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New tectonic and Metallogenic Maps of North, Central, East Asia and Adjacent Areas

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Set of maps (geological, tectonic and metallogenic) of North, Central, and East Asia at 1: 2.5 M scale were compiled by geologists of Kazakhstan, China, Korea, Mongolia, and Russia under the joint project and presented at the 34th International Geological Congress in Brisbane in 2012 [1, 2]. These maps have accumulated an unprecedented large amount of geological and metallogenic data. In this regard, at the 11th international workshop of five countries in 2013 (in Irkutsk), it was decided to develop specialized (by the types of tectonic processes) comprehensive tectonic and metallogenic maps at 1:5 M scale. Currently, tectonic and metallogenic maps: (1) accretion-collision structures and (2) large igneous provinces are being compiled.

These maps provide a separate display of complexes indicating the two main types of tectonic processes. The first map describes accretion and collision compression settings. It shows such typical complexes as ophiolites, island arcs and continental margin magmatic associations, accretion and collision granitoids, metamorphic formations, molasses, etc. The second map reflects rift and plume tectonic settings of stretching and deep, mostly mantle magmatism. Complexes-indicators in this case are the magmatic associations of intraplate environments: bimodal rift associations, plateau basalts, alkaline complexes, mafic dike belts, etc. Each of these two types of tectonic processes is associated with specific commercial fields and characteristic specific metallogenic zoning: linear for the first, concentric for the second type of settings.

Legends to the maps are based on the above approach; they include the tectonic and metallogenic part. Tectonic part of each legend contains age block with the scale of major orogenic (for the first map) or rift and plume tectonic (for the second map) events. It also includes a set of complexes-indicators registering certain geodynamic settings in the framework of the above-outlined two types of tectonic processes. Metallogenic parts of both legends incorporate sets of symbols displaying the commodities and genetic types of deposits characteristic of the accretion-collision or rift and plume tectonic settings.

Implementation of the planned approach to compilation of tectonic and metallogenic maps of new type and preliminary metallogenic analysis results based on them are illustrated exemplified by the Altai-Sayan folded area. The area is part of the Ural-Mongolian mobile belt and is located in the southwestern framing of the Siberian craton. It is characterized by numerous mineral deposits of various origins and ages. Geological complexes in the area reflect the tectonic environments of both the first and second types of tectonic processes. Early Paleozoic formations are represented by island arc, ophiolite associations and accretion-collision granitoids. The conditions of active continental margin of Andean type with zones of back-arc rifting are reconstructed for the Late Paleozoic. Mesozoic is characterized by intense intraplate magmatism and pull-apart settings.

References:

[1] Tectonic map of Northern-Central-Eastern Asia and Adjacent Areas, 1:2,500,000 (2014). SPb: VSEGEI: 15 sheets.

[2] Metallogenic map of Northern-Central-Eastern Asia and Adjacent Areas, 1:2,500,000 (2014). SPb: VSEGEI: 15 sheets.