

During the 1977 summer field season the Alaska Division of Geological and Geophysical Surveys initiated a reconnaissance geophysical rock-sampling program in the Wiseman quadrangle. Selected rock types were collected for obtaining physical rock property values and establishing a geophysical data base for geologic terrains within the southern Brooks Range schist belt. A limited and selective sampling net was initiated to provide background information for possible future detailed sampling programs with the realization that physical properties of rocks are commonly subject to wide and extreme fluctuations over short distances.

Sixty-six rock samples from the southwestern corner of the Wiseman quadrangle were collected and analyzed. Physical rock property determinations were run for natural remanent magnetization (NRM) of the oriented samples, volume magnetic susceptibility, bulk rock density, and resistivity values by conventional laboratory techniques. The collection sites for all rock samples were transferred from 1:63,360-scale field sheets and plotted onto a 1:125,000-scale sample location map.

The NRM of 37 cored samples were determined with a static fluxgate magnetometer. No AC demagnetization of the rock samples was used. The volume susceptibility measurements (μ) were made with a magnetic susceptibility bridge instrument operating at a frequency of 400 Hz (μ values = 20×10^{-6} cgs units). The density values (ρ) were determined for bulk rock densities with the buoyancy method (ρ values = ± 0.01 grams per cc³). The resistivity determinations (ρ) were made in the time domain ($T = 2.0$ sec, $T_D = 450$ millisecc, and $T_w = 550$ millisecc) and frequency domain (0.1 and 1.0 Hz). Resistivity (ohm-meter) is the inverse of rock conductivity (σ). Table 1 shows sample location numbers magnetization values, bulk rock density and resistivity values for each collection site. Table 2 lists the map number, sample designation, and a brief field description of each rock sample.

The directions of NRM for selected rock types were plotted on an equal-area stereographic projection (fig. 1) and the direction of the NRM vector was defined by declination referenced to magnetic north and inclination referenced to the horizontal (positive above and negative below) (fig. 2).

