June 1, 1995

STATE GEOLOGIST

SEISMIC HAZARD ZONES

Delineated in compliance with Chapter 7.8 Division 2 of the California Public Resources Code *(Seismic Hazards Mapping Act)*

OFFICIAL MAP

Released: February 7, 2002

STATE GEOLOGIST

IMPORTANT

PLEASE NOTE THE FOLLOWING FOR ZONES SHOWN ON THIS MAP

1) This map may not show all faults that have the potential for surface fault rupture, either within the Earthquake Fault Zones or outside their boundaries. Additionally, this map may not show all areas that have the potential for liquefaction, landsliding, strong earthquake ground shaking or other earthquake and geologic hazards. Also, a single earthquake capable of causing liquefaction or triggering landside failure will not uniformly affect the entire area zoned.

2) Faults shown are the basis for establishing the boundaries of the Earthquake Fault Zones.

3) The identification and location of these faults are based on the best available data. However, the quality of data used is varied. Traces have been depicted as accurately as possible at a map scale of 1:24,000.

4) Liquefaction zones may also contain areas susceptible to the effects of earthquake-induced landslides. This situation typically exists at or near the toes of existing landslides, downslope from rockfall or debris flow source areas, or adjacent to steep stream banks.

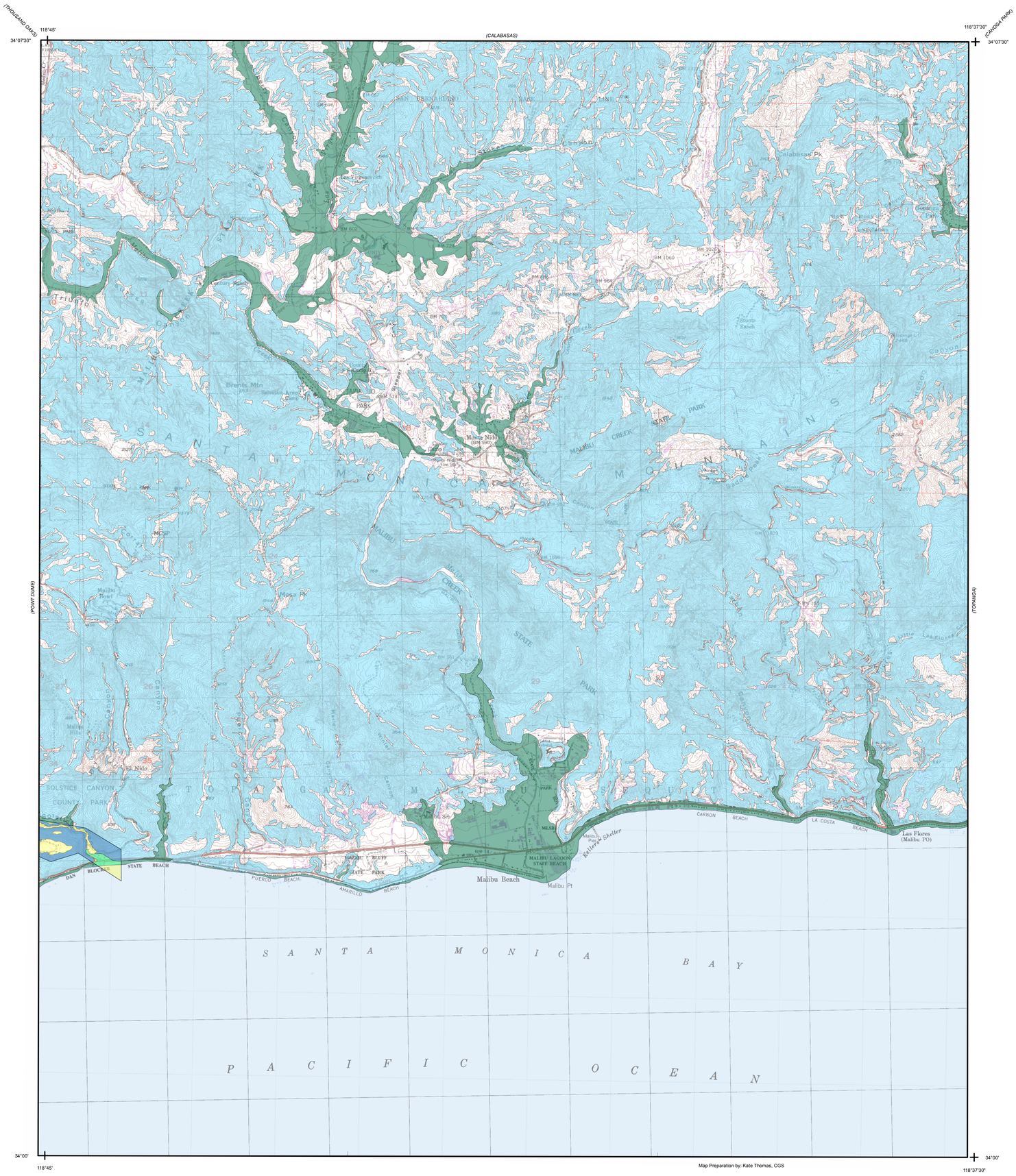
5) Landslide zones on this map were determined, in part, by adapting methods first developed by the U.S. Geological Survey (USGS). Landslide hazard maps prepared by the USGS typically use experimental approaches to assess earthquake-induced and other types of landslide hazards. Although aspects of these new methodologies may be incorporated in future CGS seismic hazard zone maps, USGS maps should not be used as substitutes for these Official SEISMIC HAZARD ZONES maps.

