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Main features of the Eurasian continental margin morphological structure in the Arctic Ocean

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The Eurasian continental margin including adjacent parts of the Lomonosov Ridge, Podvodnikov Basin, Mendeleev Rise, Nansen and Amundsen basins is characterized by complicated seabed surface. The main morphological features of the Arctic Ocean bathymetry have been generalized in the geomorphological map 1:5000000 scale. The map is based on the IBCAO v.3.0 grid adjusted with the results of Russian multi-beam and single-beam surveys.
The boundaries of the morphological elements were delineated mainly along the maximum changes of the surface profile gradient of the seabed, regardless of absolute inclination. Map legend is divided into two major sections: the continental margin and ocean floor. The first one includes shelfs, slopes and rises; the second includes abyssal plains and mid-oceanic ridge.
Main positive and negative elements of the bathymetry are shown on the shelf plains: the rises include plateaus, banks, hills and the depressions include troughs, basins. The morphological structure of the continental slopes has been studied in detail for defining the outer limit of the shelf. Two types of slope were indicated: simple and complex.
The slopes of simple structure stretch along the shelf edge in the Barents, Kara and Laptev seas. They begin at the shelf edge and without significant complication of bathymetry are traced down to the rise, and in its absence – to the abyssal plains. The inclination angles of the simple slopes are usually more than 0.7°, though in some cases may be less. Submarine valleys and shelf troughs are observed on the slopes of simple structure. The width of the slopes of this type is relatively short and typically reaches 70-150 km.
The slopes of complex structure extend along the East Siberian and Chukchi shelves. They are characterized by a variety of forms complicating the bathymetry: plateaus, terraces, hills, ridges, saddles, valleys, troughs, channels. The inclined surfaces of these forms facing the direction of depth increase are of different heights and steepness. They are regarded as intermediate segments of a dissected slope, covering everything of the morphological structures between the shelf edge limiting from above the inner slope, and the base of the outer slope, which lies on the rise or is immediately adjacent to the abyssal plain of the ocean floor (for example, the Podvodnikov Basin).
The Lomonosov Ridge in the junction zone with the Eurasia shelf is complicated with a saddle, which is a horst in excess of 1400 m and 1000 m to the Amundsen and Podvodnikov basins level respectively.
The Eurasian shelf is connected northwards with a gentle slope across a wide terrace with the Mendeleev Rise. The Mendeleev Rise along the strike is represented by a series of terraces complicated with low-amplitude isolated rises with the height to 1.5 km below sea level.
The Lomonosov Ridge, Podvodnikov Basin and Mendeleev Rise morphologically belong to the continental margin which is characterized by a “dismembered” slope. The Lomonosov Ridge and Mendeleev Rise are within the FOS and identified as a submarine elevations that are natural morphological components of the continental margin.