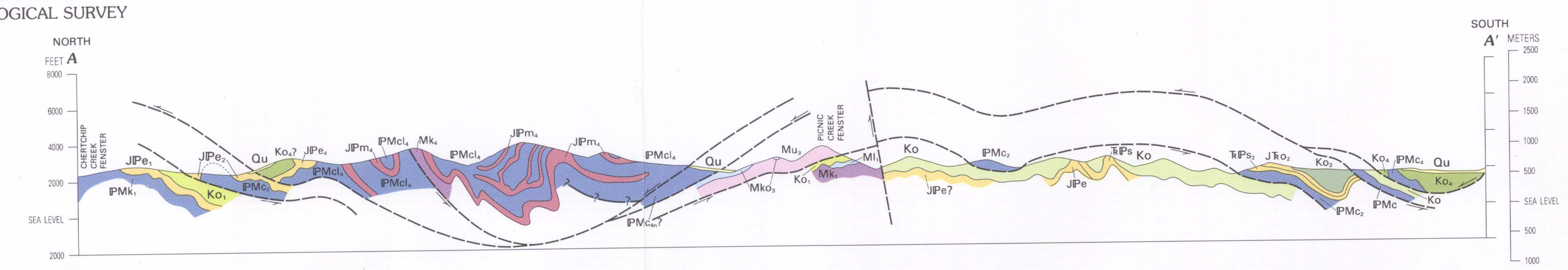
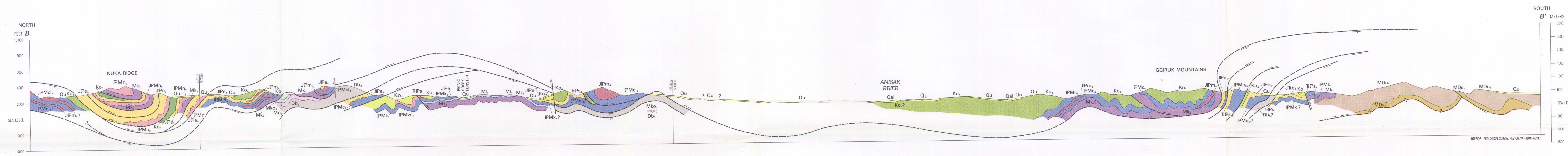
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATION SERIES
MAP I–1503 SHEET 2 OF 2
CROSS SECTIONS AND TABLES





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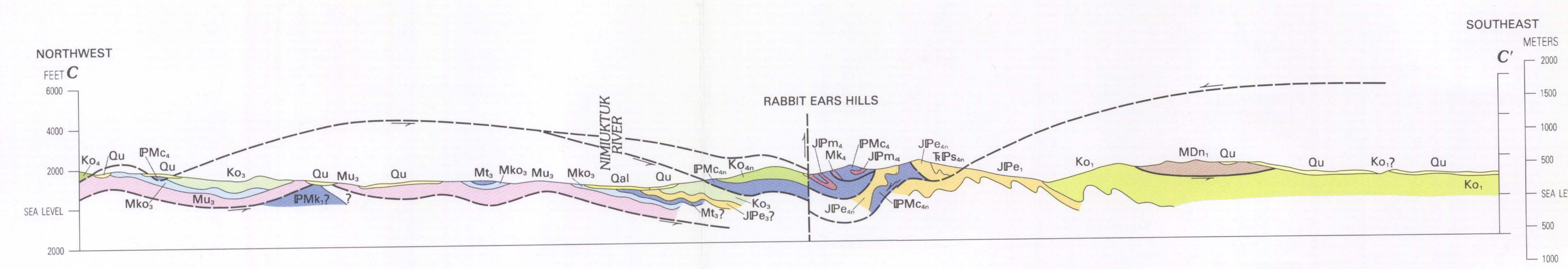

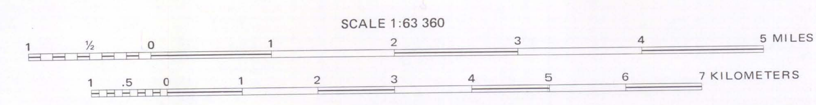

These cross sections are intended to show the generalized relations between allochthons. Detailed relations between rock units are largely schematic. In a few areas, there are folds or faults shown on the cross sections in order to rationalize the apparent structure, but they are not included on the map. Rock units have not been extrapolated beneath the color on the sections, although thrust faults are schematically illustrated below the color.

See sheet 1 for explanation of map symbols.

CROSS SECTIONS TO ACCOMPANY
RECONNAISSANCE GEOLOGIC MAP OF SOUTHEASTERN MISHEGUK MOUNTAIN QUADRANGLE, ALASKA

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1984

INTRODUCTION

This map is one of a series of three reconnaissance geologic maps of the southern Misheguk Mountain quadrangle (fig. 1). Because the geology in all three map areas is similar, a composite map explanation has been designed to facilitate their combined use and provide the reader with a better perspective of the regional geology. There are some rock units and allochthons which do not occur on all three maps. In the explanation, only the allochthons and rock units that appear on the accompanying map are colored.