Table 1. ROCK PHYSICAL PROPERTY LABORATORY DETERMINATIONS*

| Map No. | Sample Designation | Core Orientation | | Natural Remanent Magnetization (NRM) | | | | Volume Magnetic Susceptibility (μ) 10 ⁻⁶ cgs units | Rock Density (ρ) grams per cc ³ | Resistivity (ρ) ohm-meters | Map No. | Sample Designation | Field description of rock sample |
|---------|--------------------|-----------------------------|------------------------|--------------------------------------|---------------------|----------------------|---------------------|--|--|--------------------------------------|-----------|----------------------------------|---|
| | | Magnetic Azimuth degrees | Inclination degrees | Magnitude gauss | Dec. (D) degrees | Incl. (I) degrees | Dec. (D) degrees | | | | | | |
| 1 | TT DN 137 | 175 | 38 | 8.61E-01 | 8.03 | 380 | -7 | 2.10 | 2.50 | 6900 | 1 | TT DN 137 | Pyroxene monoclone-quartz metagreywacke |
| 2 | TT DN 204 | 245 | 28 | 2.88E-02 | 2.48 | 330 | -44 | 2.50 | 1900 | 2 | TT DN 204 | Calc-silicate schist | |
| 3 | TT DN 308 | 10 | 18 | 1.11E-01 | 8.74 | 845 | 83 | <30 | 2.83 | 3500 | 3 | TT DN 308 | Chlorite-quartz schist |
| 4 | TT DN 319 | 68 | 68 | 8.98E-02 | 8.24 | 85 | 85 | <30 | 2.71 | 1200 | 4 | TT DN 319 | Chlorite-quartz schist |
| 5 | TT DN 323 | 236 | 34 | 1.19E-00 | 1.74 | 158 | 63 | <30 | 2.80 | 21000 | 5 | TT DN 323 | Pyroxene monoclone-quartz schist |
| 6 | TT DN 136 | 63 | 50 | 1.54E-00 | 2.81 | 189 | -3 | 2.88 | 3500 | 6 | TT DN 136 | Pyroxene monoclone-quartz schist | |
| 7 | TT DN 24 | 270 | 0 | 2.78E-00 | 4.12 | 244 | -69 | 1910 | 2.80 | 1900 | 7 | TT DN 24 | Pyroxene monoclone-quartz schist |
| 8 | TT DN 45 | 270 | 0 | 2.38E-01 | 1.98 | 85 | 76 | <30 | 2.84 | 7800 | 8 | TT DN 45 | Pyroxene monoclone-quartz schist |
| 9 | TT DN 46 | 270 | 0 | 8.00E-01 | 1.56 | 85 | -14 | <30 | 2.80 | 6300 | 9 | TT DN 46 | Pyroxene monoclone-quartz schist |
| 10 | TT DN 131 | 289 | 63 | 8.30E-02 | 3.59 | 217 | 64 | <30 | 2.83 | 97000 | 10 | TT DN 131 | Pyroxene monoclone-quartz schist |
| 11 | TT DN 130 | 287 | 28 | 8.32E-02 | 3.89 | 186 | 44 | <30 | 2.81 | 23000 | 11 | TT DN 130 | Pyroxene monoclone-quartz schist |
| 12 | TT DN 141 | 285 | 48 | 2.08E-00 | 1.83 | 146 | 63 | <30 | 2.83 | 19000 | 12 | TT DN 141 | Chlorite-quartz schist |
| 13 | TT DN 26 | 280 | 42 | 3.72E-02 | 4.38 | 329 | 33 | <30 | 2.84 | 4200 | 13 | TT DN 26 | Chlorite-quartz schist |
| 14 | TT DN 27 | 0 | 56 | 8.33E-00 | 4.68 | 101 | 45 | <30 | 2.70 | 5900 | 14 | TT DN 27 | Pyroxene monoclone-quartz schist |
| 15 | TT DN 27 | 0 | 56 | 8.33E-00 | 4.68 | 101 | 45 | <30 | 2.70 | 5900 | 15 | TT DN 27 | Pyroxene monoclone-quartz schist |
| 16 | TT SWH 85 | 175 | 33 | 8.51E-02 | 1.78 | 313 | 50 | 80 | 2.86 | 5700 | 16 | TT SWH 85 | Grey marble |
| 17 | TT DN 80 | 245 | 85 | 1.17E-02 | 1.20 | 181 | -17 | <30 | 2.75 | 4500 | 17 | TT DN 80 | Pyroxene monoclone-quartz schist |
| 18 | TT DN 84 | 13 | 43 | 1.17E-02 | 1.20 | 183 | 81 | <30 | 2.71 | 4000 | 18 | TT DN 84 | Pyroxene monoclone-quartz schist |
