EAGLE. ALASKA

EAGLE

## DESCRIPTION OF MAP UNITS

- Qa ALLUVIUM--Sand, gravel, and silt along major streams; includes low terraces. Locally contains organic silt and peat, glacial outwash, and reworked elacial deposits. Mostly Holocene in age.
- Qc ALLUVIUM AND COLLUVIUM--Dominantly sand, gravel and silt in stream valleys and fine to coarse colluvium in heads of valleys and on slopes of valley sides. Talus, including talus cones in the more rugged mountain areas; alluvial fan deposits, till, glacial outwash, lake deposits, organic silt and peat locally included. Mostly
- Q1 LANDSLIDE DEPOSITS—Mixed coarse and fine unconsolidated debris deposited by several large landslides and(or) earthflows. Hilly landslide topography with ponds and small lakes characteristic. Small areas of such deposits not mapped. Holocene in age.
- Qt INTERMEDIATE AND HIGH TERRACE DEPOSITS -- Silt, sand, and gravel. Gravel commonly poorly sorted; stratification poor to good. Wind blown silt and sand may locally mantle terrace deposits, particularly along the Yukon River. Pleistocene and Holocene in age.
- Qm MORAINAL DEPOSITS--Primarily till in moraines; gravelly, sandy, and bouldery. Includes patches of gravel and sand. Chiefly terminal moraine, but some lateral and ground moraine and morainal material in cirques. In places includes talus and other colluvial material. Some moraines are fresh with steep-sided hillocks and ridges: large, closely spaced boulders cover the surface; ponds common. Other moraines are more subdued and surface boulders are weathered and widely scattered: locally the till has been modified by mass movement, eolian deposition, and flu-vial action. Some moraines have lost all original form and are represented only by patches of weathered till.
- TKd DETRITAL ROCKS--Conglomerate, sandstone, mudstone, shale, breccia, tuffaceous rocks, and lignite. Conglomerate very coarse to fine and clasts poorly to well rounded. In the Eagle and Seventymile areas, well-rounded black chert pebbles are characteristic. Sandstone, mudstone, and tuffaceous rocks locally contain pollen and poorly preserved plant fragments and impressions. Map unit probably ranges in age from Late Cretaceous to Pliocene in the Eagle and Seventymile area. Probably early to late Tertiary in other parts of the quadrangle. Rocks have

Moraines are of several ages, probably ranging from Illinoian to Wisconsin.

been folded and faulted.

tuff. Age unknown.

## South of Tintina fault zone

- Tf FELSIC IGNEOUS ROCKS—Tuffs, welded tuffs, volcanic breccia, and felsic shallow intrusive rocks, including porphyries, as dikes, sills, and small bodies. Dikes and masses of felsic igneous rocks too small to map, common in other units. Rocks of this unit commonly much altered and weathered; white, gray, pink, light brown, or orange brown in color. Glassy rocks are dark gray or green. Probably Tertiary in age.
- Ti INTERMEDIATE VOLCANIC ROCKS--Lava, volcanic breccia and tuff. Tan, gray, or greenish gray. Altered and weathered.
- t. Sorenson and Ketchumstuk Mountain, mixed with metabasalt and metagabbro. Many mafic dikes not shown on map. TMzd DIORITE--Primarily diorite, quartz diorite and diorite porphyry, but may include some granodiorite or gabbro. Only

TMzm MAFIC IGNEOUS ROCKS--Primarily basalt and gabbro, but may include minor andesite and diorite. In the vicinity of

- larger bodies indicated. Gray diorite and quartz diorite also occurs commonly in other igneous units. Mesozoic TMzg UNDIFFERENTIATED GRANITIC ROCKS--Primarily quartz monzonite and granodiorite, but includes granite to diorite with local aplite, alaskite, and pegmatite. Fine to coarse grained; equigranular to coarsely porphyrytic. Biotite-
- hornblende granodiorite abundant. Commonly crops out in tors. Most of larger plutons probably Mesozoic in age
- Mzh HORNBLENDE GRANODIORITE--Primarily coarse-grained hornblende granodiorite and quartz monzonite but includes some gabbro and syenite. Probably Mesozoic in age.
- JTRS GRANODIORITE OF TAYLOR MOUNTAINS--Medium- to coarse-grained granodiorite of Taylor Mountain batholith. Locally includes quartz monzonite, quartz diorite, and some diorite. Includes lamprophyre dikes. Eastern margin is gradational with zones where much country rock has been incorporated; dikes are abundant and country rock is locally hornfelsed and brecciated. Sr87/Rb87 determinations on biotite gave an age of 190 m.y. (Wasserburg
- and others, 1963, p. 258) MzPzmu MAFIC AND ULTRAMAFIC ROCKS, UNDIFFERENTIATED--Ultramafic and mafic rocks with some intermediate igneous and meta-igneous rocks. Occur as dikes, sills, and small bodies in faulted zone; largely covered. Ultramafic rocks are dark greenish black and black peridotites, all or partly serpentinized. Basaltic rocks are black or brownish black. Dioritic rocks are gray or greenish gray and fine to medium grained. Some may be metamorphosed. Local
- MzPzu ULTRAMAFIC ROCKS--Peridotites, mostly highly serpentinized, and minor hornblendite. Occur as dikes, sills, and large and small masses. Some obscurely to well foliated. Near Mt. Sorenson have diorite tectonic inclusions.

