Multiscale Hypsometric Map of Russia and Contiguous Territories

Timofey E. Samsonov, Aigul R. Khaliullina; tsamsonov@geogr.msu.ru
Lomonosov Moscow State University, Faculty of Geography, Russia

Earth surface can be treated as a system of relief forms of different horizontal and vertical extents, varying from tiny biogenic to large continental landforms. These forms comprise partonomic hierarchy. Geomorphological zoning supplements this concept by adding geographical and genetic context to it. In Russian mapping a geomorphological zoning by S.S.Voskresensky (1980) is popular which subdivides the relief into countries, districts, provinces and areas.

Hypsometric representation of relief allows depiction of only certain level of detail. Multiscale hypsometric mapping extends traditional hypsometric approach into multiscale environment. Using a multiscale modeling the full complex system of relief forms can be presented and investigated with each level of detail focusing on certain structural level of Earth's relief. The user can change the scale of the map, and hypsometric scale and the content of the map is adjusted accordingly. This requires the development of the specific two-dimensional color scales, in which the height changes in the Y direction while the scale holds the X-axis. A gradual transition between scales is implemented. Every level of detail is supported by digital elevation model structural generalization.

In this paper we present results of development of multiscale hypsometric map of Russia and contiguous territories with scale range from 1:500 000 to 1:50 000 000. Additionally to hypsometric layer and base layers, the map includes Voskresensky geomorphological zoning and the borders of glaciation eras. Every element of geomorphological zoning is supplemented by detailed description. Elementary analysis can be performed to obtain additional information such as height profiles, watersheds and slope angles. The map can be used as cartographic encyclopedia of Russian relief that represents its main structural patterns on several levels of detail.