Devonian to Cretaceous sedimentary rocks make up most of the bedrock in the southern part of the Misheguk Mountain quadrangle. We believe that these rocks were originally laid down as sedimentary deposits on an extensive continental platform located south of the rocks presently exposed in the southern Brooks Range. Marine deposition appears to have been nearly continuous, with only minor interruptions, from the Devonian through Middle Jurassic. Upper Devonian rocks comprise two distinct and coeval sedimentary successions. One is mostly composed of shallow-water limestone and dolomite, mapped as the Baird Group, and the other is a near-shore clastic wedge, mapped as the Noatak Sandstone, Kanayut Conglomerate, and Hunt Fork Shale. Mississippian rocks record a variety of sedimentary facies including shallow-water limestone and clastic rocks, mapped as the Kogruk, Utukok, and Nuka Formations, and basinal shale, chert, and micritic limestone, mapped as the Kayak Shale, Kuna Formation, Tupik Formation, black chert, and black chert and limestone. The rapid facies changes in Upper Mississippian rocks may have been produced by aulacogen development across the previously formed Devonian and Early Mississippian continental platform. We suspect that the middle or late Carboniferous was the time in which the granitic source area for the arkose in the Nuka Formation was rifted away from the south edge of the platform, leaving behind a wide continental shelf on which Pennsylvanian and younger sedimentary rock materials were deposited.

A major change occurred during the Late Mississippian or Pennsylvanian as clastic and shallow-water carbonate sedimentation ceased, and a condensed succession of deep-water sedimentary materials was deposited. From the Pennsylvanian to the Middle Jurassic, radiolarian chert and siliceous shale of the Etivluk Group (Mull and others, 1982) were deposited over all the older sedimentary rocks of the shelf. During the Late Jurassic and Early Cretaceous another major change in sedimentation occurred as this old continental shelf was broken up and successively superimposed in broad allochthonous sheets during the Brooks Range orogeny. In the early stages of the orogeny two distinct suites of igneous rocks predominantly composed of either pillow basalt, mapped as the Copter igneous sequence, or periodotite and layered gabbro, mapped as the Misheguk igneous sequence, were thrust on top of the sedimentary rocks of the shelf. The new mountain range shed extensive flyschoid deposits of mudstone and graywacke on its north and south flanks. The sedimentary materials that were deposited on the north side of the Brooks Range are called the Okpikruak Formation. As the area affected by tectonism grew larger, many of the Lower Cretaceous flyschoid deposits, with possible olistoliths composed of older rocks (Mull and others, 1976; Mull, 1979), also became greatly deformed and displaced by thrust faults.

The Late Jurassic and Early Cretaceous orogeny produced numerous thrust faults with up to tens of kilometers displacement. In localized areas where thrust faults are closely spaced, the structure is so complex that the terrane can be characterized as a "broken formation" (Hsu, 1968). The direction of thrust juxtaposition was such that upper thrust sheets traveled relatively northward over lower sheets. Total displacement of rock units across thrust faults was great enough to superimpose coeval rocks of different sedimentary facies so that rock units in one thrust sheet may be lithologically different from coeval rock units above and below. This difference is especially evident in Mississippian rocks, which appear to have had more complex facies patterns in their original basins of deposition than did the younger rock units. Numerous tight folds, many with southward-dipping axial planes, were also developed in the rocks during the thrusting period. After the time of major thrust displacement (post-late Albian), additional tectonism warped the thrust sheets into broad folds cut by some high-angle faults and relatively minor thrust faults.

In order to describe our understanding of the complex stratigraphy and structure in the Misheguk Mountain quadrangle, most rock units on this map are grouped into the named sequences and allochthons shown in figure 2. On this map, the word "sequence" is used as a stratigraphic term, meaning either a distinctive column of sedimentary rocks that were deposited contiguously or a group of associated and distinctive igneous rocks which are of wide geographic extent. Thrust sheets that contain the same or similar sequences are herein grouped together into structural units called "allochthons." In contrast, previous reports often use the same terms, such as "thrust tectonic unit," "structural sequence," or "thrust sequence," for both lithostratigraphic and tectonostratigraphic units. This previous terminology can be confusing because there is commonly a lack of distinction between stratigraphic and structural terms. Table 1 compares the named allochthons on this map with analogous terminology used in other reports.

Various parts of the same sequence are commonly superimposed several times in adjacent thrust sheets. Faults that bound thrust sheets may occur at any horizon within a sequence, so that each thrust sheet usually contains only part of a complete sequence. Thrust faults that separate thrust sheets with different sequences are mapped as "intersequence thrust faults," and those that separate thrust sheets with the same sequence are mapped as "intrasequence thrust faults."

