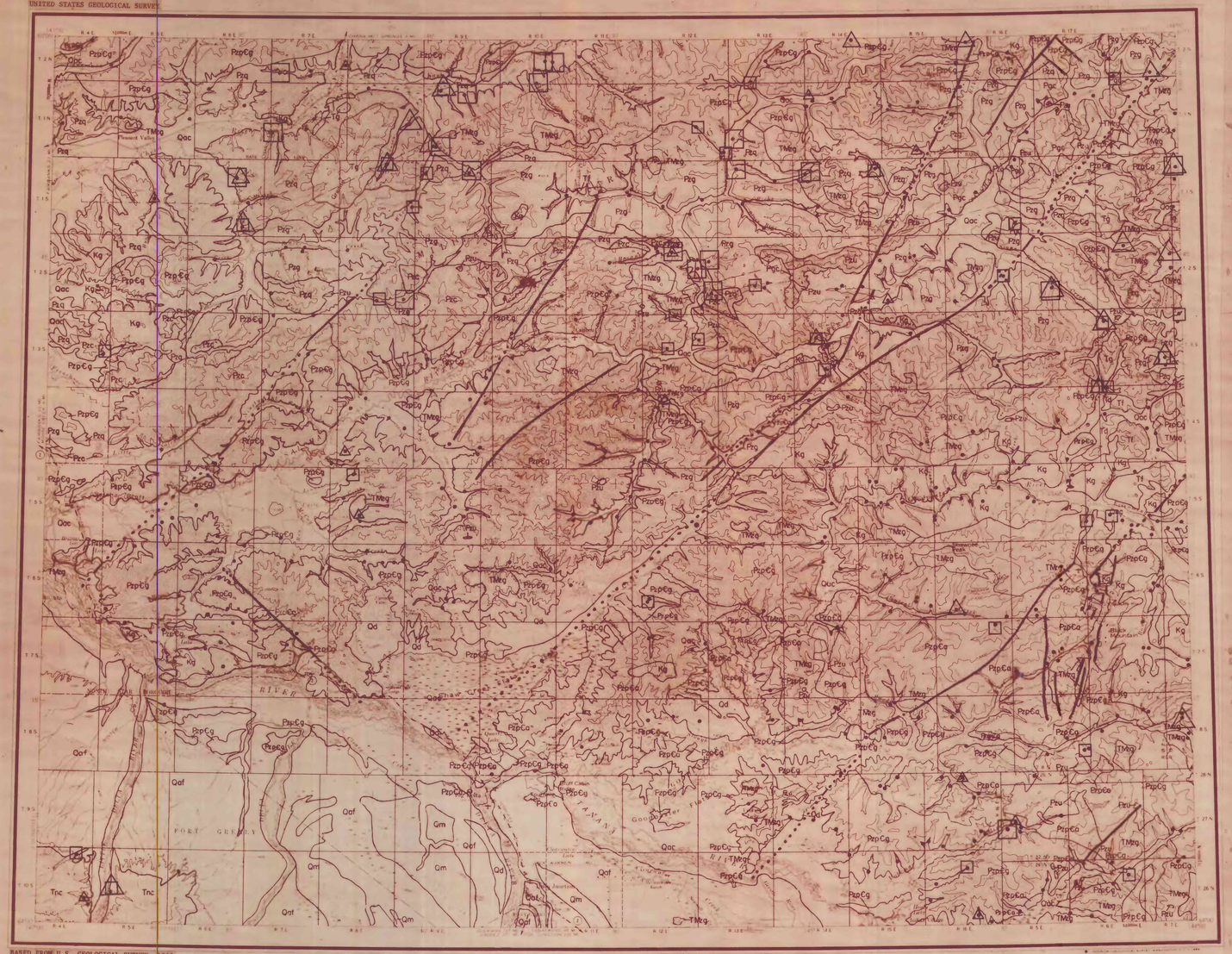
DEPARTMENT OF INTERIOR
UNITED STATES GEOLOGICAL SURVEY



BASED FROM U.S. GEOLOGICAL SURVEY, 1963

GEOCHEMICAL MAP SHOWING THE DISTRIBUTION AND ABUNDANCE OF ZINC AND CADMIUM IN THE ASH OF WILLOW LEAVES IN THE BIG DELTA QUADRANGLE, ALASKA

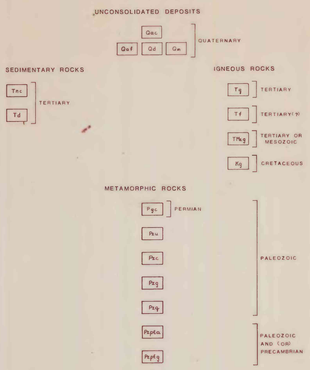
BY T. D. HESSIN, G. W. DAY, W. D. CRIM, AND M. M. DONATO

1978

EXPLANATION

GEOLOGY GENERALIZED FROM WEBER AND OTHERS (1975)

