Landslides, Geomorphology and Geology – Owl Creek 7.5-Minute Quadrangle, Humboldt County, California

by James N. Falls[1], Gerald J. Marshall[2], Don R. Braun[3], and Shannon M. B. Utley
[1]PG 5373, CEG 1696, [2]PG 5891, CEG 1909, [3]PG 4115, CEG 1310

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Universal Transverse Mercator, Zone 10N
North American Datum 1983

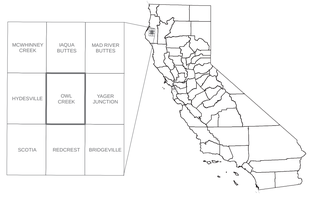
Topographic contours derived from USGS 10m National Elevation Dataset (NED).
Base of hydrography from National Hydrography Dataset Plus (NHDPlus) and California Department of Fish and Wildlife.
Base of geographic names from USGS Geographic Names Information System (GNIS).

Scale 1: 24000

1 0 0.5 0 1 2 MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET
1 0.5 0 1 2 KILOMETERS
1000 500 0 1000 2000 METERS

Contour Interval 40 feet

14.5°
APPROXIMATE MEAN DECLINATION, 2016



EXPLANATION

LANDSLIDE DEPOSITS

Rock slide: Slope movement with bedrock as its primary source material. This class of failure includes rotational and translational landslides; relatively cohesive slide masses with failure planes that are deep-seated in comparison to those debris slides of similar areal extent. The slide plane is curved in a rotational slide. Movement along a planar joint or bedding surface may be referred to as translational. Complex versions with combinations of rotational heads and translational movement or earthflows dominate are common. The cross-hatch pattern indicates a scarp; boundary is solid where the presence of the slide is definite, dashed where probable, and dotted where questionable; shading is light where the slide is dormant and dark where historically active. Arrows point downslope. The arrow indicates that the landslide type is a rock slide.

Earthflow: Slow to rapid movement of mostly fine-grained soil with some rocky debris in a semiviscous, highly plastic state. After initial failure, the mass may flow or creep seasonally in response to changes in groundwater level. These types of slope failures often include complexes of nested rotational slides and deeply incised gullies; boundaries are usually indistinct. The cross-hatch pattern indicates a scarp; boundary is solid where the presence of the slide is definite, dashed where probable, and dotted where questionable; shading is light where the slide is dormant and dark where historically active. The arrow indicates that the landslide type is an earth flow.

Debris slide: Mass of unconsolidated rock, colluvium, and coarse-grained soil that has moved slowly to rapidly downslope along a relatively steep, shallow, translational failure plane. Debris slides form steep, un-vegetated scars in the head region and possibly irregular, hummocky deposits in the toe region. Scars commonly ravel and remain un-vegetated for several seasons depending on slope aspect. Boundary is solid where the presence of the slide is definite, dashed where probable; shading is light where the slide is dormant and dark where historically active. Arrows point downslope. In addition to debris slide, a polygon with a may also indicate a soil fall/slide/topple.

Debris flow/torrent track: Long stretches of bare ground that have been scoured and eroded to bedrock by extremely rapid movement of water-laden debris. Debris flows are commonly triggered by debris sliding in the source area during high intensity rains. Debris is often deposited downslope as a tangled mass of organic material in a matrix of rock and soil; debris may be reworked and incorporated into subsequent events; lack of vegetation indicates recent activity. Depicted as a line when too narrow to map as a polygon at scale of map; point symbol ( ) represents areas too small to delineate (typically less than 0.25 acre at 1:24,000).

Other small landslide deposit: Landslide deposit too small to delineate (typically less than 0.25 acre in area at 1:24,000 scale). Includes small debris slides, earthflows, rock or soil falls/slides/ spreads/ topples.

Scarp: The steeply inclined failure surface with exposed soil and rock that marks the top of a landslide. Includes scarps for rock slides/falls, earth flows, and debris slides/flows. Multiple scarps may occur within a landslide and are referred to as secondary scarps.