Thrust sheets with the same sequence almost always occur in the same structural stacking position relative to thrust sheets with different sequences. This relation has permitted us to construct the generalized model for the stacking positions of the various allochthons and sequences shown in figure 2. This model shows the relative structural position of the allochthons, and a schematic east-to-west cross section of the Misheguk Mountain quadrangle shows the distribution of stratigraphic and igneous sequences within each allochthon. We believe that the simplest and most reasonable way to reconstruct the original depositional positions of the sequences is to unstack the allochthons in a regular manner such that upper allochthons are successively unstacked south of lower allochthons. When the sedimentary sequences are unstacked in this way, the sequences in the Nuka Ridge allochthon would have been deposited farthest to the south and the sequence in the Brooks Range allochthon farthest to the north. The igneous sequences of the Copter Peak and Misheguk Mountain allochthons were probably formed south of the sequences in the Nuka Ridge allochthon. The approximate relative locations of the sequences prior to thrust dislocation can be viewed on the right side of figure 2 if each lower sequence is considered to have been located contiguously north of the adjacent sequence(s) above.

Although post-Early Cretaceous erosion removed large parts of the upper allochthons from the area, they were never continuous across the quadrangle, as shown on figure 2. Instead, the allochthons are commonly in the form of large lens-shaped bodies or folded sheets a few hundred meters to tens of kilometers across and a few meters to a kilometer or more in thickness. In most vertical sections some of the allochthons are absent and others are internally repeated by intrasequence thrust faults. Some allochthons thin or pinch out southward. These observed relations may indicate that parts of some sheets were displaced northward by gravity gliding or that a complex folding and thrust faulting process operated.

In a few places a structurally lower allochthon, as shown in figure 2, appears to be locally thrust or folded over an allochthon known to be structurally higher in most of the region. For example, at the west end of the Poktovik Mountains on the southwestern Misheguk Mountain quadrangle map (lat 68°4.5′ N., long 161°20′ W.), the Ipnavik River allochthon is thrust over the Copter Peak allocthon. Along the east side of upper Trail Creek on the south-central Misheguk Mountain quadrangle map (lat 68°30′ N., long 160°20′ W.), the Kelly River allochthon is thrust over the Ipnavik River allochthon. Also, along the middle part of the Anisak River on the southeastern Misheguk Mountain quadrangle map (lat 68°26.5′ N., long 159°29′ W.), the Kelly River allochthon is locally thrust or folded over the Ipnavik River allochthon. See the appropriate geologic map or figure 3 for geographic locations. However, these examples cover only a small area on the maps, and they appear to be unusual.

In addition to abrupt facies changes across intersequence thrust faults, there are also more gradual facies changes between some stratigraphic sequences that occur at similar structural levels. These changes are most commonly noticeable in the Upper Mississippian and Lower Pennsylvanian rocks. Where two similar sequences occur at about the same structural level, they were probably deposited contiguously and displaced about the same amount by thrust faults. In such cases, the two similar sequences are grouped into the same allochthon. For example, this kind of gradual facies change occurs in an approximate east-west direction between an eastern facies, the Endicott sequence (Mull, 1979) or foothills sequence (Tailleur and others, 1966), and a western facies, the Key Creek sequence (this report) which compose the Brooks Range allochthon in the central and western Brooks Range (Mayfield and others, 1978). Within the Misheguk Mountain quadrangle, the Eli sequence and Kelly sequence are grouped into the same allochthon, because they are composed of similar sequences which occur at approximately the same structural level. Where the two sequences are in thrust-fault contact south of Kuruk Creek (southwestern Misheguk Mountain quadrangle map), the Eli sequence is structurally higher, a relation which suggests that in this area, the Kelly sequence was deposited north of the Eli sequence. Facies changes not separated by thrust faults of major displacement also probably occur between the Picnic and Wulik sequences and the Ipnavik and Nachralik Pass sequences. These are discussed in the next section.

Map symbols for rock units are numbered for easy identification of each allochthon. Each subscript number represents a different allochthon, and each lower case letter, a lithologic unit.

UNCERTAIN RELATIONS BETWEEN ALLOCHTHONS AND SEQUENCES

Where outcrops are poor or where facies changes may have been relatively rapid, continuity between sequences in similar structural positions may be difficult or impossible to establish. For example, the Picnic Creek allochthon has two lithologically similar stratigraphic sequences, called the Wulik and Picnic sequences. In the southern part of the Misheguk Mountain quadrangle, the Wulik sequence is mapped only west of long 161° W. and the Picnic sequence is mapped only east of long 161° W. Because the differences in these stratigraphic sequences are probably due to gradational facies changes, rather than separation by major thrust faults, they are mapped as separate sequences within the same allochthon.

Within the Ipnavik River allochthon, mafic sills are rare west of the Kugururok River and common east of the Kugururok River. Sills are also rare in what appears to be a lower thrust sheet of the Ipnavik River allochthon east of the Kugururok River. The sequence of rocks with few mafic sills is called the Nachralik Pass sequence, and the one with numerous mafic sills is called the Ipnavik sequence (fig. 2). These two similar sequences are distinguished within this allochthon, because the presence or absence of mafic sills could have important structural implications in some areas. The Nachralik Pass sequence is distinguished by map symbols that have the letter "n" following the allochthon number. For example, the black chert unit, identified as PMc$_{4n}$, in the Nachralik Pass sequence is stratigraphically equivalent to the black chert rock unit identified as PMc$_4$ in the Ipnavik sequence.