6) USGS base map standards provide that 90 percent of cultural features be located within 40 feet (horizontal accuracy) at the scale of this map. The identification and location of liquefaction and earthquake-induced landslide zones are based on available data. However, the quality of data used is varied. The zone boundaries depicted have been drawn as accurately as possible at this scale.

7) Information on this map is not sufficient to serve as a substitute for the geologic and geotechnical site investigations required under Chapters 7.5 and 7.8 of Division 2 of the California Public Resources Code.

8) Seismic Hazard Zones identified on this map may include developed land where delineated hazards have already been mitigated to city or county standards. Check with your local building/planning department for information regarding the location of such mitigated areas.

9) DISCLAIMER: The State of California and the Department of Conservation make no representations or warranties regarding the accuracy of the data from which these maps were derived. Neither the State nor the Department shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.



Map Preparation by: Kate Thomas, CGS

Earthquake Zones of Required Investigation Malibu Beach Quadrangle

California Geological Survey

This Map Shows Both Alquist-Priolo Earthquake Fault Zones and Seismic Hazard Zones Issued for the Malibu Beach Quadrangle

This map shows the location of Alquist-Priolo (AP) Earthquake Fault Zones and Seismic Hazard Zones, collectively referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps." GIS files are available at the CGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of surface fault rupture and earthquake-triggered ground failure as required by the AP Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630) and the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 42, *Fault-Rupture Hazard Zones in California*, and CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*.

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MAP EXPLANATION

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
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SEISMIC HAZARD ZONES

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Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

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The Malibu Coast Fault, in the Triunfo Pass, Point Dume, and Malibu Beach Quadrangles, Los Angeles County, California. California Geological Survey, Fault Evaluation Report FER-229.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/FER/229/

For more information on the Alquist-Priolo Earthquake Fault Zoning Act please refer to:
http://www.conservation.ca.gov/cgs/rghm/ap/Pages/main.aspx

Seismic Hazard Zone Report for the Malibu Beach 7.5-minute Quadrangle, Los Angeles County, California. California Geological Survey, Seismic Hazard Zone Report 050.
http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_050_Malibu_Beach.pdf

For more information on the Seismic Hazards Mapping Act please refer to:
http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPpgminfo.aspx

Click the link below to learn how to take greater advantage of the GeoPDF format of this map after downloading.
http://gmw.conservation.ca.gov/SHP/EZRIM/Docs/TerragoUserGuide.pdf

MALIBU BEACH QUADRANGLE

EARTHQUAKE FAULT ZONES

Delineated in compliance with Chapter 7.5 Division 2 of the California Public Resources Code *(Alquist-Priolo Earthquake Fault Zoning Act)*

REVISED OFFICIAL MAP

Released: August 16, 2007

STATE GEOLOGIST

PROFESSIONAL GEOLOGIST – STATE OF CALIFORNIA – JOHN G. PARRISH – No. 4797

SEISMIC HAZARD ZONES

Delineated in compliance with Chapter 7.8 Division 2 of the California Public Resources Code *(Seismic Hazards Mapping Act)*

OFFICIAL MAP

Released: October 17, 2001

STATE GEOLOGIST

IMPORTANT

PLEASE NOTE THE FOLLOWING FOR ZONES SHOWN ON THIS MAP

1) This map may not show all faults that have the potential for surface fault rupture, either within the Earthquake Fault Zones or outside their boundaries. Additionally, this map may not show all areas that have the potential for liquefaction, landsliding, strong earthquake ground shaking or other earthquake and geologic hazards. Also, a single earthquake capable of causing liquefaction or triggering landside failure will not uniformly affect the entire area zoned.