| 19 | TT SWH 29 | 150 | 81 | 1.78E-01 | 1.85 | 155 | 19 | 380 | 2.88 | 4700 | 19 | TT SWH 29 | Pyroxene monoclone-quartz schist |
| 20 | TT DN 92 | 180 | 31 | 1.09E-01 | 8.93 | 335 | 39 | <30 | 2.80 | 17000 | 20 | TT DN 92 | Pyroxene monoclone-quartz schist |
| 21 | TT DN 133 | 285 | 38 | 1.39E-01 | 1.69 | 293 | -30 | 3240 | 2.80 | 6300 | 21 | TT DN 133 | Pyroxene monoclone-quartz schist |
| 22 | TT DN 89 | 210 | 68 | 3.72E-02 | 4.38 | 329 | 33 | <30 | 2.81 | 23000 | 22 | TT DN 89 | Pyroxene monoclone-quartz schist |
| 23 | TT SWH 84 | 81 | 40 | 8.43E-00 | 2.48 | 110 | 39 | 4180 | 2.89 | 6300 | 23 | TT SWH 84 | Pyroxene monoclone-quartz schist |
| 24 | TT DN 97 | 185 | 42 | 3.72E-02 | 4.38 | 329 | 33 | <30 | 2.84 | 23000 | 24 | TT DN 97 | Pyroxene monoclone-quartz schist |
| 25 | TT DN 146 | 235 | 39 | 8.45E-02 | 4.95 | 36 | 42 | <30 | 2.69 | 8500 | 25 | TT DN 146 | Pyroxene monoclone-quartz schist |
| 26 | TT SWH 21 | 145 | 19 | 2.27E-02 | 3.08 | 349 | 45 | <30 | 2.85 | 3700 | 26 | TT SWH 21 | Grey marble |
| 27 | TT DN 86 | 280 | 64 | 4.18E-02 | 2.65 | 289 | 1 | <30 | 2.79 | 2100 | 27 | TT DN 86 | Pyroxene monoclone-quartz schist |
| 28 | TT SWH 45A | 87 | 81 | 2.48E-01 | 3.15 | 284 | 28 | <30 | 2.76 | 14000 | 28 | TT SWH 45A | Pyroxene monoclone-quartz schist |
| 29 | TT SWH 45B | 13 | 43 | 1.17E-02 | 1.20 | 183 | 81 | <30 | 2.71 | 28000 | 29 | TT SWH 45B | Pyroxene monoclone-quartz schist |
| 30 | TT DN 83 | 182 | 13 | 2.60E-02 | 3.26 | 171 | -64 | <30 | 2.87 | 13000 | 30 | TT DN 83 | Pyroxene monoclone-quartz schist |
| 31 | TT DN 88 | 223 | 70 | 1.38E-00 | 1.81 | 36 | 63 | <30 | 2.88 | 6300 | 31 | TT DN 88 | Pyroxene monoclone-quartz schist |
| 32 | TT DN 100C | 70 | 85 | 2.43E-02 | 3.13 | 317 | 55 | <30 | 2.68 | 6000 | 32 | TT DN 100C | Pyroxene monoclone-quartz schist |
| 33 | TT DN 29 | 130 | 29 | 1.20E-02 | 1.10 | 274 | 28 | <30 | 2.82 | 26000 | 33 | TT DN 29 | Pyroxene monoclone-quartz schist |
| 34 | TT DN 77 | 243 | 13 | 4.30E-02 | 3.77 | 136 | 39 | <30 | 2.84 | 23000 | 34 | TT DN 77 | Pyroxene monoclone-quartz schist |
| 35 | TT SWH 28 | 148 | 43 | 4.43E-02 | 3.73 | 330 | 35 | <30 | 2.74 | 3500 | 35 | TT SWH 28 | Pyroxene monoclone-quartz schist |
| 36 | TT DN 89 | 15 | 58 | 8.88E-00 | 6.11 | 3 | 33 | <30 | 2.74 | 10000 | 36 | TT DN 89 | Pyroxene monoclone-quartz schist |
| 37 | TT DN 145 | 310 | 64 | 8.61E-02 | 4.92 | 185 | 46 | <30 | 2.80 | 17000 | 37 | TT DN 145 | Pyroxene monoclone-quartz schist |
| 38 | TT SWH 21B | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 38 | TT SWH 21B | Pyroxene monoclone-quartz schist |
| 39 | TT SWH 21C | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 39 | TT SWH 21C | Pyroxene monoclone-quartz schist |
| 40 | TT SWH 21D | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 40 | TT SWH 21D | Pyroxene monoclone-quartz schist |
| 41 | TT SWH 21E | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 41 | TT SWH 21E | Pyroxene monoclone-quartz schist |
| 42 | TT SWH 21F | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 42 | TT SWH 21F | Pyroxene monoclone-quartz schist |
