GIS Mapping of the Ecosystems of the Caspian Region

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At the present time, when the problems of protection of natural ecosystems became pressing, the use GIS technologies is specially effective for their solving.

We accomplished the GIS mapping of the ecosystems of the Caspian region. The region under consideration borders the Caspian Sea in the North (from Terek river on the west coast up to Karabogaz-Gulf on the east coast) and takes up the position in two arid areas: the Eurasian steppe and the Sakhara-Gobi desert ones. From the North to the South 2 steppe subzones and 3 desert subzones change each other.

The series of maps was worked out: the map of natural ecosystems; the map of ecotypes; the map of vegetation types; the map of transformed ecosystems. Attributive information includes several data bases (DB). DB on ecosystems embrace the materials concerning the zonal position and biodiversity. DB on ecotypes contains the date on soil types, mechanical texture of soils, the degree of soil salinity, stability of sands, and floristic composition of vegetation. There is DB including the list of vegetation formations, playing a vital part in vegetation cover of the region; in this DB the materials on ecological range of each formation are available, date on its distribution within the limits of the region on a whole and within the separate subbzones. The latter DB contains types of anthropogenic influence and data on the degree of influence of the each type, also the indices of the transformation degree of natural ecosystems.

Analytic electronic maps may be used as information-inquiry supplies, but the main task of their creation is modelling on their basement GIS-systems for organization of the rational land-tenure in the Caspian region. At the present time the system of land-tenure in main cases leans upon not on natural regularities of ecosystems but on accidental factors. At modelling it is necessary to take into attention the specificity of the region reflected in analytic maps and includes in DB. For instance, within the limits of the Caspian deserts the psammophytic and hemipsammophytic ecotypes dominate. They are being transformed the most rapidly under land-tenure and this process is supported and strengthened by unfavourable weather conditions at later time. So, the strengthening of pasture impact leads to origin of unstable sands which will be dispersed further by the strong winds. Thus, these lands would not to be used for intensive pastures.