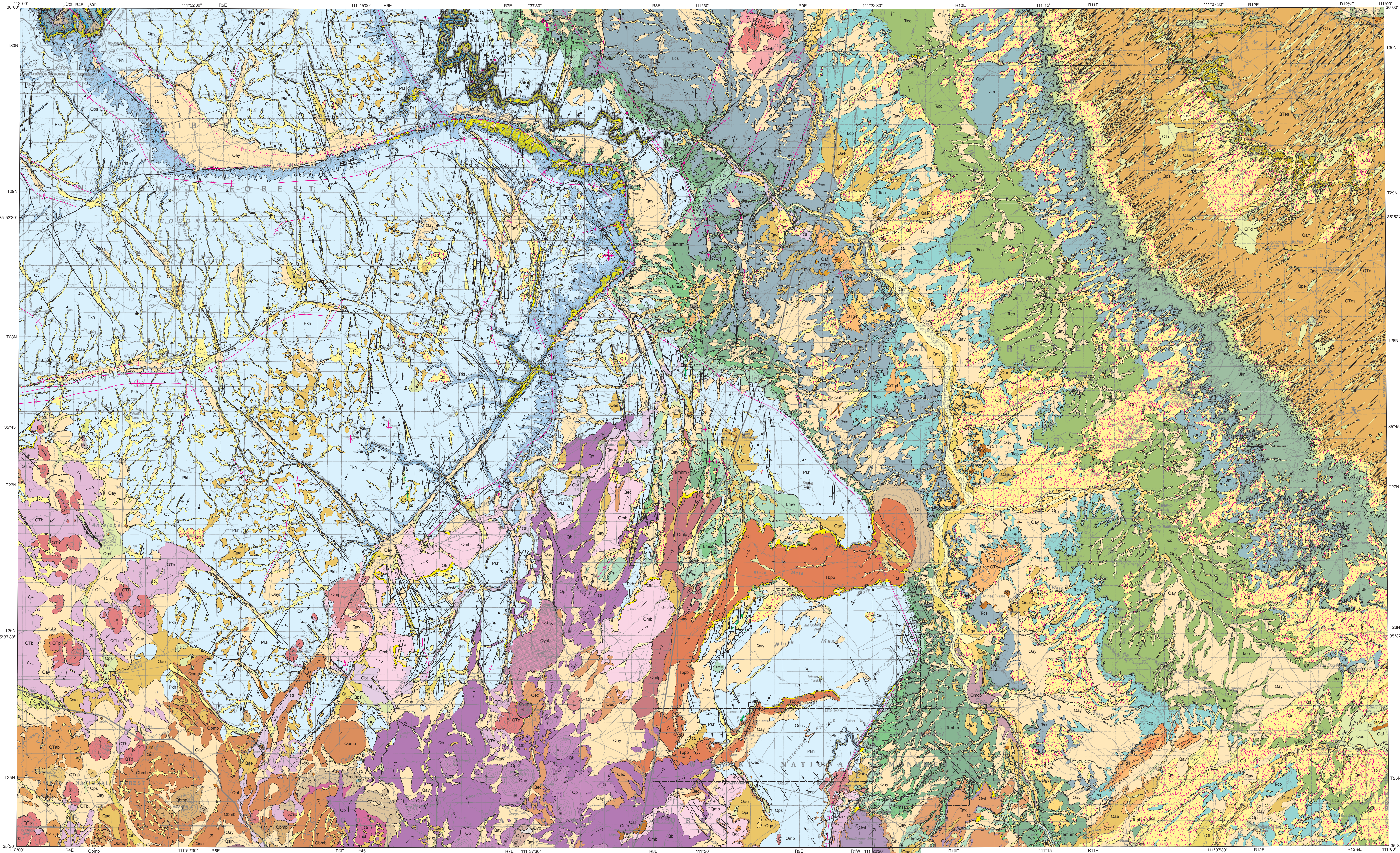


