

Freshwater quality monitoring systems: ways towards improvements

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Abstract Investigation and management of the quality of freshwater resources require data on the status of aquatic environments. These data are traditionally collected by routine monitoring systems which are supported by federal and/or local governments operating under limited budgets. This makes the optimization of water quality monitoring systems, in general, and monitoring designs, in particular, an urgent issue. The paper presents a model-driven approach to the development of efficient multi-parameter temporal designs for stream monitoring systems. The approach is based on an operation research model developed using cost-effectiveness analysis and non-linear regression models describing multi-parameter interactions. The developed model does not require site specific parameterization other than a series of water constituent concentrations measured at a given observation site. This approach was tested on a small river with a highly urbanized watershed and the results were compared with existing monitoring programmes.

Key words freshwater quality; monitoring designs; model driven approach; constraint optimization; rivers