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MODEL MONITORING OF POLLUTANTS IN THE ENVIRONMENT

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The system of monitoring of the environment is characterized by the lack of a systematic approach to the analysis of the state of natural reservoirs, as well as the accurate and operative measurement of the qualitative and quantitative indicators of environmental safety of the hydrosphere. Modelling and forecasting as components of state of natural and engineering water drainage systems in the presence of pollution sources (natural and anthropogenic) have exceptional importance. On the one hand, while designing industrial enterprises, transport highways, storages of toxic waste, landfills, etc. it is necessary to assess the future impact of these objects on the environmental state, using adequate models of distribution, migration and metabolism of pollution in the average conditions of the operation of these objects throughout the term of their work. On the other hand, using appropriate models can help to identify risks in the event of natural or man-made disasters and formulate scenarios for the elimination of the consequences of such accidents. Finally, the simulation of pollution spreading processes and the interaction of several existing pollution sources can help to determine source contribution to the actual environmental state and propose measures to compensate or minimize this impact. In addition, using

distribution models and accumulation of contaminants can determine both the maximum terms of enterprises operation that pollute the environment and the environmental capacity of water ecosystem and ways to increase it.

The tasks for the successful environmental monitoring to be solved are selection (development) of mathematical models that adequately reproduce processes of: distribution of pollution of different types, their possible forms of existence, different conditions and landscapes; pollution metabolism (processes of transition of contamination, the accumulation effect etc.); the specific conditions of the environment in which the migration or metabolism of pollution occurs; models of natural or artificial barriers that are able to delay, slow down or fix the distribution of pollution; scenarios for which emergency emissions or discharges can occur and appropriate measures to minimize the consequences of such emissions.

It is necessary to determine the relationship between the understanding of the processes that determine the sensitivity of factors relevant to the dynamics of processes and degree of adequacy, authenticity and uniqueness of this reaction to influences (Fig. 1).

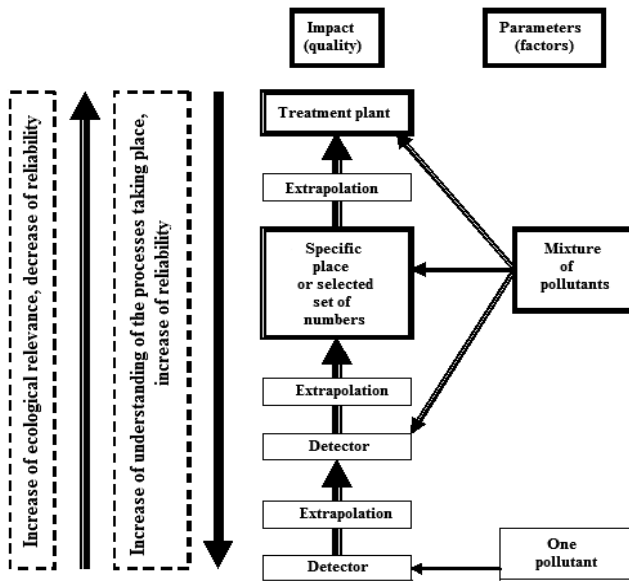


Fig.1. Connection between understanding of processes, reliability and relevancy

Such a connection can be represented as a sequential transition from one single factor and one parameter with one connection to a complex system under the conditions of a number of factors, parameters and relationships that can be combined between certain extrapolation procedures.