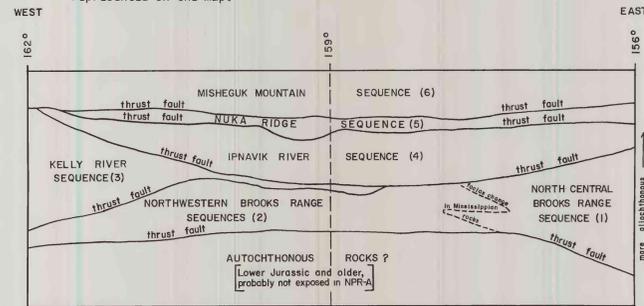


INTRODUCTION

The accompanying geologic map and description of rock units represents an interpretation of the geology in the southern part of NPR-A based upon the publications of Tailleux and others, 1966, Snelson and others, 1968, and Martin, 1970.

The south edge of NPR-A (Delong and Endicott Mountains) consists of generally coeval rock assemblages of slightly different facies which are believed to have been superimposed by large-scale horizontal thrust faults. Movement of the hanging wall relative to the footwall side of thrust faults has been from south to north, and it is probable that a distance of more than 160 km would be required to unstack the thrust plates to their original positions. Major foreshortening occurred in the latest Jurassic to middle Cretaceous. Numerous open folds and high angle faults affected the rocks after the thrusting ended.

Rock units have been grouped into discrete thrust sequences. Five of the sequences, the north central Brooks Range, northwestern Brooks Range, Kelly River, Ipanavik River, and Nuka Ridge thrust sequences, have rocks ranging in age from Cretaceous to Mississippian or Devonian. Rocks of the Misheguk Mountain thrust sequence have less certain age, but must be Jurassic or older. The relationship between the north central Brooks Range sequence and the northwestern Brooks Range sequences is uncertain; however, apparent gradational facies change in Mississippian rocks and similar structural position of these sequences suggests that they are not separated by major thrust faults. The northwestern Brooks Range thrust sequences are not well enough understood to be separated on the map, but discrete sequences may be mappable using shaly versus cherty Mississippian rocks. The diagram below is a schematic cross-section in southern NPR-A showing the relative stacking positions and spatial (east-west) distribution of the 6 major thrust plates represented on the map.



DESCRIPTION OF ROCK UNITS

SURFICIAL DEPOSITS

**Q** Quaternary  
Unconsolidated surficial deposits, stream alluvium, glacial deposits, tundra soils, and lacustrine deposits

Unconformity

AUTOCHTHONOUS ROCKS

**Kc** Upper Cretaceous  
Golville Group  
Turanton to Maestrichtian sandstone, shale, and conglomerate

Disconformity

**Kn** Upper and Lower Cretaceous  
Namsluk Group  
Albian to Cenomanian sandstone, conglomerate, and shale

**Kf** Upper and Lower Cretaceous  
Fortress Mountain Formation  
Flyschoid wacke, conglomerate, and mudstone; has Albian pelecypods and ammonites

**Km** Lower Cretaceous  
Mudstone with local coquina bed consisting of Valanginian pelecypod, *Buchia*; mapped only on the lower Killik River

**Kt** Upper and Lower Cretaceous  
Terek Formation  
Gray shale

ALLOCHTHONOUS ROCKS

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NORTH CENTRAL BROOKS RANGE THRUST SEQUENCE 1

**K1** Lower Cretaceous  
Flyschoid mudstone and subordinate wacke; has Neocomian pelecypod, *Buchia*; includes Okpikruak Formation and informally named Ipevik Formation

**db1** Jurassic  
Dabase and basalt, occurs mainly as dikes and sills

**JP1** Jurassic to Permian  
Gray red, and green chert and shale with few fine-grained gray limestone beds in upper third of unit. Has Triassic pelecypod, *Murchisonia*, in upper part; includes informally named Blankenship Formation and Shublik and Siksikup Formations

**KP1** Lower Cretaceous to Permian  
Lower Cretaceous to Permian rocks undifferentiated; includes mudstone and wacke (K) and chert and shale (JP) in structurally complex terranes

**KM1** Lower Cretaceous to Mississippian  
Lower Cretaceous to Mississippian rocks undifferentiated; includes mudstone (K), chert and shale (JP), and limestone (M) in structurally complex terranes

**M1** Mississippian  
Lisburne Group  
Limestone and dolomite with local black chert nodules in irregular layers; abundant corals, brachiopods, and foraminifera; lateral equivalent to Wachusath and Alapah Formations

**Mk** Mississippian  
Kavak shale  
Mk-siltstone, shale, and sandstone; Mk-black shale with few intercalated beds of orange or brown weathering limestone and siltstone

