

## GEOLOGIC MAPS OF THE GRAND CANYON AND ARIZONA STRIP AREA

Listed in sequential order of dates as of 8/00

\*Current use geologic maps that supercede older maps

1. Dutton, C.E., 1882, The Tertiary history of the Grand Canyon district; with atlas. U.S. Geological Survey Monograph 2, 264 p.; Atlas, 23 sheets. [Facsimile reprinting, Layton, Utah: Peregrine Smith, Inc., 264 p.; Atlas, 23 sheets. Edition limited to 1,500 copies, with introduction by Wallace Stegner.]

Dutton's maps (3) are not shown on the index map because they are very general and cover the index map ( $34^{\circ} 30'$  to  $41^{\circ}$  lat;  $110^{\circ}$  to  $115^{\circ}$  long). These maps are the first published geologic maps of this region.

2. Noble, L.F., 1914, The Shinumo quadrangle, Grand Canyon District, Arizona: U.S. Geological Survey Bulletin 549, plate 1, scale 1:48,000.
3. \*Detterman, J.S., 1956a, Photogeologic map of the Emmett Wash NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-190, scale 1:24,000.
4. Detterman, J.S., 1956b, Photogeologic map of the Lee's Ferry SW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-189, scale 1:24,000.
5. Hemphill, W.R., 1956, Photogeologic map of the Fredonia NW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-133, scale 1:24,000.
6. Marshall, C.H., 1956a, Photogeologic map of the Lost Spring Mountain NW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-146, scale 1:24,000.
7. Marshall, C.H., 1956b, Photogeologic map of the Lost Spring Mountain NE quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-145, scale 1:24,000.
8. Marshall, C.H., 1956c, Photogeologic map of the Lost Spring Mountain SE quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-144, scale 1:24,000.
9. \*Marshall, C.H., 1956d, Photogeologic map of the Short Creek SW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-140, scale 1:24,000.
10. \*Marshall, C.H., 1956e, Photogeologic map of the Short Creek SE quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-153, scale 1:24,000.
11. \*Marshall, C.H., 1956f, Photogeologic map of the Fredonia SW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-160, scale 1:24,000.

12. \*Marshall, C.H., 1956g, Photogeologic map of the Heaton Knolls NW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-143, scale 1:24,000.
13. Marshall, C.H., 1956h, Photogeologic map of the Jacob Lake NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-194, scale 1:24,000.
14. Marshall, C.H., 1956i, Photogeologic map of the Paria Plateau SE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-191, scale 1:24,000.
15. \*Marshall, C.H., and Pillmore, C.L., 1956, Photogeologic map of the Short Creek NW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-141, scale 1:24,000.
16. McQueen, Kathleen, 1956a, Photogeologic map of the Lee's Ferry NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-196, scale 1:24,000.
17. McQueen, Kathleen, 1956a, Photogeologic map of the Lee's Ferry NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-222, scale 1:24,000.
18. McQueen, Kathleen, 1956c, Photogeologic map of the Lee's Ferry SE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-169, scale 1:24,000.
19. McQueen, Kathleen, 1956d, Photogeologic map of the House Rock Spring SE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-199, scale 1:24,000.
20. \*McQueen, Kathleen, 1956e, Photogeologic map of the Paria Plateau NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Investigations Series Map I-228, scale 1:24,000.
21. \*Minard, J.P., 1956a, Photogeologic map of the Paria Plateau NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigation Series Map I-182, scale 1:24,000.
22. \*Minard, J.P., 1956b, Photogeologic map of the Paria Plateau SW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-171, scale 1:24,000.
23. \*Minard, J.P., 1956c, Photogeologic map of the Emmett Wash NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-192, scale 1:24,000.
24. \*Minard, J.P., 1956d, Photogeologic map of the Tanner Wash NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-193, scale 1:24,000.
25. \*Morris, R.H., 1956, Photogeologic map of the Shinarump MW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-139, scale 1:24,000.

