California Geological Survey
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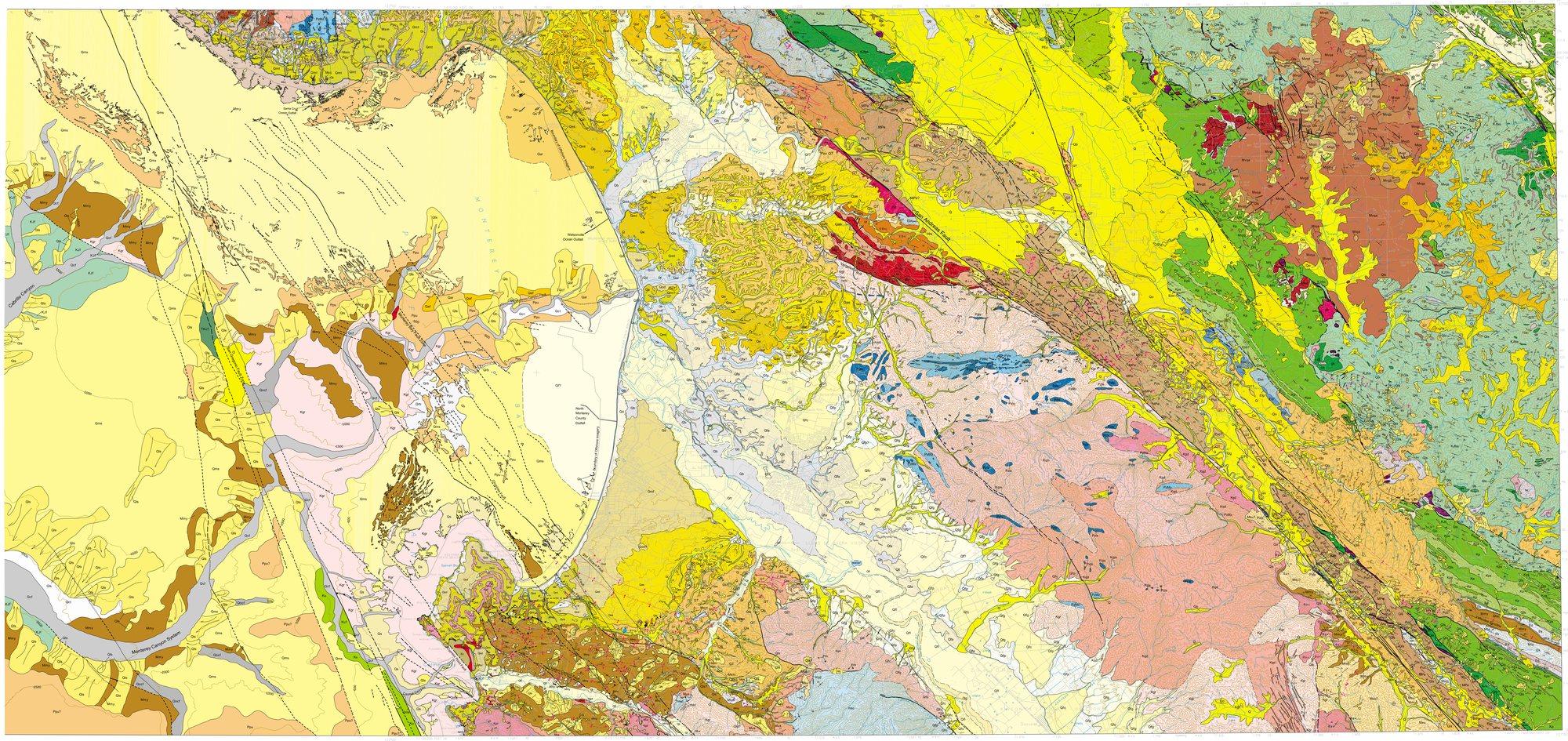
MONTEREY QUADRANGLE
SHEET 1



ABBREVIATED EXPLANATION

Approximate stratigraphic relationships only; see Map Explanation (Sheet 3) for more detailed information

Holocene

- Q — Alluvium
- af — Artificial fill
- Qe — Eolian sand
- Qo — Older alluvium
- Qt — Terrace deposits
- Qms — Marine terrace deposits
- Qf — Alluvial fan deposits
- Qs — Stream gravel
- Qs — Sand
- Qd — Dune sand
- Qls — Landslide deposits
- Qod — Older Dune Sand
- Qtw — Terrace deposits of Watsonville terrace
- Qf — Flood plain deposits
- Qcf — Canyon Fill (offshore)
- Qms — Marine sediments
- Qocf — Older canyon fill (offshore)
- Qrs — Relict beach deposits (offshore)
- Qcs — Submarine canyon terrace
- Qb — Basin deposits
- Qp — Patterson Alluvium
- Qsl — San Luis Alluvium
- Qlb — Los Banos Alluvium

