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

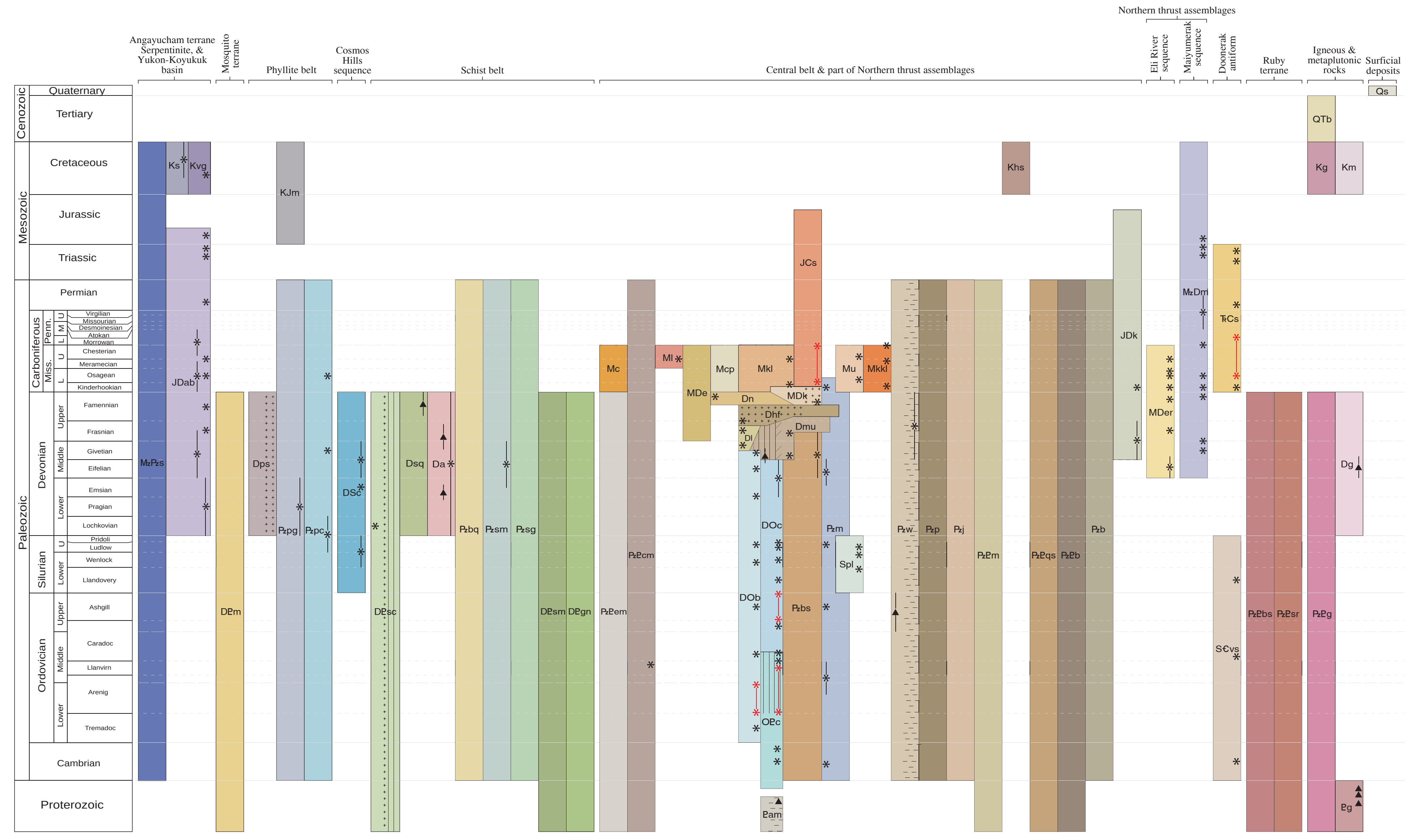
OPEN-FILE REPORT 2008–1149
Sheet 1 of 2
Bedrock geologic map of the southern Brooks Range, Alaska and accompanying conodont data
Pamphlet accompanies map

Shaded relief from National Elevation Dataset (NED) 42.7-meter Digital Elevation Models (DEMs)

Alaska Albers Equal Area Conic projection; 1927 North American Datum

SCALE 1:500 000

NATIONAL GEODETIC VERTICAL DATUM OF 1929
1984 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 15° TO 23° EAST



- ✱ Fossil age constrained, generally within one or two stages. See unit descriptions for precise age.
- ✱ Less precise fossil age constraint.
- ✱ Age tightly constrained at multiple levels between the asterisks.
- ▲ Isotopic age and error. Metamorphic cooling ages are not included.
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LIST OF MAP UNITS

[See pamphlet for detailed descriptions.]