| 43 | TT SWH 21G | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 43 | TT SWH 21G | Pyroxene monoclone-quartz schist |
| 44 | TT SWH 21H | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 44 | TT SWH 21H | Pyroxene monoclone-quartz schist |
| 45 | TT SWH 21I | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 45 | TT SWH 21I | Pyroxene monoclone-quartz schist |
| 46 | TT SWH 21J | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 46 | TT SWH 21J | Pyroxene monoclone-quartz schist |
| 47 | TT SWH 43 | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 47 | TT SWH 43 | Pyroxene monoclone-quartz schist |
| 48 | TT SWH 43 | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 48 | TT SWH 43 | Pyroxene monoclone-quartz schist |
| 49 | TT SWH 43 | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 49 | TT SWH 43 | Pyroxene monoclone-quartz schist |
| 50 | TT SWH 43 | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 50 | TT SWH 43 | Pyroxene monoclone-quartz schist |
| 51 | TT SWH 50 | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 51 | TT SWH 50 | Pyroxene monoclone-quartz schist |
| 52 | TT SWH 50X | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 52 | TT SWH 50X | Pyroxene monoclone-quartz schist |
| 53 | TT SWH 50Y | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 53 | TT SWH 50Y | Pyroxene monoclone-quartz schist |
| 54 | TT SWH 50Z | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 54 | TT SWH 50Z | Pyroxene monoclone-quartz schist |
| 55 | TT SWH 51 | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 55 | TT SWH 51 | Pyroxene monoclone-quartz schist |
| 56 | TT SWH 51B | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 56 | TT SWH 51B | Pyroxene monoclone-quartz schist |
| 57 | TT SWH 51C | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 57 | TT SWH 51C | Pyroxene monoclone-quartz schist |
| 58 | TT SWH 51D | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 58 | TT SWH 51D | Pyroxene monoclone-quartz schist |
| 59 | TT SWH 51E | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 59 | TT SWH 51E | Pyroxene monoclone-quartz schist |
| 60 | TT SWH 51F | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 60 | TT SWH 51F | Pyroxene monoclone-quartz schist |
| 61 | TT SWH 51G | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 61 | TT SWH 51G | Pyroxene monoclone-quartz schist |
| 62 | TT SWH 51H | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 62 | TT SWH 51H | Pyroxene monoclone-quartz schist |
| 63 | TT SWH 51I | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 63 | TT SWH 51I | Pyroxene monoclone-quartz schist |
| 64 | TT SWH 51J | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 64 | TT SWH 51J | Pyroxene monoclone-quartz schist |
| 65 | TT SWH 51K | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 65 | TT SWH 51K | Pyroxene monoclone-quartz schist |
| 66 | TT SWH 51L | 0 | 0 | 0 | 0 | 0 | 0 | <30 | 2.83 | 6300 | 66 | TT SWH 51L | Pyroxene monoclone-quartz schist |

