Geophysical Research Abstracts, Vol. 8, 00688, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00688

Computer technology for modeling flood protective waterworks

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Computer technology for modelling flooding zones at high water levels and modelling of protective waterworks provides an opportunity to decide the following tasks: simulation of water level rising and estimation of flooding zones, simulation of consequences of waterworks (dams) limiting flooding of territory.

Process of modelling consists of the following stages: a) creation of terrain digital elevation model (DEM) using satellite stereograms of high resolution and large-scale maps on the basis of software ERDAS IMAGINE, b) calculation and analysis of a terrain model in view of flooding at given water level, c) receptions of data on the population living in territory, subject to flooding, d) visual planning and modelling a protective dam as new DEM, e) control of expediency of a protective dam by means of calculation of the flooding area with account of created new DEM.

Digital elevation model, multispectral images of 2 m resolution and topographical maps are used as initial data for modelling protective waterworks. Spatial Analyst Arc View module is used for modelling rising of water level and estimation of flooding zones. It is possible to use 3D Analyst ArcView module for creation more realistic picture since 3D models facilitate viewed control of planning and acceptance of decisions.

Developed technology is intended for the express - evaluation of efficiency of possible flood protective waterworks and minimization of economic damage from high water levels and flooding. This technology can be used for information support of decision making persons for protection of population against flooding in extraordinary situations, and also as training program for students and designers in the field of hydraulic engineering.