The Nachralik Pass sequence is also lithologically similar to the Picnic sequence, so much so that they are difficult to distinguish where the Kelly sequence does not occur between them. For example, in the central part of the Misheguk Mountain quadrangle, there is a possibility that these two sequences may be the same sequence which has been thrust into different structural levels. However, it is more likely that the Picnic and Nachralik Pass sequences were deposited respectively north and south of the Kelly and Eli sequences, with the Picnic sequence deposited near the Wulik sequence and the Nachralik Pass sequence deposited near the Ipnavik sequence, as shown in figure 2.

The Bogie and Bastille sequences occur in the same structural level, beneath the Copter Peak allochthon (if it is present), and above the Ipnavik River allochthon and other underlying allochthons. For this reason, both sequences are included in the Nuka Ridge allochthon. The two sequences, although similar in many respects, appear to have some stratigraphic differences. The Nuka Formation in the Bogie sequence is underlain by the Kayak Shale, whereas rocks in the Bastille sequence that are possibly coeval to the Nuka Formation are conformably underlain by limestone or silty and sandy limestone. The limestone unit (unit MDl$_5$) underlying the Etivluk Group in the Bastille sequence has not been precisely dated with fossils and is assigned its age on the basis that it conformably overlies fossiliferous Devonian limestone and regionally correlates with Devonian and Mississippian limestone units in other sequences. Should further investigation locate fossil evidence that the Nuka Formation and the upper part of the limestone unit of the Bastille sequence are coeval, the age disparity would be removed. The two sequences might therefore have been deposited contiguously, with a local embayment of the Kayak Shale in parts of the Bogie sequence. However, should further investigations show that the limestone unit of the Bastille sequence is not younger than Devonian in age, then it is probable that the Nuka Formation and Kayak Shale were deposited above this limestone which would make the Bogie and Bastille sequences a single sequence. Since rocks of the Bastille sequence and Nuka Formation are not found in contact with each other, their relative positions prior to thrusting are not known, and the trend of this possible facies change is unknown.

The location of intrusion of the Misheguk igneous sequence ultramafic rocks into the Earth's crust relative to the location of extrusion of the Copter igneous sequence pillow basalts is uncertain. The contact between these sequences is always a thrust fault, with the Misheguk on top. No remnants of the Misheguk-type rocks are found within or at the lower contact of the Copter Peak allochthon. Although both the Copter Peak and Misheguk Mountain allochthons have been included in the dismembered ophiolites of Patton and others (1977), we find no evidence to indicate that these rocks are necessarily of the same origin. The basement upon which the Copter Peak basalts were erupted is either a shallow-water Devonian limestone, or it is not preserved. The petrology of the Misheguk Mountain allochthon is typical of the lower parts of many ophiolites (Patton and others, 1977; Roeder and Mull, 1978; Zimmerman and Soustek, 1979), indicating that it is probably a remnant of oceanic crust which lay south of the Arctic Alaska continental plate prior to the Brooks Range orogeny. The basalts which were probably erupted atop the Misheguk Mountain plutonic rocks have been eroded away and are no longer preserved in the quadrangle.

ACKNOWLEDGMENTS

We wish to acknowledge R. C. Crane (of Standard Oil of California) for providing us with detailed information about some outcrops that we did not visit, and Crane and C. G. Mull for helpful discussions about the structural evolution of the western Brooks Range.

FOSSIL TABLE

Table 2 is a list of the fossils which have been identified from the area encompassed by the southeastern Misheguk Mountain quadrangle geologic map. Most fossils were collected in the summer of 1978 during fieldwork for this mapping project. However, they also include previously unpublished fossil collections dating back to the 1960's. A few of the collections were made by geologists from the petroleum industry and dated by U.S. Geological Survey paleontologists.

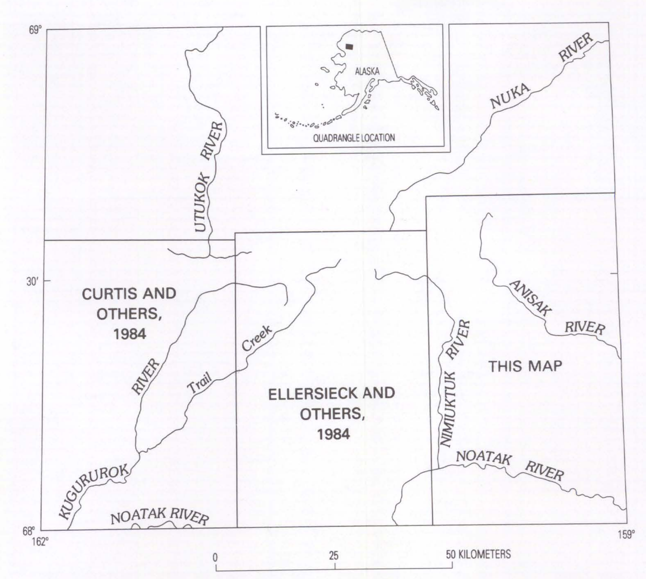

FIGURE 1.—Location of the Misheguk Mountain quadrangle, this map, and the two adjacent maps of this series.