26. \*Pillmore, C.L., 1956, Photogeologic map of the Short Creek NE quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-142, scale 1:24,000.
27. Marshall, C.H., 1957, Photogeologic map of the Hurricane Cliffs–2NE quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-252, scale 1:24,000.
28. \*McQueen, Kathleen, 1957, Photogeologic map of the Shinarump NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-225, scale 1:24,000.
29. \*Minard, J.P., 1957, Photogeologic map of the House Rock Spring NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-253, scale 1:24,000.
30. \*Morris, R.H., 1957, Photogeologic map of the Fredonia NE quadrangle, Coconino and Mohave Counties, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-247, scale 1:24,000.
31. \*Pomeroy, J.S., 1957, Photogeologic map of the House Rock Spring SW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigation Series Map I-254, scale 1:24,000.
32. \*Wells, J.D., 1958, Preliminary geologic map of the House Rock Spring NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-188, scale 1:24,000.
33. \*Petersen, R.G., 1959, Preliminary geologic map of the Emmett Wash NE quadrangle, Coconino county, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-215, scale 1:24,000.
34. \*Petersen, R.G., and Phoenix, D.A., 1959, Preliminary geologic map of the Paria Plateau NE quadrangle, Coconino county, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-214, scale 1:24,000.
35. Pomeroy, J.S., 1959, Photogeologic map of the Hurricane Cliffs–2NW quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-293, scale 1:24,000.
36. Wells, J.D., 1959, Preliminary geologic map of the House Rock Spring SE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-189, scale 1:24,000.
37. \*Wilson, E.D., and Moore, R.T., 1959, Geologic map of Mohave County, Arizona: Arizona Bureau of Mines, scale 1:375,000.
38. Wells, J.D., 1960, Stratigraphy and structure of House Rock Valley area, Coconino county, Arizona: U.S. Geological Survey Bulletin 1081-D, plate 4, scale 1:48,000.

39. \*Wilson, E.D., Moore, R.T., and O'Haire, R.T., 1960, Geologic map of Coconino County, Arizona Bureau of Mines, scale 1:375,000.
40. Maxson, J.H., 1961, Geologic map of the Bright Angel quadrangle, Grand Canyon National Park, Arizona: Grand Canyon Natural History Association, Grand Canyon, Arizona, scale 1:62,500, text on back.
41. Petersen, R.G., 1961, Preliminary geologic map of the Paria Plateau SE quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-196, scale 1:24,000.
42. \*Petersen, R.G., and Wells, J.D., 1961, Preliminary geologic map of the Emmett Wash NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-197, scale 1:24,000.
43. \*Phoenix, D.A., 1963, Geology of the Lees Ferry area, Coconino County, Arizona: U.S. Geological Survey Bulletin, 1137, 86 p., plate 1, scale 1:24,000.
44. Maxson, J.H., 1967, Preliminary geologic map of the Grand Canyon and vicinity, Arizona (eastern section): Grand Canyon Natural History Association, Grand Canyon, Arizona, scale 1:62,500.
45. Maxson, J.H., 1969, Preliminary geologic map of the Grand Canyon and vicinity, Arizona (western and central sections): Grand Canyon Natural History Association, Grand Canyon, Arizona, scale 1:62,500.
46. Cooley, C.A., Harshbarger, J.W., Akers, J.P., and Hardt, W.F., 1969, Hydrology of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah: U.S. Geological Survey Professional Paper 521-A, plate 1 in 9 sheets, scale 1:125,000.
47. Ulrich, G.E., and Bailey, N.G., 1974, Geologic map of the SP Mountain quadrangle, Coconino County, Arizona: U.S. Geological Survey Open-File Report 74-5, scale 1:24,000.
48. Huntoon, P.W., Billingsley, G.H., Breed, W.J., Sears, J.W., Ford, T.D., Clark, M.D., Babcock, R.S., and Brown, E.H., 1976, Geologic map of the Grand Canyon National Park, Arizona: Grand Canyon Natural History Association, Grand Canyon, Arizona, and the Museum of Northern Arizona, Flagstaff, Arizona, scale 1:62,500. (First edition)
49. \*Haynes, D.D., and Hackman, R.J., 1978, Geology, structure, and uranium deposits of the Marble Canyon 1° x 2° quadrangle, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-1003, scale 1:250,000.
50. Huntoon, P.W., Billingsley, G.H., Breed, W.J., Sears, J.W., Ford, T.D., Clark, M.D., Babcock, R.S., and Brown, E.H., 1980, Geologic map of the eastern Grand Canyon National Park, Arizona: Grand Canyon Natural History Association Grand Canyon, Arizona, and the Museum of Northern Arizona, Flagstaff, Arizona, scale 1:62,500. (Second edition).

