

THE FORECASTING OF HYDROLOGICAL CATASTROPHES IN GLOBAL CHANGES

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Every natural process may be separated on four additions:

1. Deterministic component described by differential equations;
2. Stochastic component having a clear period of fluctuation, a physic reasons of which is unknown;
3. Deterministic component having extremely small inertia; this component is not to be forecasted;
4. Noises.

The following principles of the forecasting of catastrophes to be offered: a) Real process may be considered as a combination of known deterministic process, unknown periodic one, and noises; b) This combination must be described correctly by the forecasting model which must be robust; c) Correct forecast of extreme hydrological events cannot be deterministic; and finally d) As parameters of model cease to be adequacy reflection of their natural prototypes, the non-parametric methods of determination of latent trends are preferable. Offered scheme may be used for both short-term and long-term forecasting as follows:

1. Deterministic differential equation of the first moment;
2. Non-parametric method of accounting of unknown factors;
3. Stochastic differential equation for an analysis of unknown components of stuied process or residuals.

As a result, we have the equations for the mode of the forecasted probability distribution, which compose the Unified Stochastic Self-Training Procedure. It gave more then 50 successful forecasts of disastrous floods and droughts. This gives ground to propose the USSTP for its application in Global changes.