



## Zoning of the Circumpolar Region after the potential fields character

T. Litvinova, S. Kashubin , and O. Petrov

Russia Geological research Institute, regional geophysics, St. Petersburg, Russian Federation (tamara\_litvinova@vsegei.ru)

Basic digital maps of the magnetic anomaly and gravity fields of Arctic, compiled as a part of the international project [Gaina et al., 2011], were updated in the Russian part of the region in 2010-2011. Zoning of anomalous potential fields in Arctic using updated Russian digital mapping projects was made.

Main tasks are: 1 – substantiation of the types and boundaries of geological structures in the Circumpolar Region after the character of magnetic anomaly and gravity fields; 2 - analysis and comparison of the magnetic anomaly and gravity fields within the Arctic Basin and its continental margins in order to reveal similarities in the character of potential fields and tectonic structures.

Analysis was performed visually using GIS ESRI ArcMap v.9.3. Previously, all digital materials on anomalous magnetic field and anomalous gravity field were compiled into a single project jointly with auxiliary materials: geological map, map of surface topography and ocean depths, map of sedimentary cover, map of crustal thickness, and fragments of different-scale tectonic maps available for the Circumpolar Region.

When delineating areas, the following ranking system (in decreasing order) was accepted: anomalous province, anomalous area, and anomalous district.

Anomalous provinces represent the largest areas of anomalous fields, characterized by a common morphostructural plan. Typically, they correspond to global objects, such as continents, oceans or their considerable parts.

Anomalous areas within the provinces correspond to major territories with their own specific features (first of all, they differ from each other in amplitude-frequency characteristics and in anomaly configuration), but at the same time preserving main features within the distinguished area. In the tectonic sense, they correspond to regional geological elements such as platforms, oceanic basins, large folded areas, etc.

Anomalous districts within anomalous areas correspond to groups of anomalies presumably of the same origin, and therefore have similar characteristics. In the tectonic sense, they correspond to geological objects such as shields, plates, individual fold belts, sedimentary basins, etc.

The following features are taken as a basis for anomalous fields typification: field morphostructure, intensity, and anomaly sign. Digital coding of six types of anomalous fields morphostructures and six types of combinations of intensity and anomaly sign is proposed.

As a result of this work, an integrated scheme of potential fields zoning in the Circumpolar Arctic linked with the tectonic zoning scheme was created.