

Nanga Parbat-Haramosh Massif

Structural summary Map

Map Units - the order of the bedrock units in this key is not intended to imply any relative ages

- Glacier, ice field
- Q Unconsolidated river terrace and alluvial fan gravels and sands (only large areas shown, in Indus Valley) - shown darker where tilted and/or gently folded
- Js Jaipur sandstone, conglomerate (strongly folded; not dated but probably Pleistocene)

Kohistan-Ladakh Series Rocks

- K Less-deformed mafic rocks: amphibolite, metabasite, metadiorite/gabbro, etc.
- Km Strongly foliated to mylonitic mafic gneisses of the Main Mantle Thrust shear zone
- Ku from TM image interpretation - ultramafics/serpentine
- Kd hornblende diorite/quartz diorite

Rocks of the Indian metasedimentary "cover" and Himalayan mylonite zones

- M6 Marbles, calc-schists, and pelitic schists, interlayered with large amphibolite/mafic gneiss sheets and boudins
- M5 Metapelitic schists (typically garnetiferous) interlayered with lesser marbles, amphibolites, graphitic schists, and psammitic schists (the latter mostly in the upper part). Minor ultramafic inclusions (meta-melange?), red diagonal lines - contains abundant deformed granite sheets
- M4 Large amphibolite sheet in east Indus Gorge section. Local ultramafic rock at base. Possibly ophiolite-derived, or Panjal Trap equivalent.
- M3 Grey porphyroclastic mylonitic quartzofeldspathic gneisses (porphyroclasts sparse to moderate abundance, and small)
- M2 Megacrystic feldspar-porphyroclastic garnetiferous mylonitic gneisses. Coarse and abundant megacrysts. Locally lower-strain (near Rama Valley)
- M1 Planar-foliated, non-porphyroclastic, very highly strained mylonitic gneisses (quartzofeldspathic, pelitic)

Plutonic Rocks of the Raikhot-Diamir and Rupal-Chhichi Shear Zones

- G4 K-feldspar porphyroclastic gneisses, mostly S/C mylonite fabrics (coarse and abundant porphyroclasts)
- G3 Biotite Granite with abundant and distinctively clumped biotite aggregates (Jalhari Granite). Much is moderately to strongly foliated, with asymmetric shear zone fabrics

Other Plutonic Rocks

- G2 Granite and leucogranite - little to moderately deformed
- G1 Strongly lineated granite in the Raikhot shear zone near Tato and moderately foliated to mylonitic leucogranite near Garol in Biji Gah

Rocks of the Nanga Parbat Core

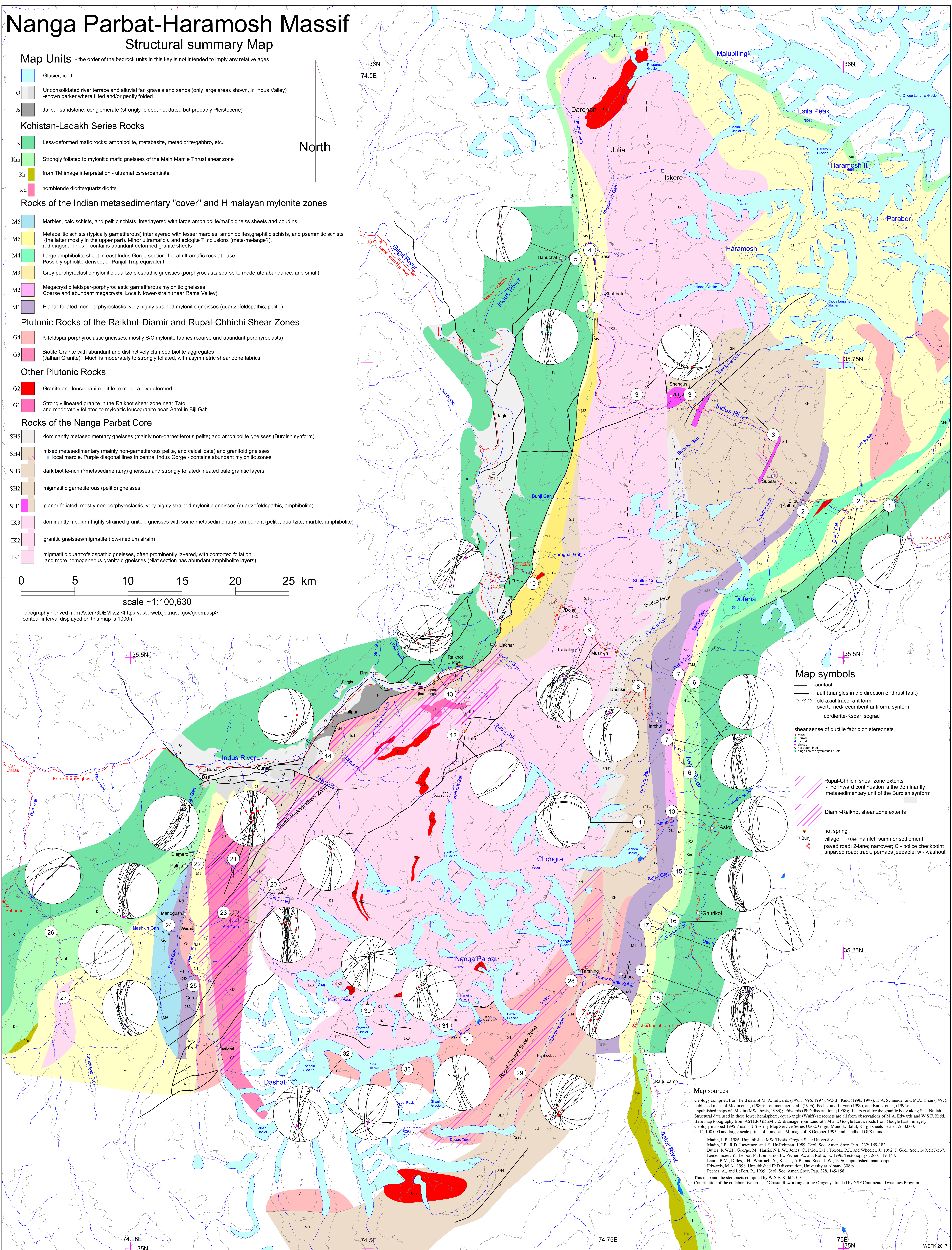
- SH5 dominantly metasedimentary gneisses (mainly non-garnetiferous pelite) and amphibolite gneisses (Burdish syform)
- SH4 mixed metasedimentary (mainly non-garnetiferous pelite, and calc-silicate) and granitoid gneisses - local marble. Purple diagonal lines in central Indus Gorge - contains abundant mylonitic zones
- SH3 dark biotite-rich (?metasedimentary) gneisses and strongly foliated/lineated pale granitic layers
- SH2 migmatitic garnetiferous (pelitic) gneisses
- SH1 planar-foliated, mostly non-porphyroclastic, very highly strained mylonitic gneisses (quartzofeldspathic, amphibolite)
- IK3 dominantly medium-highly strained granitoid gneisses with some metasedimentary component (pelite, quartzite, marble, amphibolite)
- IK2 granitic gneisses/migmatite (low-medium strain)
- IK1 migmatitic quartzofeldspathic gneisses, often prominently layered, with contorted foliation, and more homogeneous granitoid gneisses (Niat section has abundant amphibolite layers)

