

Development and Implementation of an Early Warning System for Environmental Hazards Dedicated to Users and Administrators of Public Recreational and Sports Facilities

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The Doctoral Thesis addresses the issue of pollution occurring in the area of anthropogenic recreational water reservoirs and the expected - from the point of view of the administrators of these facilities - acceptable levels of threats to users. The author attempted to develop a proposal for standards of hazard identification for the model object - anthropogenic Sosina water reservoir in Jaworzno - based on the obtained research results.

The choice of scientific issues and implementation goals was dictated by a loophole in the Polish legal system, which not only indicates to the managers of recreational water reservoirs, especially those created in post-mining areas, the recommended levels of pollution, but also does not specify in any way how to identify them. It is also not insignificant that so far, no local government unit has undertaken the development and introduction of a permanent monitoring system for key environmental parameters, which at the same time would be an early warning system for potential threats.

The implementation part of the work was devoted to the preparation of assumptions and development of a tool analysing the key parameters of the identified threats, the preparation of an application for desktop and mobile devices allowing visualization of the results. The third implementation task was the preparation of a catalogue of good practices for managers and a catalogue of expected behaviours for users.

For the purposes of the doctoral thesis, legal instruments - both domestic and international - relating to the identification of environmental hazards within anthropogenic water bodies used as bathing beaches and the obligations of administrators of such facilities were thoroughly analysed. Laws relating to three areas: water, soil and air were reviewed.

As part of the scientific part of the doctorate, physical-chemical and biological analyses of water, petrographic analyses of beach sands including biological elements, and assessment of air pollution by particulate matter combined with monitoring of weather parameters were carried out in 2019-2022. The results obtained were analysed and then the key parameters indicating the dangers to people using the reservoir were determined - from all the areas studied. It was indicated what is the permissible, safe for users and acceptable by the administrator of the reservoir level of hazards in individual environments (water, beach sand, air), after exceeding which remedial action should be taken immediately.