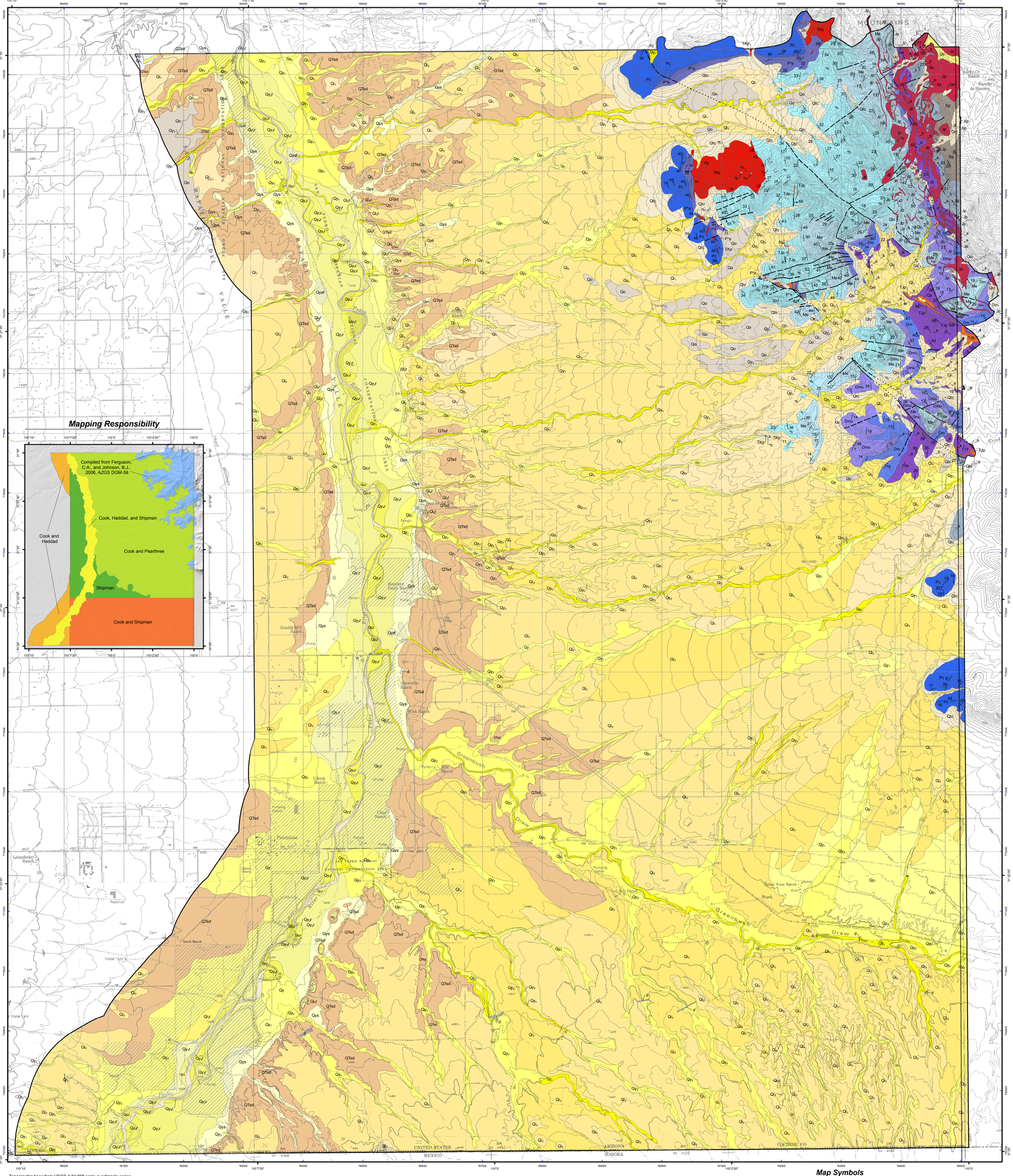

Mapping Responsibility

Topographic base from USGS 1:24,000 scale quadrangle series.
North American Datum of 1983 (NAD83). Projection and
1,000-meter grid: Universal Transverse Mercator, zone 12.

