

**COMPILATION OF GENERAL BASE MAP
"RUSSIA AND NEIGHBOURING STATES"**

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Abstract

Special features and main characteristics of new review general geographic map of Russia and neighbouring states are examined in this report.

1 General Information

At present cartographic and geodetic services of Russian Federation, Belorussia and Ukrain are preparing a general base map "Russia and Neighbouring States" scaled 1:2 500 000. It is a new version of map of Russia and other states appeared at the territory of the Soviet Union. It meets all the modern requirements in methodology, content and technology.

The "base map" term points out at universality of the source geographical base which can be modified in various ways preserving predetermined generalization features.

2 Research and Experiments

Elaboration of map content and methods of its compilation were headed by the author. It called for a number of scientific, experimental and methodological works which resulted in:

- elaboration of a new analytical projection with smooth distribution of permissible distortions all over the whole territory to be mapped;
- division into districts of Russia and neighbouring states according to density of settlements, fluvial net, automobile roads and railways, horizontal subdivision of topography, providing differentiated standard-qualification indices for selection of features to be mapped;
- a new method of compilation of land topography and sea-bottom features, which facilitated portraying peculiarities of each type of topography;
- an original method and technology of map compilation

using material of space photoimagery;

- a unified system of conventional signs fit for their digital representation and reproduction, development of cartographic base maps for neighbouring scales of maps by a photo-mechanic method, with possible microfilm production of map originals;

- a technology for preparation of maps for printing providing an optimum number of map originals to print base maps for various thematic maps.

Due to unified principles laid as a base for this map, it fits for various studies and comparison of physio-geographic, political and economic features of CIS countries and neighbouring territories.

Latest editions of maps at 1:1 000 000 and 1:500 000 scales, hydrographic and bathimetric charts, foreign cartographic products, space remote sensing imagery, permanently revised maps and reference and statistic materials were used for map compilation.

3 Mathematical Base

A normal conical equidistance projection with the least declination of scale logarithm along parallels from zero and the least extreme declination of angles was used for the map. It was elaborated by the author. Difference with the projection used for USSR map is that here the scale along meridians was taken to be one unit and lines, areas and angles distortions decreased considerably within the continental part of territory to be mapped, Thus they were about 3% and $1,5^{\circ}$ correspondingly, which is less than permissible limits of distortions for small-scale scientific-reference maps. Because of this the projection can be used not only for mapping territories of CIS countries as a whole, but also for maps of separate states, groups of states, physio-geographic and economic regions.

4 Map Content

4.1 Settlements

Settlements are plotted on the map in accordance with their types, number of habitants (population), and their political-administrative value.

Towns, settlements of urban type and rural settlements

are signed with different scripts used for their names. Classification used in statistics of many countries was taken as a base for population scale; it is the same as that used in topographic maps and foreign cartographic products. Special symbols are used for capitals of countries, first order administrative centres, and at CIS countries' second order centres as well.

Map load with settlements was based on data of special district division of territory to be mapped, according to the density of settlements. The selected map load quota allowed to plot from 15 to 40% of the main settlements in areas with dense and medium population (as for topographic maps of 1:1 000 000 scale, there are from 50 to 70%). At the rest of the territory all the main settlements were plotted, and from 40 to 100% of all the settlements.

4.2 Hidrographic Features

Hidrographic features at the map are plotted with considerable details.

District division of the territory to be mapped according to the density of fluvial net facilitated correct featuring of the fluvial net as a whole and by fluvial bassins. As a result fluvial net was plotted featuring 30% more rivers than on USSR maps of the same scale at areas with dense and very dense fluvial net. Rivers wide enough to be plotted at the map scale are shown by lines with actual shore configuration.

Navigated channels are all plotted on the map. Out of channels for land reclamation channels 20m wide and more are plotted on the map, as well as smaller channels at dry lands and swamps where they are featuring landscape and irrigation system.

Rapids and waterfalls are plotted on the map according to reference books and tourist maps. In dry areas wells are plotted on the map.

4.3 Transport

Railways are divided into two categories (main ones and others), automobile roads are subdivided into three categories (highways, main roads and others).

Selection of railways and autoroads was based on data of special district division by density of railways and

autoroads. Railways are plotted all, except short sidings in the areas with dense network of railways. Selection of autoroads was done mainly in regions with dense road network, out of other roads.

Tunnels longer than 7 km and sea railway ferries are shown on the map.

Sea ports and main navigation routes including coastwise navigation are plotted with distances between ports. Navigated rivers and channels are shown with special symbols. Selected piers are plotted on navigated rivers, depending on their value and transportation systems available at this area.

Air transportation system is represented by special symbols of international airports.

4.4 Topography and Soils

Land topography is plotted with contour lines in combination with symbols of dry river-beds, volcanoes, escarps, precipices, glaciers and it is supplemented with inscriptions of altitudes, contour lines and proper names of orographic features.

To plot the topography with contour lines the following contour intervals were chosen (in meters): -200 and lower - 100 - 50 - 0 - 50 - 100 - 150 - 200 - 250 - 300 - 400 - 500 - 750 - 1000 - 1250 - 1500 - 1750 - 2000 - 2500 - 3000 - 3500 - 4000 - 4500 - 5000 - 6000 - 7000 and higher.

To plot sea bottom topography the following contour intervals were used (in meters): 0 - 50 - 100 - 200 - 500 - and further on in 500 m up to 8000 m.

Soils are featured by swamps, salt-marshes and sands. If they have proper names, they are inscribed on the map.

4.5 Boundaries

National boundaries, boundaries of subjects of the Russian Federation, administrative boundaries of districts of the first order at territories of other states are plotted on the map, as well as boundaries of protected woodlands and national parks.

The boundaries are plotted using official documents.

5 Publication of the map

Map of Russia and neighbouring states is planned for publication in 1996. Exclusive rights for distribution of the map in other countries belongs to the Federal Service of Geodesy and Cartography of Russia.

There will be four versions of the map on 16 sheets.

Version I - Reference general geographic review map with colored coating of land topography and sea bed. There will be detailed information about settlements, political-administrative division of states, transport, hydrography, soils, orographic features, national parks and protected woodlands. There will be an index of geographical names. The map will be printed in 14 colours.

Version II - Base map for thematic maps with maximum of general geographic features, that is it will be a basic version of general geographic map. This version will be a base for political-administrative maps, maps of land use, maps of medical geography, maps of radio-active pollution, as well as for small-scale general geographic maps and for wall educational maps. It will be printed in 6 colours.

Version III - Base map for thematic maps of environment (without transport network and geographical names). The topography will be printed in blue color. It will be a base for geological maps, environmental maps, soil maps, hydrological, geobotanic, zoogeographical and other types of maps. It will be printed in 4 colours.

Version IV - Base map for social-economic maps (without orographic features and geographical names). This version will be used for compilation of maps of industrial features, trade, transport network, census maps and the like. It will be printed in 4 colours.

The base maps can be used not only in the given arrangement, but in any other format using assembly of two or several map sheets, or a part of one sheet. Thus one can form maps of states, groups of states, administrative districts, economical and physiogeographic regions.

As the map has a great value for thematic mapping, there will be a digital version of the map as well.