**Dk** Lower Mississippian  
Kavayut Conglomerate  
Includes quartz and chert pebble conglomerate and clean white sandstone

**Dss** Upper Devonian  
Sandstone, siltstone, and shale

NORTHWESTERN BROOKS RANGE THRUST SEQUENCES 2

**K2** Lower Cretaceous to Upper Jurassic  
Flyschoid wacke, mudstone, and conglomerate with local quartzitic sandstone; has Lower Cretaceous and Upper Jurassic pelecypod, *Buchia*; includes Okpikruak Formation and informally named Ipevik Formation

**RP2** Triassic to Permian  
Gray, red, and green chert and shale with few fine-grained gray limestone beds and Triassic pelecypod, *Murchisonia*, in upper part. Includes Shublik and Siksikup Formations; locally may include Lower Jurassic oil shale and chert

**RM2** Triassic to Mississippian  
Triassic to Mississippian rocks undifferentiated; includes gray chert and shale (R), and black chert and shale (M) in structurally complex terranes

**KP2** Lower Cretaceous to Permian  
Lower Cretaceous to Permian rocks undifferentiated; includes wacke and mudstone (K), and chert and shale (RP) in structurally complex terranes

**KM2** Lower Cretaceous to Mississippian  
Lower Cretaceous to Mississippian rocks undifferentiated; includes wacke and mudstone (K), chert and shale (RP), and black chert and shale (M) in structurally complex terranes

**M2** Mississippian  
Lisburne Group  
M2 - carbonaceous black chert and shale with few dark limestone beds; M2 - rhyolite tuffs and flows at Drenchwater Creek

KELLY RIVER THRUST SEQUENCE 3

**K3** Lower Cretaceous  
Flyschoid wacke and lesser mudstone; has Neocomian pelecypod, *Buchia*; includes Okpikruak Formation

**db3** Jurassic  
Dabase and basalt, occurs mainly as sills and dikes

**RP3** Triassic to Permian  
Gray and red chert and shale, has few limestone beds and Triassic pelecypod, *Murchisonia*, in upper part; includes Shublik and Siksikup Formations

**M3** Mississippian  
Lisburne Group  
M3 - siltstone, sandstone, and shale

IPNAVIK RIVER THRUST SEQUENCE 4

**K4** Lower Cretaceous  
Flyschoid wacke and mudstone with local conglomerate; has Neocomian pelecypod, *Buchia*; includes Okpikruak Formation

**db4** Jurassic  
Dabase and basalt, occurs mainly as sills and dikes

**RP4** Triassic to Permian  
Gray, red, and green chert, commonly has diabase sills; subordinate shale

**KP4** Lower Cretaceous to Permian  
Lower Cretaceous to Permian rocks undifferentiated; includes wacke and mudstone (K), diabase (db), and chert (RP) in structurally complex terranes

**KM4** Lower Cretaceous to Mississippian  
Lower Cretaceous to Mississippian rocks undifferentiated; includes gray, red, and green chert (RP), diabase (db), and black chert and limestone (M) in structurally complex terranes

**M4** Mississippian  
Lisburne Group  
M4 - well-bedded black chert and gray limestone with black chert nodules; commonly has diabase sills

**M5** Mississippian  
Siltstone, sandstone, and shale

**D1** Upper and/or Middle Devonian  
Light-gray weathering, medium- to fine-grained, thick-bedded limestone and dolomite; has brachiopods and stromatopora, *Amphipora*

NUKA RIDGE THRUST SEQUENCE 5

**K5** Lower Cretaceous  
Flyschoid wacke and mudstone with concretion concretions; includes Okpikruak Formation

**db5** Jurassic or Older  
Pillow basalt and diabase, local chert and shale

**RP5** Triassic to Permian  
Well-bedded gray and red chert with minor shale; has Triassic pelecypod, *Murchisonia*, in upper part

**KP5** Lower Cretaceous to Permian  
Lower Cretaceous to Permian rocks undifferentiated; includes wacke and mudstone (K), and gray chert (RP) in structurally complex terranes

**KM5** Lower Cretaceous to Mississippian  
Lower Cretaceous to Mississippian rocks undifferentiated; includes wacke and mudstone (K), chert (RP), and Nuka Formation (M) in structurally complex terranes

**PM5** Permian to Mississippian  
Nuka Formation  
Arkose, arkosic limestone, and glauconitic limestone; has Permian brachiopods and Mississippian cephalopods and foraminifera

MISHEGUK MOUNTAIN THRUST SEQUENCE 6

**db6** Jurassic or Older  
Pillow basalt and diabase, local chert and shale

**gb** Jurassic or Older  
Layered gabbro consisting of augite and plagioclase with variable amounts of hornblende, orthopyroxene, and olivine

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.