ANGAYUCHAM TERRANE, SERPENTINITE, & YUKON-KOYUKUK BASIN

Ks	**Conglomerate, sandstone, and shale (Cretaceous)**
Kvg	**Volcanic-clast graywacke and mudstone (Cretaceous)**
JDab	**Mafic metavolcanic and metaintrusive rocks, metachert, metalimestone, and amphibolite of the Angayucham terrane (early Jurassic to Devonian)**
MzPzs	**Serpentinite (Mesozoic? to Paleozoic?)**

MOSQUITO TERRANE

DꝐm	**Metamorphic rocks (Devonian to Proterozoic?)**—Pelitic schist, metabasite, minor felsic orthogneiss and meta-ultramafic rocks

PHYLLITE BELT

KJm	**Melange (Cretaceous to Jurassic)**—Meter to kilometer-scale fault slivers of pillow basalt, mafic schist, metagabbro, metalimestone, metachert, metamorphosed lithic sandstone, phyllite, and rare serpentinite
Dps	**Lithic sandstone and shale (Devonian)**—Gray-green lithic sandstone, lesser brown quartz sandstone, and black shale and silty shale; area with overlay pattern is schistose
Pzpg	**Phyllite and graywacke (Paleozoic?)**—Dark-gray to black phyllite and brown-weathering lithic sandstone, sandstone, and mudstone; phyllonite along northern boundary
Pzpc	**Carbonate rocks of Phyllite belt (Paleozoic)**—Fault-bounded blocks of marble, metalimestone, and dolostone

COSMOS HILLS SEQUENCE

DSc	**Carbonate rocks of Cosmos Hills (Devonian and Silurian)**—Thin-bedded to massive dolostone, metalimestone, and marble

SCHIST BELT

Dsq	**Quartz-mica schist (Devonian)**—Pelitic or semipelitic schist with scattered lenses of mafic schist, calcareous schist, albite-mica schist, graphitic metaquartzite and marble
Da	**Ambler sequence (Devonian)**—Metarhyolite, metabasite, marble, and calcareous, pelitic and carbonaceous schist
Pzbq	**Black quartzite (Paleozoic?)**
Pzsm	**Marble of the Schist belt (Paleozoic)**—Marble, graphitic schist, and dolostone
Pzsg	**Mafic schist (Paleozoic)**
DꝐsc	**Calcareous schist (Devonian to Proterozoic)**—Marble and carbonate-rich, quartz-rich, and mafic schist; vertical line overlay indicates albite-rich rocks; overlay of crosses indicates metachert, calcareous schist, and metaconglomerate

ARRIGETCH-IGIKPAK THERMAL HIGH

DꝐsm	**Schist and marble, undivided (Devonian to Proterozoic?)**—Marble, dolomitic marble, magnetite-bearing chlorite schist, and pelitic schist
DꝐgn	**Schist and paragneiss (Devonian to Proterozoic?)**—Pelitic schist, metaquartzite, mafic schist and other lithologies

