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METAL PROVINCES OF ALASKA

By

Allen L. Clark, Henry C. Berg, Edward H. Cobb, G. Donald Eberlein,
Edward M. MacKevett, Jr., and Thomas P. Miller

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Demands for information pertaining to the geology and resource potential of Alaska have been steadily increasing, but although the known mineral occurrences and deposits have been discussed in many publications and summarized in compilations (Berg and Cobb, 1967; Cobb, 1972), there has not yet been an analysis of the regional distribution of minerals throughout the State. To fill this need, maps were prepared that show major and minor mineral deposits and generalized geology, and that tentatively outline major metal provinces. Such information will be useful in formulating decisions on land-use and will provide a basic framework for metal-exploration programs.

The development of a metal province map requires a great deal of subjective reasoning. The accompanying maps are only a first attempt and will no doubt be modified and superseded as additional data become available and present data are refined.

Basic assumptions

Without detailed information concerning the age, controls, and genesis of most mineral deposits in Alaska, neither a metallogenic province map nor a metallogenic epoch map can be prepared. However, it is possible to map the distribution of kindred or diagnostic metals in large regions of Alaska. The present map was therefore prepared within

the framework of the following definition: "A metal province is any area, ranging in size from an entire region to a single mining district, which is characterized by a distinct association and(or) anomalous concentration of a metal or metals."

Using this definition, large areas of Alaska were identified as metal provinces on the basis of known lode and placer deposits, geochemical sampling, extrapolation of known geologic environments, and the subjective evaluation of geologists who are experts on the various regions of Alaska.

In developing the map it was necessary to consider the following factors:

1. In most parts of the State little information is available. However, in some areas which have been studied extensively, such as the Seward Peninsula, the information level is relatively high. Therefore, in most areas it was necessary to extrapolate metal province boundaries through areas of little-known geology and locally without known deposits on the assumption that the geology was comparable to better-known metaliferous areas. In general, such extrapolations were "straight-line." As more data become available, the boundaries of the provinces may change considerably or the province may be found to be as continuous or extensive as postulated. In the better studied areas, the boundaries of the provinces are expected to change very little and only as a result of refinement of known geologic parameters.

2. Mineral development in Alaska is in an early stage, resulting primarily from remoteness and the high cost of exploration, extraction,

and marketing of metals. Consequently, mining ventures have concentrated on commodities of high unit values, such as gold, silver, platinum, mercury, and high-grade massive copper deposits. This has injected a strong bias in the definition of the major metal provinces of Alaska. To lessen this bias, particular attention was given to the known but less well-developed deposits of each area in determining how to categorize a given metal province. No provinces were defined solely on the basis of placer occurrences as placer deposits are considered to represent a residual concentration of metals governed by specific gravity, solubility, and grain size, which might or might not represent the true metal "signature" of an area. Placer deposit districts are shown by Cobb (1972) for all of Alaska.

References cited

- Berg, H. C., and Cobb, E. H., 1967, Metalliferous lode deposits of Alaska: U.S. Geol. Survey Bull. 1246, 254 p.
- Cobb, E. H., 1972, Placer deposits of Alaska: U.S. Geol. Survey open-file report.