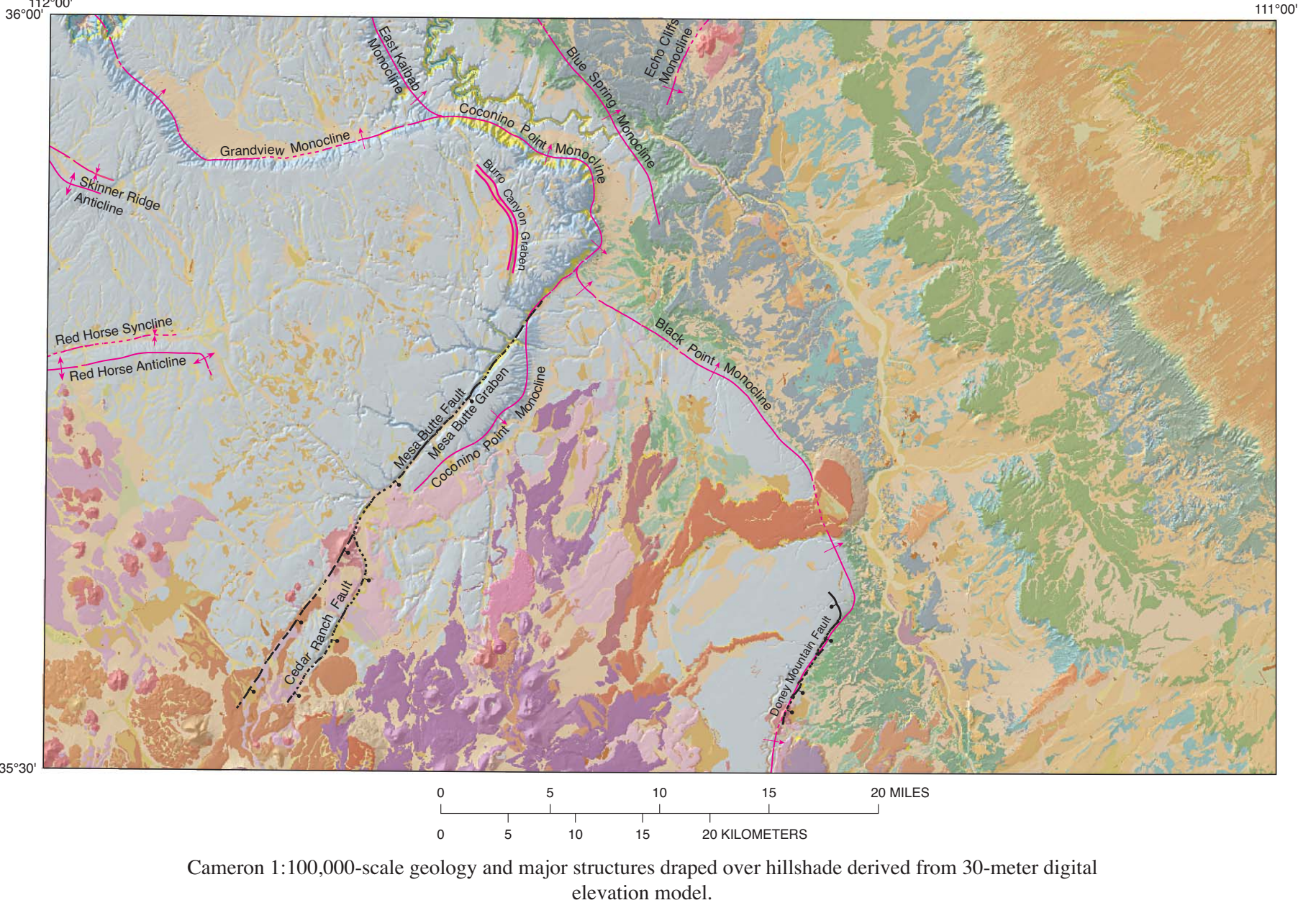
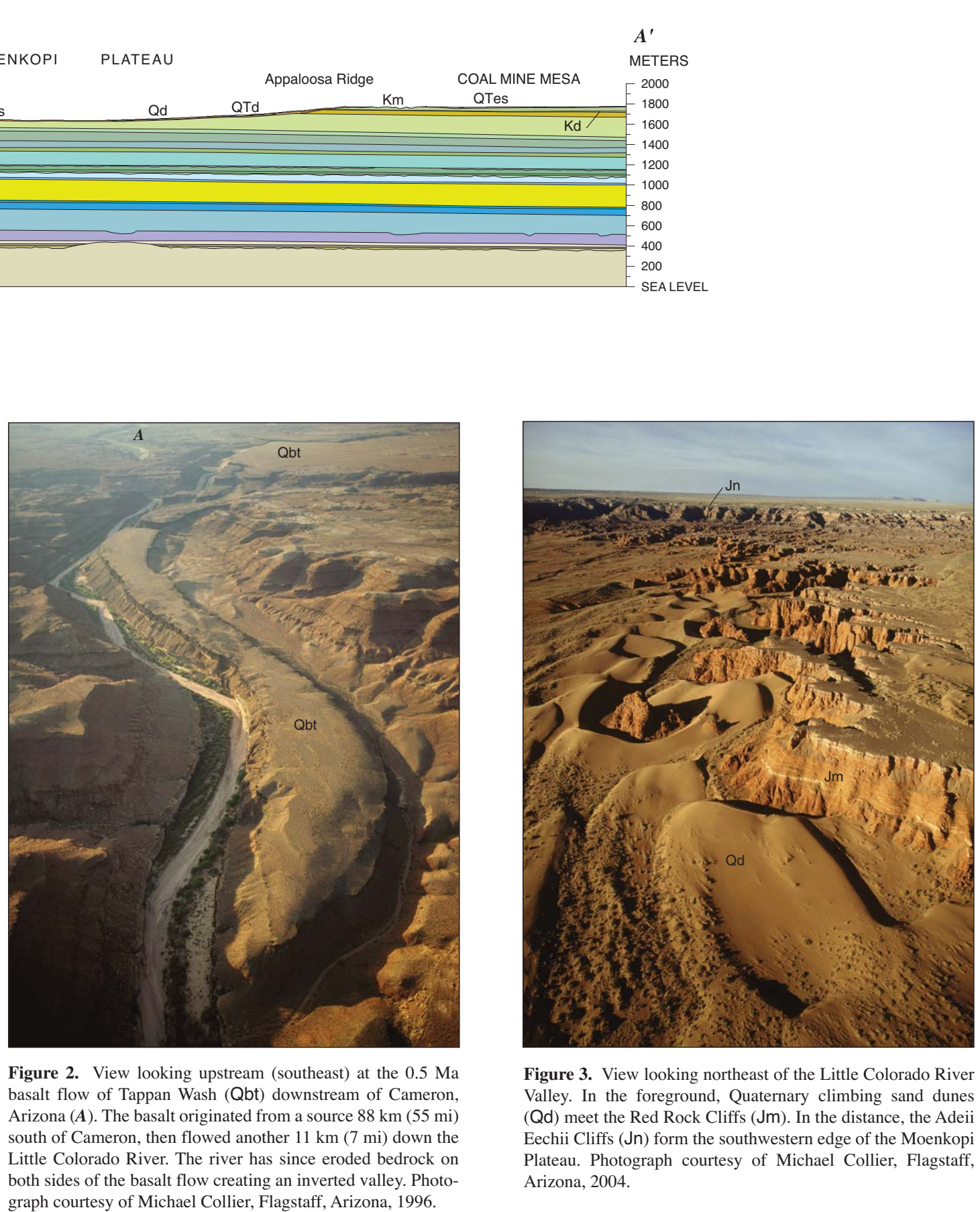
