

Porphyry Cu-Au-Mo potential of the Kamchatka Peninsula, Far East of Russia

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The comparisons of similar porphyry copper provinces and deposits around the circum-Pacific allows us to conclude that the northeastern Asia region probably hosts many undiscovered porphyry copper deposits. As a result of geological surveys carried out in the region at the end of the 20th and beginning of the 21st centuries, large epithermal Au-Ag (Kupol, Ametistovoe, Mnogovershinnoe, Svetloe) and Au-Cu porphyry (Peschanka, Malmyzh) deposits were discovered. Such discoveries confirm the high regional potential to discover gold, copper, and base metal deposits at a density comparable to known deposits in the eastern and southern parts of the Pacific belt (North America, South America, Indonesia). Moreover a promising location along with insufficient knowledge and a successful economic location along an ocean margin shared with the USA and Japan make the Kamchatka region very promising for the discovery, exploration, and production of large porphyry deposits.

The Kamchatka Peninsula region contains several metallogenic belts that hosts porphyry-style Cu-Au-Mo mineralization. The porphyry style mineralization occurs predominantly in the North Kamchatka (Koryakia), Central Kamchatka (Sredinny), and Kumroch-Ossorsky porphyry-bearing mineral districts. In Koryakia, the most promising area is the Kimlin ore zone, which includes more than nine copper-gold porphyry prospects. In Central Kamchatka there are more than 20 porphyry ore zones and deposits with predominantly Cu-Au particularly in the north and Cu-Mo-Au in the south of the metallogenic belt. For some of the porphyry occurrences in Central Kamchatka, such as Kirganik, there are enrichments in PGM. The Kumroch-Ossorsky porphyry-bearing mineral districts contain several mostly Au-Cu deposits and ore occurrences. Some porphyry prospects and deposits in the districts are believed to be co-magmatic with well-studied epithermal gold-silver mineralization, although these relationships have not been firmly established due to general lack of detailed isotopic and geochemical studies. The epithermal and porphyry deposits from the districts are thought to be related to a "fourfold age" subdivision that includes Late Cretaceous, Oligocene, Miocene, and late Tertiary-to-Holocene tectonic events, reflected in the various magmatic-volcanic arcs that formed over the subducting portion of the northward-moving Pacific plate. Porphyries of these ages have also been reported from the Alaska Peninsula region, a volcano-plutonic arc that formed along the northern Pacific subduction boundary.