CENTRAL BELT & PART OF NORTHERN THRUST ASSEMBLAGES

Khs	**Hammond River shear zone (Cretaceous?)**—Lithologically heterogeneous and mylonitic rocks
JCs	**Sedimentary rocks (Jurassic to Carboniferous)**—Sandstone, shale, argillaceous limestone, limestone, dolostone, mudstone, chert and siltstone
JDk	**Rocks of the Kivivik Creek sequence (Jurassic to Devonian)**—Phyllite, metasiltstone, metasandstone, conglomerate, shale, limestone, tuff, and chert
Mkkl	**Kekiktuk Conglomerate(?), Kayak Shale of Endicott Group and Lisburne Group (Mississippian)**—Quartzite, conglomerate, phyllite, metalimestone, slate, dolostone, marble, and chert
Mcp	**Carbonaceous chert and siliceous phyllite (Mississippian)**
Mkl	**Kayak Shale of Endicott Group and Lisburne Group (Mississippian)**—Phyllite or slate, siltstone, sandstone, limestone, and chert
Mc	**Quartz-rich conglomerate (Mississippian?)**—Quartz, chert, quartzite, and slate-clast conglomerate
Ml	**Carbonate rocks (Mississippian)**—Metalimestone, dolostone, and black chert
Mu	**Metasedimentary rocks, undivided (Mississippian)**—Quartz conglomerate, quartzite, metasandstone, phyllite, shale, and metalimestone
MDk	**Kanayut Conglomerate (Lower Mississippian? and Upper Devonian)**—Quartzite, pebbly quartzite, conglomerate, and minor siltstone; overlay of crosses indicates area underlain by undifferentiated MDk and Dn
MDe	**Endicott Group, undivided (Mississippian and Devonian)**—Shale and sandstone
Dn	**Noatak Sandstone (Devonian)**—Metasandstone, metasiltstone, and phyllite
Dhf	**Hunt Fork Shale (Late Devonian)**—Phyllite, metasiltstone, metasandstone, and limestone; overlay of crosses indicates foliated and deformed exposures
Dl	**Metalimestone (Devonian)**—Metalimestone, and lesser metasandstone, metasiltstone, phyllite, and conglomerate
Dmu	**Metasedimentary and lesser metaigneous rocks (Middle and Late Devonian)**—Calcareous, siliceous, and volcaniclastic metasedimentary rocks and metaigneous rocks; vertical line overlay indicates the volcaniclastic and metaigneous rocks; diagonal line overlay indicates ferruginous and calcareous metasedimentary rocks
Spl	**Black phyllite and metalimestone (Silurian)**—Black siliceous phyllite and metalimestone, metasandstone, metasiltstone, phyllite, and graphitic calcareous schist
DOb	**Baird Group (Devonian to Ordovician)**—Metalimestone, marble, and dolostone
DOc	**Younger carbonate rocks of the Nanielik antiform (Middle Devonian to Ordovician)**—Dolostone, metalimestone, and marble

CENTRAL BELT & PART OF NORTHERN THRUST ASSEMBLAGES [continued]

OꝐc	**Older carbonate rocks of the Nanielik antiform (Middle Ordovician to Proterozoic?)**—Dolostone, metalimestone, marble and subordinate quartzose metasedimentary rocks, carbonate conglomerate, and metabasite; vertical line overlay indicates exposures of Ordovician part only
Pzbs	**Black metasedimentary rocks (Paleozoic)**—Phyllite, marble, and dolostone
Pzm	**Marble (Paleozoic)**—Massive marble, metalimestone and dolostone
Pzw	**Metasedimentary rocks (Paleozoic)**—Metasandstone, meta-argillite, phyllite, conglomerate, and rare marble; overlay indicates lithologically more heterogeneous exposures
Pzp	**Phyllite (Paleozoic?)**—Phyllite, fine-grained schist, and phyllonite
Pzj	**Metasedimentary rocks of Jesse Mountain (Paleozoic)**—Meta-argillite, metaquartzite, and marble
Pzb	**Black phyllite and siliceous phyllite (Paleozoic?)**
PzꝐem	**Metamorphic rocks of the Ernie Lake area (Paleozoic to Proterozoic)**—Marble, dolomitic marble, quartz-mica schist, metaquartzite, calcareous schist, graphitic metaquartzite, and metabasite
PzꝐcm	**Metasedimentary and metavolcanic rocks, undivided (Paleozoic and Proterozoic?)**—Quartzite, meta-argillite, marble, phyllite, dolostone, mafic metavolcanic rocks, calcareous schist, and pelitic schist
PzꝐm	**Mafic schist (Proterozoic? to Paleozoic?)**
PzꝐqs	**Quartz-rich metasedimentary rocks (Paleozoic to Proterozoic?)**—Schist and minor metaconglomerate, marble, and calcareous schist
PzꝐb	**Metasedimentary rocks of Bluecloud Mountain (Paleozoic to Proterozoic?)**—Metaquartzite, calcareous phyllite, and impure marble
Ꝑam	**Metamorphic rocks of Mt. Angayukaqsraq (Proterozoic)**—Amphibolite, metaquartzite, calcareous schist, metapelite, and minor metagranite and metagabbro (amphibolite facies); overlay indicates parts overprinted by albite-epidote-amphibolite facies metamorphism