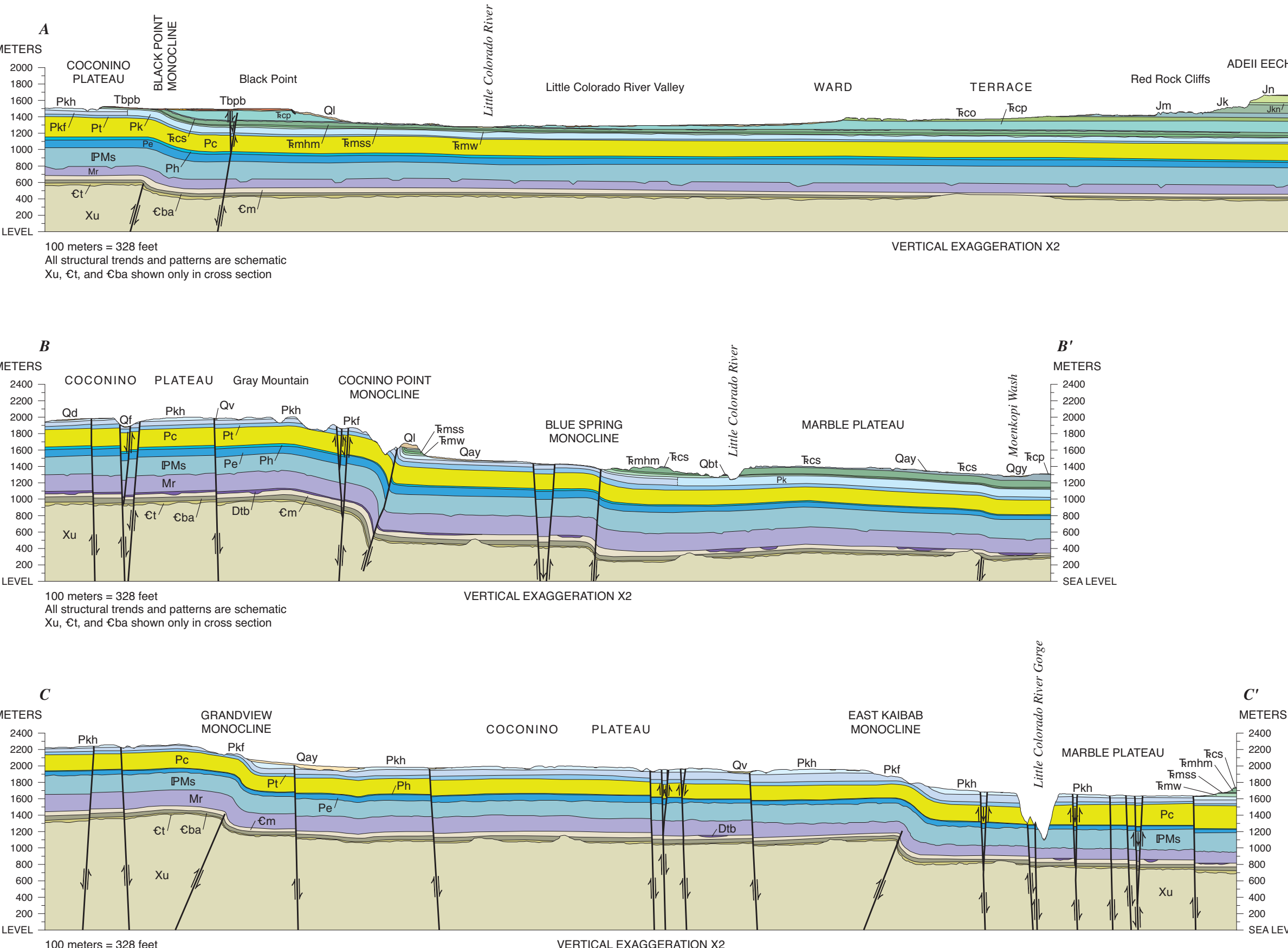