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

- Qac — ALLUVIUM, COLLUVIUM, AND MINOR GLACIAL AND EOLIAN DEPOSITS
- Qaf — ALLUVIAL FAN AND GLACIAL OUTWASH DEPOSITS
- Qd — DUNE SAND
- Qm — MORAINAL DEPOSITS

SEDIMENTARY ROCKS

- Tnc — NENANA GRAVEL AND COAL-BEARING FORMATION
- Td — DETRITAL ROCKS

IGNEOUS ROCKS

- Tg — FELSIC TUFF AND LAVA
- Tf — GRANITE AND QUARTZ MONZONITE
- TMrg — UNDIVIDED GRANITIC AND DIORITIC ROCKS
- Kg — UNDIVIDED GRANITIC AND MINOR DIORITIC ROCKS

METAMORPHIC ROCKS

- Pzu — GREENSTONE AND CHERT
- Pzu — ULTRAMAFIC ROCKS
- Pzc — CATACLASTIC SCHIST AND GNEISS
- Pzg — GREENSCHIST, QUARTZITE, MARBLE, COARSE META-ARENITE GREENSTONE, AND META-TUFF
- Pzp — QUARTZITE, SLATE, CALC-PHYLLITE, AND MARBLE
- PzpCm — AUGEN GNEISS AND MINOR AMOUNTS OF OTHER GNEISSIC ROCKS
- PzpCg — GNEISS, SCHIST, AUGEN GNEISS, AMPHIBOLITE, AND MARBLE

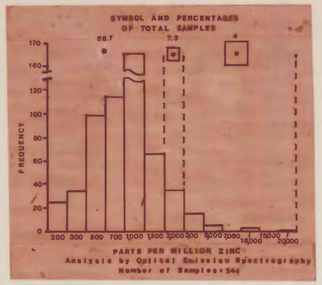
GEOLOGIC SYMBOLS

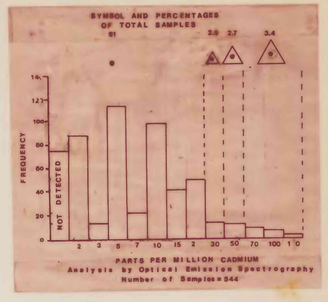
- CONTACT, APPROXIMATELY LOCATED
- FAULT OR PROBABLE FAULT; DOTTED WHERE CONCEALED

GEOCHEMICAL SYMBOLS

- SAMPLE SITE--Represents background values at sites where there are no anomalous values
- ANOMALOUS VALUES--Explained on histograms
- ZINC
- CADMIUM

BACKGROUND INFORMATION RELATING TO THIS MAP IS PUBLISHED AS U.S. GEOLOGICAL SURVEY CIRCULAR 783 AVAILABLE FREE OF CHARGE FROM THE U.S. GEOLOGICAL SURVEY, RESTON, VA. 22092





DISCUSSION

This map shows the distribution and abundance of zinc and cadmium in 544 samples of the ash of willow leaves collected in the Big Delta quadrangle in 1975 and 1977. This sampling was a part of geochemical studies made for the Alaska Mineral Resource Assessment Program. Willow leaves and twigs were collected adjacent to or as near as possible to the streams where the stream-sediment samples were collected. The areas within the quadrangle that show a low density of sample sites, particularly along the major northeast-trending fault and in the northwestern part of the quadrangle, were areas where dense brush and trees prevented helicopter landings. Areas in the southwestern and south-central parts of the quadrangle were not sampled because they are covered by thick unconsolidated deposits of Quaternary material, and very little vegetation is in evidence.

Willow is the most widespread botanical sample medium growing near streams in the Big Delta quadrangle and was available at all but two sample sites. The leaves were collected and analyzed to provide additional geochemical data on elements moving as ions in ground water.

The willow leaves and twigs were initially air-dried in cloth bags. The leaves were then hand-picked from the stems, pulverized in a commercial blender, and ashed in a muffle furnace at a peak temperature of 500°C. The ash was analyzed for 18 elements including zinc and cadmium by a semiquantitative emission spectrographic method for plant materials (Mosier, 1972). Map plots and histograms were produced from the analytical results. The range of anomalous values for each element was determined from the histograms and was subdivided into two or more plotting intervals represented by the symbols on the map and histograms.

Complete analytical data for all of the sample sites shown on this map are available in a U.S. Geological Survey Open-File Report by R. M. O'Leary and others (1978).

REFERENCES CITED

Mosier, E. L., 1972, A method for semiquantitative spectrographic analysis of plant ash for use in biogeochemical and environmental studies: Applied Spectroscopy, v. 26, no. 6, p. 636.

O'Leary, R. M., Cooley, E. F., Day, G. W., Hessin, T. D., McDougal, C. M., and McDanal, S. K., 1978, Spectrographic and chemical analyses of geochemical samples from the Big Delta quadrangle, Alaska: U.S. Geological Survey Open-File Report 78-571, 127 p.

Weber, F. R., Foster, H. D., Keith, T. E. C., and Dusel-Bacon, Cynthia, 1978, Preliminary geologic map of the Big Delta quadrangle, Alaska: U.S. Geological Survey Open-File Report 78-529A, scale 1:250,000.