NORTHERN THRUST ASSEMBLAGES

MzDm	**Igneous and sedimentary rocks of the Maiyumerak Mountains (Cretaceous? to Devonian)**— Basalt, limestone, and mélange
MDer	**Eli River sequence (Mississippian and Devonian)**—Dolostone, limestone, argillaceous or sandy limestone, sandstone, and limestone and dolostone with chert

DOONERAK ANTIFORM

TRCs	**Sedimentary rocks (Triassic to Carboniferous)**—Quartzite, phyllite, siltstone, conglomerate, shale, sandstone, limestone, argillaceous limestone, dolomitic limestone, and cherty dolostone
S€vs	**Volcanic and sedimentary rocks (Silurian to Cambrian)**—Volcanic rocks, volcaniclastic rocks, and clastic sedimentary rocks

RUBY TERRANE

PzꝐbs	**Biotite schist (Paleozoic to Proterozoic?)**
PzꝐsr	**Ruby schist (Paleozoic to Proterozoic?)**—Pelitic schist and metaquartzite

IGNEOUS AND METAPLUTONIC ROCKS

QTb	**Basalt (Quaternary? or Tertiary?)**
Kg	**Granitic rocks (Cretaceous)**
Km	**Migmatite (Cretaceous)**
Dg	**Granitic orthogneiss (Devonian)**
PzꝐg	**Granitic orthogneiss (Proterozoic)**
Ꝑg	**Granitic rocks (Paleozoic to Proterozoic?)**

SURFICIAL DEPOSITS

Qs	**Surficial sedimentary deposits, undivided** (Quaternary)

- **Quadrangle boundary, 1:250,000-scale**
- **Contact**—Depositional, intrusive, or metamorphic
- **Fault**—Dashed where thought to be present in subsurface
- **Thrust fault**—Teeth on structurally higher side
- **Normal fault**—Ball on downthrown side

BEDROCK GEOLOGIC MAP OF THE SOUTHERN BROOKS RANGE, ALASKA AND ACCOMPANYING CONODONT DATA

By

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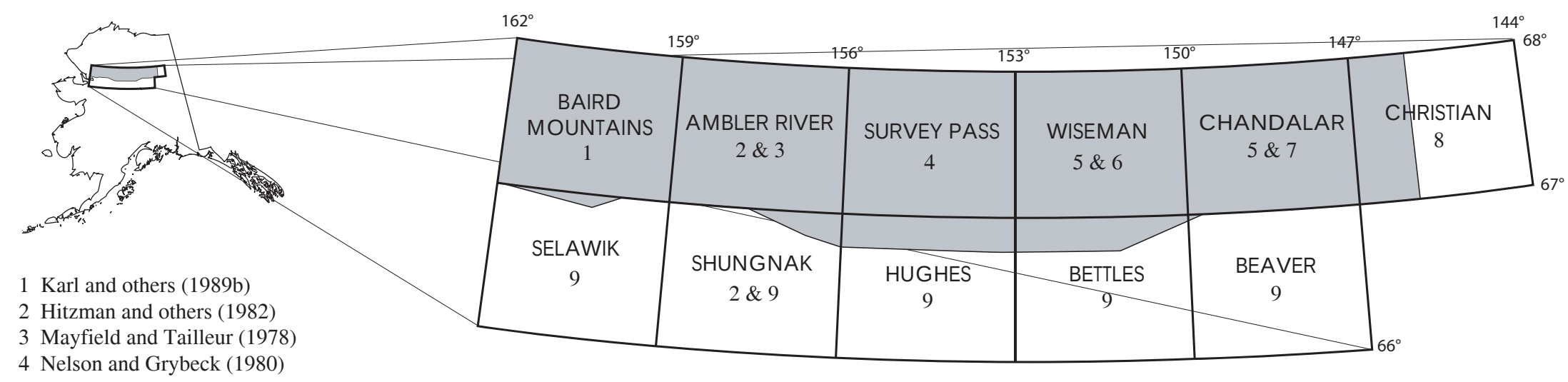
2008



1 Karl and others (1989b)
2 Hitzman and others (1982)
3 Mayfield and Tailleur (1978)
4 Nelson and Grybeck (1980)
5 Moore and others (1997b)
6 Dillon and others (1986)
7 Brosgé and Reiser (1964)
8 Brosgé and Reiser (2000)
9 Patton and others (2005)