Table 2. PRELIMINARY ROCK SAMPLE DESCRIPTION

*For Alaska Division of Geological & Geophysical Surveys by Elliot Geophysical Company, Tucson, Arizona.

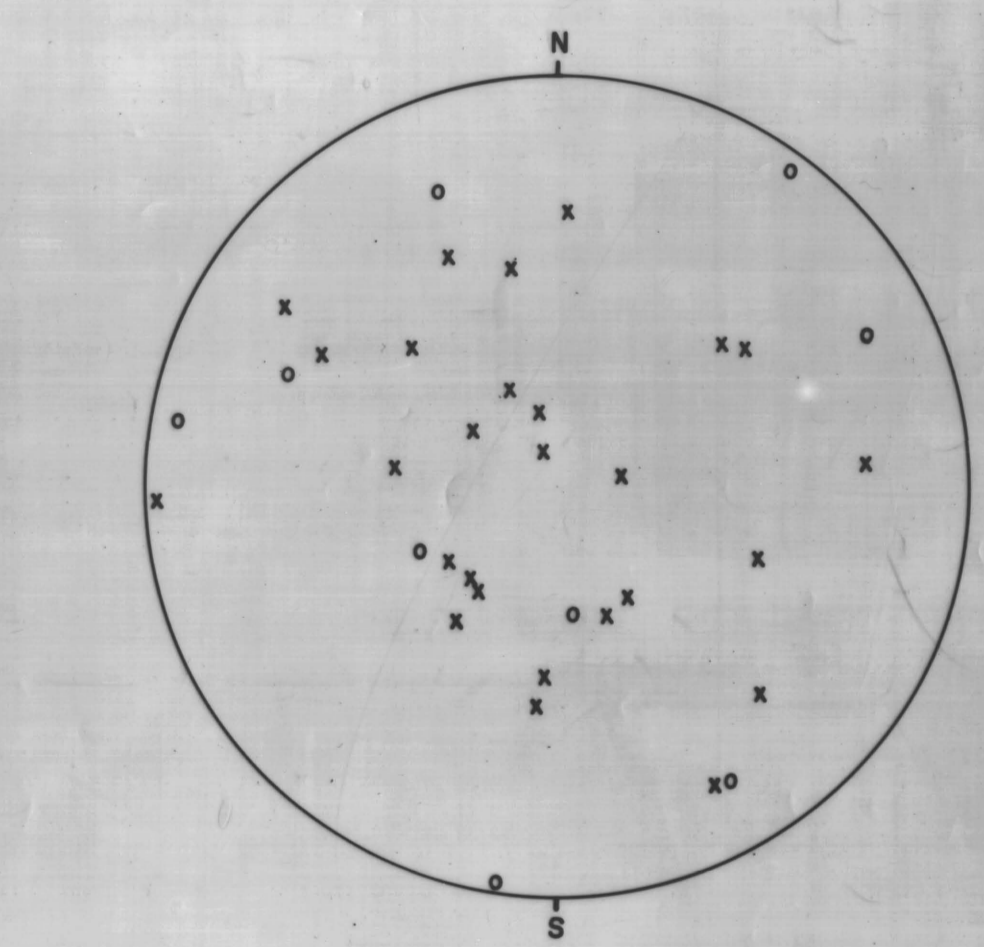


Fig. 1. Stereographic plot of directions of NRM for Paleozoic and Precambrian(?) rocks, SW corner of Wiseman quadrangle, Alaska. Data not corrected for regional geologic dip. Equal-area projection, lower hemisphere (x) and upper hemisphere (o).

