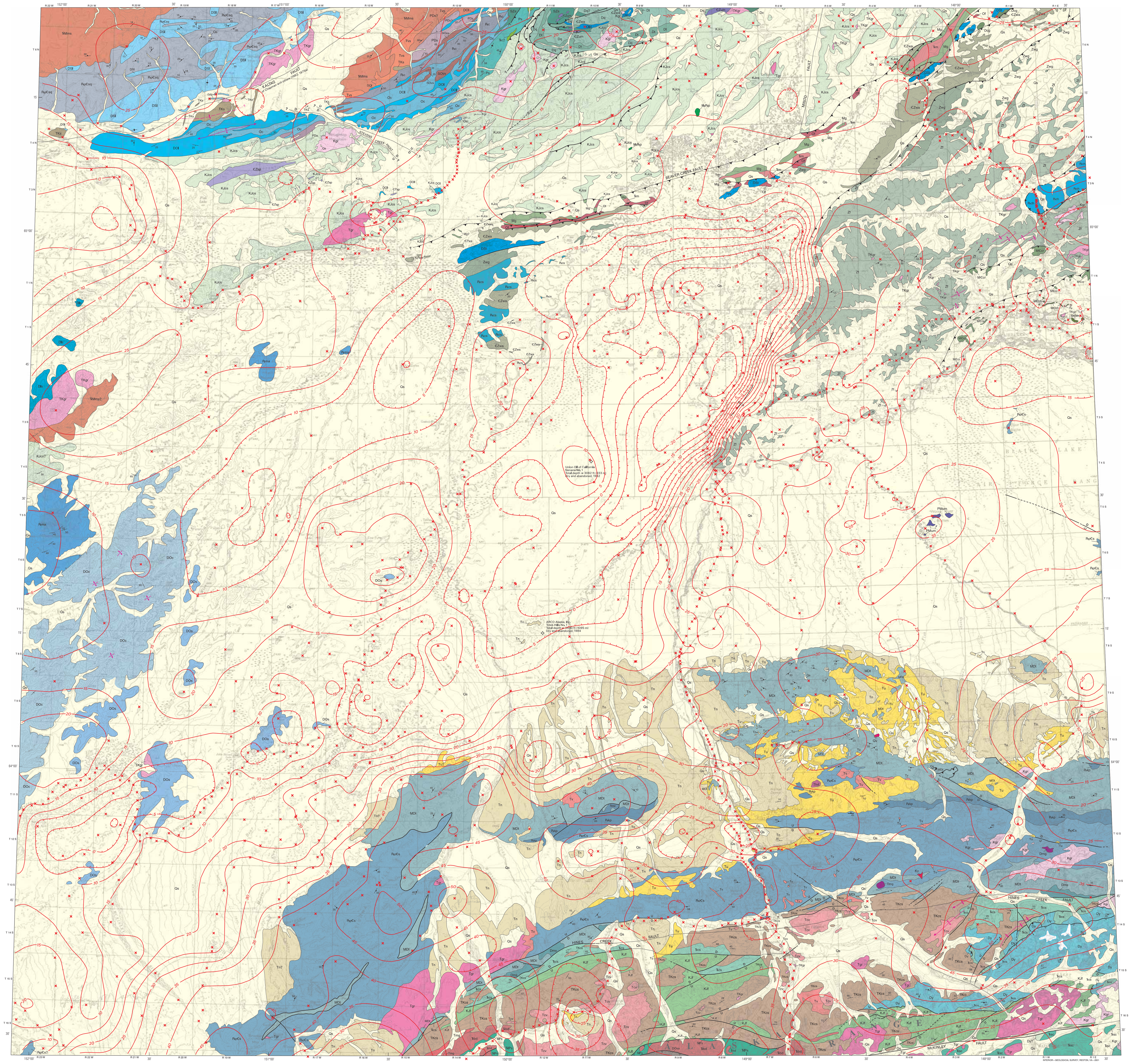
GEOLOGIC INVESTIGATIONS SERIES I–2543
Pamphlet accompanies map

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

USGS science for a changing world



Base from U.S. Geological Survey, Fairbanks, 1956 (rev. 1976); Healy, 1956 (minor rev. 1981); Kantishna River, 1952 (limited rev. 1983); Livengood, 1956 (rev. 1977); Mt. McKinley, 1958 (limited rev. 1982); Tanana, 1960 (rev. 1976)
Universal Transverse Mercator projection