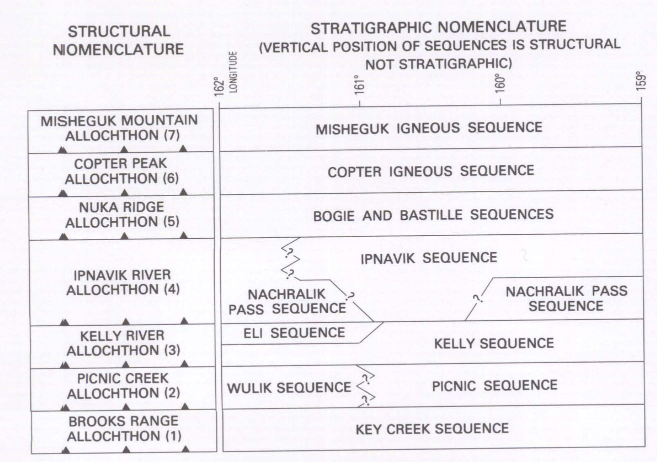

FIGURE 2.—Diagram showing the usual stacking positions of the structural units (allochthons, 1 lowest and 7 highest) and stratigraphic units (sequences) in the south half of the Misheguk Mountain quadrangle. Although the lowest thrust sheets of the Brooks Range allochthon are not exposed in the quadrangle, field relations from other areas indicate that the base is in fault contact with relatively autochonous rocks, (Mull and others, 1976; Mull and Tailleur, 1977). Allochthon contacts shown by thrust faults. Lateral and vertical positions of stratigraphic and igneous sequences are shown as a schematic cross section from west to east across the quadrangle.

EXPLANATION

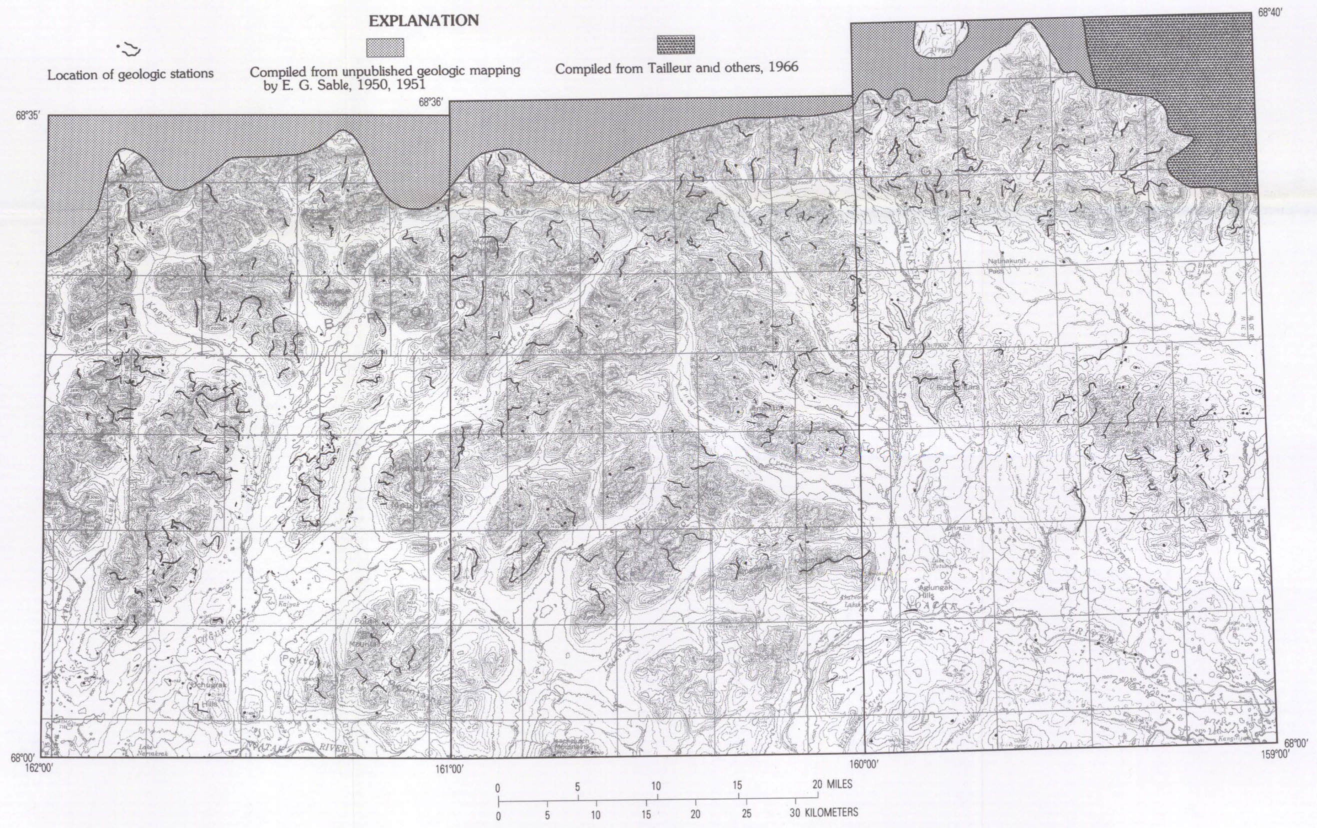

FIGURE 3.—Locations of field traverses used by the geologists who compiled this map and areas of geologic mapping from other studies which are reinterpreted for this report

