

This map shows the relationship between the larger faults and most igneous rocks of the Nelchina area. The igneous rocks were mapped only incidentally while studying the sedimentary rocks, and most of the data concerning them was obtained in the sedimentary terranes and only a little in the volcanic terranes. Nevertheless, it is believed that this map indicates in a general way the distribution and orientation of the Eocene mafic and Paleocene or Eocene felsic intrusive rocks in the areas underlain by sedimentary rocks, and of the Jurassic and Cretaceous(?) plutonic rocks in the areas underlain by the Talkeetna formation. Pre-Tertiary dikes intrude the Talkeetna formation, but are not shown. "A" and "B" mark structural highs which may be related in origin to the emplacement of the mafic intrusive rocks of Eocene age. Numerous minor fractures at "C" may also be related to the emplacement of the intrusives.

The mafic intrusive rocks are assigned an Eocene age because the extrusive rocks to which they seem related contain beds of tuff with fossil plants considered to be of Eocene age by R. W. Brown of the U. S. Geological Survey. The felsic intrusive rocks were emplaced into Upper Cretaceous marine sedimentary rocks. Similar intrusive rocks in the upper Matanuska Valley are cut by mafic dikes (Capps, 1927, p. 68) that are probably correlative with those in the Nelchina area. The plutonic rocks of the southeastern Talkeetna Mountains intrude fossiliferous Lower Jurassic marine volcanic rocks (the Talkeetna formation) and occur as boulders in conglomerates of Late Jurassic age (part of the Naknek formation). The plutonic rocks of the northern foothills of the Chugach Mountains and Sheep Mountain intrude the Talkeetna formation of Early Jurassic age and are overlain by marine sedimentary rocks of Early Cretaceous age.

REFERENCE
Capps, S. R., 1927, Geology of the upper Matanuska Valley, Alaska: U. S. Geol. Survey Bull. 791, p. 68.

EXPLANATION

Quaternary and Recent
Qgc
Glacial and alluvial deposits of the Copper River Basin

Eocene
Tv
Volcanic rocks
Basalt flows and minor pyroclastic rocks. Contain fossil plants assigned as Eocene age by R. W. Brown of the U. S. Geological Survey

Paleocene or Eocene
TKJs
Mafic dikes, sills and plugs, showing dip*
Diabase, basalt, and gabbro. Most of the dikes and sills are of undetermined extent and the dip of many is not known. Outcrops of mafic rocks for which an attitude was not recorded are shown by X. Braided patterns indicate some of anastomosing dikes

Middle Jurassic to Eocene
JK
Felsic plugs and dikes, showing dip*
Light-colored quartz and feldspar porphyries with microcrystalline or fine-grained groundmass; locally contain mafic minerals. Some plugs with fine-grained groundmasses. Dikes are of undetermined extent. Outcrops of felsic rocks for which an attitude was not recorded are shown by ▲

Jurassic and Cretaceous(?)
JKJs
Sedimentary rocks, undifferentiated*
Include many surficial deposits of Quaternary age. Stippled where bedded and changed to horizontal. Arbitrarily selected horizons shown locally by dotted contacts to delineate structural highs

Jurassic and Cretaceous(?)
JKJ
Plutonic rocks
Quartz diorite and diorite predominant, but rocks of more felsic and more mafic composition are included. J, mainly hornblende quartz diorite of late Early or Middle Jurassic age in southeastern Talkeetna Mountains. KJ, probably of the same age but possibly as young as Early Cretaceous in the northern foothills of the Chugach Mountains

Lower Jurassic
JK
Talaketa formation
Lavas and pyroclastic rocks that are dominantly andesitic but range from rhyolite to basalt and are commonly somewhat altered; and marine and non-marine sedimentary rocks. Stippled where strongly hydrothermally altered in the vicinity of Sheep Mountain

Contact
Dashed where inferred, indefinite, concealed, or mapped from aerial photographs. Queried where doubtful

Fault, showing dip
Dashed where inferred or mapped on aerial photographs, dotted where concealed, queried where doubtful. U, D indicate relative stratigraphic displacement. Queried barb indicates dip direction inferred or doubtful. S indicates dips that could not be closely determined, but were judged to be more than 60°

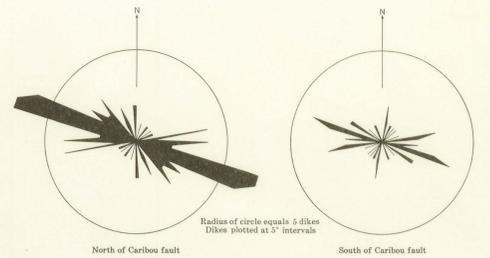
Vertical fault
Dashed where approximately located; dotted where concealed

Fault inferred from aeromagnetic data

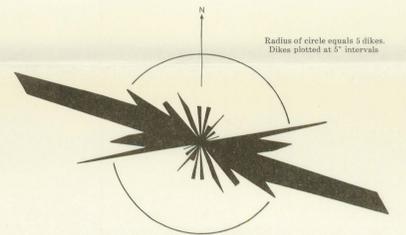
Syncline
Trace of axial plane. Dashed and queried where doubtful

A, B, C
A, B, structural high points.
C, area with many small fractures

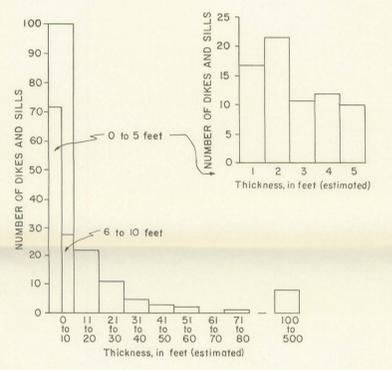
Lake



COMPASS ROSES SHOWING THE STRIKES OF 59 MAFIC DIKES NORTH OF THE CARIBOU FAULT AND 30 MAFIC DIKES SOUTH OF THE FAULT.
The dikes plotted dip more than 45° and are of Eocene age. North of the fault 94 percent of the 59 dikes plotted strike within 5° of N. 70° W., and 76 percent strike within 30° of N. 70° W. South of the fault 23 percent of the 30 dikes plotted strike within 5° of N. 70° W., and 67 percent strike within 30° of N. 70° W.



COMPASS ROSE SHOWING STRIKES OF 89 MAFIC EOCENE DIKES FROM THE NELCHINA AREA DIPPING MORE THAN 45°.
This diagram is a summation of the compass roses shown above



GENERALIZED GEOLOGIC MAP OF THE NELCHINA AREA, ALASKA, SHOWING IGNEOUS ROCKS AND LARGER FAULTS

By
Arthur Grantz
SCALE 1:96 000
1 0 1 2 3 4 5 MILES
CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL
1960