0 5 10 15 20 25 km

scale ~1:100,630

Topography derived from Aster GDEM v.2 <<https://asterweb.jpl.nasa.gov/gdem.asp>> contour interval displayed on this map is 1000m

North



Map symbols

- contact
- fault (triangles in dip direction of thrust fault)
- fold axial trace; antiform
- overturned/recumbent antiform, synform
- cordillerite-Kspat isograd
- shear sense of ductile fabric on stereonet
 - Trist
 - Normal
 - Reverse
 - Oblique
 - Not determined
 - Large line of approximately F1 slip
- Rupal-Chhichi shear zone extends - northward continuation is the dominantly metasedimentary unit of the Burdish syform
- Diamir-Raikhot shear zone extends
- hot spring
- village
- hamlet; summer settlement
- paved road; 2-lane; narrower; C - police checkpoint
- unpaved road; track, perhaps jeepable; w - washout

Map sources

Geology compiled from field data of M. A. Edwards (1995, 1996, 1997), W.S.F. Kidd (1996, 1997), D.A. Schneider and M.A. Khan (1997); published maps of Madin et al. (1989); Lemmenicier et al. (1996); Pecher and LeFort (1999), and Butler et al. (1992); unpublished maps of Madin (MSc thesis, 1986); Edwards (PhD dissertation, 1998); Laurs et al for the granitic body along Stak Nallah. Structural data used in these lower hemisphere, equal-angle (Wulff) stereonet are all from observations of M.A. Edwards and W.S.F. Kidd. Base map topography from ASTER GDEM v.2, drainage from Landsat TM and Google Earth, roads from Google Earth imagery. Geology mapped 1995-7 using US Army Map Service Series U502, Gilgit, Muztagh, Baltit, Kargil sheets scale 1:250,000, and 1:100,000 and larger scale prints of Landsat TM image of 8 October 1995, and handheld GPS units.

Madin, I. P., 1986. Unpublished MSc Thesis. Oregon State University.

Madin, I.P., R.D. Lawrence, and S. U. Rehman, 1989. Geol. Soc. Amer. Spec. Pap. 232: 169-182.

Butler, R.W.H., George, M., Harris, N.B.W., Jones, C., Prior, D.J., Treloar, P.J., and Wheeler, J., 1992. J. Geol. Soc., 149, 557-567.

Lemmenicier, Y., Le Fort P., Lombardo, B., Pecher, A., and Rolfo, F., 1996. Tectonophysics, 260, 119-143.

Laurs, B.M., Dilles, J.H., Warrach, Y., Kausar, A.B., and Snee, L.W., 1996. Unpublished manuscript.

Edwards, M.A., 1998. Unpublished PhD dissertation, University at Albany, 208 p.

Pecher, A., and LeFort, P., 1999. Geol. Soc. Amer. Spec. Pap. 328, 145-158.

This map and the stereonet compiled by W.S.F. Kidd 2017.

Contribution of the collaborative project "Crustal Reworking during Orogeny" funded by NSF Continental Dynamics Program