U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

AFGHAN GEOLOGICAL SURVEY
Prepared in cooperation with the U.S. Geological Survey and the Afghanistan Geodesy and Cartography Head Office
Under the auspices of the U.S. Agency for International Development and the U.S. Trade and Development Agency

USGS OPEN-FILE REPORT 2005-1112-A
AGS OPEN-FILE REPORT (515/516/517) 2005-1112-A
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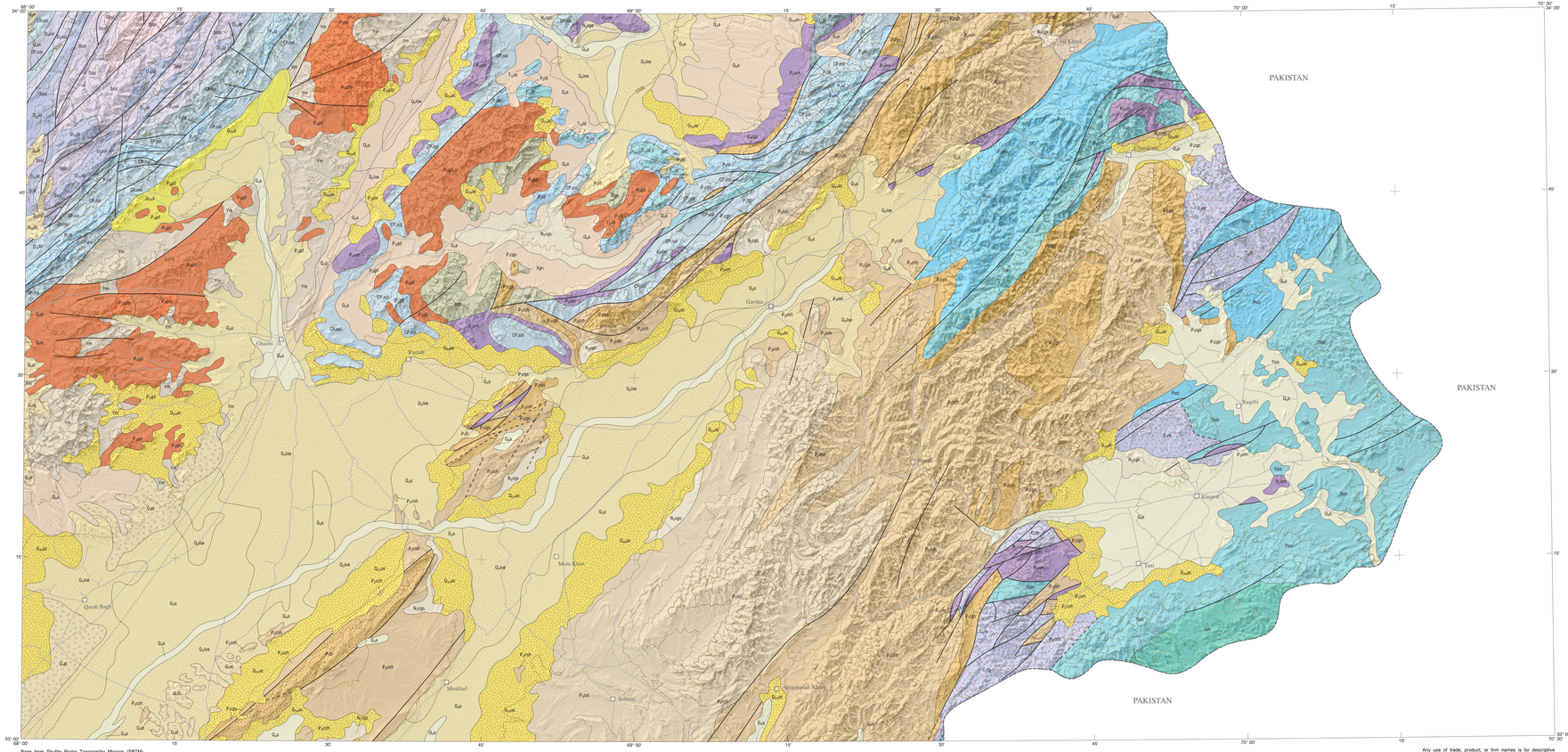
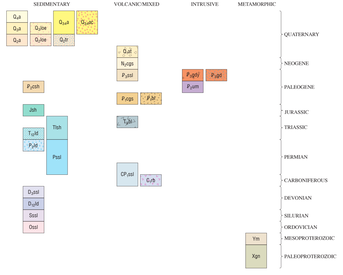


CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal **Conglomerate and sandstone (Holocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qal/pl **Conglomerate and sandstone (Holocene and late Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qal/plc **Fan alluvium and colluvium (Holocene and late Pleistocene)**—Fan alluvium and colluvium: shingly and detrital sediments, gravel, sand, clay

Qal **Conglomerate and sandstone (late Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qloe **Loess (late Pleistocene)**—Loess more abundant than sand, clay

Qal **Conglomerate and sandstone (middle Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qloe **Loess (middle Pleistocene)**—Loess more abundant than sand, clay

Qtr **Travertine (middle Pleistocene)**—Travertine

Qalt **Andesite tuff (early Pleistocene)**—Andesite, dacite tuff and welded tuff (Dashtinovar Series)

Ngps **Conglomerate and sandstone (Pliocene)**—Gray conglomerate, grit, sandstone more abundant than siltstone, clay, limestone, marl; gypsum, salt; acid to mafic volcanic rocks

P₃gd/q **Granodiorite and granosyenite (Oligocene)**—Granodiorite, alaskite, granosyenite more abundant than granite (Phase II)

P₃gd **Granodiorite (Oligocene)**—Granodiorite (Phase I)

P₃sl **Sandstone and siltstone (Oligocene)**—Sandstone, siltstone more abundant than clay, conglomerate, limestone; marl; acid and mafic volcanic rocks

P₃um **Ultramafic intrusions (Eocene)**—Dunite, peridotite, serpentinite

P₃ch **Clay and shale (Eocene)**—Clay, shale, siltstone more abundant than sandstone, limestone, marl, gypsum, conglomerate

P₃gs **Conglomerate and sandstone (Paleocene)**—Conglomerate, sandstone more abundant than siltstone, limestone, shale; mafic volcanic rocks

P₃bl **Conglomerate and sandstone (Paleocene)**—Mafic volcanic rocks more abundant than conglomerate, sandstone, siltstone, shale

Jsh **Shale (Jurassic)**—Shale and mudstone more abundant than limestone, sandstone

TRsh **Limestone and shale (Triassic)**—Limestone, shale more abundant than sandstone

T₃bl **Rhyolite lava (Late Triassic)**—Shale more abundant than phyllite, andesite to basalt (greenstone altered)

T₂ld **Limestone and dolomite (Middle and Early Triassic)**—Limestone, dolomite, marl

Prsd **Sandstone and siltstone (Permian)**—Limestone, dolomite, sandstone, siltstone, shale, phyllite, mafic volcanic rocks, bauxite and bauxite-bearing rocks

P₂ld **Limestone and dolomite (Late Permian)**—Limestone, dolomite more abundant than marl, conglomerate, sandstone, siltstone, shale, bauxite and bauxite-bearing rocks

CP₁sd **Sandstone and siltstone (Early Permian and Carboniferous)**—Sandstone and siltstone more abundant than slate, andesite to basalt volcanic rocks

C₂rh **Rhyolite to basalt (Early Carboniferous)**—Rhyolite to basalt volcanic rocks more abundant than limestone, slate, sandstone, conglomerate

D₃sl **Sandstone and siltstone (Late Devonian)**—Sandstone and siltstone more abundant than limestone

D₂ld **Limestone and dolomite (Middle and Early Devonian)**—Limestone and dolomite more abundant than sandstone, siltstone

Sssl **Sandstone and siltstone (Silurian)**—Sandstone, siltstone, shale

Ossl **Sandstone and siltstone (Ordovician)**—Sandstone and siltstone more abundant than shale