Pleistocene

- Qfa — Fan deposits of Ardisch
- Qfc — Fan deposits of Chular
- Qfp — Fan deposits of Placentia
- Qfg — Fan deposits of Gloria
- Qw — Aromas Sand (undivided)
- Qw — Eolian facies
- Qaf — Fluvial facies
- QT — Plio-Pleistocene continental deposits
- QT — Plio-Pleistocene fluvial deposits
- Qtl — Plio-Pleistocene lacustrine deposits

Pliocene

- Puc — Unnamed Pliocene continental mudstone
- Pu — Unnamed Pliocene Continental sandstone
- Ppr — Pancho Rico Formation
- Pbs — Pliocene Basaltic rocks (Coyote Volcanics)
- Ppu — Purisima Formation
- Mfe — Etchegoin Formation
- Msc — Santa Cruz Mudstone
- Mzu — Unnamed Miocene volcanic rocks
- Mzb — Unnamed Miocene sedimentary rocks
- Mzm — Santa Margarita Sandstone
- Mmy — Monterey Formation
- Mzo — Organic mudstone
- Mzt — Temblor (Mv-Basalt interbed)
- Mzl — Lone Tree Fm.
- Mzs — Unnamed Miocene sandstone

QUEN SABE VOLCANICS
- Mvap - Andesitic flows and breccia
- Mvab - Basaltic flows and breccia
- Mvqd - Dacite flows
- Mvrp - Rhyolite flows
- Mvpa - Intrusive andesite
- Mvpb - Intrusive basalt
- Mvpd - Intrusive dacite
- Mvpr - Intrusive rhyolitic rocks

Tertiary volcanic rocks
- Tva - Andesite
- Tvb - Basalt

Miocene

- Qfs — Red beds
- Qvq — Vaqueros Sandstone
- Qfsj — San Juan Bautista Formation
- Qpm — Pinnacles volcanic formation
- Kcc — Carmelite of Lawson
- Ebu — Unnamed Eocene sedimentary rocks
- Ec — Carmelo Formation
- Elm — Los Muertos Formation
- Etp — Tres Pinos Sandstone
- Ess — Arkosic sandstone
- PEu — Paleocene-Eocene sedimentary rock
- Ek — Kreyenhagen Formation
- Ed — Domengine Sandstone
- Etc — Cantua Sandstone

Oligocene

Paleocene-Eocene

- Mzu — Tertiary-Cretaceous sedimentary rock
- Ku — Upper Cretaceous sedimentary rocks
- KJf — Franciscan Complex*
- cg — Conglomerate
- ss — Sandstone
- ch — Chert
- gr — Greenstone
- Serpentinite ultramafic rock
- bs — Blueschist and semischist
- ls — Limestone
- gb — Gabbro
- Jlg — Gabbro of Logan quarry
- PzMz — Prebatholithic metasedimentary rocks Pzls - Carbonate rocks
- Kp — Panoche Formation Kps - Sandstone Kpc - Conglomerate
- Kgr — Granitic rocks
- Kqm — Quartz monzonite
- Kqd — Quartz diorite
- Kgd — Granodiorite
- KJu — Jurassic-Cretaceous sedimentary rocks

Cretaceous

Jurassic

Coast Range Ophiolite
- Jzb — Breccia
- Jz — Volcanic rocks (greenstone)
- Jz — Serpentinized ultramafic rock

- mzc — Schist of Sierra de Salinas

*part of KJf is melange (KJfm)

SYMBOLS

Contact; solid where well located; dashed where approximately located or inferred; dotted where concealed; queried where uncertain.

Fault; solid where certainly located; dashed where approximately located or inferred; dotted where concealed; queried where existence or continuation is uncertain. Arrows show direction of dip when known.

Thrust fault; barbs on upper plate; solid where certainly located; dased where approximately located or inferred; dashed where concealed; queried where existence or continuation uncertain. Arrow indicates direction of dip when known.

Anticlinal fold; solid where certainly located; dashed where inferred; dotted where concealed, queried where evidance or continuation is uncertain.

Synclinal fold; solid where certainly located; dashed where inferred; dotted where concealed, queried where evidance or continuation is uncertain.

80 — Strike and dip of stratified rocks. Number indicates dip angle in degrees when known.

Vertical beds

60 — Overturned beds

Horizontal beds

21 — Strike and dip of foliations

Arrows on landslides indicate direction of movement.

Base Map
Topographic base from USGS Monterey and Palo Alto 30'x60' quadrangles.
Shaded topographic base from USGS digital elevation models. Shaded bathymetric base from Monterey Bay Aquarium Research Institute.

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SCALE 1:100,000

2 0 2 4 6 Miles

2 0 2 4 6 Kilometers

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GEOLOGIC MAP OF THE MONTEREY 30'x60' QUADRANGLE AND ADJACENT AREAS, CALIFORNIA

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Geology Compiled 1998-2000

ABBREVIATED INDEX TO GEOLOGIC SOURCE DATA*

1. Santa Cruz Quadrangle
Clark, J.C., 1981; Stanley, R.G., and McCaffery, Robert, 1983.

2. Soquel Quadrangle
Brabb, E.E., 1989.

3. Watsonville West Quadrangle
Brabb, E.E., 1989; Dupre, W.R., and Tinsley, J.C., III, 1980; Hall, N.T., Sarna-Wojcicki, A.M., and Dupre, W.R., 1974.