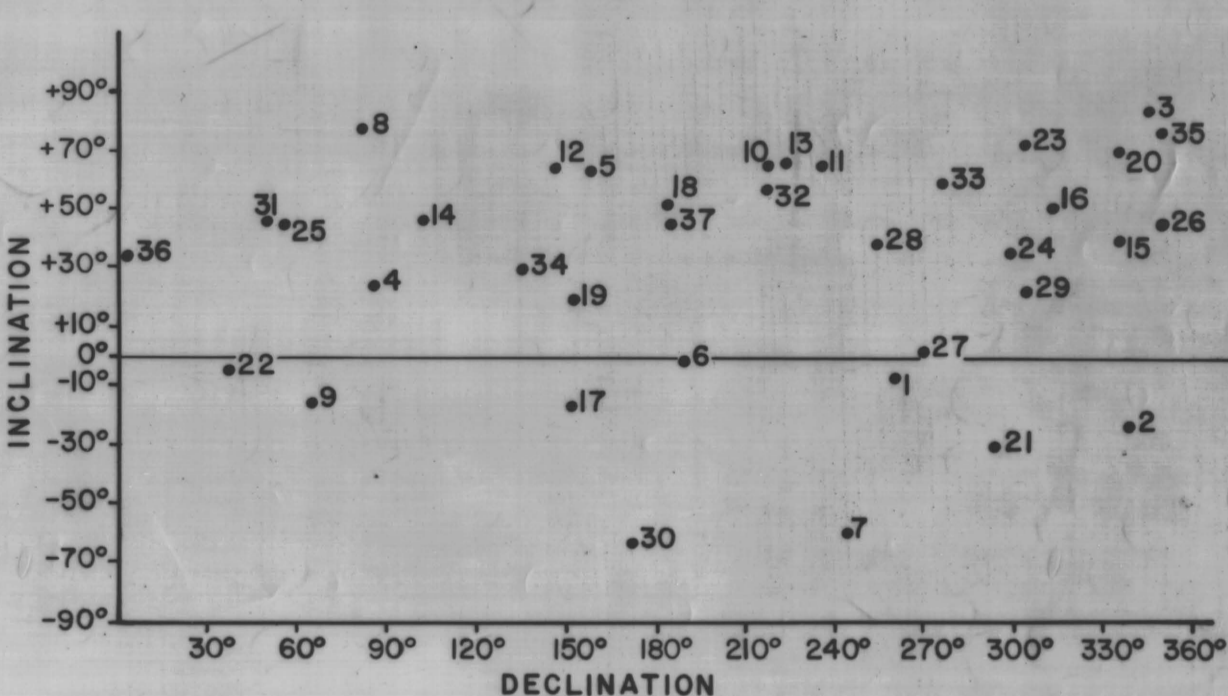
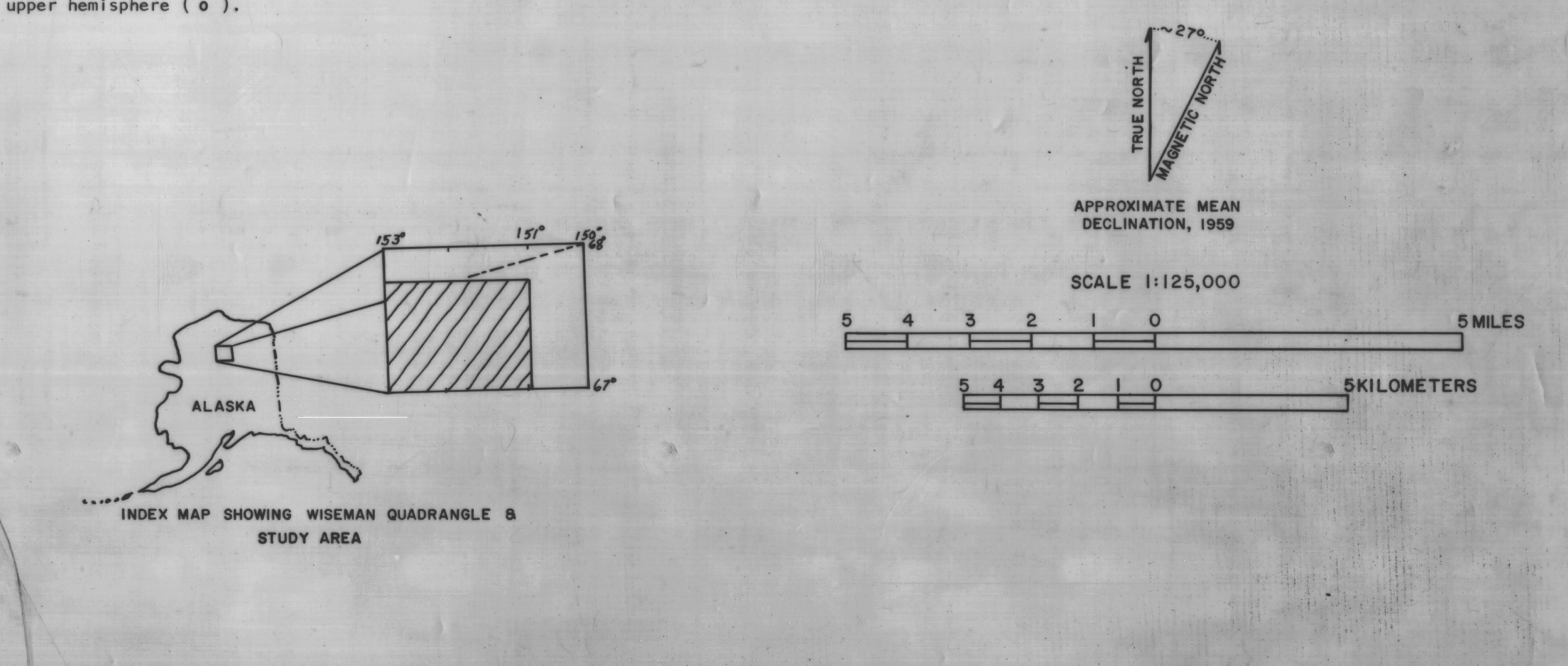


Fig. 2. Direction of NRM for 37 rock samples, SW corner of Wiseman quadrangle, Alaska. Data not corrected for geologic dip.



This is a preliminary publication of the Alaska Division of Geological and Geophysical Surveys and as such has not received final editing and review. The author will appreciate candid comments on the accuracy of the data, and welcome suggestions that will improve the report.