TABLE 1.—*Comparison of allochthons in this report with equivalent structural units of other authors*

This report	Ellersieck and others, 1979	Mayfield and others, 1979	Mull, 1979	Churkin and others, 1979	Mayfield and others, 1978	Martin, 1970	Snelson and Tailleur, 1968; Tailleur and Brosgé, 1970	Tailleur and others, 1966
Misheguk Mountain allochthon	Misheguk Mountain thrust sequence	Misheguk Mountain thrust sequence	Misheguk sequence	Not distinguished	Misheguk Mountain thrust sequence	Ultrabasic pluton sequence	Misheguk thrust tectonic unit	Not distinguished
Copter Peak allochthon	Copter Peak thrust sequence	Not distinguished	Misheguk sequence	Not distinguished	Misheguk Mountain thrust sequence	Ultrabasic pluton sequence	Misheguk thrust tectonic unit	Not distinguished
Nuka Ridge allochthon	Nuka Ridge thrust sequence	Not distinguished	Nuka sequence	Not distinguished	Nuka Ridge thrust sequence	Nuka Ridge sequence	Nuka Ridge thrust tectonic unit	Nuka Ridge sequence
Ipnavik River allochthon	Ipnavik River thrust sequence	Ipnavik River thrust sequence	Ipnavik sequence	Not distinguished	Ipnavik River thrust sequence	Ipnavik sequence	Ipnavik thrust tectonic unit	Ipnavik sequence
Kelly River allochthon	Kelly River thrust sequence	Kelly River thrust sequence	Kelly sequence	Not distinguished	Kelly River thrust sequence	De Long sequence	Kelly thrust tectonic unit	Not distinguished
Picnic Creek allochthon	Picnic Creek thrust sequence	Kuruk Creek thrust sequence	Not distinguished	Not distinguished	Northwestern Brooks Range thrust sequences	Not distinguished	Wulik thrust tectonic unit	Sequence at Kiligwa River (eastern facies)
Brooks Range allochthon	Brooks Range thrust sequence	Brooks Range thrust sequence	Endicott sequence (eastern facies)	Kagvik structural sequence	[Northwestern Brooks Range thrust sequences; North central Brooks Range thrust sequence (eastern facies)]	[Brooks Range sequence; Ivotuk Hills sequence (eastern facies)]	[Foothills thrust tectonic unit]	[Foothills sequence; Assemblage on Drenchwater Creek; Sequence at Mount Bupto (eastern facies)]

