



## **Computer technology for an estimation of flooding zones**

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Experimental computer technology for an estimation of flooding zones provides an opportunity for decision of the following problems: joint display of a matrix of relief heights, orthophotoplanes and vector layers of the data on area; the virtual three-dimensional analysis of predicted flooding zones from various positions and under different corner of sight; calculation of predicted areas of flooding zones and volumes of water on them.

Satellite images of high resolution (2 m); digital vector large-scale maps (1:25000), digital elevation model (DEM) were used as input information. DEM with resolution of 2 m in a plan was created on the basis of software ARC/INFO and ERDAS.

Extensions ERDAS IMAGINE Virtual GIS and 3D Analyst of ArcView GIS were applied for visualization of the satellite images and digital elevation model. From the prepared raster satellite images (orthophotomaps) and DEM the three-dimensional (3D) virtual model of area was created which can be add by vector layers. Technological process of estimation of predicted flooding zones consists of the following stages: creation of the three-dimensional model of area, creation of predicted water layer, the visual analysis of 3D flooding zones, calculation of characteristics of flooding zones (area and water volume).

For the more detailed analysis of flooding zones the houses from plan-schemes of settlements are put on three-dimensional model of area, and the database on the population in these houses is formed. To find out what houses lay below predicted water level, the inquiry is under construction in the GIS, the connection with database on population is carried out and the table with addresses of houses, surnames of responsible tenants and amount of the population living in them is given out.

Results of simulation of flooding zones were used in decisions-making system of water resources management in operative practice for the Volga river basin.