zones of quartz-carbonate rock and other silicic rock (chert and(or) metachert?). Ages unknown.

- MzPzt SILICIFIED TUFF(?)--White, light tan, or light gray, structureless, massive silicic rock. Probably metamorphosed
- Pzg GREENSTONE--Greenstone, dark green, mostly massive or obscurely foliated, but locally well foliated, from mafic igneous rocks. Locally original structures such as amygdules and pillows distinguishable. Includes greenschist and minor green and pink quartzite, chert, and phyllite; small serpentinized areas. In the Ketchumstuk Creek

area includes comparatively unaltered gabbro and basalt. Age uncertain, but probably mostly Paleozoic.

- Pzq QUARTZ-MICA SCHIST AND GREENSCHIST--Quartz-mica schist, greenschist, quartzite, marble, quartz phyllite, phyllite, quartz-mick Schisi And Gardaschisi--Quartz-mick schist, greenschist, quartz-mick schist, quartz-mick schist, chlorite schist, and greenstone. Locally includes cataclastic rocks and hornfels. Includes retrograded gneissic rocks, particularly near granitic contacts. Biotite present locally, but mostly not abundant. Garnet rarely present. Mostly greenschist facies but may locally include rocks of epidote-amphibolite or amphibolite facies. Poorly preserved crinoid columnals found in marble at several localities. Age uncertain, but original sediments probably mostly Paleozoic with metamorphisms in Paleo-
- Pzb BIOTITE SCHIST, QUARTZITE, AND MARBLE--Quartz-biotite and muscovite schist, quartzite, quartz-epidote schist, quartz-graphite schist, marble, quartz-amphibole schist, and some greenschist with interlayered greenstone. Locally includes quartz-biotite gneiss, retrograded gneiss, and amphibolite. Biotite abundant and garnet common locally. Probably mostly epidote-amphibolite facies, but may include greenschist and amphibolite facies rocks. Includes contact metamorphosed aluminous rocks with andalusite or secondary minerals from altering anda-

usite. Original rocks probably mostly of Paleozoic age with metamorphism in Paleozoic and(or) Mesozoic time.

- Pzp&p PHYLL.ITE--Phyllite, argillite, quartzite, and minor chert, marble, metagraywacke, and metaconglomerate. Phyllite mostly light to dark gray, greenish gray, tan or pink. Marble gray to black. Some rocks contain fine biotite. Age uncertain but probably Paleozoic and(or) Precambrian in age.
- Pzpcb BIOTITE GNEISS AND AMPHIBOLITE--Quartz-biotite gneiss and schist, amphibolite, quartzite, marble, and feldspathic
- PzpCa AUGEN GNEISS--Quartz-biotite augen gneiss, quartz-biotite gneiss, amphibolite and quartzite. Probably mostly amphibolite facies. Age uncertain, probably mostly Paleozoic but could be all or partly Precambrian. gneiss. Age uncertain but probably mostly Paleozoic and (or) Precambrian.
- Pzp&g GNEISS AND GRANITIC ROCKS, INTERMIXED--Quartz-biotite gneiss, feldspathic gneiss and quartzite, mixed with granitic rocks. Outcrops rare; mostly rubble. Appears to be amphibolite facies but metamorphic rocks complexly intruded and mixed with granitic rocks. Metamorphic rocks of uncertain age, but probably mostly Paleczoic and(or) Precambrian. Intermixed granitic rocks of Mesozoic and Tertiary age.
- Pzp€i GNEISS AND HYPABYSSAL ROCKS, INTERMIXED--Quartz-biotite gneiss, feldspathic, gneiss and quartzite intermixed with felsic hypabyssal and volcanic rocks and some granitic rubble. Outcrops rare, mostly rubble. Felsic rocks are from dikes, sills, and erosional remnants of volcanic rocks. Metamorphic rocks of uncertain age, probably Palecoic and(or) Precambrian. Felsic rocks probably of Tertiary age. Granitic rocks probably Mesozoic and(or)

NORTH OF THE TINTINA FAULT ZONE

Sandstone and conglomerate

DISCONFORMITY(?)