TABLE 2.—*Selected fossils from southeastern Misheguk Mountain quadrangle*

Map number	Field number	Latitude North	Longitude West	USGS collection number	Fossil age	Map unit	Fossil type	Identified by
1	78Ek51B	68°35′45″	159°57′06″	—	Mesozoic	JPe$_2$	Radiolaria	B. K. Holdsworth
2	78Md88	68°35′18″	159°55′00″	—	Pennsylvanian to Permian	JPe$_2$	Radiolaria	B. K. Holdsworth
3	78Md81C	68°35′14″	159°55′42″	—	Mississippian	PMc$_2$	Radiolaria	B. K. Holdsworth
4	78Ek50E2	68°34′28″	159°57′04″	—	Mississippian	PMc$_2$	Radiolaria	B. K. Holdsworth
5	78Tr68B1–2	68°31′24″	159°57′24″	—	Triassic	JPe$_1$	Radiolaria	B. K. Holdsworth
6	78Md80C, D	68°34′25″	159°37′32″	—	Mississippian to Early Pennsylvanian	PMc$_{4n}$?	Radiolaria	B. K. Holdsworth
7	78Ek52B1	68°35′00″	159°35′10″	—	Late Triassic	JPe$_4$	Radiolaria	B. K. Holdsworth
7	78Ek52C1	68°35′00″	159°35′10″	—	Mesozoic	JPe$_4$	Radiolaria	B. K. Holdsworth
8A	78Md32C	68°31′33″	159°32′46″	—	Pennsylvanian to Early Permian	TRPs$_1$	Radiolaria	B. L. Murchey
8B	78Md32D	68°31′15″	159°32′45″	—	Late Mississippian (Visean) (Mamet Zone 11-12)	Ml$_1$	Foraminifera	B. L. Mamet
9	78Md43A	68°33′31″	159°33′48″	—	Pennsylvanian to Early Permian	JPe$_2$	Radiolaria	B. K. Holdsworth
10	77Md85B	68°33′09″	159°25′42″	—	Pennsylvanian to Early Permian	JPe$_2$	Radiolaria	B. K. Holdsworth
11	77Md84	68°32′46″	159°24′12″	—	Probably Late Mississippian	PMc$_2$	Radiolaria	B. K. Holdsworth
12	78Md31C	68°31′40″	159°21′24″	—	Mississippian	PMc$_2$	Radiolaria	B. K. Holdsworth
13	77Md81X	68°30′27″	159°23′55″	—	Late Triassic	JTRo$_1$	Radiolaria	B. K. Holdsworth
14A	78Md30D	68°31′48″	159°18′06″	—	Triassic	JPe	Radiolaria	B. L. Murchey
14B	78Md30F	68°31′47″	159°18′45″	—	Late Mississippian (Visean) (Mamet Zone 11-12)	Ml$_1$	Foraminifera	B. L. Mamet
15	78Md29D	68°32′09″	159°14′36″	—	Pennsylvanian to Permian	JPe$_2$	Radiolaria	B. K. Holdsworth
16	78Md29E	68°32′46″	159°14′48″	—	Mississippian to Early Pennsylvanian	PMc$_2$	Radiolaria	B. K. Holdsworth
17	78Ek19C	68°30′13″	159°18′08″	—	Pennsylvanian to Early Permian	TRPs$_1$	Radiolaria	B. K. Holdsworth
18	78Md73B	68°29′24″	159°16′07″	—	Late Triassic	JPe$_4$	Radiolaria	B. K. Holdsworth
19	78Ek54	68°29′12″	159°03′20″	—	Mesozoic	JPe$_4$	Radiolaria	B. K. Holdsworth
20	78Ek55B	68°28′09″	159°03′11″	—	Pennsylvanian to Early Permian	TRPs	Radiolaria	B. K. Holdsworth
21	78Md95D	68°27′00″	159°59′00″	—	Pennsylvanian to Early Permian	TRPs$_1$	Radiolaria	B. L. Murchey
22	78Md72	68°27′46″	159°56′29″	—	Pennsylvanian to Early Permian	JPe$_1$	Radiolaria	B. K. Holdsworth
23	78Md68C	68°29′00″	159°46′24″	—	Triassic	JPe$_2$	Radiolaria	B. K. Holdsworth
24	78Md69A	68°28′40″	159°39′06″	—	Mesozoic	JTRo$_1$	Radiolaria	B. L. Murchey
25	78Md64B	68°23′00″	159°44′40″	—	Late Mississippian to Pennsylvanian	PMc$_{4n}$	Radiolaria	
26	78Md61A	68°17′45″	159°36′12″	—	Late Paleozoic—probably Pennsylvanian	TRPs$_1$	Radiolaria	B. L. Murchey
27	78Ek56D	68°15′51″	159°16′45″	—	Pennsylvanian to Permian	JPe	Radiolaria	B. K. Holdsworth
28	78Md109A	68°16′25″	159°09′37″	—	Late Mississippian to Pennsylvanian	PMc$_{4n}$	Radiolaria	B. L. Murchey
29	78Md37	68°15′22″	159°07′30″	—	Pennsylvanian to Early Permian	TRPs$_1$	Radiolaria	B. K. Holdsworth
30	78Md84A	68°36′19″	159°30′24″	—	Triassic	JPe$_4$	Radiolaria	B. K. Holdsworth
30	78Md84A	68°36′19″	159°30′24″	—	Early Triassic	JPe$_4$	Conodont	B. R. Wardlaw
31	78Tr32A	68°34′04″	159°26′12″	—	Late Devonian to Early Mississippian (late Famennian to middle Osagean) [1]CAI=3	Mk$_4$	Conodont	A. G. Harris
32	78Md116A	68°24′33″	159°54′30″	—	Late Devonian to Early Mississippian (late Famennian to early Kinderhookian) [1]CAI=3	Mu$_3$	Conodont	A. G. Harris
33	78Md87	68°14′24″	159°51′55″	—	Late Devonian to Early Mississippian (probably late Famennian to Kinderhookian) [1]CAI=3	Db$_3$	Conodont	A. G. Harris
34	78Tr71B	68°34′34″	159°50′06″	27589–PC	Probably Early Mississippian	Mko$_3$	Brachiopods	J. T. Dutro, Jr.
35	78Tr128C	68°19′03″	159°45′06″	—	Late Devonian to Early Mississippian	MDn$_1$	Brachiopods	J. T. Dutro, Jr.
