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Information technologies for control and management of environmental water quality

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For solving the problems of study, analysis and quality management of the environment there is ne¬ce¬ssary operatively to treat great amount of measuring information on physical, chemical and biological parameters characteristic for them. To do it in a proper way is possible only by wide use of modern mathematical methods and computers. For this purpose, it is necessary to develop automated systems and universal program packages with modern mathematical methods consisting of self-learning algorithms requiring minimal a prior information and having capability of adaptation to the most unexpected changes of the character of the investigated objects. Among the most topical problems of monitoring of a natural water environment it is necessary to develop: the automated water quality control systems for operative control and management of water pollution level; simulation of pollutants transferring in water objects; methods of making decisions about condition of controlled objects and processes taking place in them; identification of sources of emergency pollution. These problems are especially urgent in urban conditions because great number of sources of pollution exist. Their so¬lution is of great ecological and economical significance which makes possible to investigate the effect of different sources of pollution on ecological object separately from each other, as well as jointly, to predict out¬comes of such an impact and consequences of the nature protection measures against the sources of pollution. They are also actual for large plants and factories having biochemical clearing of sewages, on their design and ecological safe operation. The following systems developed by author for solving noted problems are considered in the paper: automated water quality control system, program packages of mathematical models of pollutants transport in rivers and automatic detection of river water excessive pollution sources.

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