Ford Lake Shale

Calico Bluff Formation

Nation River Formation

McCann Hill Chert

DISCONFORMITY

DISCONFORMITY

Hillard Limestone

Adams Argillite

-6f

p€l

p€b

Greenstone

p&It

Basalt and red beds

Quartzite and argillite

Limestone p€s

Funnel Creek Limestone\_

Dolomitic sandstone and shale

STRATIGRAPHIC POSITION UNCERTAIN

Road River Formation

## North of Tintina fault zone

- Pc SANDSTONE AND CONGLOMERATE -- Sandstone and wacke composed of chert and quartz grains cemented by calcite. Inter-bedded conglomerate has varicolored chert pebbles and cobbles. Contains productid brachiopods, plant fragments, bryozoa, corals, and gastropods. Coal chips common. Interbedded shale nonfossiliferous. Thickness about 300 Permian(?) in age. May lie disconformably on Calico Bluff Formation.
- CALICO BLUFF FORMATION--Rhythmically interbedded dark-brownish-gray bioclastic limestone and shale. Contains rich invertebrate fauna and a few gymnosperm pollen and spores. Thickness about 1,400 feet. Late Mississippian in
- MDf FORD LAKE SHALE--Grayish-black laminated siliceous shale and chert. Minor dark-gray siltstone, quartzite, and stone. Contains plant stems and a few brachiopods. Thickness about 3,000 feet. Late Devonian to Late Mississippian in age.
- NATION RIVER FORMATION--Rhythmically interbedded mudstone, sandstone, gritstone, and conglomerate. Graded beds common. Mudstone is olive gray and nearly everywhere has plant fragments and spores of probable Late Devonian age. Sandstone is olive-gray chert-quartz arenite and wacke, commonly with carbonate cement. Gritstone and conglomerate composed mostly of varicolored chert granules and pebbles. Thickness about 3,000 feet. Late Devon-
- MCCANN HILL CHERT--Thin-bedded and laminated dark- to light-gray chert, siliceous shale, and minor chert gritstone. Contains plant fragments, poorly preserved spores, and rare conodonts, gastropods and cephalopods. Basal part of formation has beds of dark-gray bioclastic limestone with remarkably varied fauna, including trilobites, corals, brachiopods, fish, and ostracods of Middle Devonian (Eifelian) age. Thickness 200 to 800 feet. Early Middle(?) and Late Devonian in age. Lies disconformably on Road River Formation.
- DOr ROAD RIVER FORMATION--Dark-gray graptolitic shale with lesser amounts of grayish-black laminated chert and very minor dark-gray limestone, greenish-gray dolomite, grayish-black chert arenite and chert conglomerate. Chert, chert arenite, and chert conglomerate occur mainly in basal part of formation. Graptolites indicate that most series of the Ordovician and Silurian are represented and that the younger rocks are Early Devonian (pre-Emsian). Lies disconformably on Hillard Limestone. Thickness 400 to 900 feet.
- OCh HILLARD LIMESTONE--Very fine to medium-grained pale-yellowish-brown limestone. Laminated to very thick bedded, shaly to massive parting. Has interbeds of edgewise limestone conglomerate, colitic limestone and sandy limestone. Minor dolomite, grayish-black chert, dark-gray fissile shale, siltstone, and at base, limestone boulder conglomerate. The medium-grained sandy (chert and quartz) limestone commonly contains trilobites and brachiopods. Age, Early, Middle, and Late Cambrian and, near triangulation station Crow, earliest Ordovician. Maxi-
- €a ADAMS ARGILLITE--Light-olive-gray argillite, siltstone, and cross-laminated quartzite with worm(?) burrows. Oolitic and sandy limestone near base has Archaeocyathus of Early Cambrian age. Thickness about 900 feet.
- FUNNEL CREEK LIMESTONE--Light-gray, fine- to medium-grained laminated limestone, dolomitic limestone, and dolomite. Extensively silicified and commonly colitic. Forms massive cliffs. Nonfossiliferous. Maximum thickness about 1,000 feet. Early Cambrian in age.