Ym **Metamorphic rocks, undivided (Mesoproterozoic)**—Greenschist, gneiss, quartzite, marble, amphibolite (metavolcanic lava and sedimentary rocks)

Xgn **Gneiss (Paleoproterozoic)**—Two-mica, biotite, biotite-amphibole, garnet-biotite, and plagioclase gneiss; migmatite, quartzite, marble, amphibolite

EXPLANATION OF MAP SYMBOLS

Contact

Fault—Dashed where approximately located; dotted where concealed

DATA SUMMARY

This map was produced from several larger digital datasets. Topography was derived from Shuttle Radar Topography Mission (SRTM) 85-meter digital data. Gaps in the original dataset were filled with data digitized from contours on 1:200,000-scale Soviet General Staff Sheets (1978–1997). Contours were generated by cubic convolution averaged over four pixels using TNTmips' surface-modeling capabilities. Cultural data were extracted from files downloaded from the Afghanistan Information Management Service (AIMS) Web site (http://www.aims.org.af). The AIMS files were originally derived from maps produced by the Afghanistan Geodesy and Cartography Head Office (AGCHO). Geologic data and the international boundary of Afghanistan were taken directly from Abdullah and Chmyriov (1977).

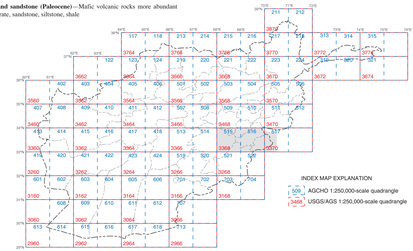
It is the primary intent of the U.S. Geological Survey (USGS) to present the geologic data in a useful format while making them publicly available. These data represent the state of geologic mapping in Afghanistan as of 2005, although the original map was released in the late 1970s (Abdullah and Chmyriov, 1977). The USGS has made no attempt to modify original geologic map-unit boundaries and faults; however, modifications to map-unit symbology, and minor modifications to map-unit descriptions, have been made to clarify lithostratigraphy and to modernize terminology. The generation of a Correlation of Map Units (CMU) diagram required interpretation of the original data, because no CMU diagram was presented by Abdullah and Chmyriov (1977).

This map is part of a series that includes a geologic map, a topographic map, a Landsat natural-color-image map, and a Landsat false-color-image map for the USGS/AGS (Afghan Geological Survey) quadrangles shown on the index map. The maps for any given quadrangle have the same open-file number but a different letter suffix, namely, A-, B-, C, and -D for the geologic, topographic, Landsat natural-color, and Landsat false-color maps, respectively. The present map series is to be followed by a second series, in which the geology is reinterpreted on the basis of analysis of remote-sensing data, limited fieldwork, and library research. The second series is to be produced by the USGS in cooperation with the AGS and AGCHO.

REFERENCE CITED

Abdullah, Sh., and Chmyriov, V.M., eds., 1977, Map of mineral resources of Afghanistan: Kabul, Ministry of Mines and Industries of the Democratic Republic of Afghanistan, Department of Geological and Mineral Survey, V/O "Technoexport" USSR, scale 1:500,000.

Geospatial analysis software developed by MicroImages, Inc., Lincoln, NE 68508-2010.



Base from Shuttle Radar Topography Mission (SRTM) 85-meter digital data
Cultural data from digital files from AIMS Web site (http://www.aims.org.af)
Projection: Universal Transverse Mercator, zone 42, WGS 84 Datum

SCALE 1:250 000
5 0 5 10 15 20 25 30 35 40 KILOMETERS
5 0 5 10 15 20 MILES
CONTOUR INTERVAL 100 METERS

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

GEOLOGIC MAP OF QUADRANGLE 3368 AND PART OF QUADRANGLE 3370, GHAZNI (515), GARDEZ (516), AND PART OF JAJI-MAYDAN (517) QUADRANGLES, AFGHANISTAN

Compiled by
Florian Maldonado and Kenzie J. Turner
2005

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