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Study area defined by USGS quadrangle boundaries using NAD 27, represented by the visible map extent. Data are maintained and distributed in California Albers (meters), NAD 83, [EPSG:3310] as shown by tics and coordinates.
Shaded topographic relief derived from USGS 10 meter NED, 2013.
Topographic base map from USGS 1950, photorevised, 1994.
Street data from US Census Bureau TIGER/Line, 2016.

Scale 1: 24000

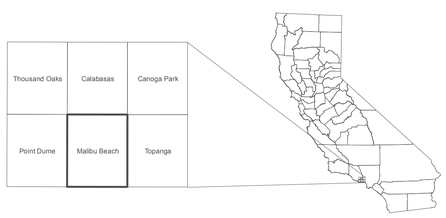
1 0.5 0 1 2 Miles
1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000 Feet
1 0.5 0 1 2 Kilometers
1000 500 0 1000 2000 Meters

Contour Interval 25 Feet

12° TRUE NORTH MAGNETIC NORTH
Approximate Declination, 2016

N

California Geological Survey
Geologic Information and Publications
801 K Street, MS 14-34
Sacramento, CA 95814-3532
www.conservation.ca.gov/cgs



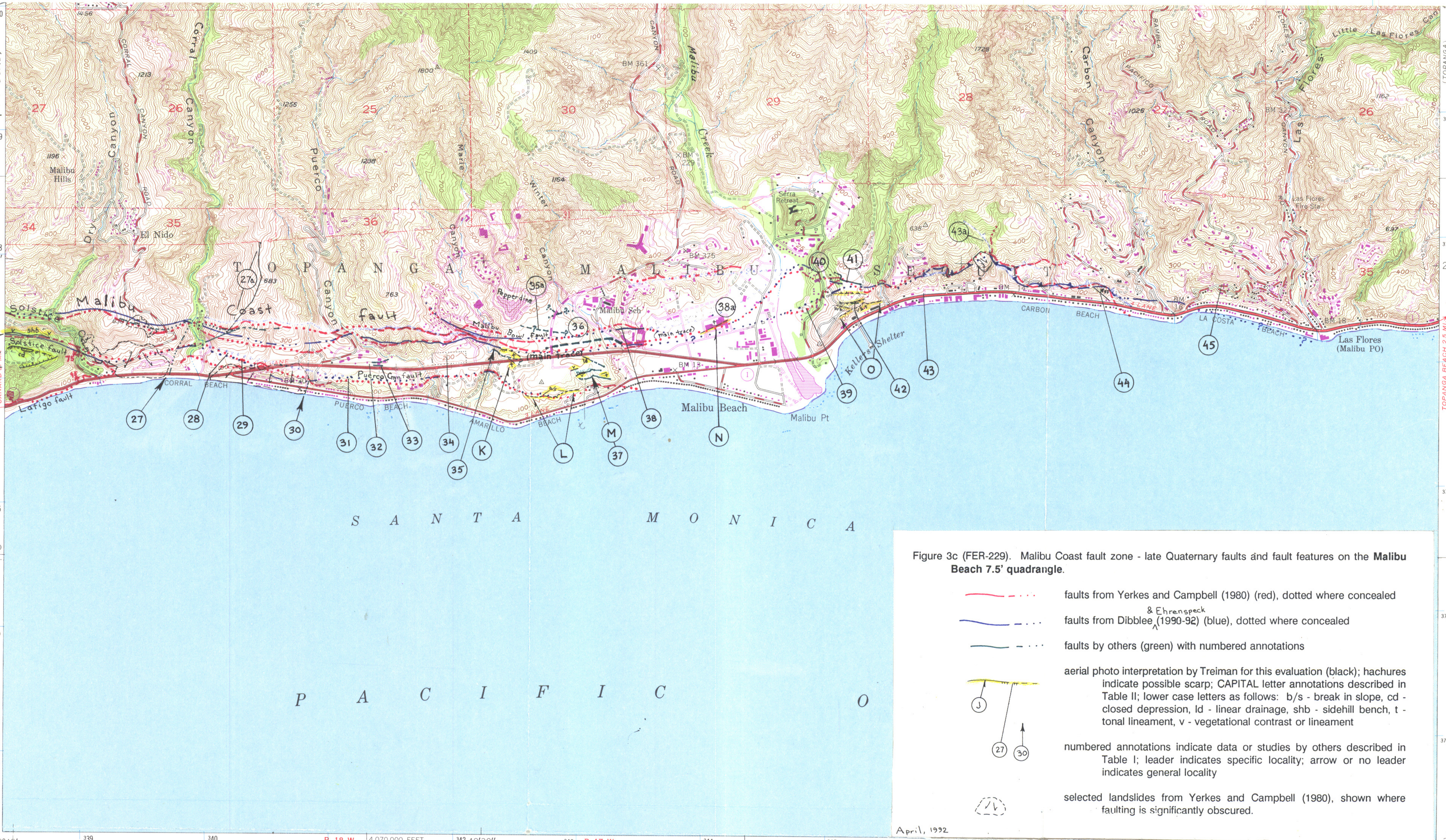


Figure 3c (FER-229). Malibu Coast fault zone - late Quaternary faults and fault features on the **Malibu Beach 7.5' quadrangle**.

faults from Yerkes and Campbell (1980) (red), dotted where concealed

faults from Dibblee & Ehrenspeck (1990-92) (blue), dotted where concealed

faults by others (green) with numbered annotations

aerial photo interpretation by Treiman for this evaluation (black); hachures indicate possible scarp; CAPITAL letter annotations described in Table II; lower case letters as follows: b/s - break in slope, cd - closed depression, ld - linear drainage, shb - sidehill bench, t - tonal lineament, v - vegetational contrast or lineament

numbered annotations indicate data or studies by others described in Table I; leader indicates specific locality; arrow or no leader indicates general locality

selected landslides from Yerkes and Campbell (1980), shown where faulting is significantly obscured.

34°00' 118°45' 339 340 R. 18 W. 4 070 000 FEET 342 42'30" 343 R. 17 W. 344 345 346 40' 347 348 349000m.E. 34°00' 118°37'30"

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1982

Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Los Angeles County

Topography by photogrammetric methods from aerial photographs taken 1947. Field checked 1950

Polyconic projection. 10,000-foot grid ticks based on California coordinate system, zone 7. 1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue. 1927 North American Datum. To place on the predicted North American Datum 1983 move the projection lines 2 meters north and 85 meters east as shown by dashed corner ticks

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Revisions shown in purple and woodland compiled from aerial photographs taken 1978 and other sources. This information not field checked. Map edited 1981

GN MN 0°57' 17 MILS 14° 249 MILS

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 25 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER

THE AVERAGE RANGE OF TIDE IS APPROXIMATELY 4 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

CALIF

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
State Route

MALIBU BEACH, CALIF.