51. Throckmorton, M.L., 1980, Reconnaissance geologic map of the Turbinella-Gambel Oak instant study area. Mohave County, Arizona: U.S. Geological Survey Open-File Report 80-136, figure 1, scale 1:24,000.
52. Throckmorton, M.L., and Hamm, L.R., 1980, Mineral resource potential map of the Turbinella-Gambel Oak instant study area, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-1146 B., scale 1:24,000.
53. Villalobos, H.A., and Hamm, L.W., 1980, Summary report of the mineral resource appraisal of the Paiute instant (primitive) study area, Mohave County, Arizona: U.S. Geological Survey Open-File Report 80-984, scale 1:24,000.
54. Huntoon, P.W., Billingsley, G.H., and Clark, M.D., 1981, Geologic map of the Hurricane Fault Zone and vicinity, western Grand Canyon, Arizona: Grand Canyon Natural History Association, Grand Canyon, Arizona, scale 1:48,000.
55. Lucchitta, Ivo, and Beard, Sue, 1981a, Preliminary geologic map of the Olaf Knolls quadrangle, Mohave County, Arizona: U.S. Geological Survey Open-File Report 81-1322, scale 1:24,000.
56. Lucchitta, Ivo, and Beard, Sue, 1981b, Preliminary geologic map of the Grand Gulch Bench quadrangle, Mohave County, Arizona: U.S. Geological Survey Open-File Report 81-1321, scale 1:24,000.
57. Huntoon, P.W., Billingsley, G.H., and Clark, M.D., 1982, Geologic map of the Lower Granite Gorge and vicinity, western Grand Canyon, Arizona: Grand Canyon Natural History Association, Grand Canyon, Arizona, scale 1:48,000.
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59. Billingsley, G.H., and Huntoon, P.W., 1983, Geologic map of Vulcan's Throne and vicinity, western Grand Canyon, Arizona: Grand Canyon Natural History Association, Grand Canyon, Arizona, scale 1:48,000.
60. Billingsley, G.H., Antweiler, J.C., and Ellis, C.E., 1983, Mineral resource potential map of the Kanab Creek roadless area, Coconino and Mohave Counties, Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-1627-A, 9 p., scale 1:24,000.
61. Bohannon R.G., Antweiler, J.C., Lucchitta, I., Anderson, R.E., Beard, L.S., Hovorka, D.S., and Briggs, J.P., 1983, Geology and mineral resource potential of the Narrows (AZ-010-135), Lime Hills (AZ-010-134), and Sand Cove (AZ-010-128) Wilderness Study Areas, Mohave County, Arizona: U.S. Geological Survey Open-File Report 83-0887, 10 p. scale 1:50,000.
62. \*Bush, A.L., 1983, Geologic map of the Vermilion Cliffs-Paria Canyon Instant Study Area and adjacent Wilderness Study Areas, Coconino County, Arizona, and Kane County, Utah: U.S.

Geological Survey Miscellaneous Field Studies Map MF-1475-A, scale 1:62,500.

63. \*Laughlin, W.D., 1983, Geologic map of the Little Colorado Gorge and vicinity, Coconino County, Arizona, *in* Laughlin, W.D., The Hydrogeologic controls on water quality, ground water circulation, and collapse breccia pipe formation in the western part of the Black Mesa hydrologic basin, Coconino County, Arizona: MS Thesis, University of Wyoming, Laramie, Wyoming, 117 p.
64. Lucchitta, Ivo, Beard, L.S., Billingsley, G.H., Antweiler, J.C., Rieck, H.J., and Lane, M.E., 1983, Geology and mineral resource potential of the Pigeon Canyon (AZ-010-109), Nevershine Mesa (AZ-010-105A), and Snap Point (AZ-010-105B) Wilderness Study Areas, Mohave County, Arizona: U.S. Geological Survey Open-File Report 83-0888, 21 p., scale 1:50,000.
65. \*Ulrich, G.E., Billingsley, G.H., Hereford, Richard, Wolf, E.W., Nealey, D.L., and Sutton, R.L., 1984, Map showing geology, structure, and uranium deposits of the Flagstaff 1° x 2° quadrangle, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-1446, scale 1:250,000.
66. \*Billingsley, G.H., Barnes, C.W., and Ulrich, G.E., 1985, Geologic map of the Coconino Point and Grandview Point quadrangles, Coconino County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map, I-1644, scale 1:62,500.
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68. Huntoon, P.W., Billingsley, G.H., Breed, W.J., Sears, J.W., Ford, T.D., Clark, M.D., Babcock, R.S., and Brown, E.H., 1986, Geologic map of the eastern Grand Canyon National Park, Arizona: Grand Canyon Natural History Association, Grand Canyon, Arizona, and the Museum of Northern Arizona, Flagstaff, Arizona, scale 1:62,500. (Third edition)
69. Wenrich, K.J., Billingsley, G.H., and Huntoon, P.W., 1986, Breccia pipe and geologic map of the northeastern Hualapai Indian Reservation and vicinity, Arizona: U.S. Geological Survey Open-File Report 86-458-A, scale 1:48,000, 29 p.
70. Billingsley, G.H., Wenrich, K.J., and Huntoon, P.W., 1986, Breccia pipe and geologic map of the southeastern Hualapai Indian Reservation and vicinity, Arizona: U.S. Geological Survey Open-File Report 86-458-B, scale 1:48,000, 26 p.
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72. Wenrich, K.J., Billingsley, G.H., and Huntoon, P.W., 1987, Breccia pipe and geologic map of the northwestern Hualapai Indian Reservation and vicinity, Arizona: U.S. Geological Survey Open-File Report 86-458-C, scale 1:48,000, 32 p.

