

FINAL REPORT

on

Creation of GIS for Amur River Basin
“Land use sketch map for 1930th”, Scale: 1:2 500 000
(May, 2007 – March, 2008)

Materials and methods. The map is compiled on the base of the analysis of topographical sheets of the various scale compiled for of the Amur River watershed mainly in the 1930-1940s of the last century in different countries. Maps of various scale are used (1: 100, 000; 1: 200,000; 1: 250, 000; 1: 300, 000; 1: 420, 000 (10 versts in inch), 1: 1, 000, 000). The total makes up 1,327 topographical sheets (the total volume of files of scanned maps is more than 120 Gb).

The map of land use on the Chinese part of the watershed is compiled on the base of the analysis of topographical sheets (1:100, 000 in scale), which were compiled for the territory of Manchuria in 1930-th by the General Staff of Kvantunsky army of Japan. It is certified by the General Staff of military-air forces of the USA on the basis of the analysis of topographic maps of the scale 1: 250, 000 made for the territory of Manchuria in the 1949-1952s. Being published in the USSR in the 1930 – 1940s of the 20th century, quadrangles (Scale 1: 100, 000 - 1: 1, 000,000) were also used for the boundary forest areas of China.

The Mongolian part of the watershed is characterized on the basis of the analysis of topographic maps of scale 1: 100, 000, 1: 200, 000, 1: 1 000, 000 compiled in the USSR in the 1930-1940s. A part of maps of scale 1: 200, 000 has been republished in the early-mid of the 1950s of the last century on the basis of the maps of scale 1: 100, 000, which were compiled in the late 1930s - the early 1940s of the 20th century.

To compile a map on land use of the Russian part of the Amur River watershed, the maps of scale 1: 100, 000; 1: 200,000; 1: 300, 000; 1: 420, 000 (10 versts in inch), and 1: 1 000, 000 were analyzed. The part of maps of scale 1: 100, 000 and 1: 300, 000 was published in the 1950s. Such maps were used only for underdeveloped territories.

The map on land use is compiled by means of GIS-PROGRAM ArcView 3.3. Coverings Arc/INFO with topology construction are formed. Attributive tables of properties, which reflect the names of types of land use and their digital coding, are created. According to a resulting scale (1: 2,5mln.), the objects with the area of 40 and more km² (that corresponds approximately to 2x3 mm on the map) and with the width - 2.5 km (that corresponds to 1, 0 mm on the map) were shown on the map.

A legend. According to a technical task, the following classes and types of land use should be shown on the map:

1. Forest lands: coniferous forests, mixed forests, deciduous forests, shrubs and sparse forests, other forest lands;
2. Meadows;
3. Agricultural lands: paddy fields, arable lands;
4. Water objects: channels, lakes, reservoirs, wide rivers, wetlands;
5. Large settlements;
6. Unused lands.

However the analysis of information containing on maps allowed us with sufficient degree of reliability to identify not 15 types of land use but 20. In addition, the following types are identified: sparse forests, shrubs, shrubs and meadows, felling areas, burnt forests, waste lands, mountain tundra, steppes, salt licks, and sandy lands.

Discussion of results. It is necessary to notice that the legends of the topographic maps published in Japan and in the USSR are essentially different. The legends of the Japanese maps are more detailed especially for the developed agricultural areas and they identify arable lands, rice fields, gardens, plantings of Manchurian millet. With the exception of only some topographical sheets for the Mongolian part of the basin and the Chita Oblast in the steppe areas where arable lands are shown, these types of land use are practically not shown on the maps of scale 1: 100, 000 published in the USSR. At the same time it is necessary to mention that the system of conventional signs (legend) for topographic maps for the territory of Manchuria is more complex and is non-uniform. So, for example, even on different maps of a Manchurian series the conventional signs characterizing wetlands or bushes are different.

The area of the separate fields occupied with arable lands and paddy fields makes up less than 40 km². Such ranges are not shown on the map of scale 1: 2, 500, 000. In this case it is necessary to take into account that paddy fields of the small size dominate.

The Japanese maps for flat territories that were economically developed are distinguished with their accuracy and are compiled with a high degree of reliability. Therefore, the borders of agricultural territories are defined rather authentically. At the same time, topographic maps on mountain forest territories contain a lot of errors: in hydronetwork drawing, in width of river valleys, in border position forest-not forest territory, and in the characteristic of forests. Information for the neighboring lists often does not match each other properly that is especially seen on the types of a vegetative cover.

For the Russian and Mongolian parts of the watershed with high degree of reliability the borders of forested territories, wetlands, burnt areas, felling areas, meadows, sparse forests, shrubs and sparse forests, shrubs, mountain tundra, steppes, salt licks, sand lands, water objects and large settlements are defined.

In most cases the borders of the types of forest lands (the coniferous, mixed and deciduous forests) have a presumptive character (for the whole watershed).

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