LANDSLIDE SOURCES and GEOMORPHOLOGY

Disrupted ground: Irregular ground surface that may be caused by complex landsliding processes resulting in features that are indistinguishable or that may be too small to delineate individually at 1:24,000; also may include areas affected by downslope creep, expansive soils, and/or gully erosion; boundaries are usually indistinct.

Debris slide slope/source area: A geomorphic feature characterized by steep, usually un-vegetated slopes that appear to have been sculpted by numerous debris slides and debris flows. Upper reaches (source areas) of these slopes are often tightly concave and very steep. Soil and colluvium atop bedrock may be disrupted by active debris slides and debris flows. Slopes near the angle of repose may be relatively stable except where weak bedding planes, bedrock joints, and fractures parallel the slope.

Inner gorge: A geomorphic feature consisting of steep slopes adjacent to channels. The gorge typically is created by accelerated downcutting in response to regional uplift. It is defined as an area of streambank between the channel and the first break in slope. Line represents long narrow features less than 150 feet wide and is broken into segments to represent a stretch of discontinuous inner gorge too small to accurately represent at 1:24,000 scale; points are used for features covering less than 0.25 acres. Slopes near the angle of repose may be relatively stable except where weak bedding planes, bedrock joints, and fractures parallel the slope.

Gully: Distinct, narrow channel formed by erosion of soil or soft rock material by running water. Channels are larger and deeper than rills and usually carry water only during and immediately after heavy rain or following the melting of ice or snow. Arrows point downstream. Line represents long narrow features less than 150 feet wide; points represent areas too small to map (typically less than 0.25 acre at 1:24,000).

STRUCTURE

Fault: Solid where location is certain, dashed where approximately located or inferred, dotted when concealed; ball and bar on downthrown block; thrust fault shown by pyramid on line.

Contact: Solid where location is certain, dotted where concealed

Strike and dip of bedding plane

Horizontal bedding

photo lineament; topo lineament

MAP UNITS

Qal **Alluvium (Holocene):** unconsolidated sand, silt, gravel, and clay deposited by streams in stream channels.

Qrt **River Terrace Deposits (Holocene):** unconsolidated poorly sorted, pebbly, gravelly sands, and sandy pebble to boulder conglomerates with occasional silt interbeds; may form steep slopes subject to debris sliding and small-scale translational/rotational slides; terraces increase in age with increasing elevation above river channel.

Qf **Alluvial Fan Deposits (Holocene):** alluvial sand and gravel deposited in characteristic fan-cone shape at the mouths of eroding stream canyons.

Qort **Older River Terraces (Pleistocene?):** slightly consolidated, poorly sorted, silty and clayey gravelly sands, and sandy, silty conglomerates with occasional silt interbeds, subject to debris sliding on steep slopes.

Qof **Older Alluvial Fan Deposits (Holocene-Pleistocene?):** poorly sorted angular sand and gravel deposits occasionally found in uplifted valley bottoms.

QTw/ QTwu **Wildcat Group (Miocene-Late Pleistocene):** moderately to poorly indurated, massive (no apparent bedding) to poorly bedded, folded, blue-gray, clayey siltstones with smaller amounts of sandstone, glauconitic and pebbly sandstone, conglomerate, and thin volcanic ash beds; unconformably overlies the Yager Terrane.

Qc **Carlotta Formation (Middle to Late Pleistocene):** gently folded, partially indurated, nonmarine conglomerate, sandstone, and claystone, with occasional volcanic ash; structural (Ogle, 1953) and stratigraphic (Woodward-Clyde Consultants, 1980, and Morrison, unpublished data) relationships and the correlations of dated volcanic ash beds (Myer and others, 1980) suggest that the Carlotta Formation may in part be a nonmarine age equivalent of the Hookton Formation (Qh).

Qsb **Scotia Bluffs Sandstone (Pleistocene-Pliocene):** folded, very compact, massive, fine-grained, shallow marine sandstone with minor amounts of siltstone and mudstone, unit generally forms cliffs, more resistant to landsliding and erosion than other members of the Wildcat Group.