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MN
10½°
2007 MAGNETIC NORTH DECLINATION (APPROXIMATE)

SCALE 1:24,000
1 0.5 0 1 Miles
1 0.5 0 1 Kilometers
0 1000 2000 3000 4000 5000 Feet
CONTOUR INTERVAL 25 FEET

GEOLOGIC MAP OF THE HEREFORD 7½' QUADRANGLE AND THE NORTHERN PART OF THE STARK 7½' QUADRANGLE, COCHISE COUNTY, ARIZONA

Joseph P. Cook, Todd C. Shipman, Philip A. Pearthree and David E. Haddad

Arizona Geological Survey Digital Geologic Map 57 (DGM-57), version 2.0

April 2009

1:24,000 scale

Citation for this map:
Cook, J.P., Shipman, T.C., Pearthree, P.A., and Haddad, D.E., 2009, Geologic Map of the Hereford 7½' Quadrangle and the Northern Part of the Stark 7½' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map 57 (DGM-57), version 2.0, 1 sheet, layout scale 1:24,000, with text.

(also available in Adobe pdf format on CD-ROM)

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Note – All bedrock geologic mapping was compiled from a preliminary, unreviewed version of:
Ferguson, C.A., and Johnson, B.A., 2006, Bedrock geologic map and cross sections of the Hereford 7.5' Quadrangle, Cochise County, Arizona: Arizona Geological Survey Digital Geologic Map DGM-58, scale 1:12,000.

Acknowledgements:
Genevieve Pearthree was the cartographer for DGM-57, version 2.0.

Map Unit Descriptions

Other units

Plowed areas - historically or actively plowed fields, irrigated pastures, and other lightly disturbed ground

d — **Disturbed ground** - disturbed due to agriculture, extensive excavation, and blockage of drainages for cattle tanks

Qtc — **Quaternary hillslope talus and colluvium** - unconsolidated to moderately-consolidated talus and colluvium deposits mantling the lower slopes of bedrock outcrops

San Pedro River alluvium

Qyaf — **Active river channel deposits** - unconsolidated, very poorly sorted sandy to cobbly beds in active river channels

Qyaf — **Flood channel and low terrace deposits** - unconsolidated sand, gravel and silt deposits on bars, low terraces and flood channels

Qyaf — **Historical river terrace deposits** - unconsolidated sand, gravel and silt deposits on low terraces inset below the abandoned early historical floodplain

Qyaf — **Latest Holocene to historical river terrace deposits** - silt, clay, sand and minor gravel deposits underlying the early historical floodplain

Qyaf — **Late to early Holocene river terrace deposits** - silt, clay, sand and minor gravel terrace deposits slightly above the early historical floodplain

Qlaf — **Late Pleistocene river terrace deposits** - gravelly, sandy river terrace deposits up to 10 m above the active river channel

Qlaf — **Middle to late Pleistocene river terrace deposits** - older, higher gravelly, sandy river terrace deposits

Piedmont Deposits

Qy1 — **Modern stream channel deposits** - unconsolidated deposits in active piedmont channels consisting of very poorly sorted sand, pebbles, cobbles, and isolated boulders

Qy2 — **Latest Holocene alluvium** - unconsolidated, very poorly sorted silty to cobbly low terrace and overflow channel deposits

Qyaf — **Late Holocene alluvium, active fan deposits** - active portions of young fan deposits exhibiting distributary drainage patterns

Qy2 — **Late Holocene alluvium** - young deposits located primarily near active channels including floodplain, low-lying terrace, and tributary channel alluvium which are part of the modern piedmont drainage system

Qy1 — **Older Holocene alluvium** - terrace deposits located primarily along the flanks of incised drainages at higher elevations than Qy2 deposits

Qys — **Fine-grained Holocene alluvium derived from the St. David Formation** - Holocene alluvium derived from distal Saint David basin fill deposits

Qy — **Holocene alluvial deposits, undifferentiated** - Holocene alluvium, undivided

Ql3 — **Late Pleistocene alluvial fan and terrace deposits** - moderately dissected, relatively planar to gently rounded alluvial terraces exhibiting moderate soil development, calcium carbonate accumulation, and tributary drainage networks

Ql2 — **Middle to late Pleistocene alluvial fan and terrace deposits** - broad, moderately to well-rounded piedmont surfaces exhibiting moderately dissected tributary drainage networks located at significantly higher elevations than younger deposits

Ql1 — **Early to middle Pleistocene alluvial fan and terrace deposits** - high standing, very well rounded, highly dissected piedmont surfaces exhibiting reddish, well-developed soils and strong calcium carbonate accumulation

Qo — **Early Pleistocene alluvial fan deposits** - deeply dissected, very well-rounded remnant alluvial fan deposits exhibiting thick, exposed, indurated petrocalcic subsurface horizons

Quaternary to Tertiary Basin Fill alluvium

QTsd — **Pliocene to early Pleistocene Saint David Formation** - basin fill sediments from the middle to upper member of the Saint David formation exposed in arroyo cuts along the San Pedro River