Base from U.S. Geological Survey, Cameron, 1983 Universal Transverse Mercator Projection

SCALE 1:100,000
1 2 3 4 5 6 7 8 MILES
1 2 3 4 5 6 7 8 9 10 KILOMETERS
CONTOUR INTERVAL 50 METERS



Geology mapped in 2003–2006 by G.H. Billingsley
Digital database by S.S. Priest and T.J. Felger
Edited by T.J. Felger; cartography by D.A. Ryan
Manuscript approved for publication June 22, 2007



LIST OF MAP UNITS
[Some unit exposures on the printed map are too small to distinguish the color for unit identification. These units are labeled where possible, and unlabeled units are attributed in the geodatabase.]

SURFICIAL DEPOSITS	
Qall	Artificial fill and quarries (Holocene)
Qa	Stream-channel deposits (Holocene)
Qf	Flood-plain deposits (Holocene)
Qds	Dune sand and sand sheet deposits (Holocene)
Qps	Ponded sediments (Holocene and Pleistocene?)
Qas	Young mixed alluvium and colluvial deposits (Holocene and Pleistocene?)
Qay	Young terrace-gravel deposits (Holocene and Pleistocene)
Qyl	Young alluvial fan deposits (Holocene and Pleistocene)
Qec	Eolian cinder deposits (Holocene and Pleistocene)
Qta	Talus and rock fall deposits (Holocene and Pleistocene)
Qld	Landslide deposits (Holocene and Pleistocene)
Qv	Valley-fill deposits (Holocene and Pleistocene)
Qtd	Old dune deposits, undivided (Pleistocene and Pliocene?)
Qtes	Old eolian sand sheet and dune deposits (Pleistocene and Pliocene?)
Qtae	Old mixed alluvium and colluvial deposits (Pleistocene and Pliocene?)
Qtp	Old terrace-gravel deposits (Pleistocene and Pliocene?)
Qtaf	Old alluvial fan deposits (Pleistocene and Pliocene)
Qtdg	Oldest terrace-gravel deposits (Pliocene and Miocene)