73. Billingsley, G.H., 1990a, Geologic map of the Purgatory Spring quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report, 90-540, scale 1:24,000.
74. Billingsley, G.H., 1990b, Geologic map of the Wolf Hole Mountain West quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 90-541, scale 1:24,000.
75. Billingsley, G.H., 1990c, Geologic map of the Lizard Point quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 90-643, scale 1:24,000.
76. Billingsley, G.H., Geologic map of the Jumpup Canyon and Big Spring quadrangles, Mohave and Coconino Counties, Arizona: U.S. Geological Survey Open-File Report 90-258, 15 p. scale 1:62,500.
77. Billingsley, G.H., 1990d, Geologic map of the Wolf Hole Mountain East quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 90-644, scale 1:24,000.
78. Billingsley, G.H., Wenrich, K.J., and Huntoon, P.W., 1990, Breccia pipe and geologic map of the southwestern Hualapai Indian Reservation and vicinity, Arizona: U.S. Geological Survey Open-File Report 86-458-D, scale 1:48,000, 33 p.
79. Billingsley, G.H., 1991a, Geologic map of the Sullivan Draw North quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 91-558, 10 p., scale 1:24,000.
80. Billingsley, G.H., 1991b, Geologic map of the Sullivan Draw South quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 91-559, 9 p., scale 1:24,000.
81. Billingsley, G.H., 1991c, Geologic map of the Mustang Knoll quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 91-560, 12 p., scale 1:24,000.
82. Billingsley, G.H., 1991d, Geologic map of the St. George quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 91-561, 11 p., scale 1:24,000.
83. \*Bohannon, R.G., 1991, Geologic map of the Jacobs Well and southern part of the Elbow Canyon quadrangles, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-2167, scale 1:24,000.
84. \*Bohannon, R.G., and Lucchitta, Ivo, 1991, Geologic map of the Mount Bangs quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-2166, scale 1:24,000.
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Arizona Geological Survey Contributed Map CM-91-K, 1 sheet, scale 1:24,000.

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92. \*Bohannon, R.G., 1992, Geologic map of the Red Pockets quadrangle, Mohave County, Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map I-2288, scale 1:24,000.
93. \*Billingsley, G.H., 1993a, Geologic map of the Lost Spring Mountain East quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 93-565, 9 p., scale 1:24,000.
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95. \*Billingsley, G.H., 1993c, Geologic map of the Dutchman Draw quadrangle, northern Mohave County, Arizona: U.S. Geological Survey, Open-File Report 93-587, 12 p., scale 1:24,000.
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101. \*Billingsley, G.H., 1994b, Geologic map of the White Pockets quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 94-244, 11 p., scale 1:24,000.
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104. \*Billingsley, G.H., 1994e, Geologic map of the Hat Knoll quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 94-554, 14 p., scale 1:24,000.
105. \*Billingsley, G.H., 1994f, Geologic map of the Moriah Knoll quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 94-634, 14 p., scale 1:24,000.
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108. \*Billingsley, G.H., and Bohannon, R.G., 1995, Geologic map of the Elbow Canyon quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 95-560, scale 1:24,000.
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111. \*Hunton, P.W., Billingsley, G.H., Sears, J.W., Ilg, B.R., Karlstrom, K.E., Williams, M.L., and Hawkins, David, 1996, Geologic map of the eastern part of the Grand Canyon National Park, Arizona: Grand Canyon Association, Grand Canyon, Arizona, and the Museum of Northern Arizona, Flagstaff, Arizona, scale 1:62,500. (Fourth edition)
112. \*Wenrich, K.J., Billingsley, G.H., and Hunton, P.W., 1996, Breccia pipe and geologic map of the northwestern part of the Hualapai Indian Reservation and vicinity, Arizona: U.S. Geological Survey Geologic Investigations Series, I-2522, 2 plates, scale 1:48,000, 16 p.
113. \*Billingsley, G.H., 1997a, Geologic map of the Mount Logan quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report, OF-97-426, 21 p., scale 1:24,000.
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County, Arizona: U.S. Geological Survey Open-File Report, OF-97-488, 19 p., scale 1:24,000.

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116. \*Billingsley, G.H., Wenrich, K.J., Huntoon, P.W., and Young, R.A., 1999, Breccia pipe and geologic map of the southwestern part of the Hualapai Indian Reservation and vicinity, Arizona: U.S. Geological Survey Miscellaneous Investigations Series, I-2554, 2 plates, scale 1:48,000, 50 p.
117. \*Billingsley, G.H., and Workman, J.B., 2000, Geologic map of the Littlefield 30' x 60' quadrangle, Mohave County, northwestern Arizona: U.S. Geological Survey Miscellaneous Geologic Investigations Series, I-2628, scale 1:100,000, 25 p., <http://geopubs.wr.usgs.gov/data.html>.
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#### GEOLOGIC MAPS IN PRESS

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