N3400—W11837.5/7.5

1950

PHOTOREVISED 1981

DMA 2252 II SW—SERIES V895

3c

229-2

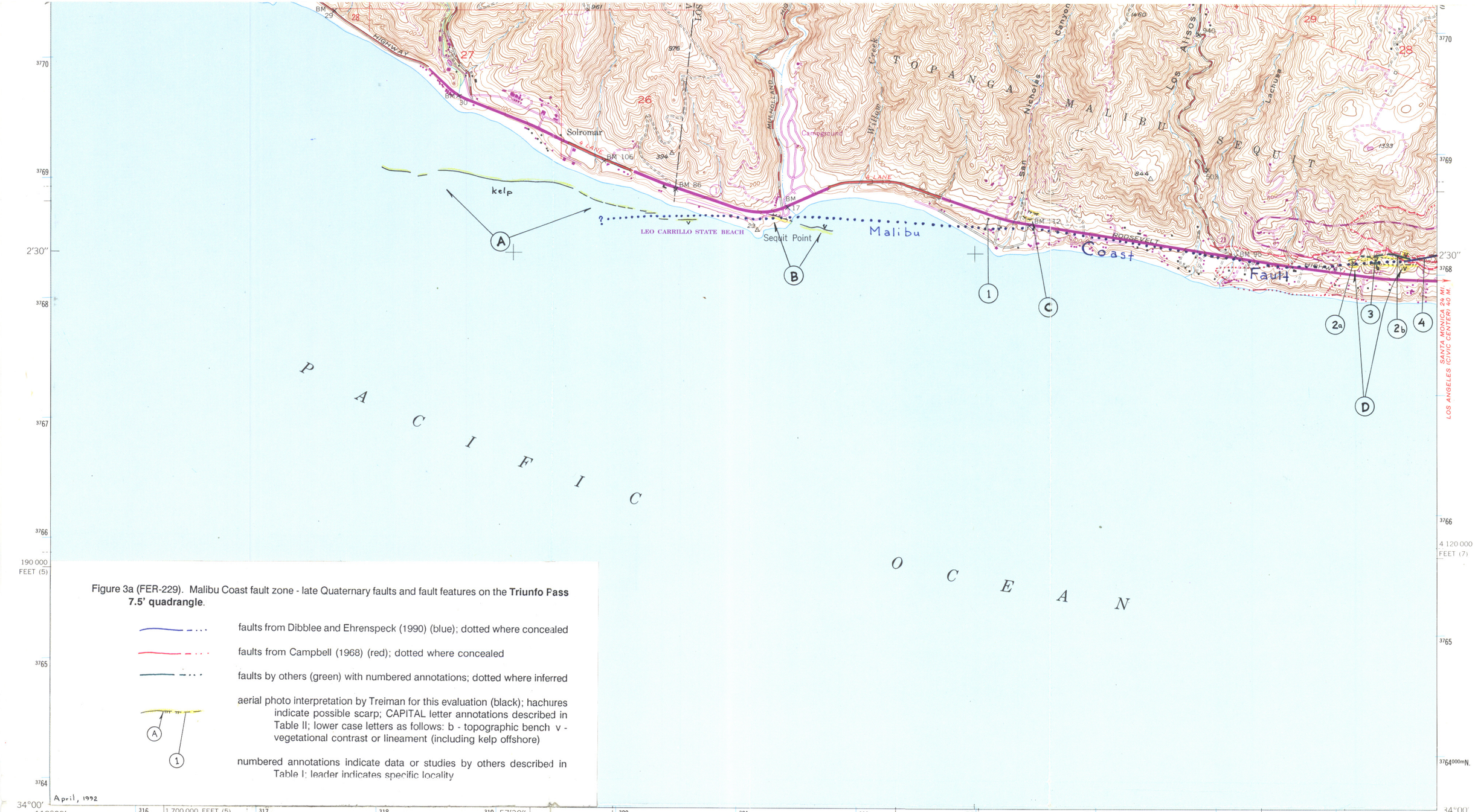


Figure 3a (FER-229). Malibu Coast fault zone - late Quaternary faults and fault features on the **Triunfo Pass 7.5' quadrangle**.

faults from Dibblee and Ehrenspeck (1990) (blue); dotted where concealed

faults from Campbell (1968) (red); dotted where concealed

faults by others (green) with numbered annotations; dotted where inferred

aerial photo interpretation by Treiman for this evaluation (black); hachures indicate possible scarp; CAPITAL letter annotations described in Table II; lower case letters as follows: b - topographic bench v - vegetational contrast or lineament (including kelp offshore)

numbered annotations indicate data or studies by others described in Table I; leader indicates specific locality

April, 1992

Mapped, edited, and published by the Geological Survey

Control by USGS, and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1947 Field check 1949

Polyconic projection. 1927 North American datum
10,000-foot grids based on California coordinate system, zones 5, and 7
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue

Dotted land lines established by private survey

Data shown in purple compiled from aerial photographs taken 1967. This information not field checked

UTM GRID AND 1967 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 25 FEET
DATUM IS MEAN SEA LEVEL
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE AVERAGE RANGE OF TIDE IS APPROXIMATELY 4 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
State Route

TRIUNFO PASS, CALIF.

SW/4 TRIUNFO PASS 15' QUADRANGLE
N3400—W11852.5/7.5

1949
PHOTOREVISED 1967
AMS 2252 III SW—SERIES V895

229-4

3a