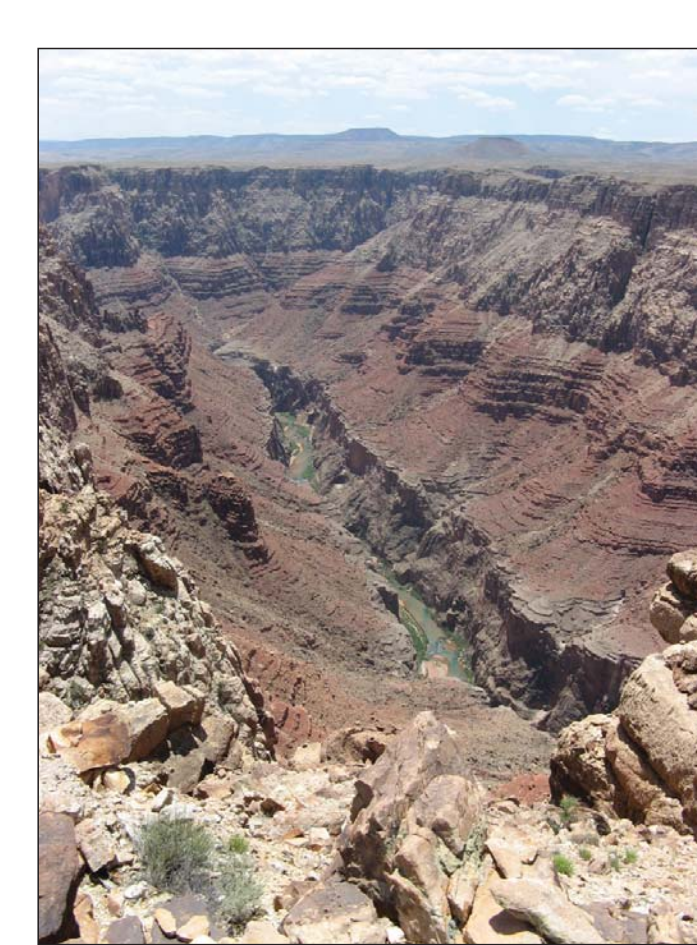
VOLCANIC ROCKS
[See table 1 in pamphlet for specific ages of volcanic rocks in the map area]
Volcanic rocks of the San Francisco Volcanic Field (Pleistocene, Pliocene, and Miocene)

Qmcb	Basalt flow of Merriam Crater (Pleistocene; Brunhes age)
Qypp	Pyroclastic deposits of S P Mountain (Pleistocene; Brunhes age)
Qyab	Basaltic andesite flow of S P Mountain (Pleistocene; Brunhes age)
Qyp	Pyroclastic deposits of five young cinder cones (Pleistocene; Brunhes age)
Qyb	Pyroclastic deposits of Shadow Mountain (Pleistocene; Brunhes age)
Qsp	Basalt flows of Shadow Mountain (Pleistocene; Brunhes age)
Qp	Pyroclastic deposits (Pleistocene; Brunhes age)
Qai	Basalt flow of Tappan Wash (Pleistocene; Brunhes age)
Qdt	Fissure deposits of Lockett Tank (Pleistocene; Brunhes age)
Qbrp	Pyroclastic deposits (Pleistocene; Brunhes or Matuyama age)
Qbrm	Basalt flows of Tappan Wash (Pleistocene; Brunhes or Matuyama age)
Qbrs	Pumice of San Francisco Mountain (Pleistocene; Matuyama age)
Qbrt	Basalt dike (Pleistocene; Matuyama age)
Qbrp	Pyroclastic deposits (Pleistocene; Matuyama age)
Qbrb	Basalt flows (Pleistocene; Matuyama age)
Qbrp	Basalt flow of Lava Point (Pleistocene; Matuyama age)
Qbrp	Rhyolite dome complex of Slate Mountain (Pleistocene; Matuyama age)
Qbrs	Basalt flows of Woodhouse Mesa (Pleistocene; Matuyama age)
Qbrt	Intrusive dike or plug (Pleistocene?) or Pliocene; Matuyama age)
Qbrp	Pyroclastic deposits (Pleistocene?) or Pliocene; Matuyama age)
Qbrp	Basalt and andesite pyroclastic deposits (Pleistocene?) or Pliocene; Matuyama age)
Qbrp	Basalt and andesite flows (Pleistocene?) or Pliocene; Matuyama age)
Qbrp	Dike in amphitheater (Pliocene; Gauss or Gilbert age)
Qbrp	Pyroclastic deposits (Pliocene; Gauss or Gilbert age)
Qbrp	Basalt flows (Pliocene; Gauss or Gilbert age)
Qbrp	Black Point Basalt flows (Pliocene)
Qbrp	Basalt flow of Cedar Ranch Mesa (Miocene)