### Tindir Group

- p&l LIMESTONE--Dark-gray laminated limestone with platy parting. Has interbeds of greenish-gray shale, siltstone, and sandstone. Includes minor pale-yellowish-brown sandy limestone, light-gray laminated dolomite, and chertcarbonate gritstone. Thickness 800 to 1,500 feet.
- DOLOMITIC SANDSTONE AND SHALE--Light-gray thin- to medium-bedded sandstone (doloarenite) and olive-gray shale. Minor gritstone and conglomerate. Doloarenite composed mostly of rounded dolomite grains with subordinate chert and quartz grains. Cross-laminations common. Weathers very pale orange and resembles crystalline dolomite at a distance. Gritstone and conglomerate composed mostly of dolomite and chert clasts and some granules, pebbles, and cobbles of granitic, volcanic and metamorphic rocks. Thickness about 2,500 feet.
- SYENITE OF MOUNT VETA——Primarily hornblende syenite porphyry, but locally equigranular. Includes hornblende quartz—
  monzonite and diorite. Potassium argon age on hornblende of 177 m.y. ± 5 m.y. (Potassium-argon age report no.

  54 (Menlo Park), 1969, by J. Von Essen)

  BASALT AND RED BEDS—Dark—greenish—gray basalt and tuff. Red beds mostly grayish—red shale and siliceous shale.

  Minor greenish—gray shale, jasper, greenstone—dolomite conglomerate, hematitic doloarenite, and vitric tuff
  and lava, largely replaced by hematite and carbonate. Thickness at least 2,500 feet. STRATIGRAPHIC POSITION UNCERTAIN
  - QUARTZITE AND ARGILLITE—Greenish-gray laminated quartzite with interbeds of greenish-gray and dark-gray argillite.

    Minor grayish red argillite, siliceous shale, chert, and dark-gray sandy limestone. Quartzite contains a few worm(?) tubes. Includes small areas of intrusive(?) greenstone. Probably equivalent to upper part of Tindir Group or possibly to argillite of Early Cambrian age. Thickness at least 1,000 feet.
  - GREENSTONE--Fine-grained greenstone that is probably altered andesite or basalt. Interlayered with tuff, volcanic conglomerate, laminated quartzite, argillite, siliceous shale, and chert. Includes coarse-grained greenstone that may be altered basic intrusive rock. Probably equivalent to basalt and red beds of Tindir Group.
  - pelt LIMESTONE ALONG TINTINA FAULT ZONE--Dark-gray medium-grained limestone. Has interbeds of dark-gray shale and argillite, siliceous shale, chert, calcareous siltstone, dolomite, tuff, and greenstone. Thickness at least 1,000 feet.

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### SOURCES OF DATA FOR MAP COMPILATION Published sources