4. Watsonville East Quadrangle
Brabb, E.E., 1989; Bryant, W. A., Smith, D. P., and Hart, E.W., 1981; Dupre, W.R., and Tinsley, J.C., III, 1980; Dibblee, T.W., Jr., 1970; Hall, N.T., Sarna-Wojcicki, A.M., and Dupre, W.R., 1974; Graymer, R.W., 1997.

5. Chittenden Quadrangle
Armstrong, C.F., 1980; Bishop, C.C., 1971; Bryant, W. A., Smith, D. P., and Hart, E.W., 1981; Dibblee, T.W., Jr., and Brabb, E.E., 1980; Graymer, R.W., 1997; Wagner, D.L., 2000.

6. San Felipe Quadrangle
Armstrong, C.F. and Wagner, D.L., 1978; Bryant, W. A., Smith, D. P., and Hart, E.W., 1981; Dibblee, T.W., Jr. and Rogers, T.H., 1975; Graymer, R.W., 1997; Rogers, T.H., 1969; Rosenberg, L.I., 1998.

7. Three Sisters Quadrangle
Bryant, W.A., 1985; Osoch, L.H., 1970; Wagner, D.L., 1989.

8. Mariposa Peak Quadrangle
Drinkwater, J.L., Song, D. H., and Russell, P.C., 1992.

9. Los Banos Valley Quadrangle
Dibblee, T.W., Jr., 1975; Lettis, W. R., 1982.

10. Ruby Canyon Quadrangle
Dibblee, T.W., Jr., 1975.

11. Quien Sabe Valley Quadrangle
Anderson, P. C., 1983; Dibblee, T.W., Jr., 1975; Prowell, D.C., 1974.

12. Tres Pinos Quadrangle
Bryant, W.A., 1985; Dibblee, T.W., Jr.,1979.

13. Hollister Quadrangle
Dibblee, T.W., Jr. and Rogers, T.H., 1975; Rogers, T.H., 1993; Rosenberg, L.I., 1998.

14. San Juan Bautista Quadrangle
Allen, J. E., 1946; Bishop, C.C., 1971; Dibblee, T.W., Jr., 1979; Dupre, W.R., and Tinsley, J.C., III, 1980.

15. Prunedale Quadrangle
Dupre, W.R., and Tinsley, J.C., III, 1980.

16. Moss Landing Quadrangle
Dupre, W.R., and Tinsley, J.C., III, 1980.

17. Marina Quadrangle
Dupre, W.R., and Tinsley, J.C., III, 1980.

18. Salinas Quadrangle
Dupre, W.R., and Tinsley, J.C., III, 1980.

19. Natividad Quadrangle
Dupre, W.R., and Tinsley, J.C., III, 1980; Bowen, O.E., 1973; Ross, D.C., 1972.

20. Mount Harlan
Dibblee, T.W., Jr., and Ross, D.C., 1973; Ross, D.C., 1972.

21. Paicines Quadrangle
Dibblee, T.W., Jr., 1979.

22. Cherry Peak Quadrangle
Dibblee, T.W., Jr., 1979; Wilson, I. F., 1943.

23. Panoche Pass Quadrangle
Dibblee, T. W., Jr., 1979; Wilson, I. F., 1943.

24. San Benito Quadrangle
Dibblee, T. W., Jr.,1979; Enos, Paul, 1969; Wilson, I. F., 1943.

25. Bickmore Canyon Quadrangle
Dibblee, T.W., Jr., 1979; Wilson, I. F., 1943.

26. Mount Johnson
Dibblee, T.W., Jr., and Ross, D.C., 1973; Ross, D.C., 1972.

27. Gonzales Quadrangle
Dibblee, T.W., Jr., and Ross, D.C., 1973.

28. Chalate Quadrangle
Bowen, O.E., 1973; Dibblee, T.W., Jr., 1999.

29. Spreckels Quadrangle
Clark, J.C., Brabb, E.E., Dupre, W.R., and Rosenberg, L.I., 1999.

30. Seaside Quadrangle
Clark J.C., Dupre, W.R., and Rosenberg, L. I., 1997.

31. Monterey Quadrangle
Clark J.C., Dupre, W.R., and Rosenberg, L. I., 1997.

32. Offshore area

Continental slope and Monterey submarine canyon system:
Greene, H.G., 1977; Greene, H.G., 1999; McCulloch, D.S., and Greene, H.G., 1990.

Continental Shelf (less 150 meter water depth):
Edtmirs, S.L., Amina, R.J., and Stevenson, A.J., in press; Edtmirs, S.L., Amina, R.J., Stevenson, A.J., and Wong, F.L., 2001.

*See readme file text for complete references