

GIS FOR CRYOSPHERE STUDIES

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Cryosphere is one of the Earth's spheres between the atmosphere, hydrosphere and lithosphere, where negative or zero temperatures prevail and water is present in solid or supercooled state. The basic components of the cryosphere are snow cover, glaciers, ice sheets, sea ices and icebergs, permafrost, river and lake ice and aufeis (naleds).

The Earth history is intimately linked with the natural processes running within the cryosphere itself and in its interaction with the atmosphere, hydrosphere and the land surface. However, many processes of such interaction as well as consequences of them are still not sufficiently studied. Note, that the natural ices themselves are rather changeable, and under conditions of the global warming serious changes proceed in the cryosphere whose results are of the global scale (sea level rise, permafrost degradation, etc.). Prediction of future state of the environment, in particular functioning of the climate system, can not be understood without thorough analysis of the cryospheric processes.

Substantial and rapid environment changes request methods which could manage a huge information flow, optimize the processes of data acquisition, data storage, data analysis and exchange. Such facilities could be given by GIS technologies. Digital data bases serve as a key component of GIS methods. We present the system of cryo data management, developed in the Institute of Geography RAS. The system provides cryo data access, generates an environment for scientific problem solving, gives opportunity to use GIS techniques for cryo data analysis. Digital Atlas "Snow and Ice on the Earth" is a base structure which arranges cryo knowledge and cryo data on global and regional levels. Thematic and regional data bases make it possible to create GIS models and to analyze interrelations, status and dynamics of cryo systems components. The system of links provides an access to distributed cryo info resources, which is a key for coordination research.