NUMERICAL MODELS OF POLLUTION FROM INDUSTRY SOURCES IN THE NOVOSIBIRSK CITY BY GIS METHODS.

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In the industrial cities of site contamination comes from multiple sources: industrial plants, highways, power plants. Aerosol transfer of pollutants that enter the atmosphere as emissions forms a complex anomaly in the city and beyond. It is important that the transport of contaminants occurs in the form of particulate matter, and in the form of water-soluble phases. In general, aerosol anomalies are determined to change the geochemical composition of soils, or contamination is captured by air filters. In Russia (where snow cover is present 5 months in the year) delineation of anomalies is easily done on the snow composition. A snow cover research is convenient and economic way of acquisition of data about receipt of pollutants from atmosphere on underlying surface. It is shown that snow is suit as a natural plane table store as a dust, macrocomponents, heavy metals, polycyclic aromatic hydrocarbons etc.

The aim of the study was to examine the chemical composition of snow cover in areas with sources of pollution and build a numerical model of local pollution from the CHP-3, CHP-3, CHP-5 Novosibirsk city and regional pollution from the city as a whole. To construct the numerical models of dust aerosol pollution have been used methods of solving inverse problems of pollutant transport. This allows for a very limited number of sampling points to retrieve information about the sources of impurity and about fields of aerosol pollution areas. Simulation of impurities field distribution was performed by using chemical analytical data and physical laws about the processes of aerosol spreading. This approach makes it possible to assess the information content of observing systems and to optimize the location and number of sampling points.

In the area of each pollution source were selected 7-10 samples, the direction of the route of sampling coincided with the prevailing wind direction typical for the winter season in the surface layer of the Novosibirsk atmosphere. Modeling was carried out in several stages. Initially the regression dependence of the pollution distribution along the sampling route was build. Next position of nodes of regular grid (x, y coordinates) was calculated. Coordinate z (pollution at the grid points) was funded by multiplying the resulting regression depending on the winter wind rose typical of the region under study. To obtain a raster model was interpolated regular grid IDW method.

The obtained patterns indicate the possibility of creating economic system for monitoring and receiving on its base assessment of long-term contamination of the atmosphere of the city and determine the characteristic emission of impurities from its territory.