QTrd **Rio Dell Formation (Pliocene-Pleistocene):** folded, partially indurated, massive mudstone, alternating thin sandstone and mudstone, and very fine-grained sandstone; often fossiliferous; landslide failures common along interface between mudstone and sandstone beds.

Ter **Eel River Formation (Pliocene):** mudstone, siltstone, and sandstone.

Ty **Franciscan Complex**

Yager Terrane (Eocene to Paleocene?): a subunit of the Franciscan Complex composed of rhythmically bedded shale and sandstone, massive to thickly bedded sandstone with minor shale, and minor lenses of pebble and boulder conglomerate; sandstone typically contains prominent detrital muscovite; sandstone and conglomerate is moderately well consolidated; siltstone, mudstone and shale tend to be highly sheared in places; silty shale and mudstone often disaggregate rapidly by slaking when wetted; sandstone units generally are massive; finer-grained layers often are well bedded. Large, deep-seated rock slides and earthflows are common in this subunit.

KJfm **Central Belt Franciscan Complex (Jurassic-Cretaceous):** includes massive to highly sheared sandstone and shale, and large areas of pervasively sheared, shaley matrix containing exotic blocks of chert, greenstone, and glaucophane schist; the entire unit appears to be prone to large-scale earthflows and debris slides.

KJfs **Sandstone (Jurassic-Cretaceous):** undifferentiated sandstone with minor amounts of sandstone and shale, probably correlative with Yager Terrane and Coastal Belt.

Individual Blocks within Central Belt Franciscan Complex

Other Map Symbols

bs	blueschist	u	undetermined
ss	sandstone	v	volcanic

wa wet area, pond

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OWL CREEK AERIAL PHOTOGRAPHS BY YEAR

1942, U.S. Department of Agriculture, Agricultural Adjustment Agency, black and white photographs, flight CVL, frames 3B-49 through 58, frames 10B-114 through 122, and frames 11B-89 and 11B-99, nominal scale 1:24,000, dated November 26, 1942.

1947, U.S. Forest Service, 1948, black and white photographs, flight CDF2, frames 10-76 through 87, frames 17-13 through 18, frames 17-31 through 38, frames 17-61 through 70, and frames 17-83 through 87,nominal scale 1:26,400, dated October 13, 1947.

1954, California Department of Natural Resources, Division of Forestry, black and white photographs, flight CVL, frames 10N-15 through 24, frames 10N-57 through 66, frames 11N-129 through 12N-138, nominal scale 1:12,000, dated August 22 and 23, 1954, respectively.

1962, Humboldt County Assessor, black and white photographs, flight HC-S-2-3, frames 19A-1 through 6, frames 20-1 through 7, frames 21-1 through 8, frames 22-1 through 7, frames 23A-1 through 7, frames 24A-1 through 7, and frames 25-1 through 7, nominal scale 1:12,000, dated August 27, 1962.

1965, U.S. Department of Agriculture, Soil Conservation Service, black and white photographs, flight CVL, frames 13FF-72 through 81 (August 13, 1965), frames 19FF-129 through 137 (August 29, 1965), frames 20F-35 through 43, (August 30, 1965), and frames 20FF-163 through 173 (August 30, 1965), nominal scale 1:20,000.

1984, WAC Inc., black and white photographs, flight WAC-84C, frames 24-183 through 190, frames 25-98 through 105, nominal scale 1:31,680, dated May 6, 1984.

1988, WAC Inc., black and white photographs, flight WAC-88CA, frames 20-137 through 144, and frames 24-32 through 37, nominal scale 1:31,680, dated July 19 and 28, 1988, respectively.

1996, WAC Inc., black and white photographs, flight WAC-96CA, frames 22-137 through 146, frames 23-30 through 38, frames 23-127 through 135, and frames 28-1 through 7, nominal scale 1:24,000, dated September 8, 1996.

2000, WAC Inc., black and white photographs, flight WAC-00-CA, frames 4-26 through 34, frames 4-111 through 118, frames 4-192 through 198, and frames 5-29 through 35, nominal scale 1:24,000, dated April 1, 2000.

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