Bedrock units

TKp — **Coarse-grained rhyolite porphyry (Late Cretaceous-Early Tertiary)** - felsic porphyry containing 10-30% phenocrysts of subhedral quartz (2-6 mm), euhedral to subhedral potassium feldspar (1-5 mm), euhedral to subhedral plagioclase (1-3 mm), and biotite (1-3 mm)

TJp — **Phenocryst-poor rhyolite porphyry and aplite (Late Cretaceous-Early Tertiary or Jurassic)** - phenocryst-poor rhyolite porphyry containing <5-7% <2-3 mm feldspar phenocrysts that grades into aplite towards the margins of dikes

Jp — **Coarse-grained rhyolite porphyry (Jurassic)** - felsic porphyry containing 10-30% phenocrysts of subhedral quartz (2-6 mm), euhedral to subhedral potassium feldspar (1-5 mm), euhedral to subhedral plagioclase (1-3 mm), and biotite (1-3 mm)

Pc — **Colina Limestone (Permian)** - medium- to thick-bedded, amalgamated skeletal limestone, typically with matrix-supported texture

P*e — **Earp Formation (Permian - Pennsylvanian)** - interbedded thin- to medium-bedded red shale, mudstone, silty mudstone, and fine-grained ripple cross-laminated sandstone with subordinate thin- to medium-bedded carbonate beds, dominated by massive micrite and skeletal wackestone

*h — **Horquilla Limestone (Pennsylvanian)** - medium- to thick-bedded cherty limestone with subordinate interbedded siliciclastic units; dark shale throughout the main part of the unit and red shale, silty shale and rare fine-grained ripple cross-laminated and cross-stratified sandstone in the upper part

Me — **Escabrosa Limestone (Mississippian)** - Medium- to thick-bedded limestone, dominated by thick-bedded, amalgamated, crinoid columnal grainstone, especially towards the base of the unit, which is typically a cliff-former

Dmu — **Upper Martin Limestone (Devonian)** - a two-part sequence that grades upward from lithologies typical of the lower Martin; recessive, medium-bedded micritic carbonate and sparsely skeletal wackestone (typically dolostone) with shale or mudstone interbeds, into lithologies typical of the Escabrosa; medium- to thick-bedded crinoid columnal skeletal packstone and grainstone

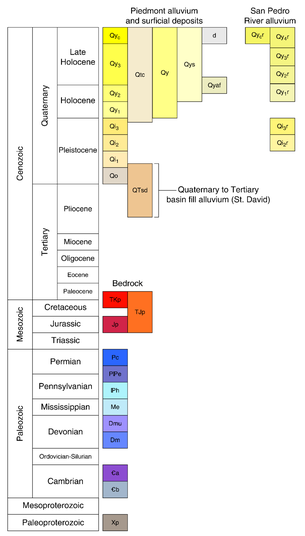
Dm — **Lower Martin Limestone (Devonian)** - dolostone, limestone, and shale. A complex sequence of thin- to medium-bedded skeletal wackestone, sparsely skeletal micrite, rare skeletal packstone, shale, calcareous mudstone, and minor quartz sandstone

_a — **Abrigo Formation (Cambrian)** - thin to medium-bedded carbonate, siltstone, silty mudstone, and fine-grained argillaceous sandstone

_b — **Bolsa Quartzite (Cambrian)** - medium- to thick-bedded, cross-stratified quartz sandstone, and pebbly feldspathic quartz sandstone

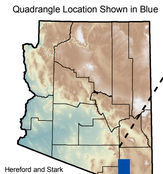
Xp — **Pinal Schist (Paleoproterozoic)** - medium- to fine-grained sericitic schist ranging from light green to dark gray

Unit Correlation



Location Index Map

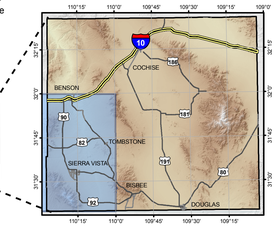
Quadrangle Location Shown in Blue



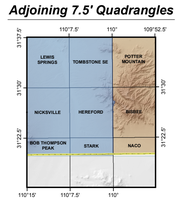
Hereford and Stark 7.5' Quadrangles are located in southwestern Cochise County.

Cochise County

Mapped Area Shown in Blue



Adjoining 7.5' Quadrangles



Map Symbols

Faults
- fault, accurate
- fault, approximate
- fault, concealed

Contacts
- accurate contact
- approximate contact

Structure Symbols
- bedding, inclined
- bedding, inclined with tops known
- generic foliation, inclined
- fault attitude
- vein orientation

Dikes
- mafic dike