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

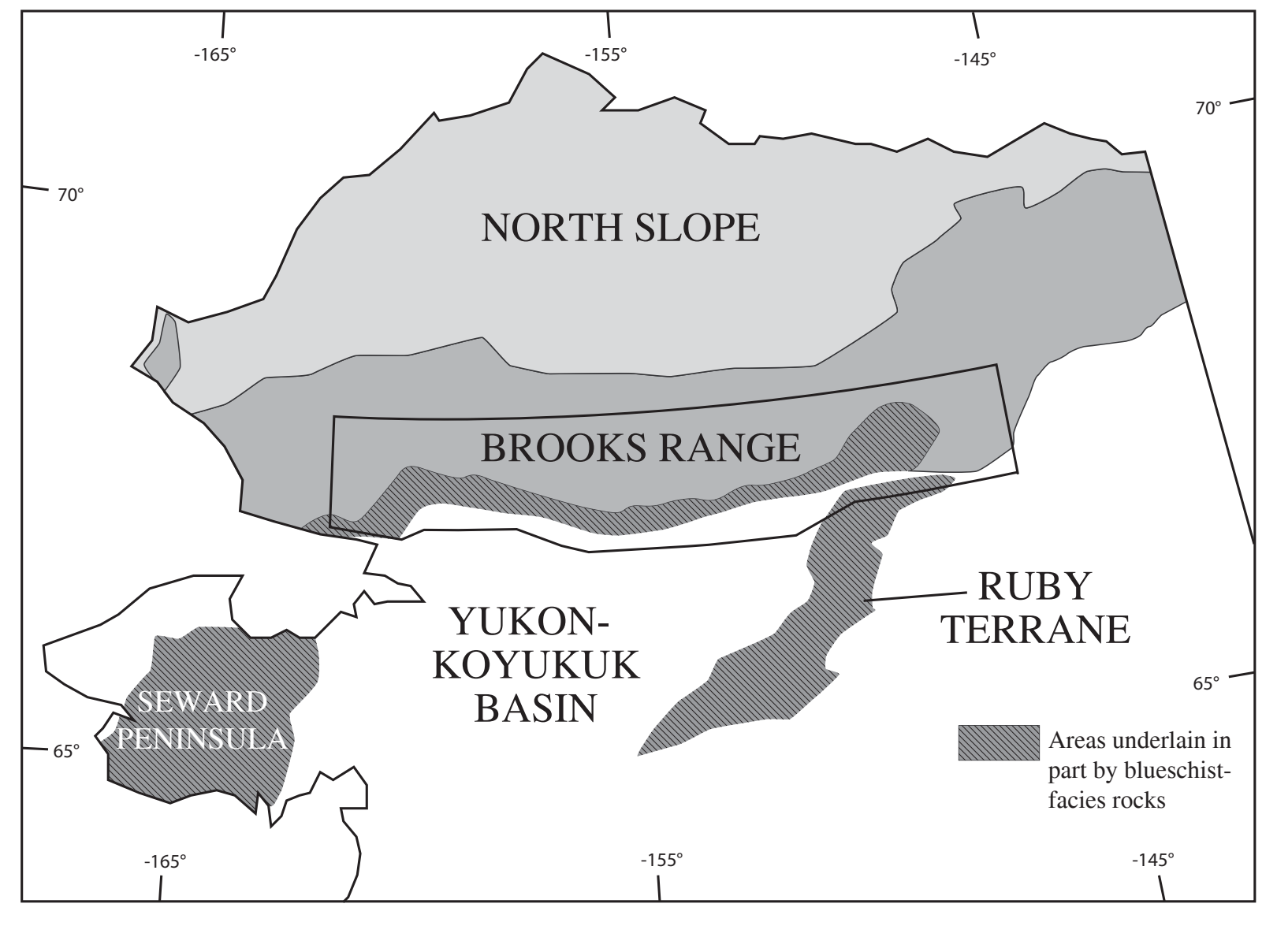


Figure 2. MAP OF NORTHERN ALASKA SHOWING MAJOR GEOGRAPHIC AREAS, GEOLOGIC PROVINCES, AND THE OUTLINE OF MAP AREA.

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