SEDIMENTARY ROCKS	
Ts	Oldest stream-channel deposits (Pleistocene?) and Miocene)
Km	Mancos Shale (Upper Cretaceous)
Kd	Dakota Sandstone (Upper Cretaceous)
Jm	Entrada Sandstone-Cow Springs Sandstone, undivided (Middle Jurassic)
Jm	Glen Canyon Group (Lower Jurassic and Upper Triassic?)
Jm	Navajo Sandstone (Lower Jurassic)
Jm	Kayenta Formation-Navajo Sandstone transition zone (Lower Jurassic)
Jm	Kayenta Sandstone (Lower Jurassic)
Jm	Mesa Verde Formation (Lower Jurassic and Upper Triassic?)
Jm	Chino Formation (Upper Triassic)
Jm	Owl Rock Member
Jm	Petrified Forest Member
Jm	Shinarump Member and sandstone and siltstone member, undivided
Jm	Moenkopi Formation, undivided (Middle?) and Lower Triassic)

Trm	Holbrook and Moqui Members, undivided (Middle?) and Lower Triassic)
Trm	Shinarump Member and lower massive sandstone member, undivided (Lower Triassic)
Trm	Wupatki Member (Lower Triassic)
Trm	Kalabab Formation, undivided (Lower Permian)
Trm	Kalabab Formation
Trm	Harrisburg Member (Lower Permian)
Trm	Fond Mountain Member (Lower Permian)
Trm	Toroweap Formation, undivided (Lower Permian)
Trm	Cocconino Sandstone and Schneibly Hill Formation, undivided (Lower Permian)
Trm	Hermit Formation (Lower Permian)
Trm	Supal Group (Lower Permian, Pennsylvanian, and Upper Mississippian)
Trm	Expansive Sandstone (Lower Permian)
Trm	Wagonwheeler (Upper Pennsylvanian, Manakacha (Middle Pennsylvanian), and Watahomigi (Lower Pennsylvanian and Upper Mississippian) Formations, undivided)
Trm	Redwall Limestone, undivided (Upper and Lower Mississippian)
Trm	Temple Butte Formation (Upper and Middle Devonian)
Trm	Tonto Group (Middle and Lower?) Cambrian)
Trm	Mesa Limestone (Middle Cambrian)
Trm	Bright Angel Shale (Middle Cambrian) – Shown only in cross section
Trm	Tapeats Sandstone (Middle and Lower?) Cambrian – Shown only in cross section
Trm	Crystalline rocks, undivided (Paleoproterozoic) – Shown only in cross section

—	Contact – Contacts between all alluvial and eolian units are approximate and arbitrary
—	Fault – Dashed where inferred or approximately located; dotted where concealed; bar and ball on downthrown side. Number is estimated fault separation in meters
—	Fracture – Open fracture (0.5 to 3.5 m wide) without offset
—	Offset fracture – Open fracture (0.5 to 3.5 m wide) with offset (generally less than 1.5 m)
—	Fold – Showing trace of axial surface and direction of plunge; dashed where approximately located; dotted where concealed
—	Anticline
—	Plunging anticline
—	Syncline
—	Plunging syncline
—	Monocline
—	Dome
—	Strike and dip of beds
—	Inclined – Measured in the field
—	Inferred – Interpreted from aerial photographs; dip amount not determined
—	Strike of vertical and subvertical joints – Interpreted from aerial photographs; symbol placed where joints are most visible on aerial photographs
—	Collapse structure – Black dot shows circular collapse structure characterized by strata dipping inward toward a central point. Magenta dot shows circular collapse structure characterized by strata dipping inward toward central point and brecciated rock
—	Sinkhole – Enclosed depression or cave. Sinkholes breached by drainages are not shown
—	Volcanic vent
—	Uranium mine
—	Flow direction of basalt



Little Colorado River Gorge showing Paleozoic strata, Mississippian (bottom) to Permian (top). (Photograph by Susan S. Priest, 2007)

Geologic Map of the Cameron 30' x 60' Quadrangle, Coconino County, Northern Arizona

By
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2007