36	66ARr163A, B, C	68°07′49″	159°53′33″	M1010	Mississippian	Mu$_1$	Brachiopods, corals	A. K. Armstrong
37	66Tr141	68°14′09″	159°29′42″	7990–SD	Middle to early Late Devonian	Db$_3$	Brachiopods, corals	J. T. Dutro, Jr. W. A. Oliver, Jr.
38	66Tr142	68°14′06″	159°28′36″	M1012	Early Mississippian	Mk$_1$	Brachiopods	J. T. Dutro, Jr.
39	66Tr120F	68°15′27″	159°26′05″	M1008	Early Mississippian	Mu$_3$	Brachiopods	J. T. Dutro, Jr. A. K. Armstrong
40	66Tr123	68°13′58″	159°21′06″	M1011	Early Mississippian	Mk$_1$	Brachiopods, corals	J. T. Dutro, Jr.
41	77Md81A	68°34′50″	159°56′36″	—	Probably Early Cretaceous	Ko$_2$	Pelecypods	C. F. Mayfield
42	78Ek20D	68°31′12″	159°19′42″	—	Probably Early Mississippian	Mk$_1$	Brachiopods	J. T. Dutro, Jr.
43	78Ek25	68°14′27″	159°13′40″	—	Probably Middle Devonian	Db$_3$	Corals, stromatoporoids	J. T. Dutro, Jr.
44	78Ek30B	68°30′30″	159°38′06″	—	Early Mississippian	Mk$_1$	Brachiopods	J. T. Dutro, Jr.
45	78Md29B	68°32′47″	159°14′00″	—	Latest Silurian to Middle Devonian	Db$_3$	Corals stromatoporpoids, brachiopods	J. T. Dutro, Jr.
46	78Md53	68°25′37″	159°48′42″	—	Early Mississippian (probably Osagean)	Mu$_3$	Brachiopods	J. T. Dutro, Jr.
47	78Md67	68°28′28″	159°46′00″	—	Probably Early Mississippian	MDl	Bryozoans	J. T. Dutro, Jr.
48	78Md112C, D	68°19′30″	159°26′06″	—	Late Devonian to Early Mississippian	MDn$_1$	Brachiopods	J. T. Dutro, Jr.
49	78Md80B	68°34′24″	159°37′12″	—	Late Mississippian (Visean) (Mamet Zone 12 or younger)	Ml	Foraminifera	B. L. Mamet
50	78Tr130D1–2	68°22′00″	159°51′00″	—	Late Mississippian (Visean) (Mamet Zone 11 or younger)	Mu$_3$	Foraminifera	B. L. Mamet
51	78Tr130E1–2	68°21′56″	159°50′33″	—	Late Mississippian (Visean) (Mamet Zone 12-13)	Mko$_3$	Foraminifera	B. L. Mamet
52	78Ek106B–E	68°29′40″	159°26′19″	—	Probably Middle Devonian (Givetian)	Dl	Brachiopods, corals, gastropods	J. T. Dutro, Jr.
53	78Tr70C	68°34′26″	159°50′48″	M7426	Early Cretaceous (late Valanginian)	Ko$_1$	Pelecypods	D. L. Jones J. W. Miller
54	78Tr46	68°27′13″	159°38′18″	M7428	Early Cretaceous (late Valanginian)	Ko$_4$?	Pelecypods	D. L. Jones J. W. Miller
55	82Tr1A–E	68°38′33″	159°17′00″	28739–PC to 28743–PC	Late Mississippian to Early Pennsylvanian (latest Chesterian to early Morrowan) [1]CAI=1½	PMn$_4$	Conodonts	A. G. Harris
55	82Tr1A–C, E	68°38′33″	159°17′00″	—	Late Mississippian (late Chesterian or younger) (Mamet Zone 18-19, 20?)	PMn$_4$	Foraminifera	B. L. Mamet
56	82Tr2C–E	68°37′15″	159°13′48″	28744–PC to 28746–PC	Late Mississippian to Early Pennsylvanian (latest Chesterian to early Morrowan) [1]CAI=2	PMn$_5$	Conodonts	A. G. Harris
56	82Tr2C, E	68°37′15″	159°13′48″	—	Late Mississippian (late Chesterian or younger) (Mamet Zone 18 or younger)	PMn$_4$	Foraminifera	B. L. Mamet
56	82Tr2B	68°37′15″	159°13′48″	—	Probably Paleozoic (Permian to Pennsylvanian)	JPe$_4$	Radiolaria	B. L. Murchey
57	82Tr3C	68°36′38″	159°12′55″	—	Probably Early Permian	JPe$_4$	Radiolaria	B. L. Murchey
	82Tr3C	68°36′38″	159°12′55″	—	Paleozoic (early Permian to Pennsylvanian)			
57	82Tr3B, E 71Tr23–20, 21	68°36′38″	159°12′55″	— —	Early Permian to Early Pennsylvanian (Mamet Zone 22 and above)	JPe$_4$?	Foraminifera	B. L. Mamet
57	82Tr3B	68°36′38″	159°12′55″	28747–PC	Late Mississippian (middle to late Chesterian) [1]CAI=2	JPe$_4$?	Conodonts	A. G. Harris
58A	82Tr4A–F	68°37′08″	159°12′38″	—	Mesozoic	JPe$_4$	Radiolaria	B. L. Murchey
58B	82Tr4G	68°37′05″	159°12′11″	—	Early Permian to Middle Pennsylvanian (Mamet Zone 22 and above)	JPe$_4$?	Foraminifera	B. L. Mamet
58B	82Tr4G	68°37′05″	159°12′11″	28748–PC	Late Mississippian (middle Chesterian) [1]CAI=2	JPe$_4$?	Conodonts	A. G. Harris
59	78Md74A	68°33′20″	159°58′50″	—	Late Mississippian (Visean) (Mamet Zone 11-12)	PMk$_1$	Foraminifera	B. L. Mamet

[1]Conodont color alteration index (CAI)-estimated maximum during temperatures reached diagenesis: CAI = 1½ (60-90° C); CAI = 2 (80-120° C); CAI = 3 (120-160° C).