### Geology adapted from published maps by:

CORRELATION OF MAP UNITS

Bicarbonate spring

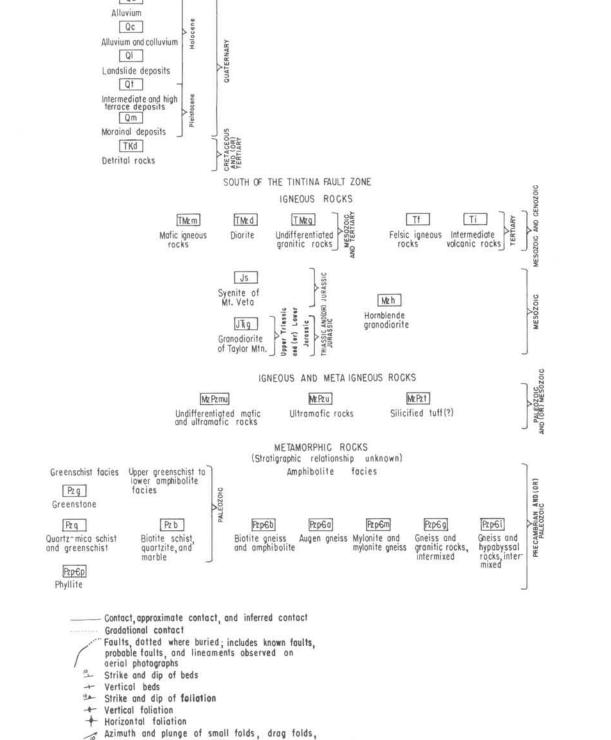
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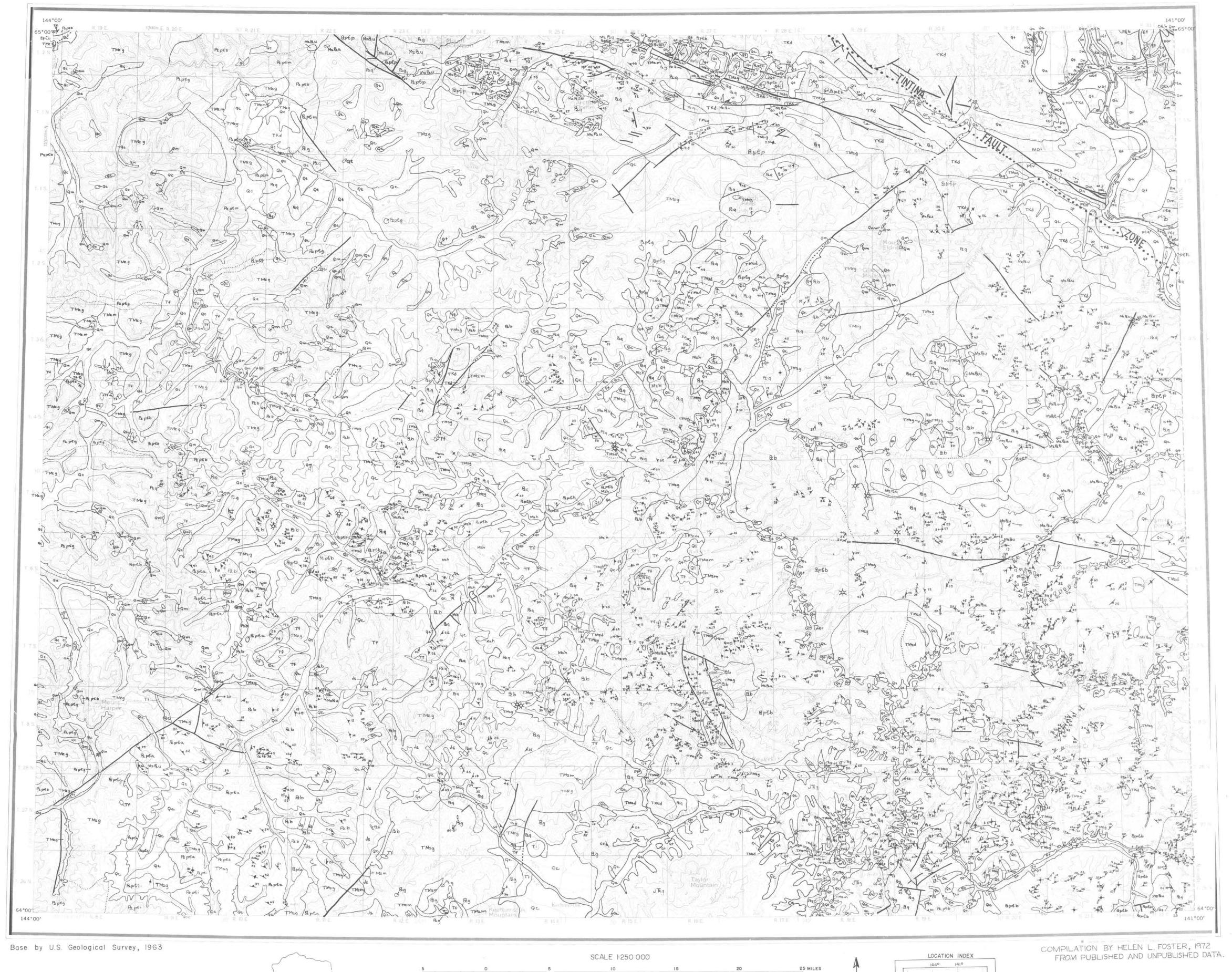
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#### Helen L. Foster, 1963-1964, 1966, 1968, 1971; assisted by Beverly Marsters, 1963; Terry C. Keith, 1964 and 1966; Sharleen MacDonald, 1968; Ronald M. Warbelow, 1968-1969; Jo Laird, 1969, Betsy Yount, 1970-1971; and Diana Gruni

H. B. Clark, 1968, assisted by Kathy Nichols; Terry Keith, 1970; and Jo Laird, 1970.





PRELIMINARY GEOLOGIC MAP OF THE EAGLE QUADRANGLE, ALASKA Compiled by Helen L. Foster, 1972

CONTOUR INTERVAL 200 FEET

1957 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 30'00' TO 30"30' EAST

ALASKA

25 KILOMETERS

MT HAYES TANACROSS