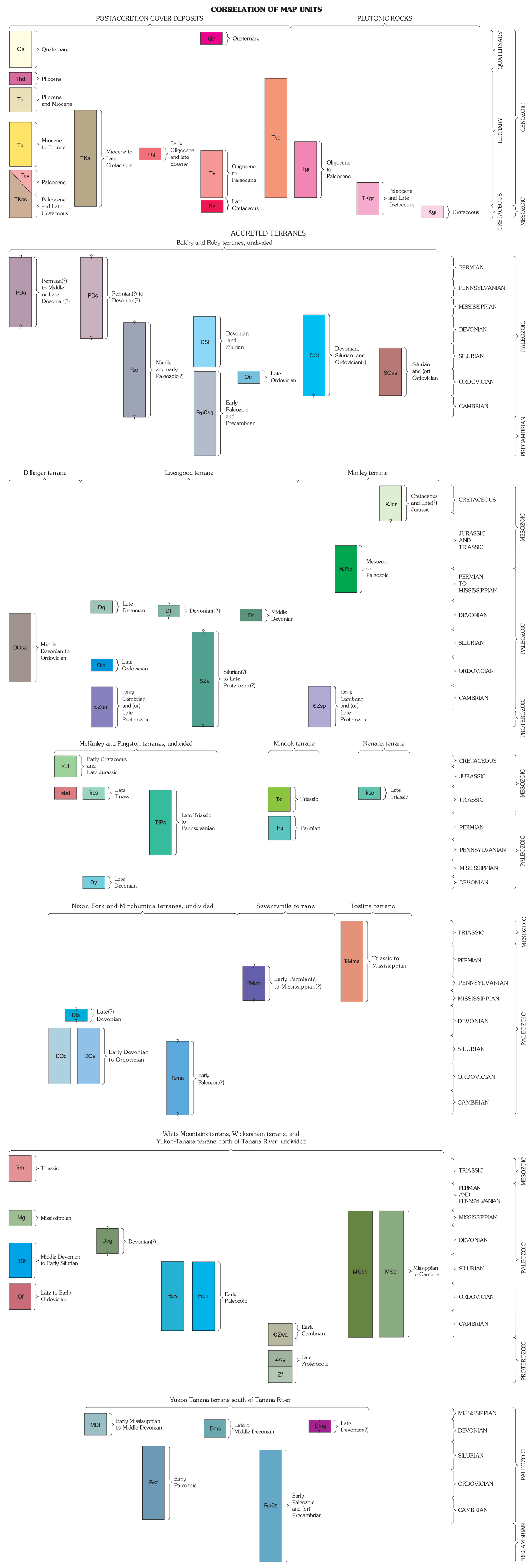
SCALE 1:250 000

CONTOUR INTERVAL 200 FEET
DASHED OR DOTTED LINES REPRESENT 100-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

APPROXIMATE MEAN DECLINATION, 2001

Bedrock geology compiled by Gina M. Frost in 1993 from sources shown on Index Map. Isostatic gravity compiled by David F. Barnes
Edited by Jan L. Zigler; layout and design by Kevin Ghequiere and Susan Mayfield; digital cartography by Richard Koch
Manuscript approved for publication March 6, 1995

CORRELATION OF MAP UNITS



LIST OF MAP UNITS

POSTACCRETION COVER DEPOSITS

- Qs — **Surficial deposits (Quaternary)**
- Qv — **Volcanic rocks (Quaternary)**
- Thd — **Hornblende dacite (Pliocene)**
- Tvs — **Volcanic and sedimentary rocks (Tertiary)**
- Tn — **Nenana Gravel (Pliocene and Miocene)**
- TKs — **Sedimentary rocks (Miocene to Late Cretaceous)**
- Tu — **Usibelli Group (Miocene to Eocene)**
- Tmg — **Mount Galen Volcanics of Decker and Gilbert (1978) (early Oligocene and late Eocene)**
- Tv — **Volcanic rocks (Oligocene to Paleocene)**
- **Cantwell Formation (Paleocene and Late Cretaceous)**
  - Tcv — **Volcanic rocks (Paleocene)**
  - TKcs — **Sedimentary rocks (Paleocene and Late Cretaceous)**
- Kv — **Volcanic rocks (Late Cretaceous)**

PLUTONIC ROCKS

- Tgr — **Granitic rocks (Oligocene to Paleocene)**
- TKgr — **Granitic rocks (Paleocene and Late Cretaceous)**
- Kgr — **Granitic rocks (Cretaceous)**

ACCRETED TERRANES

Baldry and Ruby terranes, undivided

- PDa — **Argillaceous rocks (Permian? to Middle or Late Devonian?)**
- PDs — **Schistose rocks (Permian? to Devonian?)**
- DSl — **Limestone, dolomite, greenstone, schist, and chert (Devonian and Silurian)**
- DOl — **Limestone, dolomite, greenstone, and schist (Devonian, Silurian, and Ordovician?)**
- Pzc — **Clastic rocks (middle and early Paleozoic?)**
- SOvs — **Volcanic and sedimentary rocks (Silurian and (or) Ordovician)**
- PzpCsq — **Schist, quartzite, phyllite, and slate (early Paleozoic and Precambrian)**
- Oc — **Chert (Late Ordovician)**

Dillinger terrane

- DOsa — **Sandstone, argillite, and limestone (Middle Devonian to Ordovician)**

Livengood terrane

- Dq — **Quail unit (Late Devonian)**
- Dt — **Troublesome unit (Devonian?)**
- Dc — **Cascaden Ridge unit (Middle Devonian)**
- SZa — **Amy Creek unit (Silurian? to Late Proterozoic?)**
- Old — **Livengood Dome Chert (Late Ordovician)**
- ЄZum — **Ultramafic and mafic rocks (Early Cambrian and (or) Late Proterozoic)**

Manley terrane

- KJcs — **Clastic sedimentary rocks (Cretaceous and Late? Jurassic)**
- MzPzp — **Phyllite, schistose phyllite, quartzite, siltite, amphibolite, diorite, and greenstone (Mesozoic or Paleozoic)**
- ЄZsp — **Serpentinite and mafic rocks (Early Cambrian and (or) Late Proterozoic)**

McKinley and Pingston terranes, undivided

- KJf — **Flysch (Early Cretaceous and Late Jurassic)**
- Trbd — **Basalt, diabase, gabbro, and subordinate interbedded sedimentary rocks (Late Triassic; Norian and Karnian)**
- Trcs — **Calcareous sedimentary rocks (Late Triassic; Norian and Karnian)**
- TrPs — **Flysch-like sedimentary rocks (Late Triassic to Pennsylvanian)**
- Dy — **Yanert Fork sequence (Late Devonian)**

Minook terrane

- Trc — **Black shale and chert (Triassic)**
- Ps — **Sedimentary rocks (Permian)**

Nenana terrane

- Trsc — **Sedimentary calcareous rocks (Late Triassic)**

Nixon Fork and Minchumina terranes, undivided

- Dls — **Limestone and siltstone (Late? Devonian)**
- DOc — **Chert (Early Devonian to Ordovician)**
- DOs — **Shaly rocks (Early Devonian to Ordovician)**
- Pzma — **Mudstone, argillite, grit, quartzite, calcareous quartz-chert arenite, sandy limestone, and minor chert and quartz-mica schist (early Paleozoic?)**

Seventymile terrane

- PMum — **Ultramafic and mafic rocks (Early Permian? to Mississippian?)**

Tozitna terrane

- TrMms — **Mafic igneous rocks and sedimentary rocks (Triassic to Mississippian)**

White Mountains terrane, Wickersham terrane, and Yukon-Tanana terrane north of Tanana River, undivided

- Trm — **Mafic igneous rocks (Triassic)**
- Mg — **Globe unit (Mississippian)**
- MЄbh — **Birch Hill sequence (Mississippian to Cambrian)**
- MЄcr — **Chena River sequence (Mississippian to Cambrian)**
- Dcg — **Conglomerate, graywacke, and slate (Devonian?)**
- DSt — **Tolovana Limestone (Middle Devonian to Early Silurian)**
- Pzcs — **Chert and siliceous shale (early Paleozoic)**
- Pzch — **Chatanika unit (early Paleozoic)**
- Of — **Fossil Creek Volcanics (Late to Early Ordovician)**
- ЄZwa — **Wickersham unit (Early Cambrian and Late Proterozoic)**
- Zwg — **Grit (Late Proterozoic)**
- Zf — **Fairbanks schist unit (Late Proterozoic)**

Yukon-Tanana terrane south of Tanana River

- MDt — **Totatlanika Schist (Early Mississippian to Middle Devonian)**
- Dms — **Metasedimentary rocks (Late or Middle Devonian)**
- Dmg — **Metagabbro (Late Devonian?)**
- Pzkp — **Keevy Peak Formation (early Paleozoic)**
- PzpЄs — **Pelitic and quartzose schist (early Paleozoic and (or) Precambrian)**

Contact—Dashed where inferred; dotted where concealed; queried where doubtful

Fault—Dashed where inferred; dotted where concealed; queried where doubtful

Strike-slip fault—Arrows show relative horizontal movement

Fault—U, upthrown side; D, downthrown side

Thrust fault—Sawteeth on upper plate

High-angle reverse fault—Sawteeth on upper plate

Fold—Showing crestline and plunge. Dashed where inferred; dotted where concealed; queried where doubtful

Anticline

Syncline

Strike and dip of beds

Inclined

Vertical

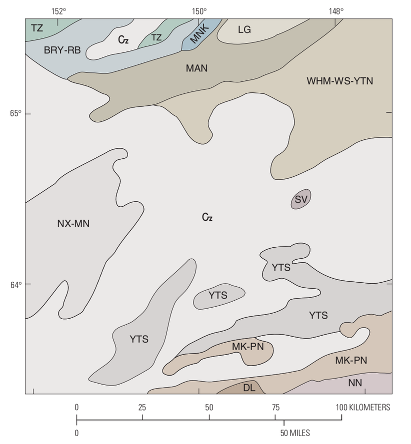
Strike and dip of foliation

Inclined

Vertical

Drill hole

Gravity contours—Contour interval 5 milligals. Hachured contours show closed areas of relatively lower gravity. X is control point

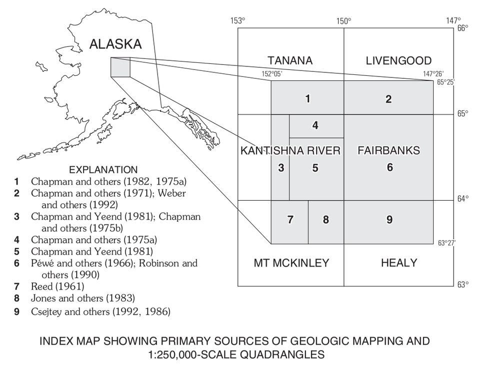


TERRANE MAP

Map of study area showing lithotectonic terranes of the Nenana basin area of central Alaska. Adapted from Jones and others (1987) and Silberling and Jones (1984).

EXPLANATION

- Cz — Cenozoic deposits
- BRY-RB — Baldry and Ruby terranes, undivided
- DL — Dillinger terrane
- LG — Livengood terrane
- MAN — Manley terrane
- MK-PN — McKinley and Pingston terranes, undivided
- MNK — Minook terrane
- NN — Nenana terrane
- NX-MN — Nixon Fork and Minchumina terranes, undivided
- SV — Seventymile terrane
- TZ — Tozitna terrane
- WHM-WS-YTN — White Mountains terrane, Wickersham terrane, and Yukon-Tanana terrane north of Tanana River, undivided
- YTS — Yukon-Tanana terrane south of Tanana River



EXPLANATION

1. Chapman and others (1982, 1975a)
2. Chapman and others (1971); Weber and others (1992)
3. Chapman and Yeend (1981); Chapman and others (1975b)
4. Chapman and others (1975a)
5. Chapman and Yeend (1981)
6. Péwé and others (1966); Robinson and others (1990)
7. Reed (1961)
8. Jones and others (1983)
9. Csejtey and others (1992, 1986)

INDEX MAP SHOWING PRIMARY SOURCES OF GEOLOGIC MAPPING AND 1:250,000-SCALE QUADRANGLES

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GEOLOGIC AND ISOSTATIC GRAVITY MAP OF THE NENANA BASIN AREA, CENTRAL ALASKA

By
Gina M. Frost, David